

DURBAN UNIVERSITY OF TECHNOLOGY

**ENHANCING SOUTH AFRICAN MATERNAL CARE WITHIN THE
PUBLIC HEALTH SYSTEM: A CASE OF STILLBIRTHS IN THE
LEJWELEPUTSWA DISTRICT MUNICIPALITY**

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**ENHANCING SOUTH AFRICAN MATERNAL CARE WITHIN THE PUBLIC HEALTH
SYSTEM: A CASE OF STILLBIRTHS IN THE LEJWELEPUTSWA DISTRICT
MUNICIPALITY**

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degree of **Doctor of Philosophy of Management Sciences**
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Business Administration
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SIMBARASHE MAGAISA

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Abstract

Maternal and perinatal health remain urgent public health concerns in South Africa, particularly in rural and underserved regions like the Lejweleputswa District of the Free State Province. Despite the presence of established maternal health policies, persistently high stillbirth rates expose deep-seated disparities in antenatal care quality and systemic inefficiencies within the public healthcare system. This study investigates the multifactorial causes of stillbirths in Lejweleputswa and proposes actionable strategies to strengthen maternal healthcare delivery and reduce preventable perinatal deaths.

The study pursued six key objectives: (a) to investigate the underlying causes and determinants of stillbirths in the district; (b) to examine the effect of socio-economic factors on antenatal care quality and stillbirth outcomes; (c) to assess awareness and utilization of antenatal and obstetric services; (d) to analyze healthcare providers' knowledge and practices regarding stillbirth prevention; (e) to evaluate maternal healthcare services, including infrastructure, staffing, and quality; and (f) to develop a model that addresses stillbirth risk factors.

A mixed-methods approach was adopted, combining quantitative data from 263 healthcare workers with qualitative interviews from midwives, nurses, and medical officers. The study validated a behavioral stillbirth prevention model anchored in the Andersen model of healthcare utilization using confirmatory factor analysis (CFA) and structural equation modeling (SEM). Quantitative findings highlighted significant links between stillbirth risk and maternal conditions such as hypertension, HIV, diabetes, and advanced maternal age. Socio-economic status and healthcare access were shown to shape ANC utilization. SEM analysis revealed that maternal healthcare attitudes significantly predicted ANC practices ($\beta = 0.551$, $p < 0.001$), which in turn influenced perceived service quality ($\beta = 0.587$, $p < 0.001$) and infant outcomes ($\beta = 0.240$, $p = 0.001$). Service quality itself strongly predicted infant outcomes ($\beta = 0.386$, $p < 0.001$). However, attitudes alone did not directly predict service quality, emphasizing the gap between knowledge and action. The qualitative insights revealed that health system inefficiencies, negative provider attitudes, cultural stigma, and financial barriers discourage early and consistent ANC attendance, despite relatively high levels of service awareness. The study concludes that stillbirth prevention requires integrated, multi-level strategies combining clinical, infrastructural, socio-economic, and culturally sensitive interventions to improve maternal and neonatal health outcomes in the district.

Declaration by student

I, Simbarashe Magaisa, declare that the work presented in this thesis results from my original research and efforts, except where specific acknowledgment has been made. This work contains no material that has been accepted for the award of any degree or diploma in my name at any university or other tertiary institution. To the best of my knowledge and belief, it contains no material previously published or written by another person, except where due reference has been made. All sources used have been properly acknowledged and referenced according to academic standards.

Simbarashe Magaisa

Signature:

Date: April 2025

Journal publication

Magaisa, S., & Dorasamy, D. N. (2024). Framework for Stillbirth, Maternal Morbidity, and Mortality Interventions in South Africa: A Systematic Literature Review using VOSViewer. *South Eastern European Journal of Public Health*, 254–268. <https://doi.org/10.70135/seejph.vi.1635>

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Dedication

This thesis is dedicated with deepest gratitude and love to my wife, Yvonne, whose unwavering support, patience, and encouragement have carried me through every challenge of this journey. To my beloved children, you are my daily inspiration and the reason I strive to be better every day.

To my sister, Lydia, and my brothers, Ashton and Philip, thank you for your constant motivation, love, and belief in my potential. To my dear parents, your sacrifices, prayers, and life lessons laid the foundation upon which this work is built. I owe it all to you.

To my friend, Pilot, thank you for your loyalty and words of wisdom in moments when I needed them most. To my spiritual guide, Rev. Luface, thank you for your prayers and for keeping my faith grounded throughout this journey.

Finally, to my supervisor, Professor Nirmala Dorasamy, your mentorship, patience, and dedication to academic excellence have shaped this work profoundly. Thank you for believing in me and guiding me with purpose and clarity.

This achievement is not mine alone—it belongs to all of you.

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Appendix 5: Statistician's Certificate

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STATISTICIAN CERTIFICATE

Date: 20 April 2025

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Faculty of Management Sciences, Durban University of Technology

PhD Thesis: **Enhancing South African maternal care within the public health system:
A case of stillbirth in the Lejweleputswa District Municipality**

I confirm that Mr Simbarashe Magaisa consulted me regarding his data analysis. I did his statistical work using both descriptive and inferential statistics. I attest that the statistical analysis conducted meets the post-graduate guidelines and addresses the research objectives.

Dr. SC Onwubu

20 April 2025

Per email

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Chapter One: Overview of the Research

1.1 INTRODUCTION

Maternal healthcare remains a critical component of public health systems worldwide, as it directly influences maternal and child mortality rates, two key indicators of a nation's health status (Souza *et al.* 2024a). South Africa, a nation renowned for its rich history and natural beauty, continues to grapple with significant challenges in its healthcare system, particularly in maternal and child health (Yuningsih, Yohandoko and Pirdaus 2024). Maternal and infant mortality rates remain elevated, exacerbated by inequitable access to healthcare services, low levels of education and awareness regarding reproductive health, as well as the ongoing issues of malnutrition and HIV/AIDS (Maswime *et al.* 2021; Adam and Daba 2024). According to Maswime *et al.* (2021), these factors collectively contribute to the country's struggle to improve health outcomes for mothers and children. In South Africa, maternal health has been a focal point of public health policy, yet challenges persist, particularly in under-resourced regions (Yuningsih, Yohandoko and Pirdaus 2024). In sub-Saharan Africa, stillbirth rates are high, with over 50% occurring in rural areas (Duke *et al.* 2022a). South Africa has experienced persistent stillbirth rates, with some improvements in certain provinces (Hlongwane *et al.* 2022a). According to Hlongwane *et al.* (2022a: 1), in South Africa (SA), approximately 16, 000 stillbirths occur annually.

Stillbirth remains a persistent and heart-wrenching challenge within the global public health landscape, particularly in low- and middle-income countries like South Africa. Defined as the death of a fetus at or after 28 weeks of gestation (World Health Organization 2024). According to the World Health Organization (2024), there are nearly two million stillbirths every year that is one every 16 seconds. Over 40% of all stillbirths occur during labor (Khalil *et al.* 2024; World Health Organization 2024). A loss that could be avoided with improved quality and respectful care during childbirth including routine monitoring and timely access to emergency obstetric care when required stillbirth is not only a personal tragedy for families but also an indicator of broader systemic issues within maternal healthcare (Khalil *et al.* 2024). Others define stillbirth as the death of a fetus after 20 weeks of gestation but before delivery, remains a significant public health issue worldwide (Murphy *et al.* 2022a). WHO recommends standardizing the international stillbirth definition for epidemiology studies, utilizing a birthweight of ≥ 1000 g and ≥ 28 weeks gestation (Kelly *et al.* 2021).

Every Newborn Action Plan (ENAP), launched in 2014 by WHO and UNICEF, aims to reduce preventable newborn deaths and stillbirths globally (Xu 2021; Datta, Ghosh and Aquino 2022). According to Quigley (2020), ENAP sets targets of fewer than 12 newborn deaths and stillbirths per 1000 births by 2030. Many low- and middle-income countries, including South Africa, have adopted newborn health policies aligned with ENAP, but implementation varies (Mary *et al.* 2023). Key strategies include improving the quality of care during pregnancy, childbirth, and the postnatal period (Organization 2016). According to Mirbaha-Hashemi *et al.* (2021a), challenges in scaling up newborn care include insufficient resources and skilled health professionals. WHO has developed comprehensive guidelines to improve maternal and newborn care quality, emphasizing both provision

and experience of care (Wojcieszek *et al.* 2023). Despite global advancements in maternal and neonatal health, South Africa continues to experience high rates of stillbirth, with substantial disparities across different provinces and municipalities (Mostert 2021).

1.2 BACKGROUND

The issue of maternal health remains a significant public health concern worldwide, with many countries striving to address disparities in maternal and neonatal outcomes. South Africa is no exception to this challenge, as maternal and neonatal health outcomes, particularly stillbirths, have been persistent concerns within the country. These issues are especially pronounced in rural and under-resourced areas (Yuningsih, Yohandoko and Pirdaus 2024). Despite efforts to reform healthcare and enhance service delivery, South Africa continues to face high rates of maternal mortality, perinatal mortality, and stillbirths, particularly in regions with limited access to quality healthcare (Mostert 2021). One such region is the Lejweleputswa District Municipality in the Free State Province, which is a focal point of concern due to its elevated rates of adverse maternal and neonatal outcomes (Lejweleputswa 2022).

The high levels of unemployment and financial insecurity in the district present additional barriers to accessing healthcare (Chinyakata, Roman and Msiza 2021; Gizaw, Astale and Kassie 2022b). According to Gizaw, Astale and Kassie (2022b), without a stable income, many women are unable to afford the transportation costs associated with traveling to healthcare facilities for routine check-ups, particularly in rural areas where health centers are often far from their homes. This results in delayed or missed antenatal visits, which are crucial for identifying and managing pregnancy complications (Chinyakata, Roman and Msiza 2021). The financial strain also extends to postnatal care, where women may face difficulties in securing proper nutrition and healthcare for themselves and their newborns after delivery (Mzazi 2022). The socio-economic challenges in Lejweleputswa are deeply intertwined with broader systemic inequalities within South Africa's healthcare system (Lejweleputswa 2022). While the National Department of Health has made significant efforts to improve maternal and child health outcomes across the country, the uneven distribution of resources between urban and rural areas has left many rural communities, such as those in Lejweleputswa, at a disadvantage (Baloyi 2021). According to Baloyi (2021), rural healthcare facilities often lack the same level of funding, infrastructure, and skilled healthcare personnel as those in urban centers, leading to significant disparities in the quality of care available to pregnant women. These systemic inequalities perpetuate a cycle of poor health outcomes, with rural women and their infants bearing a disproportionate share of the burden (Baloyi 2021; Motha 2022). Another factor contributing to the high rates of stillbirth and maternal mortality in Lejweleputswa is the lack of health education and awareness among the population (Kotzee *et al.* 2024b). Many women in rural districts, particularly those from disadvantaged backgrounds, have limited knowledge about the importance of antenatal care and the potential risks associated with pregnancy (Maluka *et al.* 2020; Tabiri *et al.* 2024). This lack of awareness can result in women not seeking medical care until late in their pregnancies or only attending health facilities when complications arise (Tabiri *et al.* 2024). In some cases, traditional beliefs and cultural practices may also play a role in discouraging women from accessing formal healthcare services, further compounding the problem (Msuya 2020).

Moreover, the health challenges in Lejweleputswa are exacerbated by high rates of preventable maternal health conditions such as infections, hypertension, and diabetes, which are common among women in the district due to the underlying socio-economic and healthcare system challenges (McCombe *et al.* 2021). According to Sikhosana *et al.* (2022), infections like syphilis and HIV, when untreated, significantly increase the risk of stillbirth. Hypertensive disorders such as pre-eclampsia and eclampsia are leading causes of maternal and perinatal mortality worldwide and are prevalent in regions like Lejweleputswa, where healthcare access is limited (Sikhosana *et al.* 2022). Managing these conditions requires consistent monitoring and timely medical interventions, often unavailable or delayed due to inadequate healthcare service delivery (Biadgo *et al.* 2019).

One of the most critical challenges facing the Lejweleputswa District Municipality is the inadequacy of healthcare infrastructure. Rural areas in the Free State Province, including Lejweleputswa, are marked by poorly equipped healthcare facilities and a chronic shortage of skilled healthcare personnel, creating significant obstacles to providing adequate maternal care (Sportlight 2021). According to Malakoane *et al.* (2020a), the underfunded and under-resourced nature of these facilities is a key driver of the high rates of maternal and neonatal mortality in the district. Essential healthcare infrastructure, including modern medical equipment, reliable transport for emergencies, and adequately staffed clinics, is severely lacking (Kruk *et al.* 2018a). According to Kruk *et al.* (2018a), these limitations are worsened by a shortage of medications and essential supplies, leading to inconsistent care for pregnant women and contributing to preventable complications. According to Malinga, du Preez and Rabie (2020), limited access to necessary medical supplies and maternal health services results in significant disparities in the quality of care available to pregnant women in rural areas like Lejweleputswa. Many healthcare facilities in the district do not have the resources to conduct regular prenatal screenings or to manage high-risk pregnancies effectively, which is crucial for the early detection of potential complications (Hlongwane 2022; Mohseni *et al.* 2023a). This lack of basic medical resources, combined with the overwhelming demand for maternal healthcare in under-resourced areas, contributes to an increase in adverse outcomes such as stillbirths and maternal deaths (Souza *et al.* 2024a).

The healthcare system in Lejweleputswa, like many other rural districts in South Africa, is frequently overwhelmed by the demand for care, leading to significant delays in receiving timely medical attention. These delays are especially harmful during pregnancy when conditions such as maternal infections, pre-eclampsia, and untreated gestational diabetes require prompt and specialized care to prevent complications. According to Marincowitz and Marincowitz (2024), delays in accessing care can lead to the worsening of these conditions, placing both the mother and the unborn child at increased risk of adverse outcomes, including stillbirth. Furthermore, Milton *et al.* (2022) noted that inconsistent access to antenatal care, a direct result of inadequate healthcare infrastructure, is a major contributor to poor maternal outcomes. Antenatal care is essential for the regular monitoring of pregnancy progress and the early detection of risk factors (Woldeamanuel and Belachew 2021). Without consistent and reliable access to such care, many women in Lejweleputswa do not receive the timely interventions needed to prevent life-threatening complications.

Inconsistent antenatal care is often due to the geographical and logistical challenges faced by rural women in accessing healthcare services (Afaya *et al.* 2020; Tshivhase *et al.* 2022). According to Afaya *et al.* (2020: 8), many women must travel long distances to reach healthcare facilities, and transportation options are frequently limited, making it difficult for them to attend regular check-ups. According to Dahab and Sakellariou (2020b: 3), one of the underlying causes of high maternal mortality in Low low-income countries (LICs) is barriers to accessing maternal health services. This issue is further compounded by the fact that many healthcare facilities are not adequately equipped to handle the large number of patients they receive, resulting in long waiting times and overburdened staff (Tshivhase *et al.* 2022). Regular antenatal visits are critical for identifying and managing potential complications early (Mostert 2021). In Lejweleputswa, the healthcare system's limitations prevent many women from receiving this vital care.

A key factor contributing to these issues is the shortage of healthcare professionals in the district, particularly those trained in maternal and neonatal care (Gumede, Taylor and Kvalsvig 2021). According to Gumede, Taylor and Kvalsvig (2021), rural healthcare facilities in South Africa often operate with insufficient staff, leading to an overextension of the existing workforce. Healthcare workers in these settings are frequently overstretched, making it difficult for them to provide the comprehensive care needed, especially for high-risk pregnancies. This shortage is particularly detrimental to maternal healthcare, where the availability of skilled personnel can be the difference between life and death (Mahada, Tshitangano and Mudau 2023b). High-risk pregnancies require specialized care that is often unavailable in rural facilities due to the absence of obstetricians and other healthcare professionals who are trained to handle complex cases (Backes *et al.* 2020). The scarcity of healthcare professionals in rural South Africa disproportionately affects women and children, as maternal and child health services are some of the most resource-intensive and require specialized expertise (Dahab and Sakellariou 2020b).

The unequal distribution of healthcare professionals in South Africa further compounds the issue, with urban centers receiving the majority of skilled healthcare workers (Maphumulo and Bhengu 2019b). Rural clinics and hospitals, on the other hand, are left under-staffed and ill-equipped to handle emergencies, particularly those involving maternal and neonatal health (Sumankuuro, Crockett and Wang 2018). This disparity is largely driven by the lack of incentives for healthcare professionals to work in rural areas, coupled with the challenging working conditions in these settings (Dahab and Sakellariou 2020a). Healthcare workers in rural districts like Lejweleputswa face long hours, insufficient support, and limited opportunities for professional development, making it difficult to attract and retain qualified personnel. This shortage of skilled healthcare workers is a critical issue in maternal care, where timely intervention is often essential to preventing complications during pregnancy and childbirth (Sahoo *et al.* 2021). The inability of healthcare facilities to provide consistent, high-quality care increases the likelihood of adverse outcomes such as stillbirth (Atkins *et al.* 2023d). For example, without adequate staff, pregnant women experiencing complications may not receive timely attention, leading to a worsening of their condition and potentially life-threatening consequences (Helou *et al.* 2021). The lack of skilled birth attendants is a major contributor to maternal and neonatal mortality, as

many women in rural areas are forced to give birth without the presence of a trained professional who can manage complications during delivery.

Socio-economic factors play a crucial role in shaping maternal health outcomes in the Lejweleputswa District Municipality, as they influence both access to healthcare and the overall well-being of pregnant women (Lejweleputswa 2022). Poverty, unemployment, and malnutrition are pervasive issues that create significant barriers for women attempting to access vital healthcare services (Plagerson 2023). For women living in impoverished conditions, seeking regular antenatal care is often a challenge, as financial constraints can limit their ability to afford the direct and indirect costs associated with healthcare (Dahab and Sakellariou 2020b). These indirect costs, which include transportation to health facilities, time off work, and childcare, are particularly burdensome for women in rural areas like Lejweleputswa (Fitzpatrick *et al.* 2023). As a result, many women delay or completely forgo essential antenatal visits, thereby increasing the likelihood of undetected pregnancy complications (Amponsah-Tabi *et al.* 2022).

The relationship between poverty and poor health outcomes is well-documented, and in Lejweleputswa, the situation is no different. Women who live in poverty are often undernourished and lack access to basic resources such as clean water, sanitation, and adequate housing (Shenoy *et al.* 2023). Malnutrition, in particular, is a significant risk factor for maternal and neonatal complications (Lassi *et al.* 2021b). According to UNICEF (2024), pregnant women who are malnourished are more likely to experience conditions such as anemia, preterm labor, and low birth weight in their infants, all of which increase the risk of stillbirth and other adverse pregnancy outcomes. Moreover, the high levels of unemployment in the district further exacerbate these challenges, as women without a stable source of income are less likely to afford healthcare services or proper nutrition during pregnancy (Murphy *et al.* 2022b).

The socio-economic challenges faced by women in rural districts are compounded by a lack of education and awareness regarding the importance of prenatal care, proper nutrition, and the early detection of pregnancy complications (Medicare and Services 2020). Low levels of education in rural areas significantly contribute to poor health literacy, which is a major barrier to improving maternal health outcomes (Sen *et al.* 2023). Women with limited education are less likely to understand the risks associated with certain pregnancy conditions or recognize the warning signs of complications (Medicare and Services 2020). This lack of health literacy often results in delays in seeking care, which can be detrimental, especially when complications such as pre-eclampsia, gestational diabetes, or infections require immediate medical attention (Tahira and Fatima 2024).

Additionally, health literacy challenges, cultural beliefs and practices surrounding pregnancy and childbirth also play a significant role in shaping women's health-seeking behaviors (Aynalem, Melesse and Bitewa 2023). In some communities within Lejweleputswa, traditional practices are deeply embedded, and many women rely on traditional birth attendants (TBAs) rather than formal healthcare services. While TBAs are respected and trusted within these communities, they often lack the medical training necessary to manage high-risk pregnancies or address complications during labor and delivery

(Aynalem, Melesse and Bitewa 2023; Felisian *et al.* 2023). This reliance on traditional care, coupled with limited access to formal healthcare, can lead to delayed treatment and increase the risk of adverse outcomes, including stillbirth (Felisian *et al.* 2023). In other instances, traditional gender roles and norms in rural areas may limit women's decision-making power regarding their own health. In some cases, pregnant women may need permission from their husbands or family members to seek medical care, which can lead to delays in accessing necessary services (Ouahid *et al.* 2023). This dynamic is particularly problematic when complications arise during pregnancy, as timely medical intervention is often critical for preventing stillbirths and maternal deaths.

Many women in Lejweleputswa live in remote villages or rural communities far from the nearest healthcare facility. The long distances they must travel to reach clinics or hospitals present a considerable logistical and financial challenge (Hub 2023). During routine antenatal visits, which are essential for monitoring the health of both the mother and the fetus, women in rural areas may need to arrange for private transportation or rely on community-based transport, both of which can be prohibitively expensive (Hlongwane *et al.* 2021). In regions where public transportation is available, it is often infrequent, poorly maintained, or unsafe, leading to additional delays (Ngubane 2021). In emergencies, such as when complications arise during labor, these delays can have fatal consequences, as timely access to obstetric care is critical to preventing maternal and neonatal deaths (Tiruneh *et al.* 2021). The difficulty in accessing transportation significantly reduces the likelihood of women receiving necessary medical care in time, increasing the risk of stillbirth and maternal mortality.

This challenge is further exacerbated by the economic disadvantages faced by many women in Lejweleputswa (Lejweleputswa 2022). According to Kotzee *et al.* (2024a), the district suffers from high levels of unemployment and poverty, which limit the ability of families to afford transportation or healthcare services. Financial constraints often force women to make difficult choices between seeking medical care and meeting other essential needs, such as food or housing (Reddy *et al.* 2020). The cost of traveling to distant healthcare facilities for routine check-ups or emergency care can be prohibitive, particularly for women who are unemployed or have limited financial resources (Ekpenyong, Matheson and Serrant 2022). As a result, many women in the district either delay seeking care or forgo it altogether, which significantly increases the likelihood of adverse pregnancy outcomes, including stillbirths (Ekpenyong, Matheson and Serrant 2022).

The delays caused by transportation challenges and economic limitations have profound consequences for maternal health outcomes in the region (Sanchez, Meaney and O'Donoghue 2019). Many pregnancy-related complications, such as pre-eclampsia, gestational diabetes, and infections, require timely medical intervention to prevent severe consequences (Jiang *et al.* 2022). According to Sanchez, Meaney and O'Donoghue (2019), without immediate access to obstetric care, women are at higher risk of experiencing complications that could lead to stillbirth or other negative outcomes. Furthermore, when women do not have access to regular antenatal check-ups, critical health issues that could have been detected early are often missed, further increasing the risk of complications during childbirth (Warri and George 2020a). In cases of prolonged labor, for example, delayed transportation can result in

irreversible harm to both the mother and the fetus, leading to stillbirth or maternal death (Ayenew 2021).

The poor infrastructure in Lejweleputswa District significantly hampers access to maternal healthcare, particularly for women living in rural areas. The inadequate road network and unreliable transportation services, coupled with the economic disadvantages faced by many women, create substantial barriers to timely and effective care (Dahab and Sakellariou 2020b). These challenges contribute to delays in seeking medical attention, which increases the risk of adverse outcomes such as stillbirths (Christou *et al.* 2020).

Despite concerted efforts by the South African government to improve maternal and child health services, systemic inefficiencies continue to hinder progress in rural districts like Lejweleputswa (Malakoane *et al.* 2020b). According to Malakoane *et al.* (2020b: 1), since the advent of democracy, the South African government has been putting charters, policies, strategies and plans in place in an effort to strengthen public health system performance and enhance service delivery. Over the years, policies and strategies aimed at reducing maternal and child mortality, such as the National Department of Health's maternal health programs and the Campaign for Accelerated Reduction of Maternal Mortality in Africa (CARMMA), have been introduced with the goal of improving outcomes for women and their newborns (Health 2012). However, these initiatives face significant challenges at the local level, particularly in rural areas, where access to quality healthcare remains a critical issue (Mahada, Tshitangano and Mudau 2023a)

One of the key barriers to progress is the decentralized nature of the South African district health system, which serves as the interface between national health policies and frontline healthcare delivery (Malakoane *et al.* 2020b). While decentralization allows for more localized decision-making and theoretically enables healthcare systems to better address the specific needs of communities, it also results in uneven implementation of policies. In rural districts like Lejweleputswa, decentralization has exacerbated disparities because many local healthcare providers lack the necessary resources, infrastructure, and capacity to deliver care that meets national standards. As Schneider *et al.* (2020) highlight, decentralized systems often struggle with inadequate funding and support, leading to gaps in service delivery and inconsistencies in the quality of care provided.

While maternal health policies at the national level emphasize the importance of timely antenatal care, skilled birth attendance, and emergency obstetric care, the reality on the ground in districts like Lejweleputswa is quite different (Mahada, Tshitangano and Mudau 2023a). According to Mahada, Tshitangano and Mudau (2023a: 1264), rural healthcare facilities are often under-resourced, with shortages of essential medical supplies, equipment, and medications. This lack of resources, combined with inadequate infrastructure and limited access to skilled healthcare professionals, makes it difficult for local providers to effectively implement national maternal health initiatives (Nuamah *et al.* 2019). As a result, many women in rural areas do not receive the comprehensive care they need during pregnancy and childbirth, increasing the risk of adverse outcomes such as stillbirth (Mahada, Tshitangano and Mudau 2023a).

The uneven distribution of resources between urban and rural areas also perpetuates inequalities in healthcare access and outcomes (Yang, Huang and Yu 2023). Urban centers, particularly in South Africa's major cities, tend to benefit from better healthcare infrastructure, more advanced medical technologies, and a higher concentration of skilled healthcare professionals (Maphumulo and Bhengu 2019b). These advantages allow urban healthcare systems to provide more comprehensive maternal care services, including regular antenatal check-ups, emergency obstetric care, and postnatal support (Wake *et al.* 2023). In contrast, rural districts like Lejweleputswa are often underserved, with healthcare facilities that are understaffed and underequipped to handle the complex needs of pregnant women, especially those experiencing high-risk pregnancies (Souza *et al.* 2024b). This urban-rural divide in healthcare access is reflected in the maternal mortality and stillbirth rates, which are significantly higher in rural areas compared to urban counterparts (Samuel, Zewotir and North 2021). Women in rural regions face multiple barriers to accessing care, including long travel distances to healthcare facilities, unreliable transportation, and financial constraints (Fong *et al.* 2022). Even when care is available, the quality of services is often lower due to the lack of resources and skilled personnel (Jaeger *et al.* 2018). Rural healthcare workers are often overburdened, managing high patient volumes with limited support, which compromises the quality of care they can provide (Kruk *et al.* 2018b). This contributes to delays in diagnosing and managing pregnancy complications, further increasing the risk of maternal and perinatal deaths (Souza *et al.* 2024b).

The high turnover rate of healthcare professionals in rural areas exacerbates these challenges. Many skilled healthcare workers are reluctant to work in under-resourced rural settings due to the difficult working conditions, lack of career development opportunities, and inadequate infrastructure (Tawana, Barkhuizen and Du Plessis 2019). According to Tawana, Barkhuizen and Du Plessis (2019: 2), this shortage of healthcare professionals, particularly obstetricians, midwives, and nurses, limits the capacity of rural health systems to provide the specialized care that is often required to manage complex maternal health cases. As a result, many women in rural areas like Lejweleputswa are left without access to the skilled care needed to prevent stillbirths and other adverse pregnancy outcomes (Gumede, Taylor and Kvalsvig 2021).

To address these systemic inefficiencies and disparities, there is a need for targeted interventions that specifically address the unique challenges faced by rural districts (Gizaw, Astale and Kassie 2022a). These could include increasing financial and technical support for rural healthcare facilities, improving the distribution of skilled healthcare professionals, and investing in infrastructure improvements such as better roads and transportation networks (Esu *et al.* 2021). Moreover, strengthening the implementation of national maternal health policies at the local level, through better coordination and resource allocation, is essential to ensure that all women, regardless of where they live, have access to quality maternal care (Houghton *et al.* 2023). Without these efforts, rural areas like Lejweleputswa will continue to experience disproportionately high rates of stillbirths and maternal mortality, further entrenching health inequalities in South Africa (Mahada, Tshitangano and Mudau 2023a).

1.2.1 The Role of National Health Policies

The South African government has implemented a range of policies aimed at reducing maternal and child mortality, reflecting its commitment to improving maternal and child health outcomes. Key initiatives such as the Maternal, Neonatal, Child, and Women's Health and Nutrition (MNCWH&N) strategy have been developed to enhance access to healthcare services for pregnant women, ensure skilled birth attendance, and improve postnatal care for both mothers and infants (D'Ambruoso *et al.* 2019). These policies are designed to address preventable maternal and perinatal deaths through interventions like expanded antenatal care services, emergency obstetric care, and better management of maternal complications (Duke *et al.* 2022b). However, despite these national-level efforts and the ambitious targets set by the MNCWH&N strategy, their effectiveness in rural and under-resourced areas remains limited (Mahada, Tshitangano and Mudau 2023a).

One of the primary reasons for this limitation is the challenge of implementation in districts like Lejweleputswa, where systemic barriers significantly hinder the success of national health initiatives (Maphumulo and Bhengu 2019c). Rural areas often face critical shortages in funding, healthcare personnel, and medical infrastructure, which directly impact the availability and quality of maternal healthcare services (RHIhub 2022). While national policies emphasize the importance of regular antenatal care visits to monitor pregnancy progress and identify potential complications early, many rural clinics lack the resources to provide consistent and comprehensive antenatal care (Gamberini, Angeli and Ambrosino 2022b). Moreover, shortages of essential medical supplies and equipment further exacerbate these gaps in care, leaving pregnant women in rural districts without access to the critical services they need to ensure healthy pregnancies (Mahada, Tshitangano and Mudau 2023a).

Staff shortages are another major obstacle that impedes the effective implementation of maternal health policies (Sarikhani, Najibi and Razavi 2024). Many healthcare facilities in rural districts like Lejweleputswa are understaffed, with nurses and midwives often overworked and responsible for managing large patient loads (Maphumulo and Bhengu 2019c). The high demand for services, coupled with the limited number of healthcare workers, leads to delays in care and contributes to suboptimal maternal health outcomes (Semaan *et al.* 2023). The uneven distribution of healthcare professionals across the country, with rural areas experiencing a disproportionate shortage of skilled staff, further widens the gap between urban and rural healthcare systems (Coombs, Campbell and Caringi 2022). This disparity in human resources is particularly problematic for high-risk pregnancies, where timely and specialized care is essential for preventing maternal and perinatal complications (Dahab and Sakellariou 2020a).

According to Dahab and Sakellariou (2020a), infrastructural deficits in rural areas are also a significant barrier to improving maternal health outcomes. Many healthcare facilities in the Lejweleputswa District are inadequately equipped to provide emergency obstetric services, such as cesarean sections or management of severe pregnancy complications (NCCEMD 2021). Without the necessary equipment and infrastructure, rural clinics and hospitals are often unable to manage obstetric emergencies, leading

to delays in receiving critical care (Amosse *et al.* 2021). In cases where emergency transportation is needed, poor road infrastructure and the long distances that patients must travel to reach healthcare facilities further contribute to the delays in receiving life-saving care (Dahab and Sakellariou 2020a; Amosse *et al.* 2021). As a result, preventable maternal and perinatal deaths continue to occur at high rates in rural districts like Lejweleputswa, despite national policies aimed at reducing these outcomes (Mahada, Tshitangano and Mudau 2023a).

Improving maternal health outcomes in Lejweleputswa and other under-resourced districts requires a multi-faceted approach that goes beyond the healthcare system itself. While addressing the shortages in funding, staff, and infrastructure is critical, there is also a need to tackle the broader social determinants of health that contribute to poor maternal outcomes (Sarikhani, Najibi and Razavi 2024). Poverty, unemployment, and lack of education all play a role in shaping health-seeking behaviors and access to care (The Lancet Public 2020). Women living in impoverished conditions are less likely to seek antenatal care early in pregnancy, often due to financial constraints and the indirect costs associated with healthcare services, such as transportation. Additionally, low levels of education in rural areas contribute to poor health literacy, making it difficult for women to understand the importance of regular antenatal visits, proper nutrition during pregnancy, and early detection of complications (Grand-Guillaume-Perrenoud *et al.*, 2022).

Moreover, improving maternal health outcomes in Lejweleputswa will require not only strengthening the healthcare system but also addressing the economic and social barriers that prevent women from accessing care. This may involve expanding social protection programs to support low-income women during pregnancy, improving transportation infrastructure in rural areas, and investing in community health education to raise awareness about maternal health and the importance of seeking timely care (Haruna, Dandeebo and Galaa 2019). Integrating these broader social interventions with targeted healthcare system reforms could help create an environment in which all women, regardless of their socio-economic status or geographic location, have access to the maternal healthcare services they need to prevent adverse pregnancy outcomes like stillbirth (Hamal *et al.* 2020).

While the South African government has made significant strides in developing policies to reduce maternal and child mortality, the effectiveness of these interventions remains limited in rural districts like Lejweleputswa due to systemic inefficiencies and social inequalities (Mahada, Tshitangano and Mudau 2023a). To address the high rates of maternal mortality and stillbirth in these areas, a multi-faceted approach that strengthens the healthcare system, improves resource allocation, and addresses the broader socio-economic determinants of health is essential. Without these concerted efforts, the disparities between urban and rural maternal health outcomes will continue to persist, undermining national progress toward reducing maternal and child mortality (Onambebe *et al.* 2023).

According to Onambebe *et al.* (2023: 323), the right to give birth safely is a fundamental human right. The challenges facing maternal health in the Lejweleputswa District Municipality reflect broader issues within South Africa's public health system. The high rates of stillbirth and maternal mortality in the region are the result of a combination of socio-economic, healthcare system, and clinical determinants (Souza

et al. 2024b). Addressing these challenges requires a comprehensive approach that not only improves access to quality maternal care but also tackles the underlying socio-economic factors that contribute to poor health outcomes (Ramavhoya, Maputle and Lebeso 2022). To reduce stillbirth rates and improve maternal health outcomes in Lejweleputswa, it is essential to strengthen healthcare infrastructure, ensure the availability of skilled healthcare professionals, and enhance access to essential medical supplies and medications. Targeted interventions are needed to address the socio-economic barriers that limit women's ability to access care, such as poverty, unemployment, and poor education (McMaughan, Oloruntoba and Smith 2020; Kreuter *et al.* 2021). By addressing both the healthcare system's deficiencies and the broader social determinants of health, South Africa can make meaningful progress toward improving maternal and neonatal health outcomes in under-resourced regions like Lejweleputswa (Mothupi, Knight and Tabana 2020b).

There is a need for collaboration between healthcare providers, policymakers, and community leaders to ensure that interventions aimed at reducing stillbirth are both culturally sensitive and responsive to the unique needs of each region. This holistic approach, which includes improving clinical care, enhancing healthcare infrastructure, and addressing socio-economic inequalities, will be critical in reducing the devastating rates of stillbirth and maternal mortality in South Africa and achieving better health outcomes for

1.3 PROBLEM STATEMENT

The problem of stillbirths within the Lejweleputswa District Municipality in South Africa highlights a critical issue in the management of maternal care within the public health system. Despite various efforts to improve maternal health outcomes, stillbirth rates remain unacceptably high, indicating a need for a comprehensive investigation to identify the underlying factors contributing to this problem (Mahada, Tshitangano and Mudau 2023a). According to Hlongwane *et al.* (2022a: 1), district hospitals and community health centers reported 2.5 stillbirths for every neonatal death, and 43% of the approximately 16000 stillbirths per year (fetal weight of 1000 g or more) occur in SA. Perinatal deaths include both stillbirths (defined as an infant born with no signs of life at 1 min and 5 min, Apgar zero) and a neonatal death (defined as a death of a neonate in the first 28 days of life (Hlongwane *et al.* 2022b). Stillbirth is the most frequently reported adverse pregnancy outcome worldwide, which imposes significant psychological and economic consequences on mothers and affected families (Tesema *et al.* 2021).

According to Hlongwane *et al.* (2022a), in South Africa (SA), approximately 16000 stillbirths occur annually and, most of these are classified as unexplained and occur in district hospitals. Many of these deaths may be caused by undetected fetal growth restriction (Gardosi *et al.* 2013; Hlongwane *et al.* 2022b). Interventions and strengthening the current antenatal care need to be improved and strengthened. According to Hlongwane *et al.* (2022b), the tools required to detect Foetal growth restriction (FGR) in LMICs especially at the level of primary care, where most women with low-risk pregnancies attend, perform extremely poorly in detecting FGR, potentially explaining the high unexplained stillbirth rate. The Lejweleputswa District Municipality, like many other rural districts in South Africa, faces several challenges that affect the provision and access to quality maternal care

services (Lejweleputswa 2022). Scarce resources, inadequate infrastructure, and a shortage of skilled healthcare providers may contribute to delays in seeking care, poor prenatal screening, and suboptimal management of complications during pregnancy and delivery (Mohseni *et al.* 2023b). These factors can result in preventable stillbirths and adverse outcomes for pregnant women. Focusing on a rural district, it will be possible to identify context-specific barriers to quality maternal care and develop targeted interventions to address them (Christou *et al.* 2020). The most common category of perinatal deaths is unexplained stillbirth, which accounts for approximately a quarter of perinatal deaths (30% in district hospitals and community health centers) and 36% of stillbirths (Hlongwane *et al.* 2022b).

The Lejweleputswa District Municipality, like many rural regions in South Africa, faces a range of challenges that significantly affect both the provision of and access to quality maternal care services. Scarce resources, including a lack of essential medical supplies and equipment, combined with inadequate healthcare infrastructure and a shortage of skilled healthcare professionals, contribute to delays in seeking care, insufficient prenatal screening, and the suboptimal management of complications during pregnancy and delivery (Masaba *et al.* 2022). These factors directly lead to preventable stillbirths and other negative outcomes for pregnant women in the district (Vallely *et al.* 2023b). The high rate of unexplained stillbirths, which account for roughly 36% of all stillbirths and nearly 30% of perinatal deaths in district hospitals and community health centers, further underscores the urgent need for improvements in antenatal care (Hlongwane *et al.* 2022a). Focusing on a rural district like Lejweleputswa, this study aims to identify context-specific barriers to quality maternal care, such as the lack of advanced screening technologies for FGR and the logistical challenges faced by rural healthcare facilities. Identifying these barriers is a critical step toward developing targeted interventions that can address the unique challenges of rural healthcare settings and reduce stillbirth rates. Improving antenatal care in these areas, particularly through better detection and management of FGR, has the potential to significantly reduce the number of preventable stillbirths and improve maternal health outcomes overall (Andrews *et al.* 2024).

This study aims to investigate and propose strategies to improve maternal health care within the public health system in South Africa, specifically focusing on reducing stillbirths in the Lejweleputswa District Municipality. The largest category of stillbirths delivered at district hospitals and community health centers is unexplained stillbirths (Hlongwane *et al.* 2022b). Through a comprehensive analysis of factors contributing to stillbirths and the first-hand experiences of healthcare providers (Gwacham-Anisiobi *et al.* 2024). This research will provide valuable insights and evidence-based recommendations to guide policy and practice improvements in maternal care, leading to reduced stillbirth rates and improved overall maternal health outcomes in the district and similar settings. The interventions will which are evident based and promotes maternal health seeking behavior. According to Christou *et al.* (2020: 548), not acting on or delaying care-seeking for problems in pregnancy or childbirth was also common and led to further delays in receiving care and ultimately increased the risk of stillbirth. The study will employ a dual model approach, using Andersen's Behavioral Model of Health Services Utilization and the Precede-Proceed Model. The application of the Precede-Proceed Model and Andersen and Andersen's Behavioral Model of Health Services Utilization in a rural district that has not

been previously utilized in maternal healthcare, this dual model helps design effective models on maternal adverse outcomes and seeks to cover the gap in stillbirth and current interventions in Lejweleputswa District Municipality.

1.4 AIM OF THE STUDY

This study aims to improve maternal care within the South African public health system by examining the prevalence, contributing factors, and systematic responses to stillbirth cases in the Lejweleputswa District Municipality. Through an integrative approach combining a literature review, policy analysis, empirical data, and a structured framework, the study aims to identify gaps, propose evidence-based interventions, and contribute to the development of a sustainable model for improving maternal health outcomes.

1.4.1 Objectives

- a. To investigate underlying causes and determinants of stillbirths, making Lejweleputswa Municipality experience one of the highest stillbirth rates.
- b. Examine the effect of socio-economic factors on the quality of antenatal care and its influence on antepartum stillbirth.
- c. To assess the awareness and utilization of antenatal and obstetric services among pregnant women in the district.
- d. To analyze healthcare providers' knowledge, attitudes, and practices regarding stillbirth prevention.
- e. To examine maternal healthcare services in the Lejweleputswa District Municipality, including infrastructure, staffing, and quality service delivery.
- f. To develop an intervention that addresses the risk factors contributing to stillbirth

1.4.2 Research Questions

- a) What are the primary underlying causes and determinants contributing to the high stillbirth rate in Lejweleputswa Municipality?
- b) How do socio-economic factors affect the quality of antenatal care received by pregnant women in Lejweleputswa Municipality?
- c) What is the level of awareness among pregnant women in Lejweleputswa Municipality regarding available antenatal and obstetric services?
- d) How do healthcare providers' attitudes and practices impact the effectiveness of stillbirth prevention strategies?
- e) What are the strengths and weaknesses of maternal healthcare services, including infrastructure, staffing, and service delivery, in Lejweleputswa District Municipality?
- f) How can an intervention addressing the risk factors of stillbirth be effectively implemented in the healthcare system of Lejweleputswa Municipality?

1.5 SIGNIFICANCE OF THE STUDY

The significance of this study lies in its potential to address the critical issue of high stillbirth rates in the Lejweleputswa District Municipality within South Africa's public health system. By investigating the underlying causes and determinants of stillbirths, this research aims to provide a comprehensive understanding of the factors contributing to this problem and propose targeted strategies to improve maternal health care. The study's outcomes will have several important implications by identifying factors contributing to stillbirths and analyzing healthcare providers' knowledge, attitudes, and practices. The study will offer valuable insights that inform policy decisions and clinical practices. This evidence-based approach can lead to the development of effective interventions to reduce stillbirth rates and improve maternal health outcomes (Atkins *et al.* 2023a). The study will examine the effect of socio-economic factors on the quality of antenatal care and its influence on antepartum stillbirths. Understanding these dynamics will help in designing interventions that enhance antenatal care services, ensuring that pregnant women receive timely and adequate care, ultimately reducing the risk of stillbirths (Riberu, Roga and Paun 2023). According to Berhe *et al.* (2023), assessing awareness and utilization of antenatal and obstetric services among pregnant women in the district, the study aims to identify gaps in service delivery and access. This will enable the development of strategies to increase awareness and utilization of these critical services, ensuring that more women benefit from available healthcare resources (Mwanja and Kazonga 2023). According to Mwanja and Kazonga (2023), the analysis of maternal healthcare services, including infrastructure, staffing, and quality service delivery, will highlight areas needing improvement. This can guide resource allocation and capacity-building efforts to enhance the overall quality of maternal healthcare services in the district (Ramavhoya, Maputle and Lebesse 2022). The focus on preventable stillbirths highlights the necessity of using models like the Precede-Proceed Model and Andersen's Behavioral Model of Health Services Utilization to create comprehensive interventions (Christou *et al.* 2023; Xin and Ren 2023b). Analyzing individual explanatory models for stillbirths and the factors influencing health service utilization such as predisposing, enabling, and need factors customized interventions can be developed to tackle the root causes and enhance health-seeking behaviors (Atkins *et al.* 2023a). These models offer a robust framework for developing targeted strategies that consider local perceptions, healthcare access, and specific risk factors related to stillbirths (Nagdev *et al.* 2023). This approach aims to improve the effectiveness of interventions designed to reduce stillbirth rates and enhance overall maternal and child health outcomes.

The study's focus on a rural district allows for the identification of context-specific barriers to quality maternal care (Dahab and Sakellariou 2020b). This ensures that the proposed interventions are tailored to the unique challenges faced by Lejweleputswa District Municipality, making them more effective and sustainable. By exploring and addressing the issue of stillbirths in a rural South African context, the study contributes to the global body of knowledge on maternal health. The findings and recommendations can be applied to similar settings in South Africa and worldwide, particularly in low- and middle-income countries (LMICs) facing comparable challenges. The study aims to significantly impact maternal health by reducing stillbirth rates and enhancing the overall quality of maternal care in

the Lejweleputswa District Municipality. The insights gained will be crucial for guiding future research, policymaking, and healthcare practices, ultimately leading to better health outcomes for mothers and their families in South Africa and beyond. This study makes a significant contribution by systematically examining the non-clinical factors, particularly healthcare workers' attitudes, that influence maternal outcomes, such as stillbirths, in the Lejweleputswa District Municipality. Through a qualitative case study approach involving in-depth interviews with healthcare providers, the study uncovers context-specific challenges like disrespectful care, delayed responses to complications, poor communication, and institutional weaknesses. By identifying these key drivers, the research provides a nuanced understanding of how interpersonal dynamics and systemic issues converge to impact maternal health. The development and validation of a conceptual model grounded in evidence and theory further strengthen the study's practical application, providing a structured framework that health systems can use to assess and improve care. Its recommendations, ranging from targeted staff training to fostering a culture of respectful maternity care, are being directly translated into policy and practice. Because these challenges are common across LMICs, the findings have broader relevance and scalability, offering a valuable resource for global maternal health interventions.

This study is of great importance as it tackles critical challenges within South Africa's public health system, with a particular emphasis on maternal care and stillbirths in the Lejweleputswa District Municipality. While South Africa has made strides in healthcare reform, the country still faces persistently high rates of maternal mortality and stillbirths, particularly in rural and underserved regions like Lejweleputswa. These areas are disproportionately affected by inadequate healthcare infrastructure, shortages of medical staff, and inequities in access to quality maternal healthcare services (Ajegbile 2023). By examining the underlying causes of stillbirths and identifying gaps in the provision of maternal care in this district, the study sheds light on the specific obstacles that continue to hinder the achievement of better health outcomes for mothers and their babies.

Understanding these challenges is crucial for developing targeted interventions that can address the root causes of poor maternal care in the district. The research will highlight deficiencies in antenatal care, delays in seeking or providing emergency obstetric services, and the socio-economic conditions that exacerbate the risk of stillbirths. These insights are not only vital for local healthcare providers and policymakers but can also inform national health strategies. The study's findings could guide the allocation of resources, inform the training and deployment of healthcare professionals, and lead to the establishment of better maternal care protocols that focus on prevention and timely intervention. Ultimately, this research has the potential to contribute to significant improvements in maternal health outcomes, reduce stillbirth rates, and ensure that all women in Lejweleputswa, regardless of their socio-economic background, have access to the care they need for a healthy pregnancy and childbirth. The significance of this study extends beyond its immediate focus on the Lejweleputswa District, as it has the potential to influence broader policy formulation and the allocation of healthcare resources within South Africa. Conducting a thorough analysis of the socio-economic and healthcare-related factors that

contribute to inadequate maternal care, the study can provide critical data to inform both local and national strategies (Kangbai *et al.* 2022). These findings could be instrumental in shaping policies aimed at enhancing healthcare delivery in rural areas, where disparities in access to quality care often lead to higher rates of stillbirths and maternal mortality. Policymakers could use this research to prioritize the allocation of resources, such as increasing the availability of healthcare professionals, improving healthcare infrastructure, and ensuring that maternal health services are better integrated within rural healthcare systems.

The research further offers a unique contribution to the global discourse on maternal health by highlighting the distinct challenges faced by South Africa's public health system. In doing so, it brings attention to issues such as inequities in healthcare access, the impact of poverty on maternal health, and the need for more tailored interventions in low-resource settings. The evidence-based solutions proposed by the study such as improving antenatal care, addressing socio-economic barriers, and optimizing healthcare delivery could serve as a blueprint for other countries facing similar challenges (Gamberini, Angeli and Ambrosino 2022b). By sharing these insights, the study not only advances the understanding of maternal health within South Africa but also provides valuable lessons that could be applied to other low- and middle-income countries striving to improve maternal health outcomes.

This study represents a crucial step toward achieving maternal health equity in South Africa. It aims to reduce the incidence of stillbirths and ensure that all women, regardless of their socio-economic status or geographic location, have access to high-quality maternal healthcare services. Women in rural and underserved areas often face significant barriers, such as limited access to skilled healthcare providers, inadequate medical facilities, and delays in receiving essential care, all of which contribute to poor maternal outcomes (Habib *et al.* 2021). This study seeks to bridge these gaps by identifying the specific challenges that hinder equitable healthcare access and proposing targeted interventions to overcome them. The findings from this research could play a pivotal role in guiding reforms aimed at ensuring that maternal health services are not only available but also accessible and of high quality, particularly in vulnerable communities. By doing so, the study aligns with broader goals of improving health equity in South Africa, where all women, irrespective of their socio-economic background, can receive the care they need to have safe and healthy pregnancies. Moreover, by addressing the systemic issues that lead to stillbirths and maternal mortality, this research contributes to the broader objective of building a more inclusive and responsive healthcare system that leaves no woman behind.

1.6 BRIEF RESEARCH STRATEGY

1.6.1 Research Design

Research design is the framework or plan that guides the methods and procedures for data collection and analysis in a research study (Wisenthige 2023). According to Wisenthige (2023), it involves determining the approach, methods, and techniques that will be used to address the research questions and objectives. The research design is developed after establishing the background, rationale, problem statement, research questions, and study objectives (Somasundaran 2022). It outlines the activities and

techniques for collecting data to obtain responses to research questions (Chen and Baptista Nunes 2023). The design is influenced by factors such as the nature of the research question, assumptions, ethical considerations, and practicalities (Debor and Debor 2018). According to Debor and Debor (2018), the objective of a research design is to provide accurate, and unbiased research insights. It can be qualitative, quantitative, or a mix of both, and can be fixed or flexible.

A mixed-methods research design is employed to explore and enhance maternal care within the public health system with a specific focus on stillbirths in the Lejweleputswa District Municipality. This approach integrates quantitative and qualitative methodologies, allowing for a comprehensive understanding of the issue by leveraging the strengths of both data types. Mixed methods research involves the strategic combination of qualitative and quantitative methods for data collection, analysis, and interpretation (Wallwey and Kajfez 2023). It is a research approach that integrates both qualitative and quantitative research within a single study (Burzlaff, Carbon and Metzner 2023). The fundamental criteria for conducting qualitative and quantitative research must be followed when conducting mixed-methods research (Palinkas 2022a). The methods of data collection involve using both qualitative and quantitative approaches to gather and analyze data, this approach allows for a more comprehensive understanding of the research topic by combining different types of data and analysis techniques (Cataldo *et al.* 2020). According to Cataldo *et al.* (2020), the use of simulated search engine results pages in combination with multiple data collection methods is effective in studying participants' information behavior.

In mixed methods research, the researcher needs to clarify the research questions, sampling method, data collection technique, and data analysis approach (Hall and Harvey 2018). The researcher should specify whether the research questions involve both qualitative and quantitative aspects (Lisboa and Julio 2019). The sampling method used should be clearly stated, whether it is purposive sampling, quota sampling, snowball sampling, or another method (Tuckerman, Kaufman and Danchin 2020). The data collection technique employed should be described, whether it is interviews, focus groups, or the use of instruments (Jalali 2013). The process of data analysis should also be explained whether it involves interpretively linking qualitative and quantitative data sets or using transformation processes such as qualitizing and quantitizing (Sandelowski 2000).

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1.6.3 Research Process

This study employs a mixed-method research design, combining quantitative and qualitative approaches to enhance understanding of stillbirths in the Lejweleputswa District Municipality. For the quantitative component, structured questionnaires with both open and closed ends will be administered to a representative sample of maternal public healthcare providers, and accounting officers in the Department of Health in the Lejweleputswa District Municipality focusing on variables such as maternal age, antenatal care attendance, and socio-economic status. Concurrently, the qualitative component will involve semi-structured interviews with a purposive sample of maternal public healthcare providers, and accounting officers in the Department of Health in the Lejweleputswa District Municipality. The objective of qualitative semi-structured questions for interviews is to gain deeper insights into personal experiences, cultural beliefs, and systemic barriers related to maternal care and stillbirths. This dual approach allows for statistical analysis of key factors influencing stillbirth rates while exploring personal experiences and contextual influences. Integrating these methods will provide a comprehensive understanding of the issue, informing targeted interventions to improve maternal care.

1.6.4 Study Context

Lejweleputswa District Municipality, situated in the northwestern part of South Africa's Free State Province, covers an area of approximately 32,287 square kilometers (Lejweleputswa 2022). According to Lejweleputswa (2022), it shares its borders with the North West Province, as well as several neighboring districts, including Fezile Dabi and Thabo Mofutsanyana, along with the Mangaung Metropolitan, the Xhariep District Municipality to the south, and the Northern Cape Province to its west. The district comprises several local municipalities, including Matjhabeng, Tswelopele, Nala, Masilonyana, and Tokologo, and is primarily rural, with its economy historically centered around agriculture and mining (Lejweleputswa 2022; Matjhabeng 2022). One of the most significant challenges facing Lejweleputswa is the weakness of its healthcare system. Healthcare services in the district are marked by chronic underfunding, shortages of medical personnel, and inadequate infrastructure (Malakoane *et al.* 2020a; Abrahams, Thani and Kahn 2022). These structural weaknesses hinder the capacity of health facilities to offer comprehensive and timely maternal care services, such as antenatal care (ANC), skilled birth attendance, and emergency obstetric care (Asamani *et al.* 2022). As a result, pregnant women in the district often experience delays in receiving critical care during pregnancy and delivery, leading to adverse outcomes such as stillbirth and maternal mortality. According to Malakoane *et al.* (2020a), the shortage of healthcare professionals is particularly acute, with many clinics and hospitals struggling to maintain adequate staffing levels of doctors, midwives, and nurses. This shortage is exacerbated by the fact that healthcare workers in rural areas are often overworked and under-resourced, further straining the capacity of the district to provide high-quality care (Malakoane *et al.* 2020a).

On top of healthcare system deficiencies, the socio-economic conditions of the population in Lejweleputswa further complicate efforts to improve maternal and neonatal health. According to Lejweleputswa (2022), many women in the district live in poverty, with limited access to necessities such as nutritious food, clean water, and adequate housing. These poor living conditions significantly heighten the risks of complications during pregnancy and childbirth (Milton *et al.* 2022). For example, maternal malnutrition is a well-documented risk factor for adverse pregnancy outcomes, including stillbirth, low birth weight, and preterm birth (Khan *et al.* 2024). Women who are undernourished during pregnancy are more likely to experience complications such as anemia, gestational hypertension, and infections, all of which can increase the likelihood of stillbirth (Willie and Maqbool 2023).

1.6.5 Sampling type

The study employs a mixed-methods research design, utilizing probability and non-probability sampling techniques to enhance the understanding of stillbirths in the Lejweleputswa District Municipality. The sampling method used should be clearly stated, whether it is purposive sampling, quota sampling, snowball sampling, or another method (Tuckerman, Kaufman and Danchin 2020). The data collection technique employed should be described, whether it is interviews, focus groups, or the use of instruments (Jalali 2013). The process of data analysis should also explain whether it involves

interpretively linking qualitative and quantitative data sets or using transformation processes such as qualitzing and quantitizing (Sandelowski 2000).

1.6.5 Study Site

The study will be conducted in Welkom town in the Lejweleputswa District Municipality, located in the Free State province of South Africa. This area includes public healthcare facilities such as public hospitals and clinics, providing a suitable setting for both quantitative and qualitative data collection.

1.6.6 Sampling approach

The study will utilize a sequential explanatory mixed methods design, where quantitative data collection and analysis are followed by qualitative data collection and analysis. The study will employ random sampling for quantitative data collection and purposive sampling for qualitative interviews. The study's two-phase design, starting with qualitative data collection to gain an understanding on the experience faced by maternal healthcare workers in the public sector, aligns with the exploratory sequential mixed method approach. A sequential explanatory mixed methods design involves collecting and analyzing quantitative data, followed by qualitative data collection and analysis (Jackson-Gordon and Plano Clark 2024). According to Jackson-Gordon and Plano Clark (2024), this allows the qualitative phase to expand upon and refine the findings from the quantitative phase. This method is beneficial for capturing participant perspectives that might be overlooked if only statistical data were used to guide the qualitative phase (Sharma *et al.* 2023c). By integrating quantitative and qualitative survey results using joint displays, researchers can create qualitative data collection prompts based on the quantitative outcomes, leading to a more thorough understanding of the research topic (Wallwey and Kajfez 2023). Employing mixed methods designs, which incorporate both quantitative and qualitative data, is crucial for tackling complex research questions that cannot be sufficiently addressed by a single approach, allowing researchers to explore relationships between variables and meet multifaceted research needs effectively (Palinkas 2022b).

Phase 1 is for the quantitative aspect, the researcher used simple random sampling. This sampling allows every individual in the population to have an equal chance of being selected (Singh and Kumari 2022). Phase 2 is for the qualitative aspect; the sample will be gathered through purposive sampling. Purposive sampling is used when a researcher has a prior purpose in mind (Singh and Kumari 2022). In this regard, the sample will consist of individuals who can provide rich data. The sample in phase 2 will not include everyone in the population available like in simple random sampling but rather those who are available and meet the inclusion criteria. Results are then interpreted to offer actionable insights and recommendations for enhancing maternal care and reducing stillbirths.

1.6.7 Population size and Tagert size

This study is conducted in the Lejweleputswa District Municipality. The Lejweleputswa District Municipality is a Category C municipality situated in the north-western part of the Free State. The district

makes up almost a third of the province and consists of the following five local municipalities, with approximately 18 towns (Allanridge, Boshof, Bothaville, Brandfort, Bultfontein, Dealesville, Hennenman, Hertzogville, Hoopstad, Odendaalsrus, Soutpan, Theunissen, Ventersburg, Verkeerdevlei, Virginia, Welkom, Wesselsbron and Winburg) distributed throughout Masilonyana, Tokologo, Tswelopele, Matjhabeng, and Nala, (Municipalities of South Africa 2023).

Population size refers to the total number of individuals or units that possess specific characteristics relevant to a research study and from which a sample can be drawn (Creswell & Creswell, 2018). It is distinct from the effective population size, which denotes those actively contributing to outcomes in a specific context—in this case, maternal healthcare. For this study, the population comprised all maternal healthcare professionals within the Lejweleputswa District Municipality in the Free State Province, South Africa. This district comprises five local municipalities: Matjhabeng, Tswelopele, Masilonyana, Nala, and Tokologo, and is served by a comprehensive network of public healthcare facilities.

Specifically, Lejweleputswa includes:

- 6 public hospitals: Bongani Regional Hospital, Mohau Hospital, Nala District Hospital, Winburg Hospital, Katleho Hospital, and Thusanong Hospital.
- 48 public clinics and community health centres, including prominent ones like Hope CHC, Allanridge Clinic, Bophelong Clinics (in Allanridge, Odendaalsrus, and Welkom), and Tshepong Clinics (Welkom and Verkeerdevlei), among others.
- 1 District Health Office, which oversees governance and coordination across all facilities.

The target population included a wide range of healthcare professionals and managers involved in maternal care services, specifically:

- Midwives
- Nurses in maternal units
- Facility managers
- Maternal unit managers
- Obstetricians and gynaecologists
- Community Health Worker (CHW) team leaders
- Local Area Managers
- District Maternal Health Coordinator
- District Director for Health Services

According to the Free State Department of Health (2023), the estimated number of professionals involved in maternal healthcare across the district exceeds 358 individuals. These professionals work

in primary healthcare clinics, district and regional hospitals, and administrative structures coordinating maternal and child health programmes.

1.6.8 Target size

A sample is a subset of individuals, units, and elements with specific characteristics that the researcher intends to investigate (Tailor 2017). The sample population will consist of one interview per healthcare facility that works with deliveries until saturation is reached. The study sample population will be doctors, nurses, and midwives who work in maternal health care in Welkom which falls under Matjhabeng Municipality. The target sample for this study is twofold, firstly quantitative data will be collected from 358 healthcare workers across selected public healthcare facilities. The sample size was calculated using the Raosoft sample size calculator with a 5% margin of error, 95% confidence level, a total population of 5225, and a response distribution of 50%. Thus, a total of 358 responses will be sufficient to produce robust results whose inferences would be reliable.

Secondly, the researcher will interview at least twenty (20) participants (healthcare workers, who are midwives, accounting officers from the district office responsible for Health, obstetricians, maternity unity managers, and gynecologists), while a minimum of twenty (20) is targeted, data will be collected until saturation is reached. This is consistent with many qualitative studies where saturation can be used to identify the appropriate sample size (Hennink et al. 2019).

For the qualitative part, a purposive sample of 32 participants was drawn from this population. The participants were selected based on their active engagement in maternal healthcare delivery and their first-hand experience with stillbirth cases, ensuring data saturation and thematic depth. For the quantitative component, facility-level data on maternal health outcomes were reviewed to validate and triangulate the qualitative insights.

This population and sampling framework reflects qualitative research best practices, which emphasize information-rich cases over numerical representativeness, allowing the study to gain nuanced insights into the human and systemic factors influencing maternal outcomes (Patton, 2015).

During the fieldwork phase of this study, several contextual challenges necessitated the expansion of the sample size and the inclusion of additional healthcare facilities across the Lejweleputswa District Municipality. Among the key challenges were:

1. Service delivery protests, which led to the temporary closure or limited accessibility of several public health facilities.
2. Persistent human resource shortages across the district, particularly in maternal health services, which meant that some facilities had few or no staff available for participation during the data collection period.

Given these realities, it became necessary to broaden the number of facilities contacted to reach a sufficient and diverse pool of healthcare professionals actively involved in maternal care and stillbirth-

related cases. The decision to increase the sample size was thus a methodological imperative to ensure the credibility, richness, and diversity of qualitative insights, which are central to robust thematic analysis (Patton, 2015).

Consequently, the final sample was drawn from more than half of the operational maternal healthcare facilities in the district, including both clinics and hospitals, as well as the Lejweleputswa District Municipality Office, which plays a strategic role in overseeing and coordinating maternal health services. The facilities accessed included:

- Hospitals: Bongani Regional Hospital, Nala District Hospital, Thusanong Hospital.
- Clinics and CHCs: Albert Luthuli Memorial Clinic, Allanridge Clinic, AM Kruger Clinic, Boithusong Clinic, Bophelong Clinics (Allanridge, Odendaalsrus, Welkom), Geneva Clinic, Hani Park Clinic, Hennenman Clinic, Kgotsong Clinics (Bothaville, Welkom), K-Maile Clinic, Leratong Clinic, Matjhabeng Clinic, Mmamahabane Clinic, OR Tambo Clinic, Phedisanang Clinic, Phomolong Clinic, Thabong Clinic, Tshepong Clinics (Welkom, Verkeerdevlei), Tshwaraganang Clinic, Virginia Clinic, and Welkom Clinic.

By diversifying the facility sample and including representatives from different levels of the healthcare system, including district managers, midwives, obstetricians, gynecologists, CHW team leaders, facility managers, and maternal unit managers, the study ensured that data reflected both clinical and managerial perspectives. This adaptive sampling approach aligns with the principles of qualitative inquiry, which prioritize information-rich cases and context-driven decision-making over rigid adherence to sample size formulas (Creswell & Poth, 2018). Furthermore, it enhanced the validity and transferability of findings, particularly about service delivery realities in under-resourced, rural district health systems.

1.6.9 Inclusion Criteria

Midwives, Community Health Works Team leaders, obstetricians, gynecologists, maternal unit managers, and district health department accounting officers dealing with health (Maternal, Women's, and Reproductive and Child Health).

1.6.10 Exclusion Criteria

Healthcare workers outside maternal care in Lejweleputswa District Municipality

Maternal healthcare practitioners in the private healthcare system in Lejweleputswa District Municipality (midwives, obstetricians, gynecologists, maternal unit managers)

District Department of health outside the Maternal, Women's, and reproductive and child health Department

1.6.11 Data collection tools

The study will utilize structured questionnaires including closed-ended and open-ended questions ensuring confidentiality and proper data storage. For qualitative data collection, the study will employ semi-structured questions, with a maximum interview time of 20 minutes. An interview guide with open-ended and closed-end questions will be used to allow participants to share detailed narratives.

The researcher will choose a venue that ensures privacy and confidentiality, such as a private room in a community center, clinic, or local health facility. This helps participants feel comfortable sharing sensitive and personal information. The researcher will ensure the venue is relaxed, with adequate seating, ventilation, and lighting. Comfortable surroundings can help participants feel at ease and more willing to engage in the discussion. The venue will be easily accessible to all participants, including those with disabilities. Consider proximity to public transportation and parking availability.

1.6.12 Quantitative and qualitative demographics of respondents

The demographic elements will be used for both quantitative tools, which are questionnaires, and qualitative tools, which are interview questions. By incorporating a demographic information section in all research tools, the study ensures comprehensive data collection that supports a detailed analysis of the study population's characteristics. This approach facilitates the interpretation of findings within the context of the participants' backgrounds and experiences.

16.13 Validity of Qualitative data

Saturation in qualitative research signifies the stage where data collection has gathered adequate information to represent all potential emergent themes within the studied phenomena (Daher 2023; Tight 2023). It is a crucial aspect of ensuring the rigor and validity of a study, often indicated by the emergence of new information, themes, categories, and codes as a sign of reaching saturation (Ünlü and Qureshi 2023). The research will interview 20 participants until saturation is reached, during data collection and analysis, the researcher continuously reviews and analyzes the data to identify emerging themes and patterns.

To enhance credibility, researchers can use design elements and validation strategies such as triangulation, negative case analysis, reflexive practices, and managing subjectivity (ARSLAN 2022). Participants can also be actively engaged in validation through member reflections, prolonged interaction with the researcher, or collaboration in different phases of the research (Salleh, Sulaiman and Gloeckner 2023). According to Firdaus, Aksar and Gong (2024), in terms of reliability, internal consistency is an important measure, and Cronbach's Alpha is commonly used to assess it.

1.6.14 Validity of Quantitative Data

Construct validity is concerned with the degree to which the instrument measures the concept, behavior, idea, or quality- that is, a theoretical construct- that it purports to measure (Sürücü and Maslakci 2020). This is the ability to distinguish between participants with and without the behavior or quality to be measured. Ensuring the validity of quantitative data is crucial in research, as it ensures that measurements accurately represent the concepts being studied (Lewis 2022). Validity encompasses both the accuracy of measurement (reliability) and the correctness of interpretation and use of the data. Researchers emphasize the importance of addressing validity considerations explicitly in their work. Key components impacting validity in quantitative studies include the quality of measures, handling of missing data, the appropriate level of measurement for dependent variables, and model checking (Heale and Twycross 2015). Validity in quantitative research is achieved through a rigorous assessment of the reliability and accuracy of instruments used for data collection. Understanding how to test and ensure the validity and reliability of scales is essential for yielding beneficial research outcomes. Ensuring high-quality measures, properly handling missing data, selecting appropriate measurement levels, and rigorously testing for reliability and accuracy, the study aims to provide valid and actionable insights into maternal healthcare improvements in the Lejweleputswa District Municipality. In this study, validity in the quantitative strand was ensured through the design, pre-testing, and expert review of the data collection questionnaire. Validity refers to the degree to which an instrument accurately measures what it is intended to measure (Creswell & Creswell, 2018). To achieve this, the questionnaire was developed based on a comprehensive review of relevant literature and existing validated instruments related to maternal health service delivery and stillbirths in low- and middle-income countries. Content validity was established by engaging subject matter experts, including public health researchers, maternal care professionals, and district-level health managers, who reviewed the items for relevance, clarity, and cultural appropriateness within the Lejweleputswa context. A pilot study was conducted in a non-randomized, yet demographically similar, clinic to refine the wording, structure, and flow of the questions. This process helped ensure that the items were clearly understood by respondents and measured the intended constructs, thereby enhancing face and construct validity. Additionally, questionnaire consistency was maintained through standardized administration procedures, which further supported internal validity by minimizing measurement bias (Babbie, 2020). The deliberate incorporation of these strategies helped strengthen the overall credibility of the quantitative findings.

1.6.15 Reliability of Qualitative Data

In qualitative research, ensuring the reliability of data involves two aspects which are transferability and trustworthiness. Transferability refers to the extent to which the findings of the study can be applied or transferred to other contexts or settings (Adler 2022). According to Adler (2022), this is achieved through detailed descriptions of the research context, participants, and procedures, as well as purposeful sampling to ensure diverse representation. Trustworthiness, on the other hand, pertains to the credibility, dependability, and confirmability of the data (Nguyen *et al.* 2021a). Techniques such as triangulation, member checks, and prolonged engagement with the participants help establish credibility, while maintaining an audit trail, employing a code-recode strategy, and maintaining reflexivity

to ensure dependability and confirmability (Kyngäs, Kääriäinen and Elo 2020; Lemon and Hayes 2020).

To ensure the reliability of the research, the researcher will use the same interview questions for all respondents according to the interview schedule. This will be done in simple language and a relaxed environment for the respondents to understand the questions clearly. The questions asked will be relevant to the subject at hand, the objectives of the study, and linked to the literature, to ensure validity and reliability, the researcher prolonged engagements with all respondents to ensure that the information provided was credible. The reliability of qualitative data in this study involves establishing the trustworthiness and transferability of the findings through detailed descriptions, purposeful sampling, credibility techniques, dependability measures, and confirmability practices. By implementing these strategies, the study aims to produce reliable and credible qualitative data, ultimately contributing to meaningful insights into maternal healthcare and strategies to reduce stillbirths in the Lejweleputswa District Municipality.

1.6.16 Reliability of Quantitative Data

Reliability is the ability to measure instruments to give similar results when applied at different times and a strong positive correlation between the results of the measuring instrument is an indication of Reliability (Sürücü and Maslakci 2020). The Reliability of the measuring instrument is an essential consideration for the results of the study to be healthy and therefore, this study will ensure that the measuring instrument used is reliable.

Test-retest Reliability approach will be used in this study, this refers to the consistency of the results obtained when the measuring instrument is applied to the same sample group at different times. The questionnaire prepared to test the Reliability of the measuring instrument with the test-retest method is first applied to a sample group. Then, the same questionnaire is applied again to the same sample group after a specific time. A high correlation between comparable survey data obtained at different times will be an indication that the measuring instrument has test-retest Reliability.

Ensuring the reliability of quantitative data in this study involves a comprehensive approach that includes statistical measures such as Cronbach's Alpha, rigorous quality control through pilot studies and test-retest reliability, and robust quality assurance practices including training, standardized procedures, and regular monitoring. By implementing these strategies, the study aims to produce reliable and credible data, ultimately contributing to meaningful improvements in maternal healthcare and reducing stillbirths in the Lejweleputswa District Municipality.

1.6.17 Qualitative data analysis

The study will use NVivo Qualitative Data Analysis for thematic content analysis, involving codifying, generating themes, and understanding patterns within the qualitative data. NVivo is a powerful qualitative data analysis (QDA) software designed to help researchers organize, analyze, and find

insights in unstructured or qualitative data, such as interviews, focus groups, and open-ended survey responses (Tang 2023).

1.6.18 Quantitative data analysis

For quantitative data analysis, the study will utilize SPSS. The process involves performing regression analysis, interpreting the coefficients, and calculating the contribution of each factor to the differences observed in the dependent variable.

1.6.19 Pilot Study for Quantitative Component

The pilot study involved a small, diverse sample of 10 participants from the Lejweleputswa District Municipality. This sample included five midwives, one gynecologist, two representatives from the Department of Health, and two nurses who assisted with maternal healthcare. The primary objective of conducting a pilot study is to identify and rectify potential issues that may not have been anticipated during the design of data collection instruments (Muasya and Mulwa 2023). Pilot studies play a crucial role in enhancing the reliability and validity of research by allowing researchers to evaluate and adjust their methods and instruments before the main study (Sundram and Romli 2023). This process ensures that the questions are clear, relevant, and comprehensive and that the data collection process is feasible and effective (Muasya and Mulwa 2023; Sundram and Romli 2023). By addressing these aspects in the pilot phase, researchers can improve the overall quality of the main study, leading to more accurate and meaningful findings.

The pilot study was conducted to test and refine the data collection instruments, ensuring their clarity, relevance, and effectiveness. This preliminary phase aimed to identify and correct any potential issues that could impact the validity and reliability of the main study. By piloting the instruments with a small, representative sample, the researcher could refine and optimize the questionnaires and interview guides, ensuring that the final data collection process would be effective and efficient (Aung, Razak and Nazry 2021). This step was crucial for minimizing potential issues during the main study and obtaining accurate and meaningful insights into the factors contributing to stillbirths in the Lejweleputswa District Municipality.

1.6.20 Pilot Study for Qualitative Component

Content validity was achieved by including questions that covered all relevant aspects of maternal healthcare and stillbirths, as informed by existing literature and expert consultations (Muasya and Mulwa 2023). Face validity was evaluated through feedback from participants during the pilot study to ensure the questions were clear and understandable. Reliability was assessed through test-retest reliability by administering the same questionnaires to a subset of participants at two different times to check for consistency in responses, and inter-rater reliability was ensured for qualitative data by having multiple researchers independently code and analyze the interview transcripts and compare their findings (Kovach, Obanua and Hutchins 2022). Ethical standards were upheld by obtaining informed

consent from all pilot study participants, ensuring they were fully aware of the study's purpose, procedures, and their right to withdraw at any time (Muasya and Mulwa 2023). Confidentiality was maintained by anonymizing all data collected and securely storing it to prevent unauthorized access (Muasya and Mulwa 2023). To avoid bias, the pilot sample was not included in the main study, ensuring that the pilot participants' experiences did not influence the main study's outcomes.

Conducting the pilot study allowed for identifying and rectifying any issues with the data collection instruments, enhancing their validity and reliability. The feedback and data gathered during this phase were instrumental in refining the questionnaires and interview guides, ensuring that the main study would be robust and effective (Adler 2022). Ethical considerations were rigorously followed, ensuring the pilot study was conducted responsibly and respectfully.

Ensuring the trustworthiness of qualitative data is essential for establishing the credibility and reliability of the research findings. In qualitative research, guaranteeing the trustworthiness of data in a pilot study is vital for refining data collection tools and methodologies to enhance credibility, transferability, dependability, and confirmability (Muasya and Mulwa 2023). Implementing rigorous strategies such as member checks, where data and interpretations are reviewed and validated by participants, helps establish the accuracy and credibility of the findings (Adler 2022). According to Adler (2022), combining qualitative data with quantitative data in pilot studies offers valuable insights into maternal healthcare and stillbirths, improving the design and feasibility of larger trials. Consequently, with these strategies, the researcher can refine their data collection instruments and methodologies, ensuring that the main study would produce reliable and valid insights into maternal healthcare and stillbirths in the Lejweleputswa District Municipality.

1.6.21 Ethical Clearance

Ethical considerations are a fundamental component of responsible research, ensuring that the rights, dignity, and well-being of all participants are protected throughout the study (Goodwill et al 2020). Adhering to established ethical principles helps promote integrity, transparency, and accountability in the research process. This research will be conducted fairly, ensuring that all participants and their settings are treated with equal respect and consideration. Participants are chosen based on their relevance to the study's objectives, including midwives, gynecologists, Department of Health officials, and nurses assisting in maternal healthcare, to ensure a comprehensive understanding of the issue. Participation in this study is voluntary, with no coercion exerted on any participant. All participants are protected from exploitation during this study and are selected based on their roles and experiences relevant to maternal healthcare. The confidentiality of participants was rigorously safeguarded. Disclosure of protected information was strictly prohibited, ensuring participants' details and responses remained confidential. All records and information were kept confidential, and no identifiable information was released. Participant anonymity was maintained by assigning codes to reactions instead of using names. Information provided by participants will be securely protected. Electronic records are stored in password-protected files and encrypted during transmission. Hard copies are locked away and

destroyed after five years. Electronic copies will be permanently deleted from storage and recycling bins, and hard copies will be shredded. The study will maintain the credibility of results will be maintained by minimizing the risk of bias and the degree of confidence in the data, its interpretation & procedures will be maintained. Participation is completely voluntary, with participants able to engage in the study without any pressure. They will be informed of the study's general purpose, risks, and methods through a "Letter of Information." Informed consent will be obtained before participation, and participants can withdraw at any point without penalty or obligation to provide a reason.

There will be no compensation for participation in this study, ensuring that involvement is based on genuine interest and willingness to contribute to the research. Permission will be obtained from gatekeepers, which is the Department of Health in Lejweleputswa District Municipality (Appendix A). The research will comply with any research ethics guidelines of IREC and FREC and will only be conducted after it has been given clearance. The DUT standard invitation to participate in the research project or informed consent will be used (DUT, 2016). Voluntary participation will be employed, and consent letters will be issued.

The results are shared with participants through a detailed report and summary presentations, ensuring they are informed of the study's outcomes and potential implications for their work and community. The Durban University of Technology retains ownership of any intellectual property resulting from this study, and no information can be used without the University's prior consent. Since no third party is involved, there is no need for a non-disclosure agreement with any other body. There are no conflicts of interest in this study. The researchers declare neutrality and impartiality, focusing solely on the study's objectives to enhance maternal care. All information shared in this study is truthful and transparent. The researcher maintains integrity in reporting the data and findings, ensuring accuracy and honesty throughout the research process.

1.7 ORGANIZATION OF THE STUDY

17.1 Chapter 1: Overview of the Research

This chapter introduces the study. It discusses the research problem and gives the study's aim and objectives. The chapter further provides the significance of the study, as well as the organization of the dissertation.

1.7.2 Chapter 2: The current state of Global Maternal Healthcare, trends, and Interventions

This chapter focuses on stillbirth and maternal care on a global level.

1.7.3 Chapter 3: South Africa maternal Healthcare, legislation, policy, and interventions

This chapter focuses on South Africa's Public Health care, including maternal health care, interventions, and policies.

1.7.4 Chapter 4: Theoretical Contribution

This chapter focuses on theories/models related to the literature and stillbirth prevention.

1.7.5 Chapter 5: Methodology

This chapter provides the research methodology used in the study. The chapter provides a detailed discussion of the research design, data collection, data analysis, pretesting of survey instruments, and relevant information, including ethical considerations.

1.7.6 Chapter 6: Presentation, Analysis, and Interpretation of Quantitative Data

This chapter presents the quantitative findings derived from the study, offering a comprehensive analysis and interpretation of the data collected.

1.7.7 Chapter 7: Presentation, Analysis, and Interpretation of Qualitative Data

This chapter presents, analyzes, and interprets the study's qualitative findings. It explores emerging themes and sub-themes derived from participant narratives, offering critical insights into the research objectives and contextual realities.

1.7.8 Chapter 8: Discussion

This chapter presents a critical discussion of the study's key findings, derived from the data analysis, and links them to the research objectives and relevant literature to provide deeper insights.

1.7.9 Chapter 9: Conclusion and Recommendations

This chapter concludes the study by summarizing the main findings, drawing key conclusions, and offering evidence-based recommendations. It also highlights the study's contributions and implications for policy, practice, and future research.

1.8 CHAPTER SUMMARY

South Africa strives to achieve Sustainable Development Goal 3, which promotes health and well-being for all ages, and to reduce stillbirths to less than 12 per 1000 births by 2025 through Every Newborn's Action Plan (ENAP). Despite progress, stillbirth rates remain high, with a national rate of 21 per 1000

and an alarming 29.3 per 1000 in the Lejweleputswa Municipality District. This study aims to enhance maternal healthcare and reduce stillbirths in Lejweleputswa by employing a mixed-method design, incorporating both quantitative and qualitative data collection. Primary data will be gathered via questionnaires and interviews with doctors, nurses, midwives, and management personnel in maternal wards. Probability sampling will ensure representativeness, while validity and reliability checks will maintain research quality. The study adheres to IREC and FREC ethical guidelines, ensuring informed consent, confidentiality, and anonymity for participants. Findings will offer insights into maternal care management within South Africa's public health system and aid in developing effective interventions. Results will be shared with health authorities, published, and presented at conferences.

Chapter Two: Literature Review: Global Perspective on Maternal Health

2.1 Introduction

Maternal health is a fundamental indicator of a nation's well-being and development, reflecting its commitment to ensuring the welfare of its citizens, particularly women and infants. Although considerable strides have been made in improving maternal health globally, disparities in access to quality healthcare persist, and challenges persist in addressing critical issues such as stillbirths. This literature review explores the multifaceted landscape of global maternal healthcare, with a particular focus on interventions and frameworks aimed at enhancing maternal and neonatal well-being, with a specific emphasis on reducing the incidence of stillbirths.

Maternal health represents a cornerstone of the United Nations' Sustainable Development Goals (SDGs), particularly Goal 3, which seeks to ensure healthy lives and promote well-being for all, and Goal 5, which aims to achieve gender equality and empower all women and girls. Despite significant progress in recent decades, the global burden of maternal mortality and morbidity remains unacceptably high (Vallely *et al.* 2023a). Furthermore, the occurrence of stillbirths, defined as the death of a baby in the womb after 28 weeks of gestation, remains a persistent challenge. The primary aim of this literature review is to conduct a thorough analysis of existing research in the field of global maternal healthcare. It places a specific emphasis on assessing interventions and frameworks designed to enhance maternal and neonatal well-being while addressing the complex issue of stillbirths. The review will delve into the multitude of factors that impact maternal health on a global scale, encompassing a wide range of determinants, from socio-economic conditions to the availability of healthcare infrastructure and access to skilled care during pregnancy and childbirth.

A central focus of this review is the examination of various strategies and measures that have been implemented within maternal healthcare space at different levels, be it on a global scale, within individual nations, or local communities – with the overarching goal of improving maternal health and reducing the incidence of stillbirths. These interventions cover a diverse spectrum of initiatives, including antenatal care, the presence of skilled healthcare professionals during childbirth, emergency obstetric care services, family planning programs, and maternal education initiatives, among others (Nishimwe, McHunu and Mukamusoni 2021a). An essential aspect of this review involves assessing the effectiveness of these interventions and providing valuable insights to inform evidence-based practices and policies aimed at achieving improved maternal and neonatal outcomes on a global scale. Understanding the trends in global stillbirth rates and the effectiveness of interventions is of paramount importance for several reasons. Understanding the trends and factors contributing to stillbirth is crucial for developing effective prevention strategies (Hug *et al.* 2021b). Identifying high-risk groups and modifiable risk factors, healthcare systems can focus on targeted interventions to reduce stillbirth rates. Reducing stillbirth rates is directly linked to improving maternal and child health (Atkins *et al.* 2023a). Successful interventions can have a positive impact on the well-being of both mothers and babies. This, in turn, contributes to the achievement of Sustainable Development Goals related to maternal and child

health (United Nations 2022). Comprehensive knowledge about stillbirth trends and interventions helps public health policymakers and healthcare systems allocate resources efficiently (Wastnedge *et al.* 2021). They can prioritize interventions with proven efficacy and allocate resources to regions with the highest stillbirth rates (Ota *et al.* 2020a). According to Ota *et al.* (2020a), stillbirth and its associated complications often lead to substantial healthcare costs. By preventing stillbirths through effective interventions, healthcare systems can reduce the economic burden on families and society. Understanding the disparities in stillbirth rates between high-income and low- and middle-income countries is crucial for achieving global health equity. It highlights the need for targeted interventions and support in regions where stillbirth rates are disproportionately high.

2.2 THE STATE OF GLOBAL MATERNAL HEALTHCARE

Maternal mortality (MM) is widely acknowledged as a general indicator of the overall health of a population, the status of women in society, and the functioning of the health system, according to the Centers for Disease Control and Prevention (CDC) and the World Health Organization (WHO) use different terms and measures to characterize MM but the maternal mortality ratio (MMR), calculated as the number of maternal deaths per 100,000 live births, is a widely utilized measure worldwide (Douthard *et al.* 2021b).

Stillbirths are a major public health issue and a sensitive marker of the quality of care around pregnancy and birth, according to the UN Global Strategy for Women's, Children's, and Adolescents' Health (2016–30) and Every Newborn Action Plan (led by UNICEF and WHO) call for an end to preventable stillbirths (Hug *et al.* 2021a). According to Hug *et al.* (2021b), recent data shows that stillbirths are an increasingly critical global health problem. In 2000, the ratio of the number of stillbirths to the number of under-five deaths was 0.30; by 2019, it had increased to 0.38. In sub-Saharan Africa, the number of stillbirths is rising: They increased from 0.77 million in 2000 to 0.82 million in 2019, as the growth in total births outpaced the decline in the region's stillbirth rate. In some high-income countries despite very low levels of neonatal mortality more stillbirths than neonatal deaths occur, and in some cases, even surpass the number of infant deaths (Hug *et al.* 2020). WHO warns that without urgent action, more than 19 million babies born in the next decade will be stillborn (Asiimwe 2021). With 2030 fast approaching and the eminent COVID-19 pandemic effects on the social, health, and economic well-being of women, it's high time to triple the efforts to reduce this danger of stillbirth so that the target set by ENAP in 2014 of reducing stillbirths to 12 or below stillbirths per 1,000 total births is achieved (Kiguli *et al.* 2021). Every newborn action plan (ENAP) launched in 2014 has set a global target of fewer than 12 newborn deaths per 1000 live births and fewer than 12 stillbirths per 1000 total births by 2030 (Datta, Ghosh and Aquino 2022).

Globally over 5,000 babies are stillborn every day, with a global estimated stillbirth rate reported as 13.9 per 1,000 total births in 2021 and, India contributes the highest absolute number of stillbirths in the world (Sharma *et al.* 2023a). India has made substantial progress in stillbirth reduction despite many challenges, and the absolute number of stillbirths remains high (Aggarwal *et al.* 2023b). In the same study Aggarwal *et al.* (2023b), present the national and state-level burden of stillbirths and discuss the

magnitude, risk factors, causes, and inequities in stillbirths and concluded that there is a need for a standard definition for the classification of stillbirths and document the cause, to roll out suitable interventions. According to Sharma *et al.* (2023a), in 2021 an estimated 286,482 babies were stillborn in India at an estimated stillbirth rate of 12.2 per 1,000 total births and, the share of stillbirths in mortalities has increased from 23% in the year 2000 to 36% in 2021.

The stillbirth audits should be institutionalized as a continuous quality improvement exercise to bring local accountability and reduce the stillbirth rate. The healthcare system and providers must be trained to offer bereavement support to the affected mothers and families. These approaches should be implemented through the primary healthcare system as well. According to Aggarwal *et al.* (2023a), health-seeking behaviors were significantly associated with stillbirths in a study from nine states of India with nearly 900,000 women. India has made a major stride in the reduction of the stillbirth rate and absolute numbers over the last two decades. The country is on track to achieve ENAP and INAP targets, however, the burden of absolute stillbirths is still high (Aggarwal *et al.* 2023a).

The SDGs are a post-2015 development-oriented agenda comprising 17 goals and 169 targets with an overarching aim of achieving global environmental, social, and economic development by 2030 with the Sustainable Development Goal S 3 seeking to ensure healthy lives and promote well-being for all ages (Stats 2019). Crucial to this goal are SDG targets 3.1 and 3.8, which seek to respectively reduce the global maternal mortality ratio to direct out-of-pocket payments for maternal healthcare at the point of service constitute a major barrier to the utilization of maternal healthcare services in SSA. To reach this goal, out-of-pocket payment should be eliminated, and this will lead to improved maternal healthcare utilization as a proxy for reducing maternal deaths. Most stillbirths are deemed preventable with equitable access to antenatal and intrapartum care, which includes comprehensive emergency obstetric care with studies showing that no or late antenatal booking, lack of awareness about danger signs such as decreased fetal movements, headache as in eclampsia, failure to recognize the seriousness of bleeding along with lack of access to institutional delivery and good intrapartum care (lack of birth preparedness) were associated with higher risk of stillbirths (Aggarwal *et al.* 2023a).

A 2020 report examining U.S. birth settings, a crucial component of maternity care, described important common practices in Australia, Canada, the Netherlands, and the United Kingdom, all committing to integrating care across birth providers, ranging from well-trained midwives attending uncomplicated deliveries to highly specialized obstetricians (Douthard *et al.* 2021b). The support of a seamless transfer across, out of, and into hospital maternity care systems; universal access to primary and maternity care before, during, and after pregnancy; and adoption of respectful care and respect for maternal autonomy was implemented. Stillbirth is a major public health challenge and a multifaceted issue that leads to significant financial, physical, mental, financial, and psychosocial implications (Aggarwal *et al.* 2023a). According to Hug *et al.* (2021b), a stillbirth occurs every 16 seconds somewhere in the world, meaning that every year, about 2 million babies are stillborn. A loss that reaches far beyond the loss of life (Hug *et al.* 2021b). UNICEF defines stillbirth as a baby born with no signs of life at 28 weeks of completed gestation (Gwacham-Anisiobi *et al.* 2023; UNICEF 2024). Stillbirth is defined as fetal death

after a prespecified gestational age and/or fetal weight, both of which have historically lacked uniformity among different countries (Tsakiridis *et al.* 2022b). Substantial variation in stillbirth rate (SBRs within as well as between HIC is also present, just as in low- and middle-income countries, women in HIC experience inequity in stillbirth and other birth outcomes depending upon their socio-economic status, geographic location, ethnicity, race, or Indigenous status (de Graaff *et al.* 2023).

According to Hug *et al.* (2020), stillbirth has a traumatic long-lasting impact on women and their families around the world, who often endure profound psychological suffering as well as stigma from their communities, even in high-income countries. Perhaps even more tragically, the majority of these deaths could have been avoided with high-quality care antenatal and during birth (Hug *et al.* 2020). Furthermore, this tragedy of life loss remains a subject that has been forsaken and, largely truant in global tracking data, reflecting the extent of this hidden problem (Gwacham-Anisiobi *et al.* 2023). They are invisible in policies and programmes and underfinanced as an area requiring intervention, targets specific to stillbirths were absent from the Millennium Development Goals (MDGs)³ and are still missing in the 2030 Agenda for Sustainable Development (Hug *et al.* 2020). This is despite being included in Every Newborn Action Plan (ENAP) led by UNICEF and WHO⁴ and the UN Global Strategy for Women's, Children's, and Adolescents' Health 2016–30 (Organization 2014a; Mirbaha-Hashemi *et al.* 2021b). Stillbirths are a neglected public health challenge and an 'unfinished business with a global burden of an estimated 1.9 million stillbirths in the year 2021 (Unicef 2020). The global burden of stillbirths is unequal, with three-quarters occurring in Sub-Saharan Africa and South Asia. Six countries- India, Pakistan, Nigeria, the Democratic Republic of the Congo, Ethiopia, and Bangladesh, contribute to half (49%) of the global stillbirths (Aggarwal *et al.* 2023a). Recently launched assessment report of Every Newborn Action Plan (ENAP)/ Ending Preventable Maternal Mortality (EPMM) has stressed an evidence-based, equity-focused approach on combined maternal, neonatal & child health interventions, at the global and regional levels, prioritization of slow-progressing countries and high burden areas within countries, linking with attaining Universal Health Coverage (Aggarwal *et al.* 2023a). It also emphasizes that at the country level, maternal and newborn health programs and interventions must be prioritized within health budgets and redesigned to ensure that high-quality care is available to all women and newborns in need (Syed *et al.* 2022).

According to Amu *et al.* (2023a: 134), improving maternal health outcomes and achieving universal health coverage (UHC) has become part of the global agenda, with substantial emphasis on low and middle-income countries (LMICs), maternal healthcare comprises antenatal care (ANC), skilled birth attendance (SBA) and postnatal care (PNC). They are proven services that play a vital role in achieving improved maternal health outcomes. Inadequate maternal healthcare utilization, therefore, constitutes a major driver of maternal complications that result in disability and mortality among women in LMICs including sub-Saharan Africa (SSA) (Lukwa *et al.* 2024). More than 800 women, for instance, die during pregnancy, childbirth, or within 42 d of termination of pregnancy each day in SSA due to obstetric complications militating against the achievement of the Sustainable Development Goals (SDGs) set by the United Nations on 25 September 2015 (Amu *et al.* 2023b).

2.2.1 State of Maternal Healthcare in the United States of America

The current state of global maternal healthcare is characterized by significant disparities and challenges. In the United States, maternal mortality rates remain high, with a disproportionate impact on ethnic minorities (PERSAUD-SHARMA 2020). In the United States of America, MM disparities continued across subpopulations, states, and geographic areas with black women having triple MMR than white women, and more of these maternal deaths are deemed preventable. The current state of maternal healthcare in the United States of America is concerning (Douthard *et al.* 2021a). Maternal mortality rates in the US are higher compared to other developed countries, with disparities seen among different ethnicities (McKinney 2023). There is a lack of screening and treatment for perinatal mental health conditions, which are leading causes of maternal mortality (Garcia and Hunter 2022). Access to hospital obstetric care in rural areas is declining, leading to adverse maternal and infant outcomes (PERSAUD-SHARMA 2020) .

Maternal healthcare in the United States is currently in a state of crisis, marked by a troubling increase in both maternal morbidity and mortality (Verma and Shainker 2020). This issue is further exacerbated by pronounced disparities in terms of race, socio-economic status, and geographical location, as highlighted in various studies such as (Verma and Shainker 2020; Douthard *et al.* 2021b). Cardiovascular disease stands out as the primary cause of maternal mortality, necessitating comprehensive policy reforms to specifically address racial and ethnic inequities (Wong and Kitsantas 2020; Mehta *et al.* 2021). Although the postpartum period is crucial for maternal health, there are significant missed opportunities in postpartum care (Cohen and Daw 2021). To combat the rising maternal mortality rate, it is imperative to implement standardized healthcare delivery and address social determinants of health (Villavicencio, McHugh and Edmonds 2020). Additionally, Khekade *et al.* (2023), underscores the importance of prevention through enhanced continuity of care and proactive management of risk factors during the preconception period.

Increased maternal age is linked to a heightened risk of stillbirth, and there are noticeable racial and ethnic disparities, with Black women experiencing a higher fetal mortality rate (Dongarwar *et al.* 2020; Pruitt *et al.* 2020). Although there has been an overall decline in stillbirth incidence, there is a rise in the rate of extreme preterm stillbirths (Dongarwar *et al.* 2020). Key risk factors for stillbirth include non-Hispanic black ethnicity, null parity, advanced maternal age, obesity, preexisting diabetes, chronic hypertension, smoking, alcohol consumption, and past obstetric history, according to Polnaszek, Clark and Rouse (2022). Despite the identification of these risk factors, a considerable proportion of stillbirths remain unexplained (Metz *et al.* 2020).

2.2.2 State of Maternal Healthcare in Brazil

Maternal healthcare in Brazil faces various challenges. The country has high rates of unnecessary cesarean sections, particularly in the private sector, with rates exceeding 80% (Rodrigues *et al.* 2022). There are inequalities in the structure of maternity hospitals, with deficiencies in physical aspects, human resources, equipment, and drugs (Madeiro *et al.* 2022). According to Bahamondes *et al.* (2020)

points out the unaddressed family planning needs and the absence of adequate prenatal and postnatal care for migrant Venezuelan women in Roraima. Studies by Pessa Valente *et al.* (2021) and Gama, Thomaz and Bittencourt (2021) delve into initiatives aimed at improving the quality of care in maternal and newborn hospitals, discussing the associated challenges in delivering healthcare during childbirth. According to Mariotti *et al.* (2024) and Bittencourt *et al.* (2021) both stress the necessity for enhanced oral health services for pregnant women and variations in the implementation of best practices in labor and childbirth care. Taking a broader view, Arruda *et al.* (2022) observes a decrease in maternal mortality in southern Brazil but notes higher rates among vulnerable women. Additionally, Andrade *et al.* (2020) underscores the prevalence of severe maternal morbidity and the imperative to enhance the quality of obstetric care.

In Brazil series of maternal deaths due to COVID-19. Barriers to access to healthcare, differences in pandemic containment measures in the country, and the high prevalence of concomitant risk factors for COVID-19 severe disease may play a role in the observed disparity compared to worldwide reports on maternal outcomes (Takemoto *et al.* 2022). The COVID-19 pandemic has further impacted the quality of maternity care, with women diagnosed with COVID-19 reporting mistreatment, lack of support, and ineffective communication during labor and delivery (Ross *et al.* 2023). Maternal mortality in southern Brazil has shown a reduction trend, but the rates remain above the recommended levels (Arruda *et al.* 2022). The adequacy of prenatal care in Brazil varies, with different criteria used for evaluation and discrepancies between national studies and government data (Martin *et al.* 2022). Overall, there is a need for improvements in childbirth practices, access to quality care, and the inclusion of women's voices in decision-making processes to enhance maternal healthcare in Brazil.

Stillbirth rates in Brazil have been declining over time, although there are still challenges to address (Bezerra *et al.* 2021). Factors associated with the decline in stillbirth rates include improvements in sociodemographic variables, reductions in intrauterine growth restriction (IUGR), progress in social determinants of health, and expansion of healthcare services (Carvalho *et al.* 2020; Rodrigues, Gurgel and Leite 2022). However, there are still regional and socio-economic disparities in stillbirth rates, with higher rates observed in the North and Northeast regions of Brazil (Menezes *et al.* 2019). The causes of stillbirth in Brazil vary, with some cases remaining unexplained or unknown, common causes include perinatal conditions, infectious diseases, fetal malformations, placental abruption, hypertensive syndromes, and maternal syphilis (Carvalho, Pellanda and Doyle 2018; Fonseca *et al.* 2019).

2.2.3 State of Maternal Healthcare in China

Maternal healthcare in China has witnessed notable advancements, marked by a consistent improvement in maternal healthcare between 2004 and 2018 (Zhao *et al.* 2021). However, there remain areas that require attention and enhancement, including the need for improved systematization, continuity, and quality of antenatal care (Hu *et al.* 2021). Disparities and inequalities still exist among different regions and rural areas. Utilization of maternal health services, such as antenatal care (ANC), institutional delivery (ID), and postnatal care (PNC), varies across provinces (Yang and Yu 2023). Factors such as place of residence, education level, income, and distance to health facilities influence

the utilization of these services(Liu, Yan and Xia 2022; Yang and Yu 2023) .Mental healthcare, particularly concerning perinatal depression, raises concerns due to limited access to qualified care (Schwank *et al.* 2020). The utilization of maternal health services has demonstrated a correlation with a decrease in maternal mortality (Zhao *et al.* 2020). Despite the implementation of the two-child policy, challenges persist in reducing maternal mortality, prompting the adoption of the Five Strategies for Maternal and Newborn Safety (Liu *et al.* 2020). Sociodemographic factors, such as age and previous pregnancies, play a role in influencing the utilization of maternal health services (Jiang *et al.* 2020). In some areas, there is a mismatch between resource input and health needs, leading to resource waste and overutilization (Yang and Yu 2023). Additionally, the current state of antenatal care in China is not optimal, with variations in the number, timing, and content of examinations (Hu *et al.* 2021). Migrant women in China also face challenges in accessing adequate maternal healthcare, with a significant proportion reporting inadequate prenatal visits and postnatal care (Zong *et al.* 2021). To improve maternal healthcare in China, targeted interventions should be implemented, including increased investment in underutilized areas, financial incentive projects for pregnant women, and improved health education.

In China, both stillbirth and syphilis place a large burden on maternal and infant health, the latest data showed that the average stillbirth rate in China was 8.8 per 1000 births from 2012 to 2014, and China ranked in the top five countries of the world in 2015 in the total number of stillbirths (Duan *et al.* 2021). Notably, Syphilis infection, especially no latent syphilis and high maternal titers, poses a significant risk for stillbirth (Duan *et al.* 2021). According to Liang *et al.* (2021), another contributing factor is maternal exposure to fine particulate matter (PM2.5) during pregnancy, with a more pronounced association during the second trimester. Although there has been an overall decrease in the prevalence of stillbirth in China, regional disparities persist, with higher rates observed in North China (Liu *et al.* 2021; Lyu *et al.* 2021). The primary causes of neonatal deaths in the country include preterm birth, intrapartum complications, and pneumonia, with elevated mortality rates in rural areas (Liu, Yan and Xia 2022). The prevalence of hypertensive disorders in pregnancy stands at 4.74%, accompanied by a low maternal mortality rate of 0.61/100,000 (Lyu *et al.* 2021). In Hong Kong, the stillbirth rate in singleton pregnancies has slightly decreased, with shifts in causes attributed to demographic changes and improved prenatal testing (Wong *et al.* 2022). However, the challenge of globally applying research on stillbirth prediction and prevention is acknowledged (Ishak and Khalil 2021).

2.2.4 State of Maternal Healthcare in Australia and New Zealand

In Australia and New Zealand, over the past several decades, the rate of late and term stillbirth has declined substantially, mainly due to the improvement of antenatal and intrapartum care, the reduction of some modifiable risk factors, and the early detection of congenital anomalies followed by prompt management (Tindal *et al.* 2022; Tsakiridis *et al.* 2022a). However, the overall stillbirth rate has remained relatively unchanged, as the incidence of important risk factors, that is obesity and advanced maternal age, is rising (Tsakiridis *et al.* 2022b). Maternal healthcare in Australia and New Zealand has seen significant developments and improvements in recent years, however, is characterized by notable

disparities and challenges (Dawson *et al.* 2019). In New Zealand, persistent inequities in maternal mental health services, particularly for Māori and Pacific mothers, are highlighted, contributing to dissatisfaction with care, as indicated (Holden *et al.* 2020; Dawson *et al.* 2021). These disparities are further influenced by age, socio-economic status, and geographic location (Dawson *et al.* 2021). In Australia, similar issues are observed, with discernible disparities in health service utilization among different population groups (Fox *et al.* 2021). Both countries face the absence of specific pregnancy and parental leave policies in medical schools, emphasizing the need for enhanced support for pregnant and parenting students (McGrath, Szabo and Bilszta 2022). Additionally, challenges in midwifery education are identified in both Australia and New Zealand. This includes the imperative to support First Peoples/Māori midwifery students, increase the visibility of midwifery, and enhance program design, content, and delivery (Sidebotham *et al.* 2021).

Abortion care has been modernized, with the increasing use of medical abortion and the introduction of safe access zones (Melville 2022). Obstetric medicine practice has also evolved, with a focus on collaboration between obstetrics and internal medicine to ensure optimal outcomes for the mother and fetus (Idel *et al.* 2017). The impact of financing mechanisms on maternal healthcare is a significant concern in Australia, particularly the two-tiered system exacerbating inequities (Fox *et al.* 2021). In New Zealand, barriers to equitable maternal health, such as physical access, political context, and cultural factors, are identified (Dawson *et al.* 2019). The influence of maternal socio-economic disadvantage on midwifery care in New Zealand underscores the necessity for targeted support for vulnerable populations, as emphasized (Dixon *et al.* 2020). These challenges collectively indicate the need for comprehensive and targeted efforts to address disparities and improve maternal healthcare outcomes in both Australia and New Zealand.

The stillbirth rate in Australia is reported at 7 per 1000 births, and the late gestation stillbirth rate is more than 30% higher than in the best-performing countries globally (Lehner *et al.* 2019; Flenady *et al.* 2020). To address this issue, the National Stillbirth Action and Implementation Plan has set a target to reduce stillbirth rates by 20% within the next five years (Flenady *et al.* 2020). Despite this initiative, public awareness of stillbirth remains low, indicating a need for a national awareness campaign (Gordon *et al.* 2020). Stillbirth remains a significant public health problem in Australia and New Zealand. Compliance with recommended investigations for stillbirth is suboptimal, and many stillbirths remain unexplained (Sexton *et al.* 2021). The risk of stillbirth is associated with increasing maternal age beyond 40, although the absolute risk remains low (PGDIP 2017). A retrospective case series audit at a Sydney tertiary referral hospital identified a significant increase in the stillbirth rate, with congenital anomalies and unexplained antepartum death as major causes (Kapurubandara *et al.* 2017). The National Health and Medical Research Council (NHMRC) and PSANZ have partnered to update a clinical practice guideline for the care of pregnant women with decreased fetal movements, aiming to improve perinatal health outcomes and reduce stillbirth rates (Daly *et al.* 2018).

Disparities in stillbirth risk and care are evident, particularly among Aboriginal and Torres Strait Islander women and those of migrant and refugee backgrounds (Rumbold *et al.* 2020). The Safer Baby Bundle

initiative, comprising five elements aimed at reducing stillbirth (Andrews *et al.* 2020). Like any other country, in Australia and New Zealand understanding the causes of stillbirth is considered crucial for the prevention (Sexton *et al.* 2021). Additionally, there is a recognized need for consistent international practice protocols for the investigation and management of stillbirth (Tsakiridis *et al.* 2022b). These efforts collectively underscore the importance of a multifaceted approach to address the challenges associated with stillbirth in Australia and to improve outcomes for mothers and infants.

2.2.5 State of Maternal Healthcare in Thailand

Stillbirth is a serious medical issue during childbirth. While, the overall stillbirths worldwide have decreased markedly, from 4 million in 1990 to 2.1 million in 2015, stillbirth estimates vary widely across geographic areas, the rates of stillbirth ranged from 1.2 per 1000 births in Iceland and 3.4 per 1000 births in Thailand to 27.6 per 1000 births in Pakistan and in South and Southeast Asia and 56.3 per 1000 births in South Sudan (Duan *et al.* 2021). In Thailand, healthcare professionals face barriers in providing effective care for pregnant adolescents, including a lack of continuity and the need for psychosocial skills (Jittitaworn *et al.* 2020). There is a lack of visibility and recognition of midwives, with pregnant women often preferring physicians for normal births (Prapawichar *et al.* 2020). Migrant Burmese women encounter difficulties in accessing culturally appropriate antenatal care due to bureaucratic and culturally insensitive practices (Prapawichar *et al.* 2020). Access to community-based reproductive health services is associated with positive delivery outcomes among displaced mothers (Perera *et al.* 2022).

The utilization of maternal healthcare services in Thailand is influenced by socio-economic factors, with disparities in service utilization among disadvantaged women (Yadav *et al.* 2021). The effectiveness of policies related to breastfeeding promotion, protection, and support in Thailand is currently being assessed (Nguyen *et al.* 2020). The practice of gestational surrogacy in Thailand has raised concerns about the risks faced by surrogates, highlighting the need for better regulations to protect their health (Attawet, Wang and Sullivan 2022). The facilitators and barriers to the utilization of maternal healthcare services in Thailand are like those in other Empowered Action Group states in India, with urban residence, higher education, and wealth being facilitators, and low education, poverty, and unwanted pregnancies being barriers (Zaveri *et al.* 2023).

Thalassemia, a prevalent genetic disorder in the country, is a significant contributor to severe cases of the disease that can lead to stillbirth (Paiboonsukwong *et al.* 2022). Placental pathology, specifically involving inflammatory-immune processes, is another common cause of stillbirth in Thailand (Taweewisit and Thorner 2022). Despite these factors, the country continues to experience a relatively high stillbirth rate, indicating a need for more effective prevention and prediction models (Ishak and Khalil 2021). The slow progress in reducing stillbirth rates in low and middle-income countries, including Thailand, underscores the importance of increased efforts in public awareness, data collection, and understanding public health priorities, according to Hug *et al.* (2021a). To address the issue, efforts should focus on eliminating outdated cultural practices and addressing factors such as preterm deliveries and maternal hypertension (Poudel *et al.* 2020). These multifaceted approaches are crucial

for improving the understanding and management of stillbirth in Thailand, ultimately contributing to better maternal and infant outcomes.

2.2.6 State of Maternal Healthcare in Pakistan

Failure to improve maternal health in sub-Saharan African countries has adverse effects as it affects a variety of health and socio-economic outcomes, maternal and newborn deaths also slow economic growth and lead to global productivity losses on the other hand, investing in better health for women and babies has far-reaching benefits for countries (Mlambo, Mvuyana and Ntshangase 2023).

Pakistan is among the top 10 countries with the highest burden of stillbirths and ranked third among the countries with a high stillbirth rate, in South Asia, the highest burden of stillbirth has been observed in India, Nigeria, Pakistan, China, and Bangladesh (Shakeel *et al.* 2023). According to Shakeel *et al.* (2023), mothers who delivered their children in Pakistan had the highest risk of stillbirths and death on the day of birth and lack of adequate antenatal health care services and delays in seeking health care during pregnancy have significantly increased the stillbirth rates in Pakistan. In Pakistan, many international and national health policies pledged to improve the health of newborns however, the issue of stillbirth was not adequately addressed. Maternal age, urban areas, educated mothers, and wealth index are important factors leading to fetus death, insufficient health facilities are one of the main reasons for poor pregnancy outcomes. Sociodemographic factors and geographical attributes play an important role as social determinants of health. There is considerable geographical heterogeneity in access to health-related facilities in Pakistan, and compared with urban dwellings, stillbirths are more likely to occur in rural dwellings (Shakeel *et al.* 2023). Globally, Japan, the Republic of Korea, Denmark, and Finland have maintained the lowest rates for a decade, with SBRs remaining below 2.0 stillbirths per 1,000 livebirths for 2021 (de Graaff *et al.* 2023). However, the 2021 stillbirth rate in high-income countries ranged from 1.6/1,000 (Japan) to 8.7/1,000 (Trinidad and Tobago), with several high-income countries reporting higher SBRs than some upper-middle-income countries. For instance, the SBR in Bosnia and Herzegovina was reported as 2.7/1,000, while this was 2.8/1,000 in Canada and Germany.

2.2.7 State of Maternal Healthcare in Ethiopia

Ethiopia is one of the top stillbirth-reporting countries worldwide, despite several measures taken to reduce the burden of stillbirth; the pace of decline was not as good as the post-neonatal death (Tsfay *et al.* 2022). Numerous studies have highlighted several factors contributing to the elevated prevalence of stillbirth in Ethiopia, and these factors encompass sociodemographic elements such as residing in rural areas, having low educational attainment, and early marriage (Wolde *et al.* 2022).. Obstetric and medical aspects, such as twin pregnancies, maternal hypertension, and complications during labor and delivery, have also been identified as significant contributors (Tasew *et al.* 2019; Worede and Dagnew 2019; Zeleke and Asemahagn 2021). Additionally, maternal complications like alcohol consumption and sexually transmitted infections have been recognized as influential factors (Zeleke and Asemahagn 2021). There is a recognized necessity for enhanced antenatal and intrapartum care, including the utilization of partographs (Mekonnen Dagne, Takele Melku and Abdurkadir Abdi 2021). The persistently

high stillbirth rate in Ethiopia, mirroring trends in other developing countries, underscores the imperative for further research and interventions to address this critical public health issue (Agbata *et al.* 2017).

2.2.8 State of Maternal Healthcare in Uganda

In Uganda, more efforts have been put up especially to reduce under-five mortality and neonatal deaths such as the provision of mosquito nets for infants to stop malaria infections, and emphasizing postnatal care among others; however, efforts to reduce stillbirths are still low since stillbirths are not even counted as deaths because one needs to be born alive to die (Asiimwe 2021). Complications arising from a mother during labour can be avoided with improved quality health care for these expectant mothers. Health facilities at all levels need to be equipped with trained personnel and equipment that ensure safe delivery (Dantas, Singh and Lample 2020). According to Dantas, Singh and Lample (2020), as women going for antenatal care overall have been significantly improving to over 90% in Uganda, studies show that more efforts to improve this ANC attendance in the third and first trimesters are needed since these stages are vital to the mother and the fetus. Improving this therefore would avert many stillbirths (Asiimwe 2021). Men need to get involved in maternal health issues of their pregnant wives by giving them support as they go for antenatal care. This support can be in the form of financial support since studies show that women of low socio-economic status are associated with high stillbirths because men are the breadwinners of most families in Uganda, making them get involved in these maternal issues of their wives will boost their economic status and subsequently reduce stillbirth since safe motherhood will be guaranteed.

Several studies have delved into the indicators and cultural factors influencing stillbirth in Uganda. In the work by Kiondo *et al.* (2021), factors like referral history, maternal age, and obstetric complications emerged as indicators of intrapartum stillbirth. A study by Ayebare *et al.* (2021) underscored the influence of cultural beliefs and practices on parental bereavement experiences after stillbirth, including the significance of kinship and social support. Studies by Musaba *et al.* (2021) and Arach *et al.* (2021) both concentrated on the occurrence and determinants of perinatal mortality, with Musaba identifying referral during active labor and elevated maternal blood lactate levels as determinants, and Arach pinpointing nulliparity and maternal age over 30 as risk factors. A study by Serunjogi *et al.* (2021) conducted a comparison of perinatal outcomes and birth defects between adolescents and older mothers, revealing an escalated risk of adverse outcomes among adolescents. According to Tamale *et al.* (2022) prevalence of pregnancy-related complications, associating late first antenatal care attendance, high gravidity, high parity, and a history of induced abortion with these complications. In separate works, Blencowe *et al.* (2021) and Balkus *et al.* (2021) both stressed the imperative for enhanced data collection and measurement methods for stillbirth and other unfavorable pregnancy outcomes.

According to Ghosh *et al.* (2022), as facility-based births increase, access to and performance of cesarean section (CS) is also increasing in many low-income and middle-income countries (LMICs). However, while global CS rates increased from 12% in 2000 to 21% in 2015, the increase has been only 5%–6% in East and South Africa. CS rates are projected to be near 30% globally by 2030, though

sub-Saharan Africa is estimated to remain below 8% and low CS rates may indicate unmet needs and missed opportunities to prevent adverse outcomes (Ghosh *et al.* 2022). Increased maternal, neonatal, and infant mortality may have been avoided by increasing access to cesarean delivery for medically indicated cases, however, lack of trained personnel or access to safe anesthesia, blood supply, and essential drugs, contribute to cesarean-related adverse outcomes in many African countries (Boatin *et al.* 2021). In Uganda, facility-based cesarian rates were 22%–32% in general hospitals and 20%–25% in referral hospitals between 2012 and 2016, and in Kenya, 2014 Demographic and Health Survey data showed an overall 13% CS rate among institutional births, with notable disparities between rural and urban populations and across socio-economic levels (Ghosh *et al.* 2022). Although this target has been met in 94 high-income countries, many African countries, including Uganda, need half the rates to reach the target, while the estimated global pre-natal deaths have reduced by about 20% over the last 4 years, Uganda's perinatal mortality of 38 deaths per 1,000 births has stagnated over the last 5 years (Arach *et al.* 2021). This is above the regional estimates for Eastern Africa (34.5 per 1,000 births) and Western Africa (35.7/1,000 births), hence, there is an urgent need for a reduction in perinatal mortality in this region. According to Shakeel *et al.* (2023), the realization of a perinatal mortality reduction, however, is a complex issue that does not only involve improvement of the accessibility and quality of healthcare but also improving nutrition, sanitation, and education. (Aboagye *et al.* 2024)

2.2.9 State of Maternal Healthcare in Kenya

Kenya has introduced the National Hospital Insurance Fund and free maternity care to improve access to maternity services; however, the stillbirth rate has remained static, with estimations of 19.67 per 1 000 births in 2013 and 19.75 per 1 000 births in 2019 and this is like other sub-Saharan countries where stillbirths have stagnated or even increased due to population growth (Ghosh *et al.* 2022). According to Shakeel *et al.* (2023) in sub-Saharan Africa, stillbirth and fistula are commonly attributed to spirits, sin, or 'curses' which portion blame on the women or their families. Similarly, marital conflicts or divorce may occur after a stillbirth as women have not met the expectation of childbearing, or because of the stigma associated with uncontrolled urine from a fistula. It is not known if stigmatization or rejection is different for women who have suffered both. It has been estimated that 4.2 million women are living with depression following an experience of stillbirth, yet this may be amplified further for women who have ongoing incontinence and poor physical health (Ngongo *et al.* 2022). WHO developed a guideline for implementing stillbirth and neonatal death audits at healthcare facilities in 2016, like many other poor resource countries, stillbirth and neonatal death rates remain high in Malawi despite the implementation of an audit (Gondwe *et al.* 2022). Communication and interaction with healthcare workers at the time of stillbirth remain in parents' long-term memories and impact emotional and psychological well-being and, cultural attitudes and norms influence how stillbirth is acknowledged and discussed in society in countries like Malawi, Zambia, and Tanzania (Danna *et al.* 2023). Experiencing the death of a baby before, during, or immediately after birth, constitutes a traumatic and painful event for parents with poor mental and physical health which can impact family dynamics including attitudes towards existing children, the tension between partners, and the potential for marriage breakdown (Danna *et al.* 2023). According to Danna *et al.* (2023), cultural beliefs and practices surrounding death vary considerably

across different contexts and groups and are a key influence on individual experiences, impacting grief, adjustment, and support needs surrounding stillbirth in an African context.

2.2.10 State of Maternal Healthcare in Zimbabwe

In less developed countries, which account for 98% of perinatal deaths, these deaths are not always registered. Third-trimester stillbirth rates in sub-Saharan Africa are approximately ten times that in developing countries (Bvochora *et al.* 2022). According to Shakeel *et al.* (2023), the perinatal mortality rate for Zimbabwe was estimated to be around 34 per 1000 births according to the Zimbabwe Demographic Health Survey of 2015. According to Bvochora *et al.* (2022), studies have shown that in Zimbabwe, women seek antenatal care late and prioritize first-child pregnancies compared to subsequent pregnancies, reasons for late booking include lack of information about the purpose of early antenatal care, long waiting times, and unfriendly services however the country aims to achieve global targets of a stillbirth rate of 12 per 1000 births or less by 2030. Neonatal mortality and stillbirth are high in Zimbabwe and appear to be driven by high preterm births, interventions for primary prevention of preterm birth and strengthened management of preterm labour and ill and small neonates are required to reduce neonatal mortality in Zimbabwe and other African countries with similar profiles (Chasekwa *et al.* 2022).

The current state of stillbirth in Zimbabwe presents a significant public health concern, with a prevalence of 9.8% among women with severe preeclampsia (Ngwenya *et al.* 2022). Various contributing factors have been identified, including unbooked status, frontal headaches, vaginal bleeding, high diastolic blood pressure, low platelet count, antepartum hemorrhage, HELLP syndrome, and fetal sex (Ngwenya *et al.* 2022). In Mutare district, adverse pregnancy outcomes, including stillbirth, are prevalent and associated with factors such as birthweight, gestational age, delivery complications, and delivery methods (Chaibva *et al.* 2019). Additionally, in urban settings in Zimbabwe, the prevalence of stillbirth is 4.1%, with preterm birth and low birth weight being common (Balkus *et al.* 2021; Lokken *et al.* 2021). These findings collectively underscore the complexity of stillbirth in Zimbabwe and the need for comprehensive strategies to address its multifactorial causes and associated risk factors.

2.2.11 State of Maternal healthcare in South Africa

South Africa invested in improving sexual, reproductive, maternal, and neonatal health (SRMNH) services, but did not reach the Millennium Development Goals targets for maternal and child health by the end of 2015 which is aligned with the United Nations Sustainable Development Goal (SDG) of reducing maternal mortality to below 70 per 100 000 live births and neonatal mortality to 12 deaths per 1000 live births (Pillay and Moodley 2024). South Africa aims to reduce institutional maternal mortality ratio (iMMR), neonatal mortality and stillbirths by 50% by 2030. In 2019, the iMMR of 120 per 100,000 live births was well above the SDG target (Chetty *et al.* 2023). Access to basic health care has improved in South Africa over the past two decades, which is evident in maternal and child mortality rates, among other indicators, neonatal mortality, infant mortality, and the mortality of children under five years of age have been markedly reduced (Ramphoma *et al.* 2022). Despite improvements in obstetrics and

neonatal care, the stillbirth rate remains high (23 per 1,000 births) in South Africa, and, the occurrence of a stillbirth is a dramatic and often life-changing event for the family involved (Jimoh, Wolvaardt and Adam 2022). The COVID-19 pandemic has undermined gains in reducing maternal and perinatal mortality in South Africa because it has a detrimental effect on maternal and infant health gains pregnant and breastfeeding women are at high risk for COVID-19-related morbidity and mortality (Fawcus *et al.* 2024). According to Fawcus *et al.* (2024), the COVID-19 pandemic and responses by governments, including lockdowns, have had various consequences for lives and livelihoods, South Africa implemented severely restrictive lockdowns to reduce transmission and limit the number of patients requiring hospitalization however interventions have had mixed consequences for routine health services.

Stillbirth is common, with 1 in 200 babies stillborn in the UK (5 per 1,000 births), as compared to South Africa, the stillbirth rate is substantially higher with 32 178 stillbirths identified by the Perinatal Problem Identification Program (Jimoh, Wolvaardt and Adam 2022). According to Jimoh, Wolvaardt and Adam (2022) Jimoh, Wolvaardt, & Adam, (2022), the stillbirth rate in SA is regarded as unacceptably high by obstetric experts. This gap is highly unacceptable and shows how South Africa is way behind when it comes to curbing the stillbirth pandemic. According to Chetty *et al.* (2023), the institutional neonatal mortality rate (12 per 1,000 live births in 2021) meets the SDG, almost 50% of neonatal deaths are avoidable (2021). This is despite the substantial reduction in iMMR since 2011, attributable to South Africa's antiretroviral treatment (ART) programme, which increased access to lifelong maternal ART at higher CD4 cell counts (Carmona *et al.* 2018).

Despite stillbirths being common in South Africa, very few local studies have been conducted to investigate the management of stillbirth by healthcare workers directly involved in maternal deliveries, the experiences of women who have delivered stillborn babies, and their satisfaction with the care they receive (Mills *et al.* 2022b). There is a 40% higher risk of a parental relationship dissolving after a stillbirth when compared with a live birth and other family members including existing children and grandparents can also be adversely affected and should be included in counseling (Jimoh, Wolvaardt and Adam 2022). Although South Africa has put some interventions to improve the accessibility of maternal healthcare services, vulnerable women including women with disabilities are still facing numerous challenges when trying to access maternal healthcare services (Mheta, Sibiya and Nkosi 2023b).

The state of global maternal healthcare reflects a complex landscape marked by progress in certain areas and persistent challenges in others (Syed *et al.* 2022). According to Syed *et al.* (2022), while many countries have made strides in improving maternal health outcomes, significant disparities and gaps still exist, contributing to maternal morbidity and mortality. Many countries have seen a decline in maternal mortality rates, owing to improved access to skilled healthcare professionals, better antenatal and postnatal care, and enhanced emergency obstetric services (Sahoo *et al.* 2021; Syed *et al.* 2022).

Global initiatives and awareness campaigns have shed light on maternal health issues, fostering collaborations between governments and international organizations to address key challenges. Efforts

have been directed towards preventive measures to contribute to healthier pregnancies and better maternal outcomes have been made, however, disparities persist, with marginalized communities and low-income countries facing higher rates of maternal morbidity and mortality. Access to quality healthcare remains a critical issue, exacerbated by socio-economic factors (Howell 2018). In certain regions, access to skilled birth attendants, emergency obstetric care, and essential maternal health services remains limited, contributing to adverse outcomes. Maternal morbidity, including stillbirths, remains a concern globally. Factors such as inadequate nutrition, infectious diseases, and lack of proper prenatal care contribute to adverse maternal health outcomes (Organization 2014a). The quality of maternal healthcare services varies widely. Some regions lack well-equipped facilities, adequately trained healthcare providers, and standardized protocols for maternal care (Souza *et al.* 2024b). Socio-cultural factors, including gender inequality, early marriage, and traditional practices, can impact maternal health outcomes, making it essential to address these issues comprehensively (Nhampoca and Maritz 2024). While progress has been made in improving maternal healthcare globally, concerted, and sustained efforts are required to overcome existing challenges and ensure that every woman has access to safe, respectful, and quality maternal healthcare services (Health 2012). Addressing disparities, promoting education, and strengthening health systems are pivotal in achieving meaningful advancements in global maternal health outcomes (Ajegbile 2023).

2.3 GLOBAL FRAMEWORK, INTERVENTIONS, GLOBAL GUIDELINES, AND GLOBAL POLICIES ON STILLBIRTH

2.3.1 Sustainable Development Goals

The Sustainable Development Goals (SDGs) are 17 interconnected goals to address global challenges such as poverty, inequality, and environmental degradation (Walker 2021). The Sustainable Development Goals (SDGs) are a visionary and multi-sectoral agenda for human development (Toska *et al.* 2022). The 2030 Agenda for Sustainable Development, encompassing the Sustainable Development Goals (SDGs), seeks to advance equity in resource distribution and environmental preservation (Tomuschat 2021). Nonetheless, there are challenges associated with encapsulating development priorities within a singular framework of goals (Fukuda-Parr 2018). Achieving the SDGs in Africa requires a paradigm shift, with a focus on poverty, gender equality, and local knowledge (Dlamini, Block and Mathibela 2023).

The global burden of stillbirths, particularly in low- and middle-income countries, remains a significant challenge to achieving Sustainable Development Goal 3.2 (Aminu and van den Broek 2019; Hug *et al.* 2021a). Stillbirth and neonatal death audits are suggested interventions to help meet the Sustainable Development Goals of reducing stillbirth and neonatal mortality. The goals were eight global development goals that aimed at addressing social determinants of health and associated detrimental health outcomes. Many interventions aimed at improving treatment do not achieve their desired change, with few efficiently implemented and sustained due to health system constraints such as poor infrastructure, insufficient resources, and poor leadership (Gondwe 2022). The Millennium Development Goals (MDGs) were adopted by UN member states in 2000, and one of them was to

reduce maternal deaths by three-quarters by 2015 before the WHO launched the Safe Motherhood Initiative which was meant to improve the quality of maternal healthcare through building a political will to come up with effective interventions and resources to address maternal mortality. Following the end of the MDGs (2015), the UN has developed Sustainable Development Goals (SDGs) which are committed to improving health and development for all member state countries. Reduction in maternal mortality remains a priority under SDG 3: 'Ensure healthy lives and promote well-being for all at all ages', the global target was reducing maternal mortality to 70 per 100,000 live births by 2030, and all member countries should reduce maternal mortality ratio (MMR) by at least two-thirds of their baseline (Ayele, Tefera and East 2021). Whilst the Sustainable Development Goals do not precisely state a stillbirth reduction target, it is an essential indicator of the quality of care in pregnancy and childbirth and a sensitive marker of a healthcare system's strength.

Over the past two decades, China as a nation has made impressive progress in improving maternal and child health, mortality among children younger than 5 years has declined from 54.1 per 1000 livebirths in 1990 to about 12.5 per 1000 livebirths in 2015, giving an annualized rate of decline of 5.9% per year (Liang *et al.* 2019). This rate significantly surpasses the necessary annual decline of 4.4% to meet the target of Millennium Development Goal (MDG) 4.1, in parallel, China has achieved a notable reduction in the maternal mortality ratio, with an annualized decrease of 6.5%, marking one of the most rapid declines globally. Although as a nation China has already achieved the Sustainable Development Goal (SDG) target of reducing the rate of maternal deaths to 70 per 100 000 livebirths, maternal mortality ratios have not been assessed at the county level (Liang *et al.* 2019).

Maternal mortality reduction has been recognized as a key healthcare problem that requires prioritizing in addressing, in 2015, the United Nations set Sustainable Development Goals to reduce the global maternal mortality ratio to 70 per 100,000 live births by 2030, and Ethiopia as a member country has been working to achieve this Sustainable Development Goals target for the last decades (Ayele, Tefera and East 2021). In 2003, the Ministry of Health of Ethiopia launched a health extension programme to help in achieving universal health coverage (UHC) and to accelerate the country's progress in meeting MDGs and SDGs in all areas of the health sector (Ayele, Tefera and East 2021). The government has been striving to enhance the availability of primary healthcare services across all regions of the nation by employing specialized and trained healthcare personnel known as health extension workers (HEWs). One of the notable accomplishments of the HEW programs from 2003 to 2018 has been the enhancement of access to maternal health services, including antenatal care (ANC) and family planning services. Universal Health Coverage (UHC) was intended to guarantee access to all essential healthcare services without imposing financial burdens. However, concerns have been raised regarding the ability to achieve the UN's SDGs in low-income countries including Ethiopia due to financial constraints, and this is because it requires reforms in health financing with the ambition of increasing public funds in healthcare expenditure (Ayele, Tefera and East 2021). In numerous low-income nations, efforts to raise healthcare spending and implement health financing reforms have encountered obstacles, primarily stemming from a lack of political dedication, in addition to budget shortfalls. To address this issue, the Ethiopian government has undertaken various reform initiatives. One such

reform involved the initiation of the Community-Based Health Insurance (CBHI) program in 2010.

According to Ayele, Tefera and East (2021), the scheme aims to strengthen healthcare financing within Ethiopia to improve access to primary healthcare and to meet SDG targets in all areas of the health sector, including maternal mortality. Advancing the attainment of SDG goal 3.2 in Ethiopia, aimed at eliminating preventable deaths among newborns and children under 5 years old, can be facilitated through a transition to sustainable and nutritious diets (Fanzo 2019). This transition can be promoted by formulating dietary guidelines rooted in the principles of sustainable healthy diets (Martini *et al.* 2021). The imperative for ongoing monitoring and evaluation of maternal and child healthcare services has been underscored (Salam and Akinyemi 2022). Additionally, recognizing the significance of addressing factors such as food security, crop production, and attitude is crucial in promoting suitable dietary practices among pregnant women (Mulugeta, Alem and Belachew 2019). The prevalence of undernutrition among pregnant women in Ethiopia is associated with residing in rural areas, having low educational status, a history of multiple births, anemia, and intestinal parasitic infections (Kumera *et al.* 2018).

In Ghana, a quality improvement intervention to reduce waiting time for emergency obstetric care and hand hygiene in the neonatal intensive care unit, improved hand hygiene compliance by 93%. Moreover, the percentage of mothers needing emergency cesarean surgery with unacceptable waiting times decreased by four times, and 93% of the sickest mothers were correctly identified (Chetty *et al.* 2023).

Maternal and child health are priority areas for public health interventions globally, including in South Africa, however, the targets to reduce maternal and child morbidity and mortality have been consistently missed in South Africa, with mortality rates for children having increased during the Millennium Development Goals (MDGs) period in 1990 (Mokwena and Modjadji 2022). Due to historical racial prejudice, poverty, unemployment, a lack of access to health care, and poor educational quality, South Africa has the world's largest economic disparity among its citizens, the majority of South Africans are dependent on the public health system and social services to meet the demands of the population. The delivery of quality and equitable health care, including oral health care, is a constitutional obligation in South Africa. Everyone has the right to have access to health care services, including reproductive health care; sufficient food and water; and social security, including, if they are unable to support themselves and their dependents, appropriate social assistance (Constitution 1996a). South Africa has several policies that support increasing access to health and creating supportive environments, although the policies focus on the primary goal of achieving health for all, there are separate policies for some vulnerable groups, such as for women and children (Ramphoma *et al.* 2022). The government of South Africa enshrined equality in Section 9 of the Bill of Rights, Article 3 of Section 9 states that "the state may not unfairly discriminate directly or indirectly against anyone on one or more grounds, including race, gender, sex, pregnancy, marital status, ethnic or social origin, color, sexual orientation, age, disability, religion, conscience, belief, culture, language and birth (Mheta, Sibiya and Nkosi 2023b).

Many other countries have developed specific action plans or strengthened newborn components within existing plans for Reproductive, Maternal, Newborn, Child, and Adolescent Health (RMNCAH).

Interventions directed toward mothers before and during pregnancy and childbirth may help reduce preterm births and stillbirths, and the survival of preterm newborns may also be improved with interventions given during these times or soon after birth (Organization 2022). Various research studies have delved into the intricacies of maternal health care within the broader framework of Reproductive, Maternal, Newborn, Child, and Adolescent Health (RMNCAH). Studies by Biradar and Halli (2023) and Tappis *et al.* (2020) both stress the necessity for integrated approaches to tackle the multifaceted challenges in this domain, especially in conflict-ridden settings. According to Sule *et al.* (2022) and Viellas *et al.* (2021) highlight the importance of comprehending and addressing gender dynamics, including the impact of social disadvantage, in the context of maternal health. Studies by Taneja *et al.* (2021) and Barfield (2021) underscore the significance of providing quality care and acknowledge the role of social determinants in influencing maternal health outcomes. Lastly, McClure *et al.* (2020) introduces the Global Network Maternal Newborn Health Registry as a valuable tool for comprehending and enhancing pregnancy outcomes.

2.3.2 Every Woman Every Child movement, which takes forward the Global Strategy for Women's and Children's Health.

Every Woman Every Child initiative, in alignment with the Global Strategy for Women's and Children's Health, strives to enhance the health and well-being of women, children, and adolescents on a global scale (Mason, Sen and Yamin 2020). The initiative aims to reduce maternal mortality and can benefit from a multi-faceted approach, education, particularly for women and their partners, is crucial in addressing poverty, and gender inequality, and improving perinatal care (Stefanovic 2021). This involves advocating for universal health coverage, addressing structural changes and accountability in strategies related to women's health, and diminishing infant mortality through national health systems (Mariya, Kuzyk and Diegtiar 2021; Womersley, Hockham and Mullins 2022). The movement underscores the significance of women's health throughout their entire lives, with a specific focus on Indigenous and First Nations communities (Conry 2023). Despite these efforts, notable health disparities persist, particularly in the United States, emphasizing the necessity for increased diversity in global health leadership (Batson, Gupta and Barry 2021). The overarching objective of the movement is to extend essential health interventions to all women, children, and adolescents by the year 2030 (Boerma *et al.* 2020).

The initiative, in alignment with the Global Strategy for Women's and Children's Health, has achieved notable progress in diminishing maternal mortality and stillbirth rates. The movement has stressed the importance of collaborative efforts and knowledge exchange, concentrating on aspects such as enhancing the quality of care, fostering early childhood development, and engaging communities (Costello and Naimy 2019; Gibson *et al.* 2021). Additionally, it has addressed the necessity for maternity care tailored to individual risks (Menard 2019). Global investments advocacy to reduce neonatal mortality (Persson, 2020), and highlighted the significance of measuring and monitoring reproductive, maternal, newborn, child, and adolescent health, as well as nutrition (Marchant *et al.* 2019; Persson 2021). The movement has also brought attention to the impact of decreased fetal movements on

perinatal mortality and explored the potential of maternity waiting homes in reducing maternal and perinatal mortality (Bekiou and Gourounti 2020; Idris *et al.* 2020). Lastly, it has underscored the influential role of gender equality and contraception in influencing maternal and child mortality (Bagade *et al.* 2020).

In Africa, the Every Woman Every Child movement, aligned with the Global Strategy for Women's and Children's Health, has made significant strides in reducing maternal mortality and stillbirth in Africa, however, challenges persist, particularly in the context of contextual factors influencing maternal healthcare utilization (Simona *et al.* 2022). The Every Woman Every Child initiative, aligned with the Global Strategy for Women's and Children's Health, holds significant importance in South Africa, where the enhancement of women's empowerment correlates with improved child health outcomes (Abreha and Zereyesus 2021). However, persistent challenges exist in meeting the sexual and reproductive health and rights of young people, emphasizing the need for sustained investment (Watson *et al.* 2021). Urgent attention is required to address violence against women and the nation's triple challenges of poverty, unemployment, and inequality, with social work playing a pivotal role (Leburu-Masigo 2020). The implementation of policies for reproductive, maternal, neonatal, child, and adolescent health faces hindrances due to system gaps, including a critical shortage of human resources and insufficient national funding (Belaid *et al.* 2020).

The Every Woman Every Child movement, aligned with the Global Strategy for Women's and Children's Health, has played a crucial role in enhancing maternal healthcare in South Africa, with digital health support, including applications such as MomConnect and WhatsApp, has been recognized as a pivotal tool in this endeavor (Muthelo *et al.* 2023). However, concerns have been raised about the inclusivity of these digital programs, with specific women facing exclusion due to factors like gender, literacy, and disability (Udenigwe and Yaya 2022). In urban areas such as Soweto, the potential of digital health solutions is constrained by issues like cost, accessibility, and crime, emphasizing the necessity for community-based interventions (Klingberg *et al.* 2022). Despite encountering challenges, pregnant women and new mothers in rural areas have demonstrated innovative strategies to overcome healthcare barriers (Laurenzi *et al.* 2020). The agency of young mothers in decision-making, particularly following unintended pregnancies, emerges as a critical aspect of maternal healthcare (Pillay 2021). Proposals for transnational cooperation and affective solidarity have been put forth as mechanisms to address maternal health inequities (Johnson 2020). Nevertheless, the experiences of young mothers seeking sexual and reproductive health services in urban areas underline the need for improved training of healthcare providers (Pillay, Manderson and Mkhwanazi 2020). Lastly, the performative dimension of motherhood, especially in low-income communities, underscores the intricate sociolinguistic dynamics influencing maternal healthcare (G'sell 2020).

2.3.3 Every Newborn Action Plan

Every Newborn Action Plan (ENAP) is a global initiative to reduce preventable newborn deaths and stillbirths, emphasizing the need for improved data on care at birth and for small and sick newborns and the importance of programmatic data for achieving Sustainable Development Goals and Universal

Health Coverage (Moxon *et al.* 2015; Hossain *et al.* 2022). ENAP has called for evidence-informed policy-making for newborn health, underlining the importance of strong health systems and policy foundations to guide programming and ultimately improve health outcomes (Mary *et al.* 2023).

According to Mary *et al.* (2023), the adoption and implementation of evidence-informed policies and guidelines are imperative for reaching newborn mortality and stillbirth outcomes, while encouraging the use of evidence in policymaking is a complex, multi-dimensional, and political process, it has been acknowledged as an essential practice for strengthening effective and efficient government decision-making for health. A global road map for ending preventable newborn and maternal mortality and stillbirth, endorsed by 194 Member States at the World Health Assembly in 2014 (Organization 2014b). Over the past decade, newborn survival and health have been increasingly recognized as a critical area of maternal/child health, significant breakthroughs resulting from increased investment, evidence, and political commitment have yielded gains in newborn survival and health worldwide. Yet, far more is needed, as called for in Every Newborn Action Plan (Anastasi, Zeck and Zhang 2021). According to Tayefi *et al.* (2021), ENAP was launched in 2014 as a global roadmap that provides a strategic plan to achieve equitable and high-quality care for mothers and newborns. It offers a clear vision of how to improve newborn health by 2035. It was developed to reduce newborn deaths and stillbirths and highlights the stillborn population whose deaths are likely to be prevented with rapid and effective resuscitation (Chen *et al.* 2020). Every Newborn Action Plan (ENAP) is a global multi-partner movement to end preventable maternal and newborn deaths and stillbirths which was conducted through a series of consultations, multiple stakeholders (governments, United Nations (UN) agencies, donors, business communities, professional associations, academic and research institutions, global initiatives, and civil society members) developed an impact framework and an action and measurement agenda for integration within national newborn health plans (Moxon *et al.* 2015). Countries with specific commitments to improving newborn health up to March 2015 are Afghanistan, Bangladesh, Benin, Bolivia (Plurinational State of), Cambodia, Cameroon, China, the Democratic Republic of the Congo, Egypt, Ethiopia, Ghana, Haiti, Kenya, India, Indonesia, Lao People's Democratic Republic, Malawi, Mali, Mongolia, Morocco, Mozambique, Namibia, Nepal, Nigeria, Oman, Papua New Guinea, Philippines, Rwanda, Senegal, Solomon Islands, South Africa, Swaziland, Timor-Leste, Uganda, United Republic of Tanzania, Viet Nam, Yemen, Zambia and Zimbabwe with Botswana, Chad, Guinea-Bissau, Djibouti, Lesotho, Madagascar, Myanmar, Pakistan, Sierra Leone, and Tajikistan developing specific commitments to improving newborn health (Organization 2015).

Despite the endorsement of the ENAP and an increase in the number of studies on stillbirths, most countries have not yet defined a stillbirth reduction target in their national health plans, Stillbirths should be systematically assessed to identify risk factors and causes and provide strategies for reducing the stillbirth rate (Abrampah *et al.* 2023). One standout priority was the lack of any rigorous comparison of large-scale household surveys of measurement approaches for stillbirths and neonatal deaths. The ENAP emphasized the strategic importance of focusing on quality care around the time of delivery (Murphy *et al.* 2022a). This includes ensuring that all pregnant women have access to the skilled quality care required for a healthy pregnancy, newborn protection, and care for small and sick babies (Wan *et*

al. 2023). This is consistent with the guidance from the World Health Organization (WHO) advocating for the presence of a skilled healthcare professional during childbirth as a measure to decrease mortality rates. Nevertheless, the advantages of having a skilled attendant during childbirth, particularly in terms of reducing neonatal mortality, are not most evident in the care and intervention offered during labor and delivery to prevent mortalities and enhance survival (Ishak and Khalil 2021).

Demographic and Health Surveys (DHS) and UNICEF's Multiple Indicator Cluster Surveys (MICS) are used every three to five years in more than 60 countries with standardized tools and reports and provide data on pregnancy outcomes for countries that account for around two-thirds of the global burden related to pregnancy outcomes (Moran and Requejo 2021). In high-burden disease countries, the main current data source is through household surveys. The most employed household surveys are the United States Agency for International Development (USAID)-supported DHS and the United Nations International Children's Fund (UNICEF)-supported Multiple Indicator Cluster Survey (MICS), however, coverage of many maternal and newborn interventions cannot feasibly and/or accurately be collected through household surveys (Moxon *et al.* 2015).

One such milestone of the ENAP is to develop a monitoring framework building on the Commission on Information and Accountability (COIA) for Women's and Children's Health to track global progress post-2015 and align with country priorities and objectives as many newborn care interventions lack standard indicator definitions and are not routinely monitored at national or global levels, especially in low and middle-income countries (LMIC). According to Moran and Requejo (2021), a coverage indicator is a population-level metric that measures the number of individuals that receive an intervention or service (numerator) out of the total population that should receive the intervention or service (the denominator).

Moreover, this roadmap helps eliminate preventable newborn mortality through global and national plans, evaluation, and accountability frameworks and it is expected that around 3 million lives will be saved each year if ENAP's evidence-based solutions and actions are implemented (Mirbaha-Hashemi *et al.* 2021a). Every Newborn Action Plan presents evidence-based solutions and sets out a clear path to 2020 with eight specific milestones for what needs to be done differently to greatly reduce mortality rates and improve maternal and newborn health by 2030 (Datta, Ghosh and Aquino 2022). Member States requested that WHO's Director General monitor progress towards the achievement of the global goal and targets and report periodically to the Health Assembly until 2030 (Organization 2017).

Neonatal mortality accounts for more than 47% of deaths among children under five globally but proper care at and around the time of birth could prevent about two-thirds of these deaths. Every Newborn Action Plan (ENAP) offers a plan and vision to improve and achieve equitable and high-quality care for mothers and newborns. We applied the bottleneck analysis tool offered by ENAP to identify obstacles and bottlenecks hindering the scale-up of newborn care across seven health system building blocks (Mirbaha-Hashemi *et al.* 2021a). In Iran, according to the World Health Organization (2016) statistics, the neonatal mortality rate was estimated to be 9.6 per 1000 live births in 2016. Although Iran has already achieved the main targets of ENAP at the national level there are still geographical disparities and inequalities in neonatal mortality, and maternal mortality among different provinces in Iran.

In 2019, India's neonatal mortality rate (NMR) was 22 per 1000 live births and had one of the largest cohorts of preterm and low birthweight neonates globally (Datta, Ghosh and Aquino 2022). One-quarter of global newborn deaths occur in the Indian subcontinent (Datta, Ghosh and Aquino 2022). India has achieved a major reduction in childhood mortality in the past two decades. However, it remains high, and the proportional share of neonatal mortality has increased which includes stillbirth. India has set a more stringent target for itself by committing to reduce its NMR and stillbirth rates to a single digit by 2030, however, the current rate of decline is not enough to achieve the target neonatal mortality rate (Kumar, Saini and Kumar 2023). As a step in this direction, India launched its newborn action plan (India Newborn Action Plan; INAP) in September 2014 and has made concerted efforts to improve access and the quality of care (Datta, Ghosh and Aquino 2022). India's performance in reducing child mortality is better than global performance, it has achieved a decrease of 64%, 70%, and 74% in NMR, IMR, and under-five mortality rate, respectively, compared with a global decline of 54%, 58% and 61% in the earlier indicators during the period 1990–2020. India has also achieved three out of the four ENAP coverage targets set for countries by 2025, however, as per a recent Lancet report based on 2000–2017 data, nearly 50% of the districts in the country would miss the National Health Policy's NHP-2025 goals and SDG-2030 targets if a higher NMR annual rate of reduction is not achieved (Datta, Ghosh and Aquino 2022). There are concerns about the quality and completeness of antenatal care visits and other program interventions. The ongoing quality assurance should be strengthened through continuous supportive supervision by involving the medical colleges in a hub and spoke model and other key stakeholders therefore, there is a need for effective and strategic engagement of the private sector in these initiatives.

ENAP in China has played a pivotal role in diminishing neonatal mortality and enhancing the well-being of mothers and newborns, underscoring the necessity for timely and high-quality data to monitor advancements, spotlighting the Five Strategies for Maternal and Newborn Safety as a crucial initiative (Liu *et al.* 2020; Moran and Requejo 2021). Despite progress, there remain gaps in executing the Early Essential Newborn Care (EENC) intervention package which is part of ENAP in China, particularly in rural health facilities, as highlighted by (Wang and Xu 2021). The plan has had to adapt to the challenges posed by the 2019 novel coronavirus epidemic, as discussed by (Committee 2020). Educational initiatives like Helping Babies Breathe have significantly contributed to the reduction in neonatal mortality (Niermeyer 2020). Success has also been witnessed in enhancing maternal and child nutrition, with support from initiatives such as the China National Birth Cohort and the Chinese Neonatal Network (Huang *et al.* 2020; Hei *et al.* 2022). Newborn, infant, and under-five mortality rate in China have decreased steadily over the past two decades, dropping to 3.9 per 1000, 6.1 per 1000, and 8.4 per 1000 in 2018 respectively (Xu 2021). According to Xu (2021), despite the significant improvements, neonatal deaths still account for around 50% of all under-five deaths and the absolute number of annual neonatal deaths is larger than in other countries.

To achieve the target set out by ENAP Zimbabwe needs to attain an annual rate of reduction of 3.8% from 2015 to 2030 (Dube *et al.* 2021). Positive action is urgently required to increase research capability and accelerate current modest progress toward key international targets, for example. Sustainable

Development Goal 3 and Every Newborn Action Plan (ENAP) for maternal, neonatal mortality, and stillbirth are to be realized in Zimbabwe (Mills *et al.* 2022c). ENAP in Zimbabwe has witnessed advancements in child participation, incorporating child representation on committees as outlined by (Fanelli, Musarandega and Chawanda 2007). Key strategies for quality improvement, exemplified by programs like Helping Babies Survive, have been recognized as crucial for meeting the plan's objectives (Ehret *et al.* 2020). Suggestions have been made regarding the utilization of digital health technologies, including the Neotree app, to enhance the quality of newborn care and improve survival rates (Wilson *et al.* 2022). To elevate pediatric care, the adoption of data-driven pediatrics through electronic health records and digital health systems has been proposed (Batani and Maharaj 2022). Successful implementation of Care Groups has been noted in promoting enhanced maternal and child nutrition towards the attainment goals of ENAP in Zimbabwe (Ncube-Murakwani *et al.* 2020). Nevertheless, challenges persist, particularly in addressing elevated levels of adolescent pregnancy and young motherhood, necessitating targeted interventions (Woollett *et al.* 2021).

ENAP was formally endorsed at the 67th World Health Assembly in May 2014 and launched at the Partners' Forum in Johannesburg, South Africa in June 2014 (Organization 2015). Intrinsically linked to maternal health, improving newborn survival and health, and preventing stillbirths start with the survival and health of women before conception and during pregnancies. The synergies between ENAP and the World Health Organization's Strategies toward Ending Preventable Maternal Mortality (EPMM), released in February 2015, will further advance efforts to end preventable deaths and improve health outcomes (Organization 2015). In South Africa at the governance capacity level, one notable intervention program, known as Essential Measures for Handling Obstetric Emergencies has successfully trained more than 9000 healthcare professionals, as a result in six selected pilot locations, there has been an approximate decrease of 35% in neonatal mortality rate since the adoption of ENAP.

Premature birth complications are the primary reason behind neonatal deaths on a global scale with the greatest impact felt in the lower- and middle-income regions of South Asia and Sub-Saharan Africa. In South Africa, a significant contributor to neonatal mortality associated with premature birth is respiratory distress syndrome, stemming from underdeveloped lungs and lack of surfactant. The World Health Organization's Every Newborn Action Plan target is for 80% of districts in South Africa to have resources available to care for small and sick newborns, including premature infants with respiratory distress syndrome (Ekhaguere *et al.* 2022).

The South African 24-Hour Movement Guidelines for Birth to 5 Years, developed through a consensus panel, offer a comprehensive framework for early childhood development (Draper *et al.* 2020). These guidelines align with the World Health Organization Essential Newborn Package ENAP, proven to enhance newborn care practices and increase survival rates in Sub-Saharan Africa (Emmanuel, Kain and Forster 2019). In South Africa, a health system strengthening intervention has resulted in measurable enhancements in newborn care, yet challenges persist in evaluating clinical care and outcomes (Horwood *et al.* 2019). Associations between maternal demographic characteristics, household socio-economic status, and adverse birth and infant growth outcomes in Saharan Africa

underscore the importance of targeted interventions (Saïd-Mohamed, Ngandu and Momberg 2020). Nevertheless, substantial gaps in preventing HIV infection among pregnant mothers, infants, children, and adolescents endure in high HIV-burden countries, including South Africa (Sam-Agudu, Folayan and Haire 2020).

2.3.4 Universal Health Coverage

Universal Health Coverage (UHC) stands as a pivotal global health objective, striving to afford all individuals access to essential health services without incurring financial hardship (Wang, Mathur and Schmidt 2020). Despite the overarching concept of 'universalism,' migrants often find themselves excluded from UHC initiatives (Mosca *et al.* 2020). The measurement of progress toward UHC proves intricate, given disparities in national resources and health systems (Kruk, Ataguba and Akweongo 2020). Proposals for legal solutions have been advanced to propel the achievement of UHC (Gostin 2020).

Universal health coverage (UHC) means that all people and communities – with no one left behind – receive the quality services they need, and are protected from health threats, without suffering financial hardship. It includes the full range of essential health services, from health promotion to prevention, treatment, rehabilitation, and palliative care, UHC is a political choice to be made by every nation (World Health Organization 2020). Universal health coverage (UHC) is a key target of the United Nations' Sustainable Development Goals, contributing to the reduction of health inequities and improvements in population health outcomes UHC embodies the concepts of equity, quality, and financial risk protection and is intended to 'leave no one behind (White and Rispel 2021). Sustainable Development Goal (SDG) 3 commits to promoting wellbeing "for all, at all ages" by the year 2030, with SDG 3.8 specifically committing to universal health coverage (UHC) (Dodd *et al.* 2021). In 2019, a significant moment emerged for leaders of nations worldwide. It presented a historic chance to guarantee that every individual, regardless of their circumstances, can receive necessary healthcare services without being hindered by issues of accessibility or affordability. During the High-level Meeting on Universal Health Coverage at the United Nations General Assembly on September 23, 2019, it became evident that states had made a deliberate political decision to pledge their commitment to universal health coverage (UHC) (World Health Organization 2020). Progressing towards Universal Health Coverage (UHC) demands the presence of effective policies, a firm commitment from policymakers, and a government capable of leading the healthcare sector. Policy discussions can serve as a crucial mechanism for governments to guide their decision-making based on evidence. Implementing UHC involves establishing agreement among all pertinent parties regarding healthcare priorities to work toward predefined objectives collectively, these priorities must be clearly outlined in national healthcare strategies, delineating the nation's path toward achieving UHC.

Leaving no one behind is a central promise of the 2030 Agenda for Sustainable Development, which recognizes health as a fundamental human right. Achieving Universal Health Coverage (UHC) is key to delivering on this promise. UHC ensures that everyone receives good quality health services, when and where needed, without incurring financial hardship arising from payments made for those services

(Organization 2023). The 2023 Universal Health Coverage Global Monitoring Report presents an alarming picture of stagnating access to essential health services and increased financial hardship from out-of-pocket health payments affecting especially the poorest and most vulnerable people. According to Organization (2023), globally, about 4.5 billion people, more than half of the world's population, lack full access to essential health services. Meanwhile, financial protection is measured through catastrophic spending added on health spending that can impoverish people as seen from Out-of-Pocket spending. Out-of-pocket expenses are referred to in the form of, medical/curative service costs (including delivery costs and drugs that cannot be specified), drug costs (only medicines purchased at pharmacies, drug stores, etc.), service fees prevention, and transportation costs for health care (UHC 2020). The problem of financial hardship arising from healthcare expenses paid directly by individuals continues to deteriorate and hinder global poverty eradication efforts. In 2019, the number of individuals facing catastrophic healthcare costs, which amounted to over 10% of their household income, rose to surpass 1 billion people, constituting nearly 14% of the world's population. Additionally, around 1.3 billion individuals, or approximately 17% of the global population, either fell into poverty or were driven further into poverty due to these out-of-pocket healthcare expenditures. This figure includes 344 million people living in extreme poverty. Out-of-pocket healthcare payments reduce households' capacity to afford essential goods and services, decreasing their overall consumption levels.

2.3.4.1 National Health Insurance in Indonesia (Jaminan Kesehatan Nasional (JKN))

The Indonesian health service system is transitioning to Universal Health Coverage (UHC) to provide health insurance for the entire community, the National Health Insurance (Jaminan Kesehatan Nasional-JKN), is the national health program dedicated to achieving UHC (UHC 2020). According to UHC (2020), achieving UHC remains a challenge for Indonesia, this is based on the analysis that, five findings need to be addressed. First, public awareness of health facilities provided by the government is still lacking. This can be seen from the screening for cervical cancer indicator, with a national index of only nine. Second, the high prevalence of smoking and unhealthy lifestyles contributes significantly to the low index for non-communicable diseases. Third, Out-of-Pocket spending on health care in Indonesia is still high, hindering efforts in providing financial protection, with almost 13 million people spending more than 10 percent of their total consumption on health services fourth, there is a gap between provinces in Java and the western parts of Indonesia with other regions. This disparity results from the uneven distribution of health workers and inadequate infrastructure in poorer areas lastly, provinces with a low service coverage index tend to have low catastrophic spending on health, and vice versa (UHC 2020). A low occurrence of catastrophic healthcare expenses may signify that individuals have limited access to health services because of geographical constraints, inadequate health infrastructure, and disparities in healthcare accessibility. It may also imply that their ability to seek medical care is restricted due to their unfavorable financial circumstances.

2.3.4.2 National Health Insurance in Philippines (Philippine Universal Health Care Act (UHC), or Republic Act 11223)

The Philippine Universal Health Care Act (UHC), or Republic Act 11223, is a law that aims to address

health barriers and achieve Universal Health Coverage in the Philippines. The UHC incorporates a health promotion component, which mandates the transformation of the country's leading health agency into a bureau to improve health literacy and mainstream preventive care (VI and Reyes 2022). The UHC Act has provisions for improving the health system and responding to future shocks, such as the COVID-19 pandemic (Ong *et al.* 2022). It also focuses on member satisfaction with the National Health Insurance, PhilHealth, and identifies factors that contribute to satisfaction, such as reliability, responsiveness, and socio-economic factors (Bautista, 2022). The Philippine Universal Health Care Act, also known as Republic Act 11223, has brought about substantial improvements in both health insurance coverage and healthcare utilization among the elderly, resulting in a reduction of wealth-related disparities (Siongco, 2020). Despite these positive outcomes, criticisms have been raised regarding the hierarchical nature of the act's contracting regulations, which may not align with the broader objectives of the law (Schuhmann, 2021).

In the Philippines, the per capita health expenditure in 2020 stood at approximately USD 430 (adjusted for purchasing power parity). This underscores the disparity between the financial resources required to effectively implement Universal Health Coverage (UHC) and the country's capacity to make such investments, to respond to such health financing gaps, the Philippines made major reforms: the passage of the Universal Health Care Law in 2019, and the recent implementation of a benefits package that encourages primary care called “Konsultasyong Sulit at Tama” (“Konsulta”) package in 2020 (Dodd *et al.* 2021). Due to previous and ongoing endeavors and programs, the nation has achieved moderate progress in aligning with the global health objectives outlined in the Sustainable Development Goals for 2030. Nevertheless, despite the existence of healthcare financing systems and patient benefit packages, the occurrence of catastrophic health expenses persistently drives Filipinos into economic hardship. Before the legislation of full population coverage in the Philippines in 2019, efforts to improve effective coverage did not only include gradual extensions to more population groups—most notably, the poor and the elderly—but also attempts to fill holes in service coverage, including for inpatient care (Capuno, Kraft and O'Donnell 2021). In the context of healthcare reforms, case rates were implemented for inpatient treatments, aiming to establish fixed rates for such services. Government hospitals were also restricted from charging poor patients and expectant women beyond specified reimbursement limits. To address high-cost inpatient treatments, a catastrophic care package was introduced. Furthermore, the benefits package was expanded to encompass medications and laboratory tests acquired outside of the hospital providing inpatient care. Hospitals began offering point-of-treatment enrollment, providing information about benefit entitlements, and assisting patients in claiming reimbursements.

2.3.4.3 Universal Health Coverage in Nigeria

The drive for realizing sustainable development goals constitutes the hub of major policies of Nigeria's present and immediate past political dispensation. The focus on welfare improvement reflects on key policies and programs adopted in Nigeria. The pursuit of growth plans has necessitated the adoption of programs that could improve the living conditions of the populace, including access to healthcare

services. One notable initiative of international repute that focuses on improving the health performance of developing countries is Universal Health Coverage (UHC) which constitutes an essential aspect of the sustainable development goals (Adebisi *et al.* 2020). The primary obstacles to attaining Universal Health Coverage (UHC) in Nigeria stem from a less-than-optimal healthcare system marked by limited budgets, insufficient financial safeguards for the impoverished, a scarcity of healthcare professionals with uneven distribution, variations in healthcare service quality, difficulties in delivering healthcare supplies, encompassing issues such as subpar coordination, a feeble referral system, and unequal utilization of healthcare services. A key aspect to achieving the UHC by 2030 in Nigeria is to intensify government spending on health relative to the total economy - namely, Gross Domestic Product (GDP) and an important aim of UHC is to ensure that all have sufficient access to healthcare needs without significant OOPs at the point of obtaining care. According to Adebisi *et al.* (2020), to this is usually achieved by risk pooling through tax-funded or Social Health Insurance (SHI) schemes, in Nigeria, healthcare financing revenue is mainly obtained from pooled and unpooled sources. The pooled sources are raised from direct and indirect taxation, budgetary allocation, and donor funding.

2.3.4.4 Universal Health Coverage in Ghana (National Health Insurance Scheme)

Universal health coverage (UHC) through a pre-payment financing mechanism remains a key strategy in achieving sustainable development goals (SDG), in 2004, Ghana was among few low- and middle-income countries (LMIC) in Africa and Asia that implemented a national health insurance scheme (NHIS) as a step towards achieving UHC (Kwarteng *et al.* 2020). Before the introduction of the National Health Insurance Scheme (NHIS) in Ghana, the healthcare financing system was primarily characterized by user fees initiated by the World Bank in the 1980s. This notorious user fee approach, commonly referred to as the "cash and carry system," necessitated immediate payment for healthcare services at the time of receiving care (Christmalls and Aidam 2020). Substantial evidence indicates that this user fee policy led to severe financial burdens related to healthcare expenses and a decline in healthcare access, particularly among disadvantaged and economically vulnerable households. According to Kwarteng *et al.* (2020), the introduction of the NHIS was therefore intended to pool risks and financial resources and remove financial barriers to equitable access to health care for all citizens especially the poor and vulnerable, furthermore, the policy objective of the scheme as set out during its introduction in 2003 was to ensure within five years, universal enrollment for all residents in Ghana (Awojobi and Adeniji 2023).

2.3.4.5 Universal Health Coverage in Zimbabwe

Implementation of health financing reforms for Universal Health Coverage (UHC) is inherently political despite the political determinants of UHC, health financing reform in Zimbabwe is often portrayed as a technical exercise with a familiar path of a thorough diagnosis of technical gaps followed by detailed prescriptions of reform priorities (Mhazo and Maponga 2022). On a global scale, health financing has become a compelling area for reform in the pursuit of Universal Health Coverage (UHC). UHC emphasizes the idea that individuals should be able to obtain the healthcare services they require without facing the threat of financial devastation or falling into poverty (Nhapi 2019). This principle is

one that Zimbabwe aligns with and endorses. In the case of reform processes in Zimbabwe, a historical and longitudinal perspective is particularly important considering that the country has gone through multiple transitions that were intertwined in a not always mutually supportive way in what has been called a transition overload, rooted in UHC is the aspect of health equity which is defined as the absence of systematic disparities in health (or its social determinants) between more and less advantaged social groups; health equity is a multidimensional concept that has been internationally considered as an essential element for health system development, including in Zimbabwe (Mhazo and Maponga 2022).

In the context of Universal Health Coverage (UHC), private health insurance (PHI) is sometimes seen differently than taxation and social security schemes, which are often seen as means to promote fairness in healthcare financing. Private insurance can be associated with unequal access to healthcare, a high number of uninsured individuals, and exclusive healthcare services for the wealthy. Nevertheless, with effective regulation, PHI has the potential to contribute to UHC efforts in several ways. These include reducing out-of-pocket (OOP) expenses, complementing public healthcare spending, alleviating the financial burden on publicly funded healthcare systems, and serving as a pathway toward the development of social health insurance systems. According to Mhazo, Maponga and Mossialos (2023), from a Universal Health Coverage (UHC) perspective, unlike taxation and social security schemes, which are commonly viewed as promoting equity in healthcare financing, private insurance often conjures up visions of unequal access, large numbers of uninsured people, and elitist healthcare for the rich. However, if properly regulated, PHI can support UHC efforts by reducing out-of-pocket (OOP) expenditures, supplementing public health expenditures, relieving fiscal pressure on publicly funded systems, and acting as a gateway to developing social health insurance systems (Tandon and Reddy 2021).

2.3.4.6 Universal Health Coverage for BRICS nations

The BRICS nations' economies are distinguishable from other emerging economies due to their rate of expansion and sheer size. As a result of their economic prosperity, health spending in the BRICS countries has been increasing, however, health security is still a distant dream in these countries due to low public health spending, lack of pre-paid health coverage, and heavy out-of-pocket spending. There is a need to change the health expenditure composition to address the challenge of regressive health spending and ensure equitable access to comprehensive healthcare services (Sahoo, Rout and Jakovljevic 2023). However, with the push for expanded coverage and the transition toward Universal Health Coverage (UHC) following the introduction of the Sustainable Development Goals (SDGs) in 2015, there is a notable change occurring in the balance between public and private sources of financing in these nations. For instance, in the case of India, there has been a consistent and continuous rise in public health expenditure in absolute terms since 1995, signifying an overall increase over time.

Expanding risk pooling is one of the major international topics in the development of UHC, however, BRICS countries accept and endorse the conceptualization of UHC. However, analysis reveals that BRICS countries' conceptualization of UHC seems to be driven by specific country circumstances and national needs (Sahoo, Rout and Jakovljevic 2023). The successful implementation and expansion of

universal healthcare in BRICS countries, including Brazil, Russia, India, and China, depend significantly on economic factors and specific characteristics (Feil 2020). These nations, representing a substantial portion of the global population and economy, have the potential to achieve universal healthcare coverage due to recent economic growth (Feil 2020). However, some challenges need to be addressed, such as the necessity for a monitoring framework for high-income countries aiming for Universal Health Coverage (UHC) (Bergen, Ruckert and Labonté 2019). Valuable insights for UHC in diverse settings can be gained from examining the provision of private healthcare services in European countries (Montagu 2021).

2.3.4.7 Universal Health Coverage in South Africa (National Health Insurance)

The South African National Health Insurance Bill states that the purpose of NHI is to achieve Universal Health Coverage (UHC) (Bust, Whyte and Olivier 2023). The World Health Organization (WHO) defines Universal Health Coverage (UHC) as the assurance that every individual can access the full range of necessary health services, including those that promote health, prevent illness, provide treatment, support recovery, and offer palliative care. Globally, various nations have pursued diverse routes towards achieving Universal Health Coverage (UHC). Presently, South Africa is in the process of healthcare system reform to implement UHC, and this involves the establishment of a national health insurance (NHI) program. This transition is being practically realized through a decentralized strategy, primarily utilizing the district health system as the principal mechanism for healthcare service delivery since the advent of democracy. These services must be of a quality that ensures their effectiveness, all while safeguarding individuals from financial hardships associated with utilizing these services. There is a global acknowledgment of the imperative to move toward UHC as a strategy to diminish the economic hardship triggered by healthcare expenditures and enhance accessibility to essential healthcare services (Michel *et al.* 2020). The National Health Insurance is a health financing system that is designed to pool funds to provide access to quality affordable personal health service for all South Africans based on their health needs, irrespective of their socio-economic status. NHI is intended to ensure that the use of health services does not result in financial hardship for individuals and their families (NDoH 2017). The National Health Insurance (NHI) marks a significant policy change that will require a profound restructuring of the existing healthcare system, encompassing both the public and private sectors. It's crucial to note that the NHI draws its authority and purpose from South Africa's National Development Plan (NDP), which serves as the roadmap outlining the envisioned societal framework for the country in the year 2030.

Primary health care (PHC) revitalization is critical to South Africa's ongoing health reforms as it serves as a platform for service delivery, the facilitation of health promotion, illness prevention, and a first point of entry into the healthcare sector, additionally, initiatives such as the universal health coverage namely the National Health Insurance (NHI) Bill aim to improve the South Africa's ailing healthcare system by increasing access and reducing inequalities (Ramphoma *et al.* 2022). According to Pauw (2022), the ANC government has begun the process of implementing a National Health Insurance Policy (NHI) with the end goal of achieving affordable and accessible Universal Health Coverage (UHC) to address the

current disparities in healthcare. The development of a national health policy plays a vital role in establishing conditions conducive to the overall well-being of a population. This policy comprises three essential components: the political, social, and cultural environment; lifestyle factors; and strategies aimed at empowerment. The political and social context of South Africa is deeply intertwined with healthcare as it directly impacts individual safety, economic success, and public involvement in politics (Pauw 2022). Many inspiring policies have been introduced since South Africa became a democracy, however, due to poor implementation and lack of evaluation, they are not effectively being utilized (Gilson, McIntyre and Mooney 2007; Pauw 2022). Under the NHI, population coverage will ensure all South Africans have access to comprehensive quality healthcare services, implying that people will be able to access healthcare services closest to where they live, and the healthcare services will be accessed at the appropriate level of care and will be delivered through certified and accredited public and private providers using the NHI Card (Fusheini and Eyles 2016).

2.3.5 National Health Promotion Policy (NHPP)

Health is regarded by the World Health Organization (WHO) as a fundamental human right, and health promotion is defined as “the process of enabling people to increase control over their health and its determinants, and thereby improve their health”, and the foundation for health promotion is based upon the Alma Ata Declaration and subsequent charters that are adopted by the WHO (Health 2015). Several studies have investigated the influence and efficacy of National Health Promotion Policies (NHPPs) across different nations. (Haque 2020) underscore the significance of these policies in addressing social and economic determinants of health, with the latter specifically examining the challenges and achievements of Bangladesh's NHP. Empirical evidence from Zheng, Luan and Sun (2022) and YOKOYAMA (2020) supports the positive impact of NHPPs on health outcomes in China and Japan, respectively. However, Tsuji (2020) and Aikins *et al.* (2021) draw attention to the ongoing need for additional efforts to realize the objectives of these policies, especially concerning Japan's Health Japan 21 and Ghana's National Health Insurance Scheme. Barry (2020) and Kavey (2020) both underscore the importance of tangible actions and evidence-based interventions within NHPPs, with the latter focusing on their role in promoting cardiovascular health in children.

The Nigerian Government developed the National Health Promotion Policy (NHPP) in 2006 to strengthen the health promotion capacity of the National Health System to deliver health care that is promotive, protective, preventive, restorative, and rehabilitative to every citizen of the country. The policy has been in operation since then (Nwankwo 2023). According to Nwankwo (2023), the implementation of the NHPP (2006) was affected by some challenges such as weak intersectoral collaboration, weak management structures, poor infrastructure, and limited understanding of the concept of health promotion and consumer rights at all levels. The decision to update the 2006 edition of the NHPP to the NHPP 2019 was driven by several factors. These factors include identified gaps in healthcare delivery, ongoing trends in Health Promotion practices, and the emergence and resurgence of significant public health concerns. The 2006 National Health Policy (NHP) acknowledged that Nigeria faced a formidable challenge of managing both Communicable and Non-Communicable Diseases

(NCDs). Additionally, issues like limited health literacy, subpar sanitation conditions, and insufficient focus on critical social determinants of health were also recognized. The updated National Health Promotion Policy (NHPP, 2019) aims to support Nigeria's commitment, as outlined in the National Health Policy, to provide comprehensive healthcare services encompassing prevention, promotion, protection, restoration, and rehabilitation for all citizens of the nation.

In 2015, in response to the World Health Organization's recommendations, the South African government implemented the National Health Promotion Policy (NHPP) to reduce maternal and child mortality rates (Mostert 2021). Central to this policy approach was the empowerment of marginalized communities to assume responsibility for their healthcare. The inception of the NHPP in 2015 was the result of collaborative efforts involving private donors, the government's health department, academia, and non-governmental organizations. These stakeholders worked together to introduce preventive services within communities, to enhance public health outcomes. The NHPP was executed between 2015 and 2019, utilizing diverse approaches. These approaches encompassed home visits conducted by community health promoters to encourage the adoption of NHPP recommendations. Additionally, education programs were conducted at public health facilities, primarily targeting pregnant women, and various media campaigns were employed to promote the concept of preventive services to mitigate maternal mortality, stillbirths, and other non-communicable diseases (Mostert 2021).

Presently, there is no South Africa-recommended guideline on the management of women with stillbirths and, the Royal College of Obstetricians and Gynecologists (RCOG) Green-top guideline is generally used (Jimoh, Wolvaardt and Adam 2022). The RCOG Green-top guidelines suggest that the international standard of care in the management of women who had stillbirths should involve counseling, investigations for possible causes of stillbirth, and follow-up visits to review results and discuss future pregnancies. The current standard of care in SA follows the RCOG Green-top guidelines as outlined by the National Department of Health in the maternity care guidelines of South Africa, furthermore, these guidelines encourage healthcare workers to be consistently sympathetic and supportive to mothers who experience stillbirths. Mothers or parents are encouraged to hold and spend time with the baby; adequate counseling that is sensitive to normal grief responses and includes an explanation of the cause of fetal death (if known) to the mother/parents is mandatory (Jimoh, Wolvaardt and Adam 2022).

As mandated by the National Health Act of 2003, the South African Government's Department of Health, is responsible for establishing policies and laws about the rights and responsibilities of its citizens, as well as the delivery of services in the public health system (Ramphoma *et al.* 2022). In addition, South Africa has several well-developed maternal and child health policies, including the South African Maternal, Perinatal, and Neonatal Health Policy 2021 and the National Health Plan, among others. Although these policies acknowledge the importance of maternal and child health, they do not explicitly mention stillbirth as an essential component of maternal health care.

According to Ramphoma *et al.* (2022), the South African National Maternal, Child, and Women's Health (MCWH) Policy states that an investment in the health of mothers and young children is an investment

in the future of the nation. The strength of a health system is reflected in the health status of children, especially when considering the vulnerability of young children, however, especially for implementation at district levels, the MCWH policy has been criticized for a lack of a rational, national planning framework, as well as uncoordinated health authorities, which result in unnecessary and high demand for care on tertiary services.

2.4 MATERNAL HEALTHCARE, STILLBIRTH, AND COVID 19

Maternal health is a critical global health concern, representing a fundamental indicator of the well-being of societies. Ensuring safe and healthy pregnancies and childbirth experiences is not only a human rights imperative but also a fundamental component of achieving sustainable development goals. Over recent years, substantial progress has been made in improving maternal health worldwide. Nevertheless, the emergence of the COVID-19 pandemic has presented an unprecedented challenge, casting a shadow over these hard-fought gains. Routine obstetric care is vital, especially in high-risk pregnancies, during the COVID-19 pandemic period, the guidelines recommended by health authorities suggest that antenatal and perinatal care should not be disrupted (Hekimoğlu and Acar 2022).

The outbreak of COVID-19 has had a profound impact on global healthcare systems, social structures, and the world economy, to prevent the spread of COVID-19, many governments have implemented regional blockades and restrictions on free activities; these regulations, the reduction of routine medical visits, and the panic during the pandemic may change pregnant women's life behaviors, thus affecting pregnancy outcomes (Hao *et al.* 2022). The initial reports of pregnant women developing COVID-19 in Wuhan and surrounding areas in China indicated that no confirmed cases of vertical transmission were occurring, although there were some suspicious cases (Schwartz *et al.* 2021). As COVID-19 continued to spread across China and various global regions, there was a rising number of neonates testing positive for the virus in both China and other locations. Consequently, the need to investigate whether vertical transmission was taking place became increasingly significant. Vertical transmission can happen through various means, including during pregnancy, during childbirth, and after delivery. Of particular concern was the possibility of intrauterine transplacental transmission of SARS-CoV-2 in certain cases (Schwartz 2020).

Preliminary evidence from China and other countries has suggested that coronavirus disease 2019 (COVID-19) mitigation measures have caused a decline in preterm births, but evidence is conflicting (Xie *et al.* 2022). While early reports from China suggested that pregnant women with COVID-19 were not passing the virus to their newborns, concerns about the potential for fetal infection and other negative consequences persisted. As large numbers of pregnant women became infected, increasing numbers of neonates testing positive for SARS-CoV-2 were reported from China and elsewhere, eventually, placental pathology analysis confirmed that maternal-fetal transmission from infected mothers was occurring in a small percentage of infants, making SARS-CoV-2 the newest congenitally transmissible agent to be described (Schwartz 2022).

Pregnant women are at increased risk for severe COVID-19-related illness, and COVID-19 is

associated with an increased risk for adverse pregnancy outcomes and maternal and neonatal complications (DeSisto *et al.* 2021). Between March 2020 and September 2021, as well as before and during the period when the Delta variant was most widespread in the United States (from March 2020 to June 2021 and from July to September 2021), there were a total of 1,249,634 deliveries. Among these deliveries, stillbirths were infrequent, accounting for 8,154 cases, which is approximately 0.65% of all deliveries. Out of these stillbirths, 273 (about 1.26%) took place among the 21,653 deliveries where women had documented COVID-19 at the time of delivery, while the remaining 7,881 cases (approximately 0.64%) occurred in the 1,227,981 deliveries where COVID-19 was not documented. According to DeSisto *et al.* (2021), implementing evidence-based COVID-19 prevention strategies, including vaccination before or during pregnancy, is critical to reducing the impact of COVID-19 on stillbirths. A national study published in May 2021 with a sample size of over 340,000 pregnant women in England found that stillbirth occurred more frequently in those who had SARS-CoV-2 infection, compared to those without (Khalil *et al.* 2022). Stillbirth is a recently recognized complication of COVID-19 in pregnant women, other congenitally transmitted infections from viruses, bacteria, and parasites can cause stillbirth by infecting fetal organs following transplacental transmission of the agent from the maternal bloodstream. However, recent research on pregnant women with COVID-19 having stillbirths indicates that there is another mechanism of stillbirth that can occur in placentas infected with SARS-CoV-2 (Schwartz 2022).

An early report from St George's Hospital in London found that the incidence of stillbirth was significantly higher during the pandemic compared with the pre-pandemic period, however, the number of stillbirths was small (Khalil *et al.* 2022). Information from the United Kingdom indicates that the Alpha and Delta variants of SARS-CoV-2 have more detrimental effects on maternal and perinatal outcomes (Donati *et al.* 2022). It's worth highlighting that none of the women who experienced stillbirths had COVID-19. This raises the potential that the cause of these stillbirths may have been indirectly related to the pandemic. One plausible explanation is that these women might have delayed seeking medical care because they were reluctant to go to the hospital out of fear of contracting SARS-CoV-2. Another possibility is that they chose not to burden an already overwhelmed healthcare system, a topic that received extensive media coverage during that period (Naz, Rahat and Memon 2021).

Like the United Kingdom, India conducted widespread public health campaigns, urging people to stay home and minimize the risk of infection. Additionally, public transportation services were reduced, which posed significant challenges for women residing in rural regions. High-risk pregnant women faced a more substantial threat of pregnancy-related health complications or even mortality compared to the risks associated with COVID-19 (Kumar 2022). Typically, these women receive more intensive prenatal care and monitoring than those with low-risk pregnancies. However, the decrease in healthcare services and attendance disproportionately disadvantaged high-risk pregnant women. According to Donati *et al.* (2021), from the beginning of the pandemic, the Italian Obstetric Surveillance System (ItOSS) launched a national population-based prospective study, enrolling any pregnant woman with confirmed SARS-CoV-2 infection, admitted to a hospital, until the end of June 2021.

In 2017, the Mphatlalatsane Initiative was launched to provide a national unified response for improving the quality and equity of SRMNH care at the cusp of the National Health Insurance reform using the Institute for Health Improvement quality improvement (QI) methodology (Chetty *et al.* 2023). Given the emergence of COVID-19 in March 2020 in South Africa with concomitant increased public health measures and national level-5 lockdown, the Mphatlalatsane Initiative was adapted to provide much-needed support for maternal and perinatal care during the pandemic. The impact of COVID-19 on maternal healthcare in South Africa has been substantial, as indicated by studies reporting elevated rates of stillbirth and maternal mortality among pregnant women who tested positive for COVID-19 (Basu, Chauke and Magoro 2022; Bhoora *et al.* 2022; Basu, Chauke and Magoro 2023). The emergence of the COVID-19 variant 501Y.V2 has further worsened these issues, contributing to increased rates of hypertension, stillbirth, and preterm cesarean section (Basu, Chauke and Magoro 2023). Despite the heightened occurrence of symptoms and comorbidities, the incidence of adverse fetal outcomes among pregnant women with COVID-19 in South Africa remains relatively low (Basu, Chauke and Magoro 2022). However, the pandemic has disrupted essential services like antenatal care, skilled birth attendance, and postnatal family planning, resulting in unmet contraception needs and a rise in unintended pregnancies (Ameyaw *et al.* 2021). Addressing these challenges and ensuring access to high-quality maternal healthcare services requires the implementation of innovative measures, such as the utilization of telemedicine.

2.5 Conclusion

The current state of global maternal healthcare presents a complex and multifaceted landscape characterized by significant disparities in access and quality. In the United States, despite legislative efforts, maternal mortality rates remain high, particularly among ethnic minorities (PERSAUD-SHARMA 2020). Advances in global maternal health, from policy to individual care, have been made, but more work is needed to sustain these improvements (Khorrami *et al.* 2019). In some regions, with improvements in maternal health indicators, reduction in maternal mortality, and the implementation of effective policies. However, significant challenges persist, particularly in low-resource settings, conflict zones, and regions affected by the ongoing COVID-19 pandemic like South Africa particularly in rural districts.

The prevailing status of global maternal healthcare is characterized by substantial disparities in the utilization of services, their quality, and the resulting outcomes. Factors such as women's education, exposure to mass media, autonomy, and economic standing play a pivotal role in determining the extent to which maternal healthcare services are accessed (Yadav *et al.* 2021). A global disparity exists in health system design, posing obstacles to advancements in maternal and newborn survival (Roder-DeWan *et al.* 2020). Although policies providing free maternal care can alleviate financial burdens, they may not independently address existing inequities (Oyugi, Kendall and Peckham 2021). Health inequalities for women on a global scale extend beyond maternal health, with those of lower socio-economic status facing the highest risks (Myatra, Tripathy and Einav 2021). Delays in seeking care and maternal mortality are influenced by social and cultural factors such as poor socio-economic status,

limited knowledge, and low incomes (Omer *et al.* 2021). There is a recognized need for a robust measurement system for maternal, newborn, and child health (Marchant *et al.* 2020). Moving forward, a concerted global effort is needed to bridge existing gaps, improve access to maternal healthcare, and address the root causes of disparities. This involves continued research, policy advocacy, and the implementation of targeted interventions to ensure that all women, regardless of their geographical location or socio-economic status, have access to safe and effective maternal healthcare.

Studies underscore the importance of integrated approaches, recognizing the interplay of social, economic, and cultural determinants of maternal health. Issues such as stillbirth, maternal mortality, and disruptions caused by health crises like COVID-19 highlight the vulnerability of maternal healthcare systems worldwide. Addressing these challenges requires a comprehensive strategy that includes not only medical interventions but also focuses on socio-economic factors, gender dynamics, and the broader health infrastructure. The global landscape of maternal healthcare has been significantly affected by the COVID-19 pandemic, with variations in case fatality rates and factors predicting maternal death (Sharma *et al.* 2022). Pregnant women, especially in low-resource areas, face an elevated risk of severe illness and maternal mortality due to COVID-19 (Hantoushzadeh *et al.* 2020). Additionally, the pandemic has been linked to an increased likelihood of stillbirth, particularly during the prevalence of the Delta variant (DeSisto *et al.* 2021). Although stillbirths are rare, their occurrence is higher in deliveries involving COVID-19 (DeSisto *et al.* 2021). Disparities in service utilization, quality, and outcomes persist, influenced by factors such as education, economic status, and health system design. The resurgence of maternal mortality in certain regions, including the United States, signals the need for continued attention and intervention.

South African pregnant women, particularly those with hypertension, have experienced an elevated maternal mortality rate during the pandemic (Basu, Chauke and Magoro 2022). Ongoing research is exploring the impact of COVID-19 on maternal and neonatal outcomes, focusing on aspects such as vertical transmission and delivery methods (Michailidou *et al.* 2021). The pandemic has underscored the importance of evidence-based clinical guidelines and research in the realm of maternal-fetal medicine (Boelig *et al.* 2021).

Moving forward, a global commitment to reducing disparities, improving access to maternal healthcare, and addressing the root causes of inequities is imperative. Investments in robust measurement systems for maternal, newborn, and child health will facilitate ongoing monitoring and evaluation, allowing for targeted interventions and continuous improvement. As the world grapples with the ongoing challenges posed by the pandemic, there is a collective responsibility to ensure that maternal healthcare remains a priority, with a focus on inclusivity, equity, and resilience.

Chapter 3: South African Public Healthcare

3.1 INTRODUCTION

In the landscape of public health, legislation and interventions wield significant influence, particularly in maternal healthcare. This chapter seeks to explore and analyze the pivotal role played by legislative frameworks and intervention strategies in shaping public maternal healthcare as well as the nature of the public healthcare system in South Africa. Understanding the intricate interplay between legal mandates and targeted interventions is crucial for comprehending the dynamics that contribute to the effectiveness or challenges within the maternal healthcare system. As South Africa grapples with the complexities of providing accessible and high-quality maternal healthcare to its diverse population Maphumulo and Bhengu (2019c), a comprehensive examination of existing literature will illuminate the legislative landscape and interventions that contribute to the shaping of the public maternal healthcare landscape. This review aims to provide a nuanced understanding of the current state, challenges, and potential advancements in South Africa's public maternal healthcare, offering valuable insights for policymakers, healthcare practitioners, and researchers dedicated to advancing maternal health outcomes in the country.

3.2 NATURE OF THE SOUTH AFRICA PUBLIC HEALTHCARE SYSTEM

The transformation of the South African healthcare system has been notable since the 1990s, emphasizing community involvement in primary care (Tsoabisi and Bayat 2012). Currently, the system is undergoing restructuring, with a primary focus on adopting a primary healthcare model and introducing the National Health Insurance initiative (Weeks 2013; Maphumulo and Bhengu 2019a). Despite these changes, the healthcare system grapples with persistent historical issues, including racial and gender discrimination, income disparities, and a shortage of human resources (Coovadia *et al.* 2009). The pursuit of universal health coverage, particularly through the National Health Insurance, is viewed as a potential remedy for these challenges (Ataguba 2010; Fusheini and Eyles 2016). The South African healthcare system confronts numerous challenges, encompassing insufficient funding, diminished staff morale, and a low staff-to-patient ratio (Aikman 2019). This situation has resulted in a lack of cohesion and integrated health data among healthcare providers (Chuma and Sibiya 2022). Language barriers further complicate the delivery of healthcare services (Makovhololo and Iyamu 2020). Additionally, social inequality, poverty, and unemployment contribute to the compromised quality of healthcare services (de Villiers 2021). The Free State Province, in particular, grapples with issues such as fragmented health services, inadequate staffing, and financial constraints (Malakoane *et al.* 2020a). Addressing these challenges requires a focus on the socio-economic determinants of health, the establishment of a fully public, nonprofit healthcare system, and investment in the often-undervalued female workforce (Valiani 2020).

Health has a crucial role in sustaining economic development as it is both a need for and a result of economic progress. This implies that health significantly contributes to achieving sustainable

development and positive health outcomes (Hlafa, Sibanda and Hompashe 2019). South Africa has a historical background of racial segregation and discrimination, where the health system and its policies were utilized to uphold white supremacy and capitalist principles. However, in 1994, the country transitioned into a democracy, and the African National Congress (ANC), the elected party, formulated a National Health Policy to rectify past injustices (Pauw 2022). Over the last 20 years, the proportion of government transfers about total health expenditure (THE) has significantly grown, going up from 36% in 2000 to 59% in 2019. Health spending per capita and as a proportion of GDP has consistently increased over this time. Private voluntary health insurance (VHI) in South Africa only offers coverage to those with high incomes in the private sector. This has resulted in a lack of human resources in the public sector.

Since the end of apartheid in 1994, South Africa has experienced dramatic and rapid changes in population health, with the first years of post-apartheid South Africa characterized by economic growth and notable steps toward reducing inequalities in health and high levels of mortality from infectious and maternal causes (Achoki *et al.* 2022). The South African constitution mandates the rectification of historical inequalities and the implementation of practical steps, given existing resources, to gradually fulfill the population's entitlement to accessible, high-quality essential healthcare (Wilkinson *et al.* 2022). Regrettably, the onset of the HIV/AIDS epidemic in the early 2000s, before the implementation of antiretroviral drug therapy (ART), caused significant disruptions to the health system and negated numerous advancements in public health leading to an increase in HIV/AIDS-related maternal mortalities including stillbirth. Since 1996, user fees have been waived for all seeking primary public healthcare, although eligibility for free care at public healthcare. Eligibility for receiving free care at public sector hospitals is determined through a means test while accessing a private healthcare facility typically requires payment out-of-pocket (OOP) or coverage by health insurance, which may still involve the patient incurring a co-payment (Gordon, Booysen and Mbonigaba 2020).

Despite significant economic advancement in the post-apartheid era, more than half of South Africa's populace resides in poverty (de Villiers 2021). The socio-economic gap within the nation is among the most pronounced globally. In 2018, the World Bank issued a report on poverty and inequality in South Africa, identifying it as the world's most unequal society, attributed not solely to income disparities but also to wealth imbalances (de Villiers 2021). According to the World Bank, the top one percent of South Africans control 70.9% of the country's wealth while 60% of the country's population collectively controls only seven percent of the country's assets, and despite the end of apartheid, this split is largely still along racial lines. Around 80% of South Africa's population relies on healthcare services offered by publicly funded institutions, supported by taxes. Only about 15% of the populace has opted for private voluntary health insurance, granting access to private healthcare providers. Additionally, some uninsured individuals seek private healthcare and cover the costs directly (Wilkinson *et al.* 2022). The United Nations estimates the population of South Africa to be around 60,414,495 as of 2023 (World Meter, 2023), while Statistics South Africa (Stats SA) predicts a population of 62 million people (STATSSA 2023). However, most of this population relies on healthcare services provided by government-run public institutions such as public clinics and hospitals.

Currently, South Africa's health system is sharply divided between public and private sectors, with both sectors governed by the Minister of Health whose mandate includes setting national policy priorities and regulating all health sector actors (Whyle and Olivier 2023). South Africa has embraced the delegation of authority and responsibility for certain public functions, often shifting from national to provincial or local governments. This health system decentralization is undertaken with the belief that it can effectively tackle political, managerial, and operational challenges, leading to improved systemic efficiency and cost-effectiveness. Currently, South Africa struggles to ensure equitable access to healthcare services. Approximately 16% of the population possesses health insurance, facilitating access to high-quality healthcare in the private sector. Additionally, an estimated 21% of individuals lack health insurance but have the financial means to utilize private healthcare services. Meanwhile, over 63% of the populace depends on the public sector for their standard healthcare needs (Masuku, Sabela and Jili 2020). Most of the population is confined to the ineffective public sector healthcare system, resulting in an imbalanced distribution of healthcare resources that disproportionately benefits individuals with higher incomes.

In South Africa, the healthcare system operates on a dual structure, where the less privileged predominantly rely on the under-resourced public sector. In contrast, those with financial means, often equipped with private medical insurance, predominantly seek services from the private sector. Since 1996, user fees have been waived for all seeking primary public healthcare, although eligibility for free care at public sector hospitals is subject to a means test, and to access a private healthcare facility one must pay out-of-pocket (OOP) or be covered by health insurance (even then the patient may incur a co-payment) (Gordon, Booysen and Mbonigaba 2020). Enhancing the efficiency of the public health system is imperative for achieving Universal Health Coverage (UHC) in South Africa. The country is confronted with a complex array of health challenges, including a dual HIV-TB epidemic, accounting for approximately 17% of the global burden. Additionally, South Africa experiences high rates of maternal and child mortality, constituting about 1% of the global burden, alongside elevated levels of violence and injuries, comprising around 1.3% of the global burden. Furthermore, there is a growing prevalence of non-communicable diseases, contributing about 1% to the global burden of disease (Malakoane *et al.* 2020a).

While South Africa spends more on health than any other African country, studies suggest that improvements in health outcomes are not proportional to the amount spent, like many other countries, South Africa is a federal system, and health is a provincial competency wherein provincial governments determine their health priorities (Achoki *et al.* 2022). One could argue that this has played a role in the noticeable differences in health outcomes across provinces, particularly in recent times. Nevertheless, the lasting impact of the discriminatory apartheid regime still shapes health results, particularly in terms of population dynamics, interprovincial socio-economic disparities, and variations in health funding and the development of the health system. Forty-nine million people or 83 percent of the entire population of 62 million rely on the public healthcare system in South Africa. Coupled with a shortage of medical professionals, high migration, inequality, and unemployment; healthcare provision is under extreme pressure (Ngobeni, Breitenbach and Aye 2020). The Census 2022 results show that the population of

South Africa was 62 million in 2022, increasing from 51,7 million in 2011, and this represents an average annual growth rate of 1,8% between the two periods, which is the largest since 1996 (IX). According to StatSA Gauteng remained the province with the highest population (15 million), while Northern Cape has the smallest population at 1,3 million. About 56% of the country's population lives in three provinces, namely Gauteng, KwaZulu-Natal, and the Western Cape, and has moved from being the 5th-largest province in terms of population size in 1996 to being the 3rd largest in 2022. Black Africans continue to constitute the majority population group at 81.4%, followed by coloreds at 8.2%, whites at 7.3%, and Indians/Asians at 2.7%. The percentage of the white population has consistently decreased, declining from 11% in 1996 to 7.3% in 2022. Health is a key priority in South Africa's development plan, however, while approximately 86 percent of the country's population access health services through the public sector, only 50 percent of the health expenditure is provided by the government (Van Staden 2021). Disparities in healthcare expenditure persist, leading to variations in the quality of healthcare between the public and private sectors. This further complicates issues related to access to and the quality of health services, especially for individuals residing in rural areas.

In South Africa, socio-economic factors predominantly influence access to healthcare services, resulting in more affluent individuals acquiring healthcare services more effectively than those facing economic disadvantages. The democratic South African government in 1994 had one task, among many, to provide primary healthcare (PHC) for every South African, and the government's central task was to address the disempowerment, discrimination, and underdevelopment that had weakened the healthcare system over the past few decades (Hlafa, Sibanda and Hompashe 2019). The South African health system is made up of the public and private health sectors, with the former being operated by the various provincial government health departments (Hlafa, Sibanda and Hompashe 2019). The public health sector is structured into primary, secondary, and tertiary health services, delivered through diverse health facilities situated within and overseen by distinct provincial departments. The National Department of Health monitors and manages this system. South Africa is now 25 years into democracy, but inequality remains high in the country in many sectors, and the health sector is not an exception, and the ability to have access to quality services is mainly influenced by the socio-economic status of the people, rather than the need for care (Mhlanga and Garidzirai 2020). The majority of South Africans rely on public healthcare facilities for their healthcare needs, and in 2019, Statistics South Africa (StatsSA) indicated that 71.5% of households sought care from public healthcare facilities, while 27.1% opted for private healthcare facilities when in need of healthcare services.

3.3 CHALLENGES FACING SOUTH AFRICAN HEALTHCARE SYSTEM

Since the advent of democracy, the South African government has been putting charters, policies, strategies, and plans in place to strengthen public health system performance and enhance service delivery, however, public health programme performance and outcomes remained poor while the burden of disease increased (Malakoane *et al.* 2020a). Despite all the plans and strategies regulatory and policy interventions, and a clear agenda for quality health care and significant annual expenditure, public health system shortcomings continue to endanger the health and lives of South Africans and

have resulted in a loss of confidence among users (Hlafa, Sibanda and Hompashe 2019). The South African healthcare system still experiences a significant divide in terms of access to, and quality of healthcare services, 25 years post-apartheid (Maphumulo and Bhengu 2019a; Van Staden 2021). The South African health system faces a range of systemic and structural challenges, which include widespread inefficiencies, staff shortages, variability in skill sets between rural and urban areas, and suboptimal care levels and patient management (de Villiers 2021).

➤ **Inequities in access to Healthcare Services**

Despite the end of apartheid in the early 1990s, South Africa remains racially and economically segregated. The country is beset by persistent social inequality, poverty, unemployment, a heavy burden of disease, and the inequitable quality of healthcare service provision (de Villiers 2021). In 2021, South Africa (SA) had a population of approximately 60 million and was classified as an upper-middle-income country. According to the global wealth inequality review of 2022, SA is the most unequal country in the world (Ngene, Khaliq and Moodley 2023). According to Ngene, Khaliq and Moodley (2023), South Africa has an obvious disparity between urban and rural communities with the latter being more likely to have limited resources, particularly in health care services, with 84% of the population (predominantly disadvantaged economic groups) depend on public health care services. The South African healthcare system is marked by significant disparities in access to services, with rural and low-income populations facing the greatest challenges (Gordon, Booysen and Mbonigaba 2020; Reilly 2021). The unequal distribution of health insurance coverage worsens the existing disparities, which primarily benefits those with higher incomes (Barasa *et al.* 2021). Social innovation in healthcare, including implementing innovative financial mechanisms, can potentially mitigate these disparities (de Villiers 2021). Nonetheless, the heavy reliance on private healthcare and the steep expenses associated with medical insurance exacerbate household vulnerability, particularly among lower-income demographics (Morudu and Kollamparambil 2020). Addressing these disparities should focus on eliminating user fees for skilled childbirth services and advocating for high-quality education (Ogundele, Pavlova and Groot 2020; Obse and Ataguba 2021).

The South African healthcare system exhibits inequities in access and quality of care. The public health system is not meeting national standards, leading to dissatisfaction among households (Shenaaz 2023). The geographical distribution of healthcare resources, such as physicians, does not align with the burden of disease, resulting in unequal access to care (Mannie, Strydom and Kharrazi 2022). The country's two-tiered health system, with a private sector catering to high-income groups, exacerbates resource shortages in the public sector (Ranabhat 2019). Despite improvements in healthcare system performance, gains have been unevenly distributed, with economically advantaged provinces experiencing the greatest improvements (Achoki *et al.* 2022). According to Gordon, Booysen and Mbonigaba (2020), in South Africa, the socio-economically disadvantaged are more likely to experience poor health status, disability, the simultaneous occurrence of more than one condition/disease (multi-morbidity), and are less likely to use inpatient care.

➤ **Shortages of healthcare personnel and resources**

South Africa encounters difficulties in generating enough qualified nurses due to constrained capacity in nursing institutions and inadequate faculty members available to instruct and guide students (Allied 2024). Consequently, this leads to fewer graduates joining the workforce annually. Like numerous nations globally, South Africa is grappling with a notable deficit of nursing professionals. This scarcity carries extensive ramifications for the country's healthcare infrastructure, imposing substantial strains on current healthcare staff and undermining the standard of patient care (Allied 2024). This piece will delve into the origins and repercussions of the nursing shortage in South Africa, alongside potential remedies to tackle this urgent concern. The emigration of skilled healthcare workers, including nurses, midwives, and doctors, is a major concern as it exacerbates the shortage and leaves the healthcare system struggling to meet the growing demand. South African nurses are seeking better job opportunities abroad, attracted by higher salaries, better working conditions, and opportunities for professional growth (Gardiner 2023). The consequences of brain drain in healthcare include the loss of young minds, a decline in scientific development, and the receipt of highly qualified minds by other countries (Najib *et al.* 2019). The brain drain out of South Africa is evident, with highly educated and skilled individuals emigrating to top destination countries. The global migration of healthcare workers is considered a crisis in health sector human resources, driven by a shortage of healthcare workers in wealthy countries and push factors in home countries (Yu 2022).

The healthcare workforce in South Africa particularly nurses is indeed aging, and there is a shortage of younger professionals entering the field to replace them. This situation has been exacerbated by nurses migrating to richer countries, creating a health crisis in developing countries (Lerotholi and Bezuidenhout 2023). The impact of an aging workforce and higher retirement age on youth unemployment has been studied, and it has been found that higher retirement age is significantly related to youth unemployment (Rahat, Aliyu and Iwu 2020). South Africa is known for its diversity, and optimizing the potential of a multicultural group of employees remains a challenge for organizations in the country (Kelly, Els and Rossouw 2020). The proportion of elderly individuals in South Africa is growing rapidly, and the country is set to experience a doubling of the population over the age of 65 by 2020. This presents a challenge for tertiary institutions in training professionals capable of addressing the complex needs of an aging population (Tanyi and Pelser 2019). The nursing workforce in South Africa faced additional challenges due to the COVID-19 pandemic, with healthcare workers being infected and overworked (Stiegler and Bouchard 2020a).

Nurses in South Africa often face heavy workloads, long hours, and high-stress environments, which contribute to burnout and disillusionment (Fathuse, Hlongwana and Ginindza 2023). Limited resources and support further exacerbate these challenges, leading some nurses to leave the profession entirely (Barnard *et al.* 2023; Fathuse, Hlongwana and Ginindza 2023). The demanding nature of the job, coupled with occupational exposure to high mortality, staff shortages, and consistent feelings of grief, contribute to emotional exhaustion and depersonalization among nurses

(Gniewek *et al.* 2023). Job satisfaction levels and work-related burnout are important determinants of nurses' retention and turnover rates, as well as their work performance and the quality of nursing care provided (Bruce and Sangweni 2012).

The shortage of skilled healthcare workers in South Africa, particularly in rural areas, is a significant challenge (Zihindula *et al.* 2019). This has led to overburdened facilities and long waiting times (Faruk *et al.* 2020). Various factors contribute to the shortage and poor retention of healthcare workers in rural areas, including individual-level factors, unattractive living and working conditions, and insufficient financial incentives (Ahmed *et al.* 2020). The shortage of healthcare workers has been attributed to a mismatch between demand and supply, loss of personnel to developed countries, poorly functioning education systems, and poor working conditions (Gumede, Taylor and Kvalsvig 2023). The healthcare system in South Africa has been under strain due to the COVID-19 pandemic, which has further highlighted the pre-existing shortcomings in the healthcare system and its governing bodies (Sibanda *et al.* 2023). The pandemic has also resulted in increased workloads for healthcare workers, with mandated process changes and COVID-19 isolation protocols prioritizing critical care treatment at the expense of less acute ones (Mokhele *et al.* 2022). Strategies to address the shortage of healthcare workers and improve healthcare provision include internal reforms to the health and education sectors, setting regional targets, and monitoring the size and composition of the workforce (Wright *et al.* 2022).

The shortage of healthcare professionals in South Africa has severe consequences for both healthcare providers and patients. The lack of resources in hospitals leads to healthcare workers leaving for better opportunities, resulting in a deficiency of resources and negative impacts on patient care (Jiyane and Khunou 2023). Strategic talent management practices can improve nurse work engagement in public hospitals, but there are gaps in management commitment and talent review processes (Lerotholi and Bezuidenhout 2023). The shortage of critical healthcare skills in South Africa is caused by a mismatch between demand and supply, loss of personnel to developed countries, and poorly functioning education systems (Gumede, Taylor and Kvalsvig 2023). These shortages result in compromised healthcare quality, longer waiting times, and increased mortality rates.

➤ **High burden of non-communicable diseases (NCDs)**

The South African healthcare system is facing a growing burden of non-communicable diseases (NCDs) such as diabetes, hypertension, and cardiovascular disease, necessitating comprehensive prevention and management strategies (Roomaney *et al.* 2020; Disang, Weller and Campbell 2021; Moyo and Musekiwa 2022). The prevalence of NCDs among people living with HIV in sub-Saharan Africa, especially in South Africa is a particular concern (Moyo and Musekiwa 2022). Multimorbidity, the coexistence of multiple chronic conditions, is also a significant issue, with studies reporting a high prevalence in South Africa (Kaluvu *et al.* 2022). The integration of HIV and NCD care is a key area for improvement, with a need for more rigorous study designs and reliable measures (Kemp *et al.* 2018). The association between heavy metal toxicity and NCDs in the HIV population is an

emerging area of research (Folorunso *et al.* 2021)

In South Africa, deaths due to major non-communicable diseases (NCD) such as cardiovascular diseases, cancer, diabetes, and chronic lower respiratory diseases increased by 58,7% over 20 years, from 103 428 in 1997 to 164 205 in 2018 (StatsSA 2023). According to StatsSA (2023), the median age at death in years was 65 for males and 69 for females. In terms of the burden of NCDs and mortality rates KwaZulu-Natal, Gauteng, Western Cape, and Eastern Cape provinces have some of the highest numbers of deaths due to NCDs. This may reflect their large populations as they host almost two-thirds of the population of South Africa. Free State has one of the lowest numbers of NCD-related deaths in absolute numbers, but some of the highest mortality rates (StatsSA 2023). According to StatsSA (2023), in terms of the burden of NCDs and mortality rates KwaZulu-Natal, Gauteng, Western Cape, and Eastern Cape provinces have some of the highest numbers of deaths due to NCDs (StatsSA 2023). This may reflect their large populations as they host almost two-thirds of the population of South Africa. This is further complicated by the country's high HIV/AIDS burden, which has led to a protracted epidemiological transition (Bradshaw 2019). Despite improvements in healthcare system performance, there are significant inequalities in mortality and life expectancy, with the greatest gains in economically advantaged provinces (Achoki 2022). Free State has one of the lowest numbers of NCD-related deaths in absolute numbers, but some of the highest mortality rates (StatsSA 2023).

South Africa has a high prevalence of infectious diseases such as HIV/AIDS, tuberculosis, and malaria, which puts a strain on healthcare resources (Daviaud *et al.* 2019; Day *et al.* 2021; Mulemfo, Moyo and Mavhandu-Mudzusi 2023). LGBTQI+ individuals face discrimination and stigma when accessing HIV management services in public primary healthcare facilities, leading to unequal access to healthcare services (Daviaud *et al.* 2019). District, subdistrict, and regional divisions, with hospital information available for public healthcare specialists characterize the healthcare system in South Africa (Motlhaoleng *et al.* 2023). The implementation of national TB management guidelines in South Africa is challenging, with gaps in knowledge and practice among healthcare workers (Mafirakureva *et al.* 2023). The direct medical costs for managing hip fractures within the public healthcare system in South Africa are high, highlighting the need for budgeting and planning hip fracture services. Overall, the burden of infectious diseases and the challenges in healthcare provision in South Africa necessitate targeted interventions and resource allocation to address these issues.

➤ **Lack of good governance, infrastructure deficits, and accountability**

Governance and accountability issues within the South African healthcare system have resulted in reports of corruption, mismanagement, and inefficiency, leading to a loss of public trust and undermining the effectiveness of healthcare delivery (Malakoane *et al.* 2023). Poor governance practices and inadequate oversight mechanisms in the South African healthcare system have led to cases of mismanagement within healthcare institutions (Mathonsi, Chinomona and Schutte 2023). This includes issues such as nepotism, favoritism in procurement processes, and improper

allocation of resources (Govender, Proches and Kader 2023). These mismanagement practices can result in inefficiencies and failures in service delivery. According to Malakoane *et al.* (2023), these issues have been observed at various levels, including operational-level health managers and quality assurance managers. Factors such as lack of policy awareness among health managers, poor infrastructure, and human resource challenges have been identified as barriers to implementing quality standards in health facilities (Matahela, Adekola and Mavhandu-Mudzusi 2023). According to Brooks (2004); (Cwaile 2023) the successful implementation of oversight mechanisms to promote accountability in South African municipalities has also been impeded by factors such as ineffective internal control tracking, and limitations in progress checks by the Auditor General. Nepotism in municipal appointments, and management's inability to enforce consequences (Moji, Nhede and Masiya 2022).

Corruption in the South African healthcare system, including embezzlement, bribery, and kickbacks, has been a significant issue, leading to resource diversion, compromised service quality, and healthcare access inequalities (Hsiao, Vogt and Quentin 2019; Masenya and Mthombeni 2023). This unethical behavior has been linked to the abuse of power, patient harm, and neglect of social responsibility (Rheeder 2021). Legal practitioners have also been implicated in fraudulent activities, particularly in litigation related to medical negligence (Mantzaris and Pillay 2021). The payment of bribes for medical care has been found to significantly increase the reported difficulties in obtaining care, hindering progress towards Universal Health Coverage (Hsiao, Vogt and Quentin 2019). The persistence of corruption in post-apartheid South Africa, including in land administration and governance, poses a threat to transitional justice and transformation imperatives (Mathiba 2021). The need for sound ethical conduct in public administration, including transparency, accountability, and efficiency, has been emphasized as a key determinant for effective public service delivery (Shava and Mazenda 2021).

There have been reports of corruption, mismanagement, and inefficiency within the South African healthcare system, leading to a lack of trust and accountability (Govender 2000; Malakoane *et al.* 2023). The introduction of managed care in the last decade was an attempt to control costs, but it has also led to challenges in healthcare waste management and compliance with guidelines (Vumase 2009; Fagbadebo and Ile 2022). The increase in medico-legal claims further highlights the issues within the system, with money being diverted from healthcare priorities (Fagbadebo and Ile 2022). Instances of corruption, including embezzlement, bribery, and kickbacks, have been reported within the South African healthcare system (Fourie and Malan 2022). According to Fourie and Malan (2022), this unethical behavior diverts resources away from patient care, compromises the quality of services, and perpetuates inequalities in access to healthcare. The high levels of fraud, corruption, and collusion among public officials in South Africa have had little consequence management to date (Bhamjee *et al.* 2022). The healthcare system in South Africa is under-resourced and fragmented, with inadequate access to the social determinants of health (Bhamjee *et al.* 2022). Efforts should be made to improve the healthcare system, increase the financial budgets allocated to audiology resources, and employ additional audiologists in public sector

hospitals (Stiegler and Bouchard 2020b).

The South African healthcare system faces significant challenges, including inefficiency, bureaucratic processes, and administrative bottlenecks that hinder the delivery of timely and effective services (Maphumulo and Bhengu 2019a; Ngobeni, Breitenbach and Aye 2020). These issues have led to a decline in the quality of care, eroding public trust (Maphumulo and Bhengu 2019a). The system is also plagued by poor healthcare outcomes, despite high levels of public expenditure (Ngobeni, Breitenbach and Aye 2020). The system's financial management and budgeting practices are generally well-structured, but there are disparities in budget execution and a limited link between performance indicators and the budget process (Mutymbizi-Mafunda *et al.* 2023).

The South African healthcare system faces significant challenges due to infrastructure deficits, which hinder the delivery of quality care and exacerbate existing issues (West *et al.* 2021). According to West *et al.* (2021), these deficits are particularly pronounced in rural areas, where providers struggle to define and deliver quality care due to inadequate clinic structure and resources. The COVID-19 pandemic has further highlighted these challenges, including the deterioration of public health infrastructure and weak healthcare systems (Alegbeleye and Mohammed 2020). Despite the implementation of quality improvement programs, the system continues to face difficulties in delivering the desired level of care (Maphumulo and Bhengu 2019a). The integration of HIV and TB services is also hindered by systemic challenges, including inadequate infrastructure (Kalonji and Mahomed 2019). These challenges are further compounded by a lack of funding, poor staff morale, and a low staff-to-patient ratio (Aikman 2019). In resource-poor intensive care settings, the lack of equipment and infrastructure poses significant challenges to healthcare professionals (Netshisaulu, Malelelo-Ndou and Ramathuba 2019).

The healthcare system also grapples with numerous challenges, including scarcities of medical equipment, diagnostic tools, and supplies, which are exacerbated by insufficient funding, low staff morale, and a disproportionate staff-to-patient ratio (Netshisaulu, Malelelo-Ndou and Ramathuba 2019; Randa and McGarry 2023). According to Randa and McGarry (2023), issues such as substandard infrastructure, poverty, and geographical barriers further impede access to healthcare services. Inadequate training of healthcare personnel, especially in the proper management of medical waste, adds to these challenges. The procurement process for essential medicines in public sector hospitals faces obstacles, leading to persistent shortages. Shortages of medical equipment, diagnostic tools, and supplies are common in many healthcare facilities in South Africa, leading to delays in care and suboptimal health outcomes (Mohlala *et al.* 2023). A study conducted in labor units found that midwives experienced barriers to using equipment when administering care to pregnant women, including a lack of examination lights, overhead radiant warmers, and weighing scales for newborns (Babbar and Rani 2022). A study focused on healthcare staff working in forensic care centers and highlighted the challenges they face in providing care and support for survivors of sexual violence, including barriers to accessing care and working in an uncondusive

environment (Babbar and Rani 2022).

Healthcare facilities often suffer from deteriorating conditions, malfunctioning equipment, and unsanitary environments due to budget constraints and resource limitations (Mathonsi, Chinomona and Schutte 2023). According to Mathonsi, Chinomona and Schutte (2023); (Ramodipa *et al.* 2023) this poses risks to both patients and healthcare workers. The maintenance of healthcare infrastructure is often neglected, leading to these issues. The lack of prioritization and financial challenges make it difficult for hospitals to meet the minimum requirements of healthcare waste management, such as waste segregation (Moeti *et al.* 2023). In addition, there is limited integration of healthcare waste management plans, resulting in inadequate health and safety aspects, environmental pollution, and limited community participation (Lister *et al.* 2022). These challenges highlight the need for improved healthcare policies, strategies, and resources to address the maintenance and management of healthcare facilities in South Africa.

3.4 CHALLENGES FACING SOUTH AFRICAN MATERNAL HEALTHCARE AND STILLBIRTH

South Africa's maternal healthcare and stillbirth rates face complex challenges, encompassing issues like the management of hypertensive disorders in pregnancy, the detection of fetal growth restriction, and the provision of high-risk care (Pattinson, Hlongwane and Vannevel 2019). Such challenges facing South Africa's maternal healthcare include inadequate implementation of postnatal care guidelines, lack of basic knowledge about the guidelines, absence of midwives in maternity units, inadequate facilities and resources, lack of support and training for midwives, and poor communication and information sharing (Okeke and Ngunyulu 2023). Factors associated with the failure to use institutional delivery services include long distances from healthcare facilities, lack of transport and transport fare, shortages of skilled staff, failure to disclose pregnancy, cultural and religious beliefs, and staff attitudes (Mlotshwa and Sibiya 2023). Stillbirth remains a significant issue in South Africa, with risk factors including socio-economic challenges, HIV, hypertension, and mental health disorders (Hlongwane, Pattinson and Bergh 2023). Maternal experiences of in-patient care in cases of stillbirth highlight the need for improved psychosocial care and adaptation of guidelines to consider cultural practices (Rees *et al.* 2022).

➤ Maternal Mortality

South Africa grapples with a high maternal mortality ratio, highlighting obstacles in accessing quality maternal healthcare services, particularly in rural regions. Most research underscores the significance of sociocultural and health system factors in shaping pregnancy and delivery challenges, with many women opting for traditional practitioners over healthcare facilities for prenatal and childbirth care (Makhado *et al.* 2023). Moreover, factors such as fertility rates, GDP per capita, and HIV prevalence have been identified as significant contributors to maternal mortality (Mlambo, Mvuyana and Ntshangase 2023). Recognizing the importance of systematic collection and analysis of maternal near misses (MNMs), efforts are underway to leverage this data for enhancing maternity care and preventing fatalities (Heitkamp *et al.* 2022). Risk factors for adverse postnatal outcomes in South Africa encompass socio-economic hardships, HIV, hypertension, and mental health conditions (Heitkamp *et al.* 2022).

South Africa's high maternal mortality ratio is influenced by a range of factors. Studies by Bomela (2020) and Msibi-Afolayan *et al.* (2023) both highlight the role of sociodemographic factors, with the former noting variations in causes of death across different groups and the latter identifying HIV as a major contributor. Cultural factors, such as the perception of post-delivery bleeding and the pressure to have children, also play a role (Marabele *et al.* 2020). The low utilization of maternal health services, particularly in rural areas, is a significant issue (Musizvingoza 2020). Gender inequities and the shortage of skilled birth attendants are identified as key drivers of maternal mortality in Africa (Yaya, Anjorin and Adedini 2021). However, the accuracy of data on maternal mortality in Sub-Saharan Africa, including South Africa, is a concern (Musarandega *et al.* 2022). Practitioners in the medical field encounter difficulties in addressing stillbirths, including challenges related to communication, cultural differences, and feelings of shame (Lappeman and Swartz 2019). Barriers to hospital delivery, such as the fear of maltreatment and perceived low quality of care, add to these challenges (Best 2019). The causes of stillbirths in South Africa are diverse, encompassing factors such as maternal infections, hypertensive disorders, and fetal sepsis (Madhi *et al.* 2019; McClure *et al.* 2022).

➤ **Accessibility of Maternal Healthcare Services Challenges**

South Africa is actively working towards enhancing the accessibility of maternal healthcare services. Despite the implementation of interventions aimed at improving accessibility, vulnerable groups, particularly women with disabilities, continue to encounter numerous challenges when seeking access to these services (Mheta, Sibiya and Nkosi 2023a). According to Mheta, Sibiya and Nkosi (2023a) the women with physical impairments encountered inaccessible buildings, narrow passages, small consultation rooms, and equipment that was not adjustable, such as beds and scales.

The concern over low breastfeeding rates in South Africa, exacerbated by the weak implementation of regulations exacerbated by the weak implementation of regulations (Seabela, Modjadji and Mokwena 2023). Contextual factors such as education, poverty, and access to health facilities significantly influence maternal healthcare utilization (Okeke and Ngunyulu 2023). The high incidence of eclampsia in Sub-Saharan Africa, including South Africa, is deemed a preventable tragedy that warrants a holistic approach (Modjadji *et al.* 2023).

Disparities in access to maternal healthcare exist between urban and rural areas in South Africa, with rural populations facing greater barriers due to limited healthcare infrastructure and resources (Rees *et al.* 2022; Sigamoney and Singh 2023). Factors hindering healthcare access in peri-urban communities include poor infrastructure, poverty, and geographical location (Sibiya, Ngxongo and Bhengu 2018). In rural areas, challenges in accessing antenatal care services contribute to high maternal mortality and morbidity rates (Gizamba *et al.* 2022). According to Gizamba *et al.* (2022), barriers to accessing healthcare services in rural areas include limited availability of testing equipment, unaffordable transport costs, longer waiting times, and delayed referral. Additionally, social and cultural beliefs, as well as past pregnancy experiences, can impact access and utilization

of antenatal care services (Khambule 2016).

Pregnant women and new mothers in these areas face resource shortages, inconsistent communication, and long travel times to clinics, leading to frustration and dejection (Laurenzi *et al.* 2020). Transportation barriers, economic factors, and cultural beliefs are key barriers to accessing maternal care in South Africa (Dahab and Sakellariou 2020a). Socio-economic inequalities in healthcare access are pervasive in South Africa, with the socio-economically disadvantaged facing discrimination across the continuum of access (Gordon, Booysen and Mbonigaba 2020). In rural areas, disparities in health and access to healthcare are exacerbated by poverty, occupation, education, insurance, and lack of competence (Reilly 2021). The use of information and communication technology (ICT) has been proposed as a potential solution to improve rural healthcare delivery in South Africa (Faruk *et al.* 2020). However, within-country wealth-related inequalities in skilled birth attendance and cesarean delivery persist, with vulnerable populations being particularly affected (Bobo *et al.* 2021). To address these disparities, it is recommended to review healthcare policies, implement National Health Insurance, and develop strategies to strengthen antenatal care services and community education.

➤ **Fragmented Maternity Protection Policies in South Africa**

The presence of fragmented maternity protection policies creates difficulties for both employees and employers in understanding their respective rights and responsibilities (Pereira-Kotze *et al.* 2022). Further complicating the issue is the absence of a standardized set of outcomes for stillbirth prevention and bereavement care, as highlighted (Dube *et al.* 2022). The COVID-19 pandemic added extra challenges, including shortages of personal protective equipment and difficulties in reaching workplaces (Semaan *et al.* 2022). The policy framework is fragmented and difficult to interpret, making it challenging for employees to know their maternity rights entitlements and for employers to understand their responsibilities (Pereira-Kotze *et al.* 2023b). The components of maternity protection are dispersed through many policy documents, and there is weak alignment within the government on maternity protection (Schumacher and Dressel 2022). Implementation, monitoring, and enforcement of existing maternity protection policies are inadequate. This fragmented policy environment and lack of clarity make it difficult for non-standard workers, such as domestic workers, to access maternity protection benefits, particularly cash benefits (Schumacher and Dressel 2022; Pereira-Kotze *et al.* 2023b). Addressing these challenges requires legislative and implementation measures to ensure greater policy coherence and comprehensive guidance on maternity protection rights.

Fragmented maternity protection policies in South Africa refer to the lack of comprehensive and cohesive regulations and support systems aimed at protecting the rights and well-being of pregnant women and new mothers in the workplace. These policies often lack consistency and may be spread across different laws, regulations, and guidelines, leading to confusion and gaps in coverage.

Fragmented maternity protection policies in South Africa refer to the lack of comprehensive and

cohesive regulations and support systems aimed at protecting the rights and well-being of pregnant women and new mothers in the workplace (Okeke and Ngunyulu 2023; Pereira-Kotze, Faber and Doherty 2023). According to Okeke and Ngunyulu (2023), these policies often lack consistency and may be spread across different laws, regulations, and guidelines, leading to confusion and gaps in coverage. Stakeholders in South Africa have a limited understanding of comprehensive maternity protection, and there are challenges in accessing cash payments while on maternity leave (Botha and Govender 2023). Midwives play a key role in postnatal care, but there are obstacles to their implementation of maternal care guidelines, including a lack of basic knowledge, inadequate facilities and resources, and poor information sharing (Pereira-Kotze *et al.* 2023a).

The fragmented nature of maternity protection policies in South Africa can result in challenges for pregnant women and new mothers in accessing their rights and entitlements, navigating workplace accommodations, and ensuring their health and well-being during pregnancy and postpartum (Pereira-Kotze, Faber and Doherty 2023). The policy framework is fragmented and difficult to interpret, leading to confusion for both employees and employers (Pereira-Kotze *et al.* 2023a). Domestic workers, who are a vulnerable group, face unique challenges in accessing maternity protection, such as difficulties in monitoring their place of work (Pereira-Kotze, Doherty and Faber 2022). According to Pereira-Kotze, Doherty and Faber (2022), there is a need for comprehensive and integrated maternity protection policies that address the diverse needs of women in the workforce and promote their rights to maternity leave, job security, and breastfeeding support.

➤ **Socio-economic Factors**

Socio-economic factors such as education, poverty, and access to health facilities significantly impact maternal healthcare utilization in South Africa. Socio-economic factors such as education, poverty, and access to health facilities significantly impact maternal healthcare utilization in South Africa (Obse and Ataguba 2021; Mhlanga and Hassan 2022; Simona *et al.* 2022). In South Africa and contribute to adverse maternal and infant health outcomes (Musizvingoza 2020). According to musizvingoza (2020), these factors are also key determinants of maternal health services utilization in rural areas, where low utilization rates and inequitable access persist. Studies have shown that factors such as long distance from healthcare facilities, lack of transport and transport fare, shortages of skilled staff, cultural and religious beliefs, and staff attitudes contribute to the failure to use institutional delivery services (Mlotshwa and Sibiya 2023). Additionally, the acceptability of maternal healthcare is influenced by factors such as provider, healthcare, and community, which can affect women's willingness to seek maternal healthcare services (Bucyibaruta *et al.* 2023). Socio-economic factors, including living in informal houses, are associated with reduced access to public healthcare facilities, highlighting the disparities in healthcare access based on socio-economic status (Moeti *et al.* 2023). The influence of contextual factors, such as educational status, poverty, media exposure, and access to health facilities, on maternal healthcare utilization in sub-Saharan Africa is also significant (Simona *et al.* 2022). The presence of healthcare workers, particularly physicians and nurses/midwives, is positively associated with maternal health service utilization (Rosser *et al.* 2022). However, the prevalence of health insurance coverage among

women in South Africa is relatively low, with significant disparities based on education, wealth, and place of residence (Amu *et al.* 2021). These findings underscore the need for targeted interventions to address these disparities and improve maternal healthcare utilization in South Africa.

In South Africa, socio-economic inequalities are pervasive across the continuum of healthcare access, with affordability and ability to pay being major drivers of these disparities (Gordon, Booysen and Mbonigaba 2020). These disparities are compounded by individual and contextual factors including age, marital status, employment, parity, health insurance coverage, wealth status, and place of residence (Seidu 2020). Transportation barriers, economic factors, cultural beliefs, lack of family support, and poor quality of care are identified as key barriers to accessing maternal healthcare in low-income countries in Africa, including South Africa (Dahab and Sakellariou 2020a). The depth of antenatal care coverage and associated inequalities in South Africa are also influenced by wealth, education, and area of residency (Obse and Ataguba 2021). Furthermore, according to Obse and Ataguba (2021), the perception of the quality of care under free maternal healthcare policies in sub-Saharan Africa, including South Africa, is significant.

➤ **Cultural and Societal Factors Challenges in South Africa Maternal Healthcare**

Cultural beliefs and practices in South Africa can influence maternal healthcare-seeking behavior and adherence to medical advice, presenting challenges for maternal healthcare delivery (Makhado *et al.* 2023; Modjadji *et al.* 2023). Sociocultural factors, such as the preference for traditional experts over health facilities during pregnancy and childbirth, and the lack of interaction between societal expectations and the healthcare system, contribute to problems and maternal mortality (Seabela, Modjadji and Mokwena 2023). Cultural norms and health system norms need to collaborate to reduce maternal mortality (Chakona 2020). In addition, cultural beliefs, and societal norms impact exclusive breastfeeding practices, with traditional and cultural beliefs informing decisions to exclusively breastfeed or mix-feed infants. Family beliefs and practices, as well as societal and cultural norms, can act as facilitators or barriers to breastfeeding, highlighting the need for context-specific breastfeeding messages and culturally appropriate counseling (Sibiya *et al.* 2020).

A range of studies have highlighted the complex interplay of cultural and societal factors in South Africa's maternal healthcare. (Marabele *et al.* 2020; Nkwo, Orji and Ajah 2021) underscore the influence of traditional beliefs and practices, with the former suggesting the need for culturally appropriate interventions. Studies by Simona *et al.* (2022) and MUSIZVINGOZA (2020) further emphasizing the role of contextual factors such as education, poverty, and gender norms in South African maternal healthcare utilization.

➤ **Human resources constraints**

South Africa is facing a critical shortage of human resources in maternal healthcare, leading to high maternal mortality rates and inadequate access to essential services for pregnant women (Mlotshwa and Sibiya 2023). The shortage of skilled staff, including midwives, is a significant factor contributing to this problem (Okeke and Ngunyulu 2023). Inadequate postnatal care services and suboptimal implementation of maternal care guidelines further exacerbate the situation. The lack of

basic knowledge about the guidelines, absence of midwives in maternity units, inadequate facilities and resources, and poor information sharing, and communication are some of the obstacles to effective implementation (Mohulatsi, Garutsa and Bahule 2023). The shortage of human resources in maternal healthcare has several consequences. These include delays in receiving skilled care during childbirth, leading to increased risks of stillbirth, neonatal death, and maternal death (Olseén *et al.* 2020). Factors contributing to the shortage of healthcare professionals in South Africa include a mismatch between demand and supply, loss of personnel to developed countries, poorly functioning education systems, and poor working conditions (Mlotshwa and Sibiya 2023). The shortage of midwives and medical equipment in rural provinces like Limpopo further exacerbates the problem (Mothiba, Skaal and Berggren 2019). This shortage of human resources hinders the achievement of the global reduction in maternal mortality and poses a significant health challenge, particularly in developing countries and sub-Saharan Africa (Gumede, Taylor and Kvalsvig 2023).

The shortage of skilled healthcare workers in South Africa poses significant challenges to ensuring safe pregnancies and reducing maternal mortality rates (Simona *et al.* 2022). Interventions to increase the use of skilled birth attendants, such as community health workers and text messages, have shown promise in sub-Saharan Africa (Kyololo *et al.* 2021). In South Africa, midwives face challenges in managing postpartum hemorrhage due to a lack of time and a shortage of human resources (Ramavhoya *et al.* 2021).

➤ **Lack of Maternal Education**

The lack of maternal education presents a significant challenge in South Africa's public maternal healthcare system, particularly in the context of the prevention of mother-to-child transmission (PMTCT) of HIV (Habedi 2020). This issue is further compounded by resource shortages, inconsistent communication, and long travel times to clinics, which pregnant women and new mothers in rural areas must navigate (Laurenzi *et al.* 2020). The low utilization of maternal health services in Sub-Saharan Africa is influenced by various social determinants, including educational level (MUSIZVINGOZA 2020). Despite the provision of free maternal healthcare, healthcare providers and managers perceive the quality of care as poor, with factors such as late reimbursement of funds and lack of essential drugs contributing to this perception (Ansu-Mensah *et al.* 2021). Illiterate women in rural areas face communication barriers and rely on family and neighbors to access maternal healthcare (Matovelo *et al.* 2021). The experiences of young mothers in urban areas highlight the need for improved training of healthcare providers to deliver high-quality care (Pillay, Manderson and Mkhwanazi 2020).

The lack of maternal education in South Africa has been identified as a significant factor affecting maternal and perinatal outcomes (Okeke and Ngunyulu 2023). Studies have shown that women with higher levels of education are more likely to delay their second birth, leading to longer inter-birth intervals (Afolabi and Palamuleni 2022). Additionally, inadequate knowledge about maternal care guidelines, a lack of midwives in maternity units, and inadequate training of midwives contribute to suboptimal implementation of postnatal care recommendations (Susuman 2015). This

lack of education and training results in a gap between the provision of postnatal care services and the effective implementation of maternal recommendations (Ramphoma and Lee 2022). A study by (Jochim *et al.* 2022) underscored the impact of maternal empowerment and socio-economic status on educational access for girls, with the latter emphasizing the need for interventions addressing poverty and family relationships. Studies by Naidoo, Muthukrishna and Nkabinde (2021) and Pillay (2021) explore the experiences of teenage mothers, revealing the influence of social narratives and the role of agency in navigating barriers to education. Research by Ohonba, Ngapah and Simo-Kengne (2019) and Malatji, Dube and Nkala-Dlamini (2020) further emphasize the importance of maternal education and supportive policies in improving child health outcomes and re-engagement with education. Furthermore, Modjadji (2021), underscores the need for targeted education and communication strategies to address the impact of low maternal education on child growth in rural areas.

3.5 SOUTH AFRICA DISTRICT HEALTH SYSTEM

Since the establishment of democratic governance, the South African government has implemented charters, policies, strategies, and plans to bolster the effectiveness of the public health system and improve service delivery. The implementation of the district health system in South Africa has brought forth various initiatives and challenges (Robertson, Moosa and Jeenah 2021). Additionally, Jinabhai *et al.* (2021) delves into the challenges associated with expediting the implementation of the District Health Information System, including issues related to data quality and interoperability. According to Thomas, Buch and Pillay (2021) underscores the crucial role played by community health workers in delivering comprehensive care, while Orgill *et al.* (2021) highlighting the significance of bottom-up innovation in enhancing health management capacity. Studies by Adedini *et al.* (2021); (Physicians 2022) both underscore the necessity for dependable health and demographic surveillance systems and emphasize the contribution of family physicians to district health services. Additionally, (Day *et al.* 2021); Msomi, Kalusopa and Luthuli (2021) underscore the importance of change management in implementing electronic health records and the potential of routine facility data in monitoring progress toward achieving universal health service coverage.

Despite these efforts, the performance of public health programs and the associated outcomes have continued to be subpar, accompanied by a rise in the disease burden (Malakoane *et al.* 2020a). Various studies have brought attention to critical issues within the South African district health system. In the realm of resource allocation inefficiencies and challenges, Babalola and Moodley (2020); (Malakoane *et al.* 2020a) have both highlighted concerns. Babalola specifically delved into the technical efficiency and productivity of public district hospitals in KwaZulu-Natal and Free State provinces. The district health system in Free State Province, South Africa faces significant challenges, including fragmentation of services, staff shortages, and financial problems (Malakoane *et al.* 2020a). These issues have led to poor performance on health indicators (Babalola and Moodley 2020). To address these challenges, the Free State Department of Health has developed the Health Systems Governance & Accountability (HSGA) intervention model to improve service delivery and address operational defects (Malakoane *et*

al. 2020a).

Numerous studies have delved into the district health system within the Free State Province of South Africa, particularly focusing on maternal healthcare. Mothupi, De Man *et al.* (2021), devised a composite index for monitoring the continuum of maternal health service delivery, pinpointing areas requiring enhancement. This effort was complemented by the same author's review of health and non-health sector indicators, revealing that although 74% of interventions were measured, gaps persisted, especially in domains such as health promotion and maternal nutrition. According to Mukinda (2021) evaluated the efficacy of surveillance and response mechanisms for maternal, perinatal, neonatal, and child deaths, highlighting performance variations. Habedi (2020) delved into healthcare workers' perspectives on the availability and accessibility of the prevention of mother-to-child transmission programs, uncovering challenges such as limited knowledge and resources. (Mukinda *et al.* 2021) outlined challenges within the Free State's public health system, encompassing service fragmentation, staff shortages, and financial issues. In a study, Stansert Katzen *et al.* (2020) discovered that community health workers' home visits had a limited yet significant impact on maternal and child health.

3.6 MATERNAL ADVERSE OUTCOME AND STILLBIRTH IN SOUTH AFRICA

Maternal health outcomes in South Africa (SA) remain poor despite national investments toward their improvement (Mothupi *et al.* 2021). Every day, approximately 810 women die from preventable complications during pregnancy, childbirth, or the postpartum period, according to the 2019 Lancet global report, approximately 2.9 million newborns die in their first month of life, according to the World Health Organization (Gamberini *et al.* 2023). Complications during pregnancy stand as the primary contributors to both mortality and negative outcomes in pregnancy, serving as the primary cause of morbidity and mortality for mothers and newborns in low- and middle-income countries (LMICs). These adverse outcomes, such as low birth weight (LBW), preterm birth (PTB), and stillbirth, or perinatal death, lead to enduring physical and psychological consequences. Various factors, including intra- or extra-uterine infections, microbial imbalances, and an aberrant immune system, among others, are associated with these unfavorable pregnancy outcomes. Maternal infections, stemming from bacteria, viruses, parasites, or fungi, have the potential to induce complications at any stage of pregnancy. Numerous studies have indicated that pregnant women, due to compensatory physiological and immunologic responses, are more vulnerable to diverse infections.

➤ Stillbirths in South Africa

Stillbirths are associated with immense socio-economic consequences, including impaired physical and mental well-being of bereaved parents and financial costs to families and the healthcare system (Madhi *et al.* 2019). A baby who dies after 28 weeks of pregnancy, but before or during birth, is classified as a stillbirth (WHO 2023). According to Ikedionwu *et al.* (2020), stillbirth or the death of a fetus before birth (beyond 24 weeks gestation or birthweight of 500 g). Stillbirth is generally defined as a fetus with no signs of life before the complete expulsion or extraction from its mother, and after a pre-defined duration of gestation; after delivery, it is confirmed that the fetus

does not show any evidence of life and cannot be resuscitated (Da Silva *et al.* 2016).

Stillbirth remains a significant issue in South Africa, with approximately 16,000 stillbirths occurring annually (Hlongwane, Pattinson and Bergh 2023). Placental insufficiency is a major cause of stillbirths, and screening with continuous-wave Doppler ultrasound (CWDU) has shown promise in detecting this condition (Hlongwane, Pattinson and Bergh 2023). The causes of stillbirth are varied, including maternal hypertensive disorders, placental separation and hemorrhage, and chorioamnionitis (Madhi *et al.* 2019). The major causes of stillbirth include pregnancy and childbirth-related complications, prolonged pregnancy, maternal infections such as malaria, syphilis and HIV, maternal conditions especially hypertension, and diabetes, and fetal growth restriction (when an unborn baby is unable to achieve its growth potential and therefore smaller than it should be) (Organization 2024). According to Organization (2024), congenital abnormalities are responsible for less than 10% of stillbirths reported nationally in high-income countries and the exact proportion in low-income settings is unknown due to limitations in diagnostics. Factors related to the age of the mother and practicing smoking can also increase the risk of maternal disease and stillbirth (Organization 2024). The emotional impact of stillbirth on medical practitioners is also a key consideration (Lappeman and Swartz 2019). Factors such as inadequate maternity care and failure to utilize available services contribute to the high stillbirth rate (Inyang-Etoh, Abudu and Bassey 2019). Implementing CWDU screening in routine antenatal care, combined with appropriate management protocols, has resulted in a 35-43% reduction in stillbirths (Hlongwane *et al.* 2022b).

The implementation of the national health promotion policy has shown some success in reducing stillbirth and maternal mortality, particularly in the South African population (Mostert 2021). However, more research is needed to identify and address the modifiable risk factors for stillbirth in South Africa (Mukherjee *et al.* 2024). Research on stillbirth problems in South Africa has identified various factors contributing to this issue. These include sociodemographic factors such as rural residence, low education, and early marriage, as well as medical conditions like hypertension and diabetes (Madhi *et al.* 2019). The impact of the national health promotion policy on stillbirth and maternal mortality in South Africa has been quantified, with a reduction in stillbirths and maternal mortalities observed (Mostert 2021).

Research on stillbirth in the Free State province of South Africa has identified various contributing factors. Maternal and neonatal factors, such as Apgar score, gestational age, birth weight, and parity, have been found to significantly influence perinatal deaths (Malinga, du Preez and Rabie 2020). Medical practitioners in the region have been found to experience emotional challenges in managing stillbirths, which are exacerbated by the societal context (Lappeman and Swartz 2019). Specific causes of stillbirths in South Africa include hypertension, placental or fetal infections, pathological placental conditions, and clinical obstetric complications (Madhi *et al.* 2019). The impact of the national health promotion policy on stillbirth and maternal mortality in South Africa has been quantified, with a slight bias towards the South African population (Mostert 2021). The risk of stillbirth is higher for small-for-gestational-age and large-for-gestational-age pregnancies in the

Western Cape Province (Lavin *et al.* 2019). However, there is a lack of research on risk factors for stillbirth in sub-Saharan Africa, including South Africa (Mukherjee *et al.* 2024).

➤ **Miscarriage in South Africa**

Miscarriage, also known as spontaneous abortion, refers to the loss of a pregnancy before 20 weeks of gestation. It encompasses various instances of pregnancy loss and outcomes where the embryo or fetus is unable to sustain itself autonomously (Khan and Ali 2023). The frequency of spontaneous miscarriage is estimated to be around 10-15% of all pregnancies (Bohn 2023; Khan and Ali 2023). Maternal factors, including nutritional status, can affect the developing embryo and increase the risk of early pregnancy fetal demise (Barbe *et al.* 2022). It is a common complication of pregnancy, can be caused by a variety of factors, including genetic, anatomic, autoimmune, and endocrine issues (Kaur and Gupta 2016; Verma and Roy 2020). The transition from "abortion" to "miscarriage" in medical language was influenced by a 1985 Lancet letter (Malory 2022). Recurrent spontaneous abortion, defined as three or more miscarriages, can be caused by various factors, including age, genetic issues, and environmental factors (La *et al.* 2021). The psychological impact of spontaneous miscarriage on women is significant, leading to increased stress levels, particularly related to medical and obstetric risks and fetal health (Ho *et al.* 2022). The care provided for spontaneous miscarriage varies, with surgical management being more common among women with higher education and socio-economic status (Malpica *et al.* 2021). Improving language and communication surrounding intrauterine death and preterm delivery can help mitigate disenfranchised grief, misplaced guilt, and shock experienced by those affected. Psychological management and appropriate support are crucial for women who experience spontaneous miscarriage.

In South Africa, maternal miscarriage is a significant issues ,studies have shown that self-induced pregnancy termination after 24 weeks' gestation contributes to preterm births and perinatal morbidity and mortality (Mandondo *et al.* 2018). Trauma exposure, including rape, and depression have been identified as drivers of miscarriage, abortion, and stillbirths (Abrahams *et al.* 2023). Unintended pregnancies also contribute to the burden of miscarriages, abortions, and live births, with the costs of unintended pregnancies in South Africa being substantial (Le *et al.* 2015).

Research in South Africa has identified several key causes of stillbirth and miscarriage, including maternal hypertensive disorders, placental separation and hemorrhage, and chorioamnionitis (Madhi *et al.* 2019). Other risk factors include previous history of miscarriage, underutilization of antenatal care, premature rupture of membrane, maternal age, inter-pregnancy interval, malaria, HIV, and hypertension in pregnancy (Mabrouk *et al.* 2022). In South Africa, trauma exposure and depression have been identified as drivers of adverse pregnancy outcomes (APOs) such as miscarriage, abortion, and stillbirths (Mabetha *et al.* 2022). Additionally, occupational factors, including pesticide spraying during pregnancy, have been associated with an increased risk of spontaneous miscarriage (Naidoo *et al.* 2011; Abrahams *et al.* 2023). Other factors such as financial dependence, feeling unready to have a child, and lack of support from family and partners have

also been identified as reasons for terminating pregnancies (De Jonge *et al.* 1995; Abrahams *et al.* 2023). Pregnant women with multi-drug-resistant tuberculosis (MDR-TB) have been found to have high rates of adverse pregnancy outcomes, including miscarriage (Stroeken *et al.* 2023). Social and cultural factors, such as unintended pregnancies, as well as occupational factors like pesticide exposure, have also been identified as contributors to miscarriage (Dalton *et al.* 2023).

➤ **Low Birth Weight**

The definition of low birth weight (LBW) as a birth weight of less than 2500 g, as per the World Health Organization (WHO), has been widely used for decades (Organization 2019). However, recent studies have suggested that an outcome-based definition of LBW may be more appropriate, with a threshold of less than 2200 g in low- and middle-income countries (Laopaiboon *et al.* 2019). Maternal age has been found to have no significant association with LBW, while LBW has been identified as a risk factor for non-communicable diseases in adults (Bianchi and Restrepo 2022). Maternal factors, such as age, height, education, and socio-economic status, have been found to affect LBW in institutional deliveries (Chaithra, Chiniwar and Menasinkai 2020). LBW has been linked to insulin resistance at birth, which may contribute to the increased risk of diseases in later life (Tian *et al.* 2019).

Low birth weight is a significant issue in South Africa, particularly among very low birth weight (VLBW) and extremely low birth weight (ELBW) infants. These infants are at high risk of growth failure and developmental delay later in life. Studies have shown that VLBW infants in South Africa experience catch-up growth within the first 6-18 months of corrected age, with head circumference recovering best (Michaelis *et al.* 2023). Factors such as household food security, alcohol use, and maternal hypertension have been associated with low birth weight and stunting in South African children (Harper *et al.* 2023). Neonatal mortality rates in South Africa, particularly among VLBW infants, remain higher than in developed countries. However, better antenatal care attendance, coverage of antenatal steroids, temperature control after birth, infection prevention and control practices, breastfeeding rates, and kangaroo mother care can improve survival rates (Ingemyr *et al.* 2022). Despite the high mortality rates, ELBW infants who survive in South Africa have shown good neurodevelopmental outcomes, with most falling within the normal range for cognition, language, and motor skills (Ramdin *et al.* 2022). Morbidity and mortality rates among ELBW neonates in South Africa are still high, highlighting the need for resources to improve neonatal resuscitation, surfactant therapy, and the availability of intensive-care beds (Musiime *et al.* 2021).

Low birth weight (LBW) is a significant issue in South Africa, with a prevalence of 11.4% among newborns. Factors contributing to LBW include maternal age, gestational age, and multiple pregnancies (Tshotetsi *et al.* 2019). In the Eastern Cape province, LBW is associated with higher mortality, particularly in very low birth weight (VLBW) infants (Michaelis *et al.* 2021). Maternal prenatal stress during the first trimester has been linked to lower birth weight in Soweto, (Kim *et al.* 2021).

➤ Neonatal and Under 5 Mortality

Neonatal and under-5 mortality rates are important indicators of child health and development. The Sustainable Development Goals (SDGs) aim to reduce neonatal mortality rates to below 12 deaths per 1000 live births and under 5 mortality rates to below 25 deaths per 1000 live births by 2030 (Memon *et al.* 2023b). The neonatal phase, which refers to the first 28 days of life, is indeed the most critical period for a child's survival. Many newborns die soon after delivery, with a significant number of deaths occurring within the first four weeks of life, particularly within the first week. Neonatal mortality is a global burden, with most deaths occurring in developing countries like South Africa (Saha 2023). Common causes of neonatal mortality include infections, birth asphyxia, injuries, premature births, and congenital defects (Wake *et al.* 2022). Almost two-thirds of infant deaths occur in the first month of life; among these, more than two-thirds die in their first week (Getaneh *et al.* 2022). Every day, an estimated 6,500 newborn fatalities occur worldwide, with one-third of all newborn deaths happening within the first day of life, and the remaining three-quarters occurring within the first week (Dol *et al.* 2023; Saha 2023). Birth asphyxia is the leading cause of death on the first day, severe infection between days 2 and 7, and diarrhea between days 8 and 28 (Alamneh *et al.* 2020). According to Blencowe and Cousens (2013), inadequate newborn care and socio-economic and environmental factors contribute to neonatal mortality. The main causes of under-5 mortality include neonatal disorders, diarrheal diseases, lower respiratory infections, congenital birth defects, and malaria (Tessema *et al.* 2023). According to Nieuwoudt, Mackay and Mda (2022), neonatal and under-5 mortality rates in South Africa are higher than global and national averages.

The neonatal mortality rate in South Africa is higher than the global average and varies across different hospitals and regions within the country (Ingemyr *et al.* 2022). Factors contributing to neonatal mortality include prematurity, infections, immaturity-related complications, congenital abnormalities, and hypoxia (Nieuwoudt, Mackay and Mda 2022; Siyotula and Arnold 2022). Strategies to improve neonatal survival include better antenatal care attendance, coverage of antenatal steroids, temperature control after birth, improving infection prevention and control practices, breastfeeding rates, and kangaroo mother care (Nieuwoudt, Mackay and Mda 2022). The neonatal mortality rate is a significant South African public health concern, with a high incidence of early neonatal deaths. Studies conducted at Dora Nginza Hospital (DNH) found that the neonatal mortality rate at the hospital was higher than the global and national averages (Ingemyr *et al.* 2022; Nieuwoudt, Mackay and Mda 2022). In another study at Charlotte Maxeke Johannesburg Academic Hospital (CMJAH), it was found that prematurity and its complications were the main cause of neonatal deaths, with a survival rate of 66.5% for very low birth weight (VLBW) infants (Nieuwoudt, Mackay and Mda 2022). Additionally, a population-level surveillance study in South Africa aimed to determine the burden and etiology of neonatal infections. The study found that neonatal infections, including those caused by Group B streptococcus (GBS), contribute to neonatal mortality, including stillbirths (Meiring *et al.* 2022). These findings highlight the need for improved infection prevention and control, appropriate resource allocation, and quality antenatal care to reduce neonatal mortality.

in South Africa.

3.7 MATERNAL HEALTHCARE INTERVENTIONS IN SOUTH AFRICA

Since 1994, several health policies that focus explicitly on the alleviation of inequity in healthcare service provision have been implemented in South Africa, these included the introduction of free-health policies, the district health system, and health sector reforms such as prioritization of primary healthcare (PHC), in itself a social justice philosophy (Schneider *et al.* 2020).

3.7.1 Prevention of Mother-to-Child Transmissions (PMTCT)

In 2003, South Africa implemented a nationwide program to prevent the transmission of HIV from mothers to their children during childbirth (PMTCT). By 2017, more than 90% of pregnant women in South Africa living with HIV were undergoing antiretroviral therapy (ART) (Maswime *et al.* 2021). South Africa's (SA) prevention of mother-to-child transmission (PMTCT) program for HIV has experienced notable triumphs in recent years by ensuring favorable outcomes for pregnant women with HIV and diminishing the risk of transmitting the virus vertically to their infants (Wessels *et al.* 2020). The paramount measure to prevent vertical transmission involves sustaining undetectable levels of maternal HIV viral load (VL) through the implementation of effective antiretroviral therapy (ART). Consequently, the percentage of HIV-exposed children contracting the virus during the perinatal period dropped significantly from 18.0% in 2010 to 2.7% by 2017. This program aimed to reduce the transmission of HIV from mothers living with HIV to their infants during childbirth and breastfeeding, and the key strategy involved providing antiretroviral therapy (ART) to pregnant women living with HIV to prevent transmission to their babies. South Africa has significantly progressed in diminishing the vertical transmission of the human immunodeficiency virus (HIV) during the initial two months of an infant's life, dropping from 23% in 2003 to a remarkable 0.7% in 2019. This achievement is notable, especially considering the consistently high antenatal HIV prevalence of approximately 30% (Wessels *et al.* 2020). This achievement is a testament to the importance of comprehensive HIV prevention and treatment programs, particularly in the context of maternal and child health. Such initiatives not only save lives but also contribute to the broader goal of controlling and eventually ending the HIV/AIDS epidemic.

Several milestones are recommended for ending the global HIV epidemic by 2030, including the elimination of mother-to-child HIV transmission as per the World Health Organization (WHO) definition, it is characterized by a rate of less than 50 new pediatric HIV infections per 100,000 live births and a transmission rate of less than 5% in breastfed infants, sustained for a minimum of one year (Daniels, Spooner and Coutsooudis 2022). According to Wessels, Sherman *et al.* (2020), the updated South African National Guideline for the Prevention of Mother-to-Child Transmission of Communicable Infections (2019) delineates three key strategies aimed at enhancing program effectiveness. These strategies encompass (Wessels *et al.* 2020):

- a) preventing primary HIV infection and unintended pregnancies among women of childbearing age,
- b) elevating maternal viral suppression rates during delivery and the post-delivery phase using

potent and well-tolerated antiretroviral regimens, strategic monitoring of maternal viral loads, ensuring continuity of care for mothers post-delivery, and integrating mother-infant healthcare, and

- c) providing heightened prophylaxis to infants born to mothers with elevated HIV viral loads during the breastfeeding period, all while actively working to restore maternal viral suppression.

Despite having the Prevention of Mother-to-Child Transmission (PMTCT) program in place for twenty years, South Africa has not successfully eradicated the transmission of HIV from mother to child during pregnancy. The accessibility of maternal health services was diminished amid the COVID-19 pandemic, which could have posed a threat to the effectiveness of the PMTCT program (Naidoo *et al.* 2023). A study by Naidoo *et al.* (2023) on Prevention-of-mother-to-child-transmission (PMTCT) program outcomes in South Africa in the pre-COVID and COVID eras, concluded that the increase in maternal HIV incidence and prevalence during the COVID era suggests a lapse in HIV prevention strategies during the COVID pandemic. There is an urgent need to improve community test-and-treat campaigns among women of reproductive age in the community and increase access to HIV pre-exposure prophylaxis for pregnant women, especially during periods of health crises. With the disruption of COVID-19 on the PMTCT program, this transmission of mother to child contributes to maternal adverse outcomes including stillbirth.

3.7.2 National Development Plan (NDP)

The United Nations' Sustainable Development Goal (SDG) 3.8 strives towards the achievement of access to quality, effective, and affordable medical care for all and the assurance of universal coverage, in addition, mandated in South Africa's National Development Plan (NDP) is the goal to provide universal equitable, efficient and quality healthcare (Gordon, Booysen and Mbonigaba 2020). The objective of South Africa's National Development Plan (NDP) is to achieve universal, fair, effective, and high-quality healthcare. Despite these global and national policy priorities, addressing socio-economic disparities in healthcare access remains a significant focus on the policy agenda. The National Development Plan directs its efforts toward reinforcing primary and district health systems, recognizing them as fundamental to enhancing health results, particularly in maternal, perinatal, and neonatal health. Within the NDP 2030's array of objectives, specific goals about the Primary Health Care (PHC) re-engineering initiative include the successful implementation of health system reforms, the deployment of PHC teams for delivering healthcare to families and communities, and the realization of universal health coverage (Chetty *et al.* 2023).

The National Development Plan for maternal healthcare in South Africa encounters a range of challenges and opportunities. Examining the potential impact of health insurance coverage on the utilization of maternal healthcare services is crucial within the plan's considerations (Amu *et al.* 2023b). While home visits by community health workers have been shown to enhance maternal caregiving, their impact on infant outcomes is limited (Stansert Katzen *et al.* 2020). Issues related to the quality of care arise under the free maternal care policy, with factors such as extended waiting times and inadequate supplies contributing to poor perceptions (Ansu-Mensah *et al.* 2020). Challenges persist in the

availability and accessibility of the prevention of mother-to-child transmission programs in South Africa (Habedi 2020). Monitoring service provision along the continuum of care for maternal health in South Africa reveals significant gaps (Mothupi, Knight and Tabana 2020a). The maternity protection policy in South Africa is characterized by fragmentation and accessibility challenges (Pereira-Kotze *et al.* 2022). Additionally, healthcare providers and managers perceive the quality of care under the free maternal healthcare policy as subpar (Ansu-Mensah *et al.* 2021).

3.7.3 National Health Insurance

Internationally, there is considerable momentum behind the adoption of universal health coverage as the policy solution to rectify shortcomings in healthcare systems and ensure the fair distribution of high-quality healthcare (Naidoo, Suleman and Bangalee 2023). Universal health coverage (UHC) is an integral component of Sustainable Development Goal 3 established by the United Nations, and numerous nations are presently implementing substantial healthcare policy changes to achieve UHC (Whyte and Olivier 2023). As a participant in the World Health Assembly's 2014 resolution titled 'Health Intervention and Technology Assessment in Support of Universal Health Coverage' (67.23), South Africa committed to providing quality healthcare for all by implementing the National Health Insurance system (Masuku, Sabela and Jili 2020). South Africa has pursued universal health coverage (UHC) for its population since the first democratic elections in 1994 by embarking on major health policy reform to deliver universal health coverage through the establishment of National Health Insurance (Wilkinson *et al.* 2022). The National Health Insurance (NHI) is an important development that underpins democracy in South Africa, it aims to redress the inequities of public healthcare delivery by implementing transformational policies toward establishing inclusive public healthcare coverage for the entire population of South Africa, with more emphasis on health promotion (Sithole 2015). Fulfilling this requirement remains challenging in a highly resource-constrained environment amidst growing healthcare demands, extreme disparities in healthcare access, quality, and spending between public and private sectors, as well as the variable quality of public sector healthcare between and within provinces (Wilkinson *et al.* 2022).

The health system in South Africa comprises both a private and a public sector. Currently, both public and private sectors are governed by the Minister of Health whose mandate includes setting national policy priorities and regulating all health sector actors (Whyte and Olivier 2023). This dual structure has faced criticism for its inequitable character, as private healthcare is predominantly utilized by the socio-economic elite, while most of the population depends on the under-resourced and overwhelmed public sector. To address the current disparities in healthcare, the South African government has begun the process of implementing a National Health Insurance Policy (NHI) with the end goal of achieving affordable and accessible Universal Health Coverage (UHC) (Pauw 2022). National health insurance (NHI) has become a pivotal element within ongoing health financing reforms in middle and low-income nations, playing a crucial role in achieving universal health coverage. In South Africa the constitution guarantees healthcare access for all, however, inequalities still exist regarding the burden of both communicable and non-communicable diseases as well as health access and funding distributions:

almost 50% of total health expenditure is spent on 16% of the population covered by private medical insurance schemes, and the remainder is spent on the 84% of the population who depend on the under-resourced public sector, lack the means to access care in the private sector, and have a higher disease burden (Govender *et al.* 2021).

The objective of NHI is to establish a unified health system that enables individuals to receive high-quality health services regardless of their socio-economic status, in addition to diminishing financial obstacles linked to the expense of accessing health services. The presence of health insurance will affect healthcare-seeking behavior by influencing decisions on whether, when, and from where care is sought. The planned National Health Insurance (NHI) Fund will provide UHC for all South Africans, using a single payer and a common health benefits package (HBP) to purchase health services from both public and private sector providers (Wilkinson *et al.* 2022). Essentially, the reform is designed to close the existing gap in the two-tiered health system. In the current scenario, most citizens depend on a public health system characterized by limited access and suboptimal care quality, while a primarily affluent minority accesses healthcare in a well-resourced private sector. To bring about this reform, the government plans to implement a purchaser-provider split and create an NHI Fund serving as the singular public purchaser. This fund will procure health services on behalf of the government for the entire population from a diverse provision platform that encompasses both public and private providers. Creating the NHI HBP necessitates a shift in South Africa from implicit to explicit decision-making processes. This transition is crucial to guarantee uniform, fair, and equitable access to health technologies across all levels of care. The National Health Insurance (NHI) is a reform initiative designed to transition South Africa toward universal health coverage and to address the existing dual-tiered health system where the public and private sectors operate independently (Ngwaru *et al.* 2019).

Primary healthcare (PHC) is the first point of entry, providing basic services to individuals. South Africa is in the process of re-engineering its PHC as part of National Health Insurance (NHI) plans to ensure universal healthcare coverage (Kanji 2022). According to Kanji (2022), Primary healthcare (PHC) is the first level of care and entry for individuals into the healthcare system, which is accessible at PHC clinics and community health centers (CHCs). The services at these healthcare facilities include maternal and childcare, immunizations, family planning, and care for chronic illnesses, usually managed by nurses with advisory support and regular visits by medical practitioners and other relevant healthcare specialists.

The South African Government is in the process of developing a National Health Insurance (NHI) system in response to concerns about inequalities within the country's healthcare system, including uneven access to healthcare across various socio-economic groups (Mhlana and Garidzirai 2020; Mhlana and Hassan 2022). The National Health Insurance Bill seeks to provide for universal access to health care services in the Republic through the National Health Insurance White Paper and the Constitution of South Africa, envisages the establishment of a National Health Insurance Fund, and sets out its powers, functions, and governance structures (Africa 2023). The main objective and idea of NHI is to include individuals who lack insurance, particularly those who cannot afford coverage from medical

schemes. According to DOH (2018), the NHI aims to explore avenues for increasing healthcare accessibility for those currently unable to afford it or facing barriers to obtaining necessary services. Another motivation is addressing the disparity in expenditure between the private sector and the public sector, which caters to approximately 84 percent of the population. To address the existing dual-tiered healthcare system, the NHI intends to generate additional health resources by introducing a compulsory "health tax" applicable to everyone. The goal is to achieve universal access as the integration of the two-tier system progresses gradually. Over time, reforms in purchasing will be implemented, leading to a diminishing distinction between public and private healthcare providers. This transformation goes beyond enhancing the quality and availability of resources like medicines, equipment, and staff in the public sector; it also involves reshaping the operations of the private sector to align more with public policy objectives rather than solely prioritizing profits.

The Fund will procure healthcare services for all registered users, and the proposed legislation will establish systems to ensure fair, effective, and efficient utilization of the Fund's resources to address the health requirements of users. Additionally, the bill aims to prevent or restrict undesirable, unethical, and unlawful practices associated with the Fund. It also endeavors to overcome obstacles to access. The National Department of Health (NDOH) has engaged in consultations with various stakeholders, including medical scheme administrators, labor representatives, the pharmaceutical industry, professional associations, statutory bodies, government departments, academia, civil society, and Parliament. Since the introduction of the NHI Green Paper in August 2011, the NDOH has received over 100 submissions, and an international conference was organized to share experiences on implementing universal coverage from other nations (Matsoso and Fryatt 2013). During the initial stage spanning from 2012 to 2016, the focus primarily involved implementing pilot programs and initiatives aimed at strengthening the healthcare system. Despite advancements in the past decade, as outlined in the NHI Green Paper and White Paper that propose a gradual implementation strategy, progress has been notably slower than initially expected (Ngwaru *et al.* 2019). The government aims to implement this reform by introducing a separation between the purchaser and provider roles. It involves creating an NHI Fund as the sole public purchaser. This fund will be responsible for procuring health services on behalf of the government for the entire population. The services will be sourced from a mixed provision platform that incorporates both public and private providers. The second and ongoing phase, covering the period from 2017 to 2022, is dedicated to establishing the legal and institutional framework for the NHI. This includes the formation of the NHI Fund, contracting units for primary care (CUPs), and various ministerial advisory committees.

The Department of Health (DoH) released a comprehensive policy document, a white paper on NHI, in 2015, open for public feedback. The public responded with an impressive number of over 300,000 written submissions, offering comments on the NHI policy (Lexology 2023). The development of the Green Paper lacked transparency, deviating from the fundamental principles of public consultation and participation integral to the Primary Health Care approach outlined in the Constitution of the Republic of South Africa, 1996. The NHI Green Paper accurately identifies various challenges and provides an overview of the disease burden in South Africa, a crucial factor in designing any healthcare system. It

articulates a philosophical strategy aimed at achieving universal access for all, with a particular emphasis on primary healthcare. The reform, as detailed in the 2017 NHI White Paper, seeks to transition South Africa toward Universal Health Coverage (UHC) ensuring all individuals and communities have fair access to the high-quality health services they require, without subjecting users to financial difficulties (Ngwaru *et al.* 2019).

The publication of the NHI Bill in July 2019 marked a significant stride in establishing the legal foundation for NHI. Nonetheless, despite certain advancements, the reform has been relatively sluggish in its progression, having undergone almost a decade of policymaking and over six years of pilot initiatives. Some of the activities outlined in the White Paper for implementation during phase two have experienced limited substantial development (Ngwaru *et al.* 2019). Following 12 years of public discourse and parliamentary processes, the National Health Insurance Bill (the Bill) received approval from the National Assembly on June 12, 2023, and the endorsement marks a notable advancement in the realization of universal health coverage, and recently approved with the National Council of Provinces (NCOP) (Lexology 2023). The National Assembly's approval of the Bill is part of the broader initiative to formalize it into law.

3.7.4 Mphatlalatsane Intervention

Mphatlalatsane is a multi-year project (2019-22) seeking to improve maternal and newborn health outcomes through quality improvement methodologies, implemented in selected districts of three provinces, and steered by a national partnership of governmental, non-governmental, and academic players implementing a range of interventions, including Plan-Do-Study-Act (PDSA) cycles, training, audit, mortality surveillance and patient support, amongst other approaches, in primary health care and referral (district and regional) hospitals (Schneider and Mianda 2022).

Despite global progress in reducing maternal and neonatal mortality and stillbirths, much work remains to be done to achieve the Sustainable Development Goals, furthermore, reports indicate that coronavirus disease (COVID-19) disrupts the provision and uptake of routine maternal and neonatal health care (MNH) services and negatively impacts cumulative pre-COVID-19 achievement (Odendaal *et al.* 2022). According to Odendaal, Goga *et al.* (2022), Mphatlalatsane is implemented by the Department of Health in 4 purposively selected health districts across the Eastern Cape, Limpopo, and Mpumalanga provinces, to reduce institutional maternal and neonatal mortality and stillbirths by up to 50% from 2018 to 2022 in 7 selected facilities in each province. Following the South African Maternal, Perinatal, and Neonatal Health Policy, Mphatlalatsane builds on a decade of national initiatives aimed at enhancing maternal, neonatal, and child health services in the country.

3.8 Legislation, Regulation, and Policies on Healthcare System in South Africa

Since its advent to power in 1994, the new South African government has put a succession of charters, policies, strategies, and plans in place to strengthen public health system performance and enhance health service delivery, in addition, the national and provincial governments have increasingly adopted the WHO building blocks approach in assessing public health system performance (Hlafa, Sibanda and

Hompashe 2019).

3.8.1 Constitution of South Africa

In 1996, the Constitution of South Africa became legally binding, with the Bill of Rights playing a crucial role by granting a range of fundamental rights to all South African citizens (Bairwa and Banshiwal). In a significant departure from the past, citizens' rights are no longer contingent on the color of their skin or other distinguishing features. The fundamental right to health is essential for the physical and mental well-being of every individual, serving as a prerequisite for the enjoyment of other human rights. This includes the pursuit of a satisfactory standard of living. The South African Constitution explicitly addresses the right to healthcare services in three distinct sections. The Constitutional Court of South Africa has interpreted these provisions to mean that the state must progressively realize the right to healthcare, considering available resources, however, the Constitution provides a framework, but the actual implementation of healthcare services is governed by specific laws and policies developed by the South African government (Murphy *et al.* 2021). The South African Constitution's Bill of Rights includes several provisions related to healthcare and Section 27(1)(a): Everyone has the right to access healthcare services and Section 27(1)(b) states that the government must take reasonable legislative and other measures to achieve the progressive realization of the right to access healthcare services (ÁFRICA 2020). Furthermore, Section 27(2) states that no one may be refused emergency medical treatment, and according to Section 27(3), the state must provide appropriate healthcare services and facilities. Section 27(4) of the Bill of Rights, the state must take measures to ensure access to healthcare services for vulnerable groups, such as children, the elderly, and those with disabilities, and according to Section 27(5), no one may be denied access to healthcare services because of their inability to pay. Most importantly, in summary, Universal access is provided for in section 27(1)(a) which states that "Everyone has the right to have access to health care services, including reproductive health care, and" Section 27(1)(b) provides for the State to " take reasonable legislative and other measures, within its available resources to achieve the progressive realization of the right (Singh, Govender and Reddy 2005). According to section 7(2) of the Constitution⁶ the State is obliged to respect, protect, promote, and fulfill all the rights in the Bill of Rights). The obligation to respect the right obliges the State to refrain from denying or limiting access to health care services to anyone, and these should be available to all on a non-discriminatory basis (Singh, Govender and Reddy 2005).

Maternal mortality and morbidity are widely recognized as fundamental human rights issues, and women's right to sexual and reproductive health care including maternity care that is available, accessible, acceptable, and of high quality (AAAQ) is a central tenet of the technical guidance issued by the Office of the United Nations High Commissioner for Human Rights (OHCHR) on a "Human rights-based approach to reduce preventable maternal morbidity and mortality (Jolivet *et al.* 2021). A human rights approach to maternal health is considered a useful framework in international efforts to reduce maternal mortality, although fundamental human rights principles are incorporated into legal and medical frameworks, human rights must be translated into measurable actions and outcomes (Solnes Miltenburg *et al.* 2016). The Respectful Maternity Care Charter, the Universal Rights of Childbearing

Women', launched by the White Ribbon Alliance, is a recent attempt to demonstrate the link of human rights in maternal health with a focus on the interpersonal aspects of care received by women seeking maternity services. Ensuring the right to respectful care for maternal and newborn health, a critical dimension of quality and acceptability, requires meeting standards for Respectful Maternity Care (RMC), and the absence of mistreatment does not constitute Respectful Maternity Care (Jolivet *et al.* 2021). The guidance emphasizes that upholding women's sexual and reproductive health rights involves adhering to standards related to healthcare facilities, goods, and services. It specifies that providing respectful care to women accessing health services is a crucial aspect of ensuring both quality and acceptability and this is in line with the position of the South African Human Rights Commission as well as the South African Constitution (Bill of Rights). Furthermore, this aligns with one of the cornerstone principles of the (Organization) 1995 of the World Health Organization constitution to promote maternal and child health and welfare and to foster the ability to live harmoniously in a changing total environment. The enjoyment of the highest attainable standard of health has been recognized as a fundamental right by the international community since the adoption of the Constitution of the World Health Organization (WHO) in 1946 (Leary 1994). In the realm of international human rights, the term "right to health" is employed to denote the comprehensive and detailed clauses about health found in the WHO Constitution and legally binding human rights treaties. This usage underscores the social and ethical dimensions of both healthcare and health status. The Alma-Ata Declaration of 1978 emerged as a major milestone of the twentieth century in the field of public health, and it identified primary health care as the key to the attainment of the goal of Health for All (Fee and Brown 2015). The declaration stipulated that primary health care is fundamental healthcare that relies on practical, scientifically sound, and socially acceptable methods and technology. It aims to be universally accessible to individuals and families in the community, with their active participation, at a cost that the community and the country can sustain at every stage of development. Primary health care serves as an integral component of the national health system, being its central function and focus on the context of overall social and economic community development. It represents the initial point of contact for individuals, families, and communities within the national health system, bringing healthcare as close as possible to where people reside and work. Additionally, it constitutes the foundational elements of an ongoing healthcare process.

The Human Rights Commission under the Bill of Rights has been charged with monitoring the realization of these rights, which include the right access to health care (Constitution 1996b). This right is found in several provisions, but most elaborately in Section 27 of the Constitution, which provides that: Everyone has the right to have access to (a) health care services, including reproductive health care (Ngwena 2000). Human rights litigation inspires the transformation of social norms and plays a critical role in supporting domestic programs and campaigns designed to improve access to reproductive health care and reduce maternal mortality (Dunn, Lesyna and Zaret 2017). This is in line with the rights-based approach to health and healthcare has been the subject of much discourse since the 1948 Universal Declaration of Human Rights (UDHR). Article 25.1 of the UDHR bestows on everyone "the right to a standard of living adequate for them to enjoy good health and well-being including food, clothing, housing, medical care, social services, and the right to security in the event of circumstances beyond their control such as unemployment, disability, sickness, widowhood, old age or

any other lack of livelihood”, and Article 25.2 recognizes specifically the rights of motherhood and childhood and provides for adequate care and social protection to be given to all children regardless of how they are born (Simona *et al.* 2023). More than a decade ago, the United Nations Human Rights Council passed a resolution recognizing maternal health as a human right (Baumont *et al.* 2023). Following these advocates on a global scale rallied to establish the entitlement to respectful maternity care, a right that has received formal acknowledgment from the World Health Organization. Moreover, it has garnered endorsement from over 90 international, civil society, and health professional organizations, including South Africa.

3.8.2 National Health Act

The National Health Act (2003) provides a legal framework for providing comprehensive healthcare services, including maternal healthcare, in both public and private sectors, and outlines the rights and responsibilities of patients and healthcare providers. Pregnant and lactating women and children below the age of six years, whom community health centers funded by the State must provide are not members or beneficiaries of medical aid schemes, with free health services; all persons, except members of medical aid schemes and their dependents and persons receiving compensation for compensable occupational diseases, with free primary health care services and women, subject to the Choice on Termination of Pregnancy Act, 1996 (Act No. 92 of 1996), free termination of pregnancy services (Africa 2003).

The impact of the National Health Act on maternal healthcare in South Africa is well-documented, with several studies highlighting its positive effects. Pereira-Kotze *et al.* (2022) and Ansu-Mensah *et al.* (2020); (Ansu-Mensah *et al.* 2021) both stress the importance of comprehensive guidance and improved quality of care. The Act has been linked to improved maternal caregiving and increased attendance at antenatal care visits (Stansert Katzen *et al.* 2020). Additionally, the utilization of mHealth interventions, such as informative text messages, has demonstrated efficacy in enhancing the uptake of maternal health services (Coleman *et al.* 2020). Nevertheless, the Act's effectiveness is influenced by contextual factors, including educational status, poverty, and access to health facilities (MUSIZVINGOZA 2020; Simona *et al.* 2022). It is imperative to address these factors to further maximize the benefits of the Act for maternal healthcare in South Africa.

To a reasonable extent, the National Health Act in South Africa exhibits several inadequacies in its provisions for maternal healthcare. These shortcomings encompass the disregard for maternal depression screening and treatment, obstacles to accessing perinatal mental health care, fragmented maternity protection policies, and insufficient sexual and reproductive health services for adolescent girls and young women (Davids *et al.* 2020; Mokwena 2021; Pereira-Kotze *et al.* 2022). The implementation of policies related to reproductive, maternal, neonatal, child, and adolescent health is hindered by gaps in the health system, and there are deficiencies in indicators for monitoring service provision in maternal health (Mothupi, Knight and Tabana 2020a). Healthcare providers and managers perceive the quality of care under the free maternal healthcare policy as subpar (Ansu-Mensah *et al.* 2021). Furthermore, pregnant women and new mothers in rural South Africa encounter various barriers

when attempting to access formal maternal and child health services (Laurenzi *et al.* 2020).

3.8.3 Nursing Act

The Nursing Act (2005) regulates the profession and ensures that nurses are adequately trained and qualified to provide maternal healthcare services. The Act is the binding force to provide recognition and cohesion to the nursing profession and has been promulgated so that it is in the interest of the public, and the fundamental purpose of the Act is to ensure regulation by statute by implementing a sound and effective level of nursing service to all citizens (Council and Verpleging 2005). Public maternal healthcare in South Africa plays a crucial role in addressing the issue of stillbirths. The World Health Organization (WHO) identifies delivery in a health facility as an important strategy that can reduce maternal mortality, especially when the delivery is attended by skilled healthcare professionals (Malatji and Madiba 2020). While delivering babies in healthcare facilities is a crucial approach to lowering maternal mortality rates, several factors in low-income regions, including cultural norms, geographical distance, transportation barriers, service expenses, religious convictions, and the tradition of relying on traditional birth attendants, continue to hinder women from opting for healthcare facilities for childbirth. According to Malatji and Madiba (2020), research indicates that to choose healthcare facilities for delivery, women require a guarantee that they will receive dignified and respectful treatment during childbirth. There is evidence that women's previous birth experiences play a major role in their choice of current and future birth settings, and a negative experience during labor and childbirth damages the trust between the woman and healthcare providers and impacts the decision regarding future delivery in a health facility (Malatji and Madiba 2020).

South Africa adopted the WHO's Better Birth Initiative strategy of Mother and Baby-Friendly Birthing Facilities (MBFBF) in response to calls for greater attention, research, and advocacy around the maltreatment of women during childbirth, and the implementation of the MBFBF strategy qualifies birthing facilities to be accredited as mother-baby friendly, nevertheless, disrespect and abuse are common in midwifery-led obstetric units (MOUs) in primary health facilities (PHC) in South Africa (Malatji and Madiba 2020). According to Malatji and Madiba (2020), maternity care in South Africa is characterized by the maldistribution of midwives, task overloads, heavy responsibilities, demoralization, a lack of motivation, poorly resourced facilities, and an ever-burgeoning demand for health services, however, certain facilities have received accreditation as mother-baby-friendly establishments, aligning with the strategy outlined in the WHO Better Birth Initiative.

Nurses and midwives in South Africa are the frontline health care practitioners in providing care to the community as they form the bulk of the health force, and the care provided by nurse practitioners is a unique life experience, characterized by "a unique relationship between health care users and nurse practitioners which is multifaceted and highly complex (Mathibe-Neke and Gardner 2015). Article 12 of the International Covenant on Economic, Social, and Cultural Rights (ICESCR) provides for the "enjoyment of the highest attainable standard of physical and mental health conducive to living a life of dignity" (Singh, Govender and Reddy 2005). This implies that healthcare facilities, products, and services need to be adequately accessible in both quantity and economic terms. Furthermore, they

should align with ethical and cultural standards and meet medically appropriate quality criteria.

3.8.4 National Health Policy

The National Health Policy, introduced by the ANC government, dates back to 1994 (Lexology 2023). A comprehensive national health policy is vital for establishing conditions that promote the well-being of an entire population. Three key components of such a policy encompass the political, social, and cultural context, lifestyle considerations, and strategies that empower individuals. The political and social context of South Africa is deeply intertwined with healthcare as it directly impacts individual safety, economic success, and public involvement in politics (Pauw 2022).

The National Health Policy regarding maternal healthcare in South Africa is characterized by complexity and fragmentation, creating challenges for both employees and employers in understanding and accessing maternity protection rights (Pereira-Kotze *et al.* 2022). Despite the presence of multiple policies and guidelines, sexual and reproductive health services for adolescent girls and young women remain inadequate, resulting in elevated rates of pregnancy and HIV transmission (Davids *et al.* 2020). The implementation of policies related to reproductive, maternal, neonatal, child, and adolescent health faces hindrances due to weaknesses in the health system, including a severe shortage of human resources and insufficient medicines and supplies (Belaid *et al.* 2020). Neglect of maternal depression screening and treatment infringes upon the constitutional rights of affected children and contributes to adverse health and social outcomes (Mokwena 2021). Monitoring service provision across the continuum of care for maternal health exhibits gaps, particularly in areas such as health promotion, maternal nutrition, empowerment, and quality of care (Mothupi, Knight and Tabana 2020a). The increasing burden of non-communicable diseases among women of reproductive age in South Africa necessitates a reassessment of policy prioritization and implementation (Yaya *et al.* 2020).

3.8.5 National Health Promotion Policy

From 2015 to 2019, in alignment with the recommendations of the World Health Organization, the South African government put into action The National Health Promotion Policy (NHPP) intending to decrease maternal and child mortality rates (Mostert 2021). At the core of this policy approach was the empowerment and mobilization of marginalized communities to assume responsibility for their health. NHPP's services encompassed educational initiatives covering integrated management of childhood illnesses, breastfeeding, programs promoting healthy eating, and campaigns for immunization, efforts to prevent violence against women and children, initiatives combating substance abuse, and measures to deter tobacco consumption.

The National Health Promotion Policy in South Africa aims to address healthcare system deficiencies and promote equitable distribution of quality healthcare. The policy focuses on the implementation of a National Health Insurance (NHI) system, which includes the re-engineering of the primary healthcare system (PHC) and the role of pharmacists in this process (Naidoo, Suleman and Bangalee 2023). The policy discourse on migration and health in South Africa mainly emphasizes the negative aspects of migration, potentially fueling anti-migrant sentiment and hindering inclusive and equitable healthcare

for migrant and mobile groups (Adebisi *et al.* 2020). The National Adolescent & Youth Health Policy aims to improve the health of young people in South Africa through a range of interventions and the empowerment of young people in policy implementation (Boachie, Thsehla and Hofman 2022).

The policy on maternal healthcare in South Africa aims to address the challenges faced by adolescent mothers, integrate oral health services into existing general health programs, improve the implementation of maternal care guidelines, and measure the acceptability of maternal healthcare (Ramphoma and Lee 2022). The policy recognizes the role of midwives in postnatal care and highlights the need for adequate training, resources, and support to effectively implement maternal care recommendations (Okeke and Ngunyulu 2023). Additionally, the policy defines and measures the acceptability of maternal healthcare, providing insights into improving maternal health outcomes (Bucyibaruta *et al.* 2023). The integration of oral health into primary healthcare and the development of an Integrated Maternal and Child Oral Health policy are proposed to improve access to oral health services and reduce the oral disease burden among vulnerable populations (Ramphoma *et al.* 2022).

Furthermore, on the downward, the National Health Promotion Policy on Maternal Healthcare in South Africa faces challenges due to a fragmented legal and policy landscape, making it difficult for pregnant and breastfeeding women to access comprehensive benefits (Pereira-Kotze *et al.* 2022). These difficulties are exacerbated by weaknesses in the healthcare system, including a critical shortage of human resources, insufficient essential drugs and supplies, and low national funding (Belaid *et al.* 2020). Perceptions of poor quality of care under the free maternal healthcare policy are influenced by factors such as extended waiting times, unfavorable attitudes of providers, and inadequate drug supply (Ansu-Mensah *et al.* 2020). Concerns are also raised about the lack of emphasis on health promotion in the National Health Insurance Bill (Freeman, Simmonds and Parry 2020). While policy documents on adolescent health in South Africa are considered gender-sensitive, they are seldom gender-transformative (Jacobs, George and De Jong 2021). The perception of subpar quality of maternal healthcare is reinforced by healthcare providers and managers (Ansu-Mensah *et al.* 2021). Barriers to accessing perinatal mental health care include prioritization of physical health, insufficient provider numbers, and inadequate implementation of a human rights-based mental health policy (Brown, MacNaughton and Sprague 2020). Despite efforts to promote equity-focused legislation and policy, social health inequalities persist among vulnerable populations (Mac-Seing *et al.* 2020).

3.8.6 Purpose and Application of Act (NHI Bill)

The National Health Insurance (NHI) Bill in South Africa is a significant piece of proposed legislation that aims to introduce a universal health coverage system in the country. Chapter one of the Bill, titled "Purpose and Application of Act," outlines that the primary objective is to create and sustain a National Health Insurance Fund (NHI Fund) within the Republic (Lexology 2023). This fund will be financed through compulsory prepayments to achieve sustainable and cost-effective universal access to high-quality healthcare services. Additionally, the Bill specifies that it does not extend to the National Defence Force and State Security Agency.

3.8.6.1 Purpose of Act

The objective of this legislation is to establish and manage a National Health Insurance Fund in the Republic, supported by compulsory prepayments. The aim is to achieve sustainable and affordable universal access to high-quality healthcare services by: (a) functioning as the sole purchaser and payer of healthcare services, ensuring an impartial and just distribution; (b) securing the ongoing funding viability for healthcare services in the Republic; and (c) promoting fairness and effectiveness in funding through the consolidation of resources and strategic procurement of healthcare services, medications, health products, and related items from accredited and contracted healthcare service providers (No 2019).

3.8.6.2 Application of Act

This legislation applies to all health establishments, except military health services and establishments, members of the National Defence Force and the State Security Agency are not subject to this Act (No 2019). In the event of any conflict regarding the matters addressed in this Act and the provisions of other laws, except the Constitution and the Public Finance Management Act, this Act takes precedence. According to the NHI bill, it is important to note that this Act does not modify, alter, or impact the funding and functions of any state entities concerning healthcare services until the enactment or amendment of legislation as envisioned in sections 77 and 214, in conjunction with section 227, of the Constitution, along with any other pertinent legislation (No 2019).

3.9. ECONOMIC POLICIES THAT IMPACTED THE HEALTHCARE SYSTEM POST-APARTHEID

Policy decisions taken by the government over the last fifteen years such as the introduction of GEAR, fiscal discipline, privatization, retrenchment of health workers, and deliberate strengthening of the private sector have all contributed to the state of the current public healthcare system in South Africa. In 1996, the African National Congress (ANC) government embraced the Growth Employment and Redistribution strategy (GEAR) as its fresh economic framework to advance its transformation goals. In this process, the ANC bypassed economic policy consultations with its political allies and asserted that GEAR was non-negotiable (Mathebula 2015). The impact of the Growth Employment and Redistribution strategy (GEAR) on maternal healthcare in South Africa is multifaceted. While economic growth has been associated with a decrease in maternal mortality, the utilization of maternal healthcare services is shaped by various contextual factors, including education, poverty, and accessibility to health facilities (Frank 2020; Simona *et al.* 2022). The challenges confronted by informal workers, who often lack formal labor protection and healthcare access, are of significant concern (Bhan *et al.* 2020). Healthcare providers and managers perceive the quality of care under the free maternal healthcare policy as subpar, highlighting the necessity for more inclusive healthcare initiatives (van der Merwe, Grobbelaar and Bam 2019; Ansu-Mensah *et al.* 2021). Legislation and policies regarding maternity protection in South Africa are fragmented, creating challenges for employees to comprehend their rights, and enhancing maternal health conditions should center on initiatives for women's empowerment, fostering male involvement in maternal health, and promoting education.

3.10 CONCLUSION

The nature of the public healthcare system in South Africa is characterized by a complex interplay of strengths and challenges. The country's healthcare system reflects a commitment to addressing public health needs, with a focus on providing accessible and affordable services to all citizens. However, several persistent issues pose significant challenges to the effectiveness and efficiency of the system. The comprehensive exploration of the literature on legislation and interventions underscores their pivotal role in shaping public maternal healthcare in South Africa. The South African public healthcare system confronts substantial challenges, including staff and equipment shortages resulting from austerity measures (Fana and Goudge 2021) and a failure to implement disability management policies (Govender *et al.* 2021). Despite these obstacles, public healthcare facilities experience high utilization driven by factors like affordability and convenience (Mhlanga and Hassan 2022). The system is marked by racial and economic segregation, characterized by persistent social inequality and a significant disease burden (de Villiers 2021). The potential solution of implementing the National Health Insurance (NHI) is met with concerns regarding the lack of clarity and understanding of the NHI Bill (Murphy and Moosa 2021). Emphasis is placed on the necessity for social innovation and collaboration between the government and non-state actors (de Villiers 2021).

One of the notable strengths is the existence of a well-established public healthcare infrastructure that serves as a critical resource for a large portion of the population. The provision of essential services, such as antenatal care, vaccinations, and treatment for infectious diseases, demonstrates the system's commitment to primary healthcare. On the downside, the public healthcare system grapples with various challenges, including resource constraints, understaffing, and a high burden of disease, particularly related to HIV/AIDS and tuberculosis. Insufficient funding and inadequate human resources limit the system's capacity to meet the growing healthcare demands of the population, leading to long waiting times, overcrowded facilities, and disparities in service quality.

The decentralization of healthcare services to the district level reflects a commitment to providing accessible and community-focused healthcare. However, several persistent issues impact the effectiveness and efficiency of the district healthcare system. The district healthcare system in South Africa encounters significant obstacles, including technical inefficiencies and productivity concerns in public district hospitals, as well as issues like fragmented services, staff shortages, and financial constraints (Babalola and Moodley 2020; Malakoane *et al.* 2020a). Despite these difficulties, there are opportunities for enhancement, such as leveraging bottom-up innovation to strengthen health management capabilities and the imperative for health system strengthening to address financial limitations and service delivery gaps (Kredo *et al.* 2020; Orgill *et al.* 2021). The implementation of the National Health Insurance (NHI) framework is anticipated to play a pivotal role in addressing some of these challenges by providing financial protection and improving access to quality healthcare services. However, concerns about the effective implementation, resource allocation, and overall clarity regarding the NHI persist. While the district healthcare system in South Africa strives to deliver community-oriented healthcare, ongoing efforts are needed to address resource constraints, reduce disparities,

and ensure the successful implementation of comprehensive healthcare reforms like the NHI. Collaborative efforts involving various stakeholders will be essential to building a resilient and inclusive district healthcare system that meets the diverse healthcare needs of South Africa's population.

The landscape of maternal adverse outcomes and stillbirth in South Africa reflects a complex interplay of challenges and opportunities. The country grapples with significant issues, including disparities in healthcare utilization, the burden of infectious diseases, and the impact of external factors such as the COVID-19 pandemic. Numerous studies have emphasized the elevated occurrence of unfavorable birth outcomes in South Africa, citing factors like low birth weight, preterm birth, and maternal health conditions as contributors to these outcomes (Mokhele *et al.* 2021; Tamirat *et al.* 2021; Basu, Chauke and Magoro 2022). Specific conditions, such as multi-drug resistant tuberculosis and cardiac disease, have been linked to notably high rates of adverse outcomes (Balieva *et al.* 2021; Mokhele *et al.* 2021). The challenges have been further exacerbated by the COVID-19 pandemic, leading to heightened mortality and stillbirth rates among pregnant women (Basu, Chauke and Magoro 2022). These findings underscore the imperative for targeted interventions aimed at enhancing maternal and neonatal health in South Africa. While the South African public healthcare system has made strides in providing accessible healthcare services, persistent challenges necessitate ongoing efforts to enhance infrastructure, allocate resources strategically, and address systemic issues to ensure the delivery of quality and equitable healthcare for all citizens.

Furthermore, interventions ranging from community-based programs to technological innovations such as artificial intelligence have demonstrated their potential to address specific challenges within the maternal healthcare system. However, a critical evaluation of these interventions is essential to identify gaps, assess scalability, and ensure sustained impact. As South Africa continues to navigate the complexities of maternal healthcare, future research should focus on the evolving legislative landscape and the effectiveness of ongoing and potential interventions. Policymakers, healthcare practitioners, and researchers alike can draw upon the insights gleaned from this literature review to inform evidence-based strategies, ultimately contributing to the enhancement of public maternal healthcare in South Africa. This knowledge is imperative for advancing the broader goals of maternal health, promoting maternal rights, and achieving positive health outcomes for both mothers and infants in the South African context.

Chapter Four: Theoretical Models for the Research

4.1 INTRODUCTION

This literature review aims to explore and analyze the dual models employed in this study. These two models provide a systematic approach to understanding, analyzing, and addressing the multifaceted factors contributing to stillbirths. By synthesizing existing knowledge on public health management models for stillbirth, this review aims to contribute to a deeper understanding of the complexities surrounding stillbirth prevention and provide insights for policymakers, healthcare practitioners, and researchers working towards improving maternal and neonatal health outcomes. Several models and frameworks can be used in maternal health management with a focus on maternal mortality and stillbirth prevention. Some relevant models include the Precede-Proceed Model, Health Care Seeking Behavior Model, Social Ecological Model, Health Belief Model, Trans theoretical Model (Stages of Change), and Behavioral Intervention Wheel, Quality Improvement Models, and Perinatal Periods of Risk (PPOR) model.

These models provide a comprehensive framework for examining the multifaceted factors influencing maternal healthcare-seeking behavior and subsequently contribute to preventing adverse maternal outcomes. The study will employ the Precede-Proceed Model by Green and Kreuter (1991) and the Health Care Seeking Behavior Model by Andersen and Newman (1973). Based on the Anderson behavior model, the study constructed the adjusted Andersen theoretical model of influencing factors on healthcare-seeking behavior according to the research purpose and variable information availability. The predisposing characteristics were employment and income status gender, age, region, rural residence, educational background, marital status, drinking, and smoking. The PPM was adapted by incorporating a Health Care Seeking Behavior Model. This ensured the design of any resultant intervention would explicitly address multi-level determinants of physical activity in the management of stillbirth in this study.

4.2 THE PRECEDE-PROCEED MODEL

The Precede-Proceed Model, originally formulated by Green and Kreuter in 1970, has undergone significant development and has emerged as a widely embraced framework for health promotion and behavior change interventions (Howat *et al.* 1997; Terry 2022). Planning models exist at a macroscopic level; they serve as an organizing framework for an entire health promotion effort aimed at fostering reduction in a given disease (Crosby and Noar 2011). As a planning model, the Precede model was developed by Lawrence W. Green in 1975 (Parlas and Eryilmaz 2022). At its core, a theory is a set of testable propositions that help us to explain and predict phenomena, such as health behaviors (Crosby and Noar 2011).

4.2.1 Background of Precede-Proceed Model

Health needs assessment tools such as the Precede-Proceed Model (PPM) identify the key health

concerns of communities. (Handyside *et al.* 2021). PPM is an evaluation tool used for the analysis of determining factors that underpin behavior modifications relevant to improving health status over time (Saulle *et al.* 2020). Since its inception by Lawrence Green in 1974, the PPM has served as both a moral compass and a practical roadmap in the realms of health education and health promotion. Later expanded by Green and Kreuter with the addition of Proceed in 1991, this model offered valuable guidance to professionals in these fields (Porter 2016). The model (PPM) has offered both moral and practical guidance in the realms of health education and health promotion, and presently, it stands as one of the most widely employed and comprehensive approaches to health promotion (Porter 2016; Kim *et al.* 2022). The model is a process for behavior change and can lead to the promotion of self-care behavior (Mosavi, Aliakbari and Rabiei 2020).

The predisposing, reinforcing, and enabling constructs in educational diagnosis and evaluation policy, regulatory, and organizational constructs in educational and environmental development PPM has been used as a theoretical framework to guide health promotion strategies to prevent chronic diseases and improve the quality of life (Kim *et al.* 2022). Educational programs are the predominant intervention employing the theoretical framework of the Precede-Proceed Model. Within the educational assessment component of the model, factors influencing behavior and environmental changes are categorized into predisposing, reinforcing, and enabling factors (Kim *et al.* 2022; Kara and Başbakkal 2023). In successive stages, it allows healthcare professionals to describe problems and deficiencies, assess health status through identified problems, and develop a plan for them (Parlas and Eryilmaz 2022). The reference point of the model is composed of nine phases: voluntary cooperation, determination of individuals, the degree of change in their knowledge, and active participation in health practices (Parlas and Eryilmaz 2022; Majeed, Afzal and Ozigi 2023).

Green and Kreuter's PPM for health promotion has been widely used by government and specialist health organizations, identifying several predisposing, enabling, and reinforcing factors that contribute to poor care and control of various diseases whilst they all suggest to implementation of screening strategies and programs (Saulle *et al.* 2020). The model, a comprehensive planning framework for health promotion, applies to addressing the issue of stillbirth. Numerous studies have developed prediction models for stillbirth, incorporating factors like maternal comorbidity, place of residence, and fetal presentation (Tiruneh *et al.* 2022). According to Townsend *et al.* (2021) and (Wojcieszek *et al.* 2018), both emphasize the need for individualized monitoring and intervention to prevent stillbirth, with the latter calling for well-designed trials to assess the effectiveness of interventions. Studies by both (Sexton *et al.* 2020) and (Åmark, Westgren and Persson 2018) have developed prediction models for stillbirth, with the former focusing on late-pregnancy stillbirth and the latter on stillbirth in women with overweight or obese. Through the PPM model comprehensive planning tool for health promotion on the global issue of stillbirth, (Ishak and Khalil 2021) emphasizes the need for universally applicable evidence to address this problem, while (Hug *et al.* 2021a) underscores the importance of raising public awareness and understanding local public health priorities. According to Dube *et al.* (2022) and (Malacova *et al.* 2020) focus on the development of a core outcome set for stillbirth prevention and the use of machine learning for stillbirth risk prediction, respectively and these studies collectively

underscore the need for a comprehensive approach to stillbirth prevention, which the PPM provides. This planning model is not a theory; instead, it is a method of approaching the complex task of making substantial progress in the reduction of morbidity and mortality at the community level through developing, implementing, and evaluating health promotion programs (Crosby and Noar 2011).

4.2.2 Assumptions of the Precede-Proceed Model

The Precede-Proceed Model, a comprehensive framework for health program planning, assumes that behavior change is a complex process influenced by multiple factors (Weinstein and Sandman 1992; Tramm, McCarthy and Yates 2012). The model starts from the assumption that if a health promotion intervention is to be functional, the population must have an active role and indicate which factors hamper the efficacy of planned interventions (Saulle *et al.* 2020). According to Saulle *et al.* (2020), when designing prevention programs, it is fundamental to analyze the socio-demographic and psychological characteristics that influence and determine health behavior and quality of life, and not just the consistency and adequacy of the objectives, or the intervention efficacy. Before implementing any intervention, these considerations should be considered, involving the expertise of various disciplines like social marketing, epidemiology, psychology, medical sociology, and public health.

4.2.3 Application of the Precede-Proceed Model

PPM is a systematic model for planning health programs designed to enhance the quality of life for a specific target group through strategic educational and planned initiatives, it furnishes a logical framework that can serve as the foundation for health promotion initiatives and projects (KARA and BAŞBAKKAL 2023). The initial phase of the model, Precede, serves as the diagnostic component, focusing on identifying and planning requirements, and proceed represents the action-oriented segment of the model, encompassing the initiatives to be executed. The Precede component of the model assesses social, epidemiological, behavioral, environmental, educational, and ecological factors to inform the development of an intervention, and the Proceed component consists of pilot testing and evaluation (Taylor, Cairns and Glass 2021a). The model consists of eight phases: social assessment, epidemiological assessment, educational/ecological assessment, administrative/policy assessment and intervention planning, implementation, process evaluation, impact evaluation, and performance evaluation (Kim *et al.* 2022). It is a multistep approach to the development and implementation of a health promotion program.

Health practitioners can create effective and sustainable interventions by using the Precede-Proceed Model (PPM) and focusing on evaluation at various stages (Bammann *et al.* 2021). The PPM is a valuable framework for health intervention programs, particularly in screening contexts, as it helps elucidate the relationships between variables such as knowledge and screening (Saulle *et al.* 2020). This model was successfully employed in piloting a physical activity intervention for healthcare workers, resulting in positive outcomes (Fetherman and Cebrick-Grossman 2023). Although the PPM has been underutilized in community pharmacy research, it proves effective in identifying health priorities and developing targeted health services (Handyside *et al.* 2021). Evaluations of healthcare improvement

programs frequently lack consistent definitions and theoretical frameworks for sustainability (Hamilton *et al.* 2023). Adopting a complex systems perspective in public health evaluation can produce stronger evidence for enhancing health and reducing health inequalities (McGill *et al.* 2021). This involves the formulation, planning, implementation, and evaluation of the initiative as shown in the diagram in Figure 4.1.

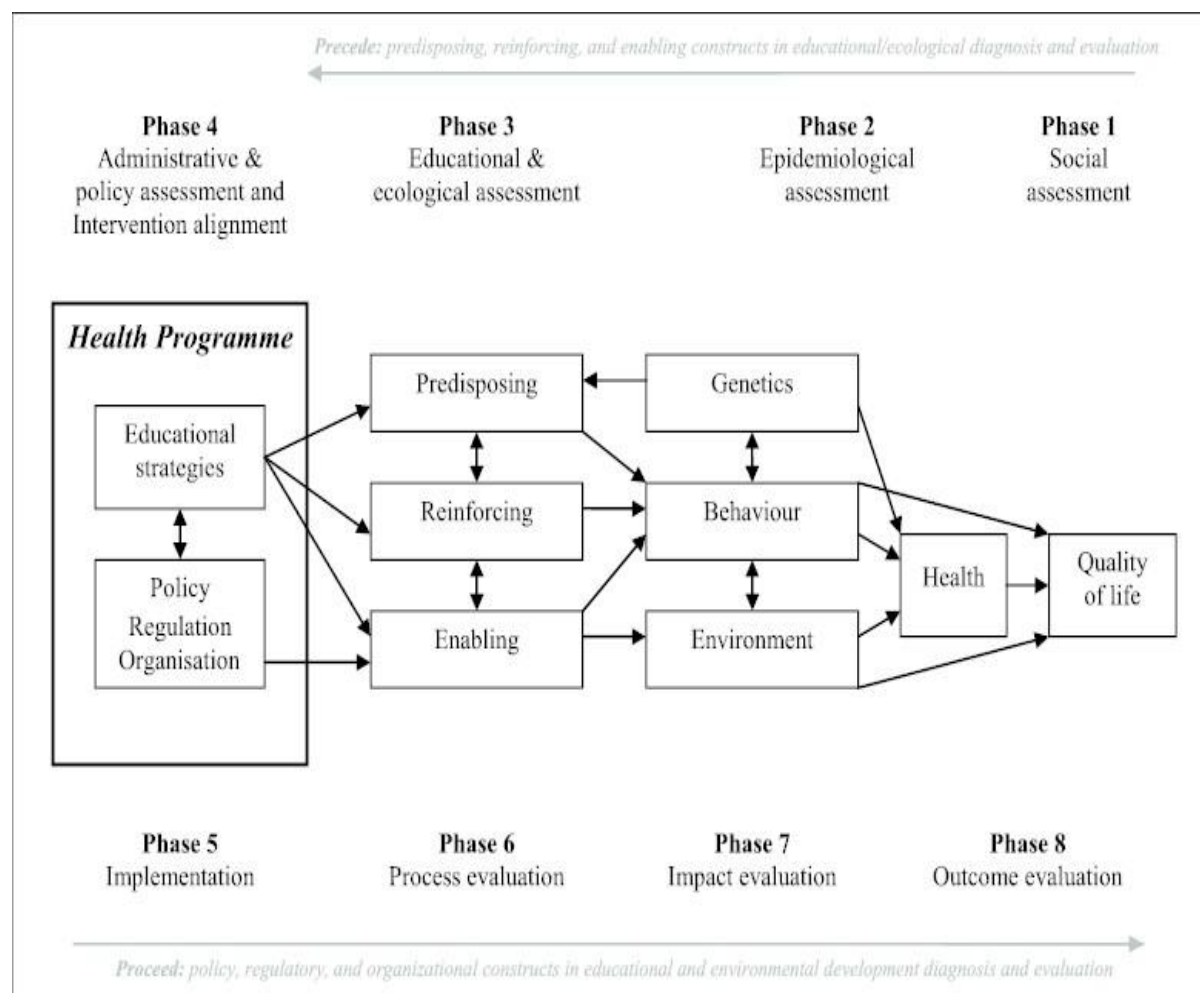


Figure 4. 1: The Precede–Proceed Model for Health Programme Planning and Evaluation

Source: Adapted from Porter (2016)

The PPM framework serves as a tool for pinpointing precise intervention areas, enabling the amalgamation of individual and environmental factors into a streamlined program. It encompasses the examination of organizational, administrative, and policy elements that could either impede or facilitate the effective implementation of a program (Bammann *et al.* 2021; Gamal El-Said *et al.* 2021). In this model, it is important to provide health education for a problem that has been explained correctly to the target audience (Parlas and Eryilmaz 2022). The PPM is quite simple to understand once one realizes that it embodies two key aspects of intervention: (a) planning, and (b) evaluation (Crosby and Noar 2011).

4.2.4 Precede-Proceed Model and Stillbirth Management (Model linkage to the study)

In the study on stillbirth prevention, the Precede-Proceed Model serves as a guiding framework to assess the various factors influencing the occurrence of stillbirths and to design effective interventions. The model acknowledges the issue's complexity by incorporating social, environmental, behavioral, and policy dimensions. Using this model, researchers can systematically identify predisposing factors that make individuals susceptible to stillbirth, reinforcing factors that influence the continuation of specific behaviors, and enabling factors that either facilitate or hinder the adoption of preventive measures. The Precede-Proceed Model is effective in improving maternal healthcare in various ways. It has been found to enhance care knowledge, skills, and a sense of competence in mothers of preterm infants (Li *et al.* 2022). A study by (Beydokhti *et al.* 2021) showcased the potential of the model in preventing postpartum depression. Moreover, the model has been applied to preconception care, as evidenced by studies conducted by (Lassi *et al.* 2021a), revealing its effectiveness in enhancing the maternal nutritional status and improving birth outcomes in low- and middle-income countries. Nevertheless, (David, Evans and Fraser 2021) and (Sachan *et al.* 2021) emphasized the necessity for additional research and the importance of addressing specific challenges in prenatal and newborn care.

Several studies have investigated the application of the Precede-Proceed Model in the context of maternal healthcare. (Abd Elhaleem Ebraheem Elagamy *et al.* 2021) reported that a nursing intervention guided by the model significantly enhanced knowledge and adherence to preventive behaviors among high-risk pregnant women. In contrast, (Teshome *et al.* 2020) identified various barriers to adopting preconception care, encompassing factors related to women, husbands, communities, health services, and the media. (Indira, Kumar and Aravindan 2021) underscored the necessity for improvements in prenatal care, addressing aspects such as the adequacy of prenatal consultations and the significance of birth preparedness and complication readiness. (Alatawi, Faheem and Alabdulaziz 2021) and (Pacheco, Lozada and Saade 2020) highlighted the pivotal role of knowledge, attitude, and practice in birth preparedness, emphasizing the importance of early interventions during medical emergencies in pregnancy.

The model has been applied in several studies to tackle deficiencies in maternal healthcare. A study in Zimbabwe revealed that late initiation of prenatal care and missed visits were prevalent, with cost and inadequate family support identified as significant barriers (David, Evans and Fraser 2021). However, the model's application in specific contexts, such as the prenatal care pathway in Zimbabwe, and the perceptions of preconception care in Zimbabwean women, also reveals the need for tailored interventions to address local challenges (David *et al.* 2021; Siraha *et al.* 2020). According to Pentecost and Meloni (2020) further emphasize the need for a holistic approach to maternal healthcare, considering the broader social and environmental factors influencing health outcomes. In Lesotho, PPM was applied in various studies to address various barriers and improve service utilization. A study by (Morojele 2022) highlights the need to address concerns about starting antiretroviral treatment among pregnant women. While Teshome *et al.* (2020); (Tiruneh *et al.* 2022) emphasize the importance of addressing barriers to preconception care and using maternal and newborn health services.

Lack of knowledge and incorrect practices regarding genital hygiene increase the risk of infection, women can be protected from these infections by teaching correct genital hygiene behaviors through health education based on recognized models (Parlas and Eryilmaz 2022). The epidemiological assessment within the Precede-Proceed Model allows researchers to examine the prevalence and impact of stillbirths within a given population. Behavioral and environmental assessments help identify specific behaviors contributing to stillbirths and environmental factors influencing these behaviors. Educational and ecological assessments allow for identifying educational needs and understanding the broader ecological context affecting stillbirth rates.

4.2.5 Precede-Proceed Model Criticism

The Precede-Proceed Model, a widely used framework for health promotion planning, has been critiqued for its lack of a clear theoretical basis and inconsistent application (Green and Kreuter 1999; Bammann *et al.* 2021). According to Bammann *et al.* (2021), the PPM lacks a framework for the concrete development of the intervention. Moreover, the transfer of the PPM phases into action has been realized differently across studies since a comprehensive guide is missing, underlining the need for methodological work in this field (Bammann *et al.* 2021). Using the PPM is labor-intensive and this may be seen as a drawback to many professionals (Crosby and Noar 2011). According to Crosby & Noar (2011), the model is not tertiary prevention but also labor intensive and even far more costly. Although the use of the Precede-Proceed Model has been recommended, several studies have used only the Precede section of the model as their theoretical framework (Kim *et al.* 2022). According to Kim *et al.* (2022), the model may lack specificity in certain areas, such as identifying precise intervention strategies or determining the most effective methods for evaluating program outcomes.

Studies have shown that the model is effective in health intervention programs, particularly in screening contexts, but there is a need to integrate it with a more comprehensive understanding of the ecological and cultural context of health behavior (Saulle *et al.* 2020). Socio-structural variables, such as age, education level, gender, and income, have been found to mediate the relationship between these determinants and health behavior (Hagger and Hamilton 2021). The persistence of socio-economic health inequalities and the need for a more effective approach to address them have been highlighted (Wilderink *et al.* 2022). The Precede-Proceed Model has been used to identify determinants of health-related quality of life among adults with low socio-economic status and multiple healthcare needs, however, the model's limitations in addressing systemic inequalities and broader structural determinants remain a concern (Cho, Cui and Kim 2023). The linear approach of the Precede-Proceed Model doesn't fully account for the dynamic and iterative nature of public health interventions, which often require continual adaptation and refinement (Yousefi Nooraie *et al.* 2021b). This model's emphasis on planning and evaluation may not sufficiently address the changing needs and priorities of stakeholders and target users over time (Yousefi Nooraie *et al.* 2021a).

The Precede-Proceed Model, while a structured approach to planning and evaluating public health interventions, may not fully accommodate the dynamic and iterative nature of these initiatives, which often demand continuous adaptation and refinement based on feedback and emerging evidence. The

model's emphasis on predetermined steps and a linear process may limit its flexibility and responsiveness to evolving circumstances. This limitation was outlined by Parlas and Eryilmaz (2022), which explored the application of the Precede-Proceed Model across various health interventions. These studies advocate for ongoing adjustments and modifications to address unintended consequences, enhance outcomes, and ensure the continued relevance and effectiveness of the interventions. The Precede-Proceed Model serves as a theoretical framework for health promotion interventions, often utilized to enhance health outcomes by improving knowledge (Kim *et al.* 2022). Nonetheless, critics contend that the model might not sufficiently encompass broader social, environmental, and structural determinants that impact health outcomes, potentially constraining its effectiveness in tackling complex public health issues (More and Phillips 2022). While the model prioritizes behavior change, it may not fully encompass these external factors that substantially contribute to health outcomes (Kim *et al.* 2022). This implies that supplementing the Precede-Proceed Model with other approaches considering these broader influences on health may be necessary (Sales, Farr and Spertus 2022). Overall, while the Precede-Proceed Model provides a valuable framework for health promotion planning and evaluation, it is essential to recognize its limitations and consider complementary approaches to address the diverse and multifaceted determinants of health.

4.2.6 Justification of Precede-Proceed Model on Maternal Healthcare Management

The Precede-Proceed Model is a widely recognized framework in public health that offers a structured approach to planning, implementing, and evaluating health promotion interventions. When applied to maternal healthcare management, the PPM provides a systematic process for identifying, addressing, and preventing maternal health issues. Maternal healthcare management encompasses a broad range of services and interventions aimed at promoting the health and well-being of pregnant women before, during, and after childbirth. These services include prenatal care, antenatal education, delivery assistance, postnatal care, and breastfeeding support. Effective maternal healthcare management is crucial for reducing maternal morbidity and mortality, improving birth outcomes, and ensuring the overall health and well-being of mothers and their babies.

The Precede-Proceed Model has proven to be beneficial across various facets of maternal healthcare management. According to Lang *et al.* (2017), preconception care is underscored as crucial, aligning with the assessment and planning phases of the model. Moreover, its application among high-risk pregnant women has enhanced knowledge and preventive measures against preeclampsia (Abd Elhaleem Ebraheem Elagamy *et al.* 2021).

The Early Care model, which facilitates early initiation of perinatal care, resonates with the Precede-Proceed Model's emphasis on social and environmental factors (Augur, Ellis and Moon 2022). The model has demonstrated its effectiveness across various maternal healthcare management scenarios. A study by Li *et al.* (2022) showcased its applicability in crafting educational programs aimed at enhancing genital health behaviors and knowledge, as well as skill and competence in mothers of preterm infants, respectively. Additionally, Beydokhti *et al.* (2021) observed positive outcomes from nursing interventions and educational counseling programs rooted in the model, leading to improved

knowledge and adoption of preventive behaviors among high-risk pregnant women and in the prevention of postpartum depression. Supporting this, (Kim *et al.* 2022) conducted a systematic review and meta-analysis affirming the model's role in enhancing health outcomes and quality of life. Moreover, (Alba *et al.* 2019) demonstrated the model's effectiveness in midwifery-led care, notably improving maternal and neonatal health outcomes.

A study by Pratami, Sukesu and Suparji (2022) revealed the model's effectiveness in enhancing maternal health behavior during pregnancy by addressing various factors such as technological aspects, social and familial connections, cultural norms and practices, regulatory frameworks, and educational components. Furthermore, a quasi-randomized controlled trial demonstrated that implementing the Precede-Proceed Model led to improvements in knowledge, skills, and confidence levels among mothers of preterm infants (Li *et al.* 2022). Additionally, a commentary suggested the development of a Pre-eclampsia/Eclampsia (PE/E) Model grounded in primary healthcare principles and based on the Precede-Proceed Model, aiming to enhance antenatal care quality and broaden maternal health service access (Warren *et al.* 2020). Collectively, these findings provide substantial support for the utilization of the Precede-Proceed Model in managing maternal healthcare effectively.

In rural districts such as Lejweleputswa district, the PPM is a valuable framework for addressing maternal healthcare management in rural districts, as evidenced by several studies. A study by Dubey and Singh (2021) highlights the importance of community-based interventions, which are a key component of the model. In agreement, Udenigwe *et al.* (2021b) further support this, showing the impact of district prioritization and the need for policy reforms in rural areas. Taking a slight turn, Nadkarni *et al.* (2019) emphasize the role of resource allocation and capacity building, which are also key elements of the model. Additionally, Viswanathan *et al.* (2020) underscore the need for tailored interventions and the importance of birth preparedness and complication readiness, which can be addressed through the model's planning and implementation phases. The Precede-Proceed Model has garnered justification for its application in rural districts due to several key factors. Its efficacy in fostering health promotion and inducing behavior change within communities has been evidenced. For instance, in managing hypertension, the model has been utilized to educate patients and enhance their self-care abilities (Pondaag and Sembiring 2022). The model has facilitated the development of innovative healthcare services tailored to rural settings like, in tackling untreated hearing loss, the model served as a framework for establishing a community pharmacy-based ear health service, which received positive feedback from consumers (Taylor, Cairns and Glass 2021b). Moreover, the model has been instrumental in addressing specific healthcare hurdles prevalent in rural areas, and managing high-risk pregnancies, the model was instrumental in devising a prenatal education initiative that bolstered knowledge and preventive measures (Azinar *et al.* 2018). The Precede-Proceed Model offers a valuable framework for guiding maternal healthcare management initiatives by providing a systematic process for identifying health needs, developing targeted interventions, and evaluating program outcomes. By applying this model, healthcare providers and policymakers can work towards improving maternal health outcomes promoting the well-being of mothers and their babies and reducing preventable stillbirth in Lejweleputswa district.

4.3 ANDERSEN'S BEHAVIORAL MODEL OF HEALTH SERVICES UTILIZATION

Healthcare utilization refers to the use of the healthcare system 'by persons to prevent and cure health problems, promote the maintenance of health and well-being, or obtain information about one's health status and prognosis (Gellman 2020; Lederle, Tempes and Bitzer 2021). According to Lederle, Tempes and Bitzer (2021), a needs-oriented healthcare system addresses an individual's healthcare requirements as determined objectively by healthcare professionals, taking into account the individual's demands. Successful interaction between healthcare providers and patients can help prevent overutilization, underutilization, and inappropriate utilization of healthcare services. Numerous models have emerged across diverse fields aiming at examining, and forecasting individuals' intentions and actions when accessing healthcare services. The Behavioral Model of Health Services Utilization (BMHSU) is widely cited in health services research as the primary framework for understanding healthcare service utilization (Kabir 2021). Developed by Andersen, this model originated from a national quantitative survey focused on elucidating patterns of health services utilization among families (Kabir 2021; Lederle, Tempes and Bitzer 2021).

4.3.1 Background of the model

The Andersen model of health care utilization is a framework that provides a theoretical understanding used to understand the factors that influence the utilization of health services (Alkhawaldeh *et al.* 2023). According to Alkhawaldeh *et al.* (2023), the model considers predisposing factors which are age and education, enabling factors (income and hospital density), and need factors which are health status. Several studies have applied this model to different healthcare contexts. For example, a study in India found that factors such as age, education level, and parental attitudes towards oral health were associated with dental health service utilization among schoolchildren (Nagdev *et al.* 2023). In recent years, Andersen's initial behavioral model has undergone continuous development, where the new focus was placed on various factors (Andersen 2008). The factors include consumer satisfaction, which was introduced in the 1970s, 'health status', 'personal health practice', and 'external environment' in the 1980s (Andersen and Newman 1973; Andersen 1995). In 1995, Andersen himself reviewed the model and its development and has since included feedback loops to consider how treatment outcomes affect health behavior with additional 'contextual and individual characteristics' were added to the model in the 2000s (Andersen 2008; Alkhawaldeh *et al.* 2023). According to Alkhawaldeh *et al.* (2023), further developments were carried out in cooperation with other authors, like, Andersen and Newman's Framework of Viewing Health Services Utilization or Aday and Andersen's Framework for the study of Access to Medical Care.

The model was modified for specific settings like complementary and alternative medicine and specific target groups like the behavioral model for vulnerable populations for homeless people (Grech *et al.* 2022; Alkhawaldeh *et al.* 2023). The model has been adopted for homeless people, resulting in the Behavioral Model for Vulnerable Populations of homeless individuals (Grech *et al.* 2022). This modification of the BMHSU aims to identify the health needs and predict health service use among homeless populations, identifying unmet needs and facilitating the provision of targeted health services

to people experiencing homelessness (Stein, Andersen and Gelberg 2007). Additionally, the BMHSU has been applied to specific settings such as complementary and alternative medicine and these modifications of the BMHSU highlight the versatility and applicability of the model in different contexts and for different populations. Currently, many versions of the model for different settings or target groups are available and applied in health services research. The most current and comprehensive model is the BMHSU of the year 2013, which focuses on the factors that facilitate or impede an individual's access to healthcare services (Alkhawaldeh *et al.* 2023). According to the model, access is determined by contextual characteristics, individual characteristics, health behaviors, and outcomes. Contextual characteristics include circumstances and the environment; individual characteristics are determined by a person's life circumstances including, for example, genetics and socialization; health behaviors are an individual's practices; and outcomes are reflected by an individual's health status and consumer satisfaction (Petrovic and Blank 2015).

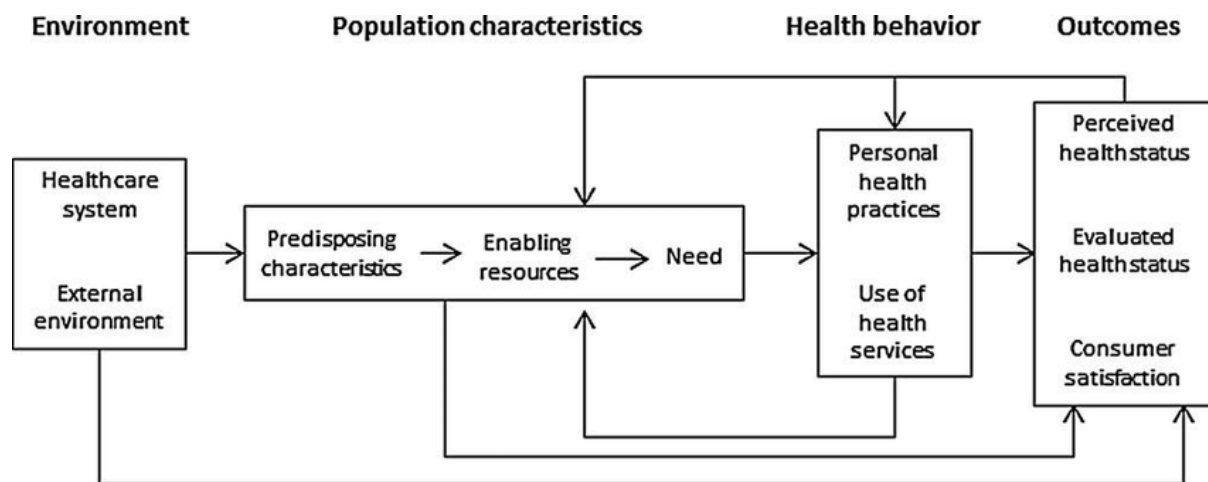


Figure 4. 2: Andersen Model of Healthcare Utilization

Source: Adapted from Dosh *et al.* (2013)

Health utilization provides a comprehensive framework for understanding the complex factors that shape healthcare utilization patterns among diverse populations. It has been widely used in research and policy development to identify disparities in access to care and inform interventions aimed at improving healthcare delivery and outcomes (Yang and Hussin 2023).

4.3.2 Application of Healthcare-seeking Behavior

Healthcare-seeking behavior is influenced by various factors, including socio-economic status, cultural beliefs, and perceived severity of illness (Li *et al.* 2024). Research indicates that individuals with higher socio-economic status are more likely to utilize high-quality health services (Li *et al.* 2020). Cultural influences are significant, as seen in the Shawi people's preference for traditional remedies (Bussalleu *et al.* 2021). Symptom severity also plays a role, with conditions like fever leading to more medical

consultations (Zhang *et al.* 2020). Barriers to healthcare access include distance, costs, and cultural insensitivity (Bussalleu *et al.* 2021; Podder *et al.* 2021). Additionally, health insurance enrollment and higher education levels positively correlate with appropriate healthcare-seeking behaviors (Podder *et al.* 2021). Understanding these patterns is essential for enhancing healthcare delivery and outcomes (Fatma and Ramamohan 2023). Studies in Indonesia have highlighted the impact of sociocultural beliefs and developed models of care-seeking pathways (Widayanti *et al.* 2020).

A study in Nigeria used the model to identify factors influencing the usage of intermittent preventive treatment of malaria in pregnancy, including maternal education, health insurance enrollment, and community perception of malaria (Solanke *et al.* 2023). In China, the model was used to explore the impact of factors such as age, GDP per capita, and health resources on health service utilization at the provincial level (Xin and Ren 2023a). Additionally, a study in the US found that factors such as age, education level, and sleep duration were associated with emergency department visits and hospitalizations (Xin and Ren 2023a). In Jordan, Alhalaseh *et al.* (2023) found that knowledge, stigma, and life satisfaction were predictive of seeking formal mental health services among primary care patients with depression. Health Behavior includes personal health beliefs and practices and the use of health services (Doshi *et al.* 2013). Figure 4.2 shows the healthcare utilization and determinants of health utilization behavior.

4.3.3 Newman's Health Care Seeking Behavior Model and Stillbirth Management (Model linkage to the study)

The Andersen and Newman Health Care Seeking Behavior Model is a widely recognized framework that explains how various factors influence individuals' decisions to seek healthcare services (Alkhawaldeh *et al.* 2023). This model considers three main categories of factors: predisposing characteristics, enabling resources, and need factors. When addressing the complex issue of maternal care and stillbirth management in the Lejweleputswa District Municipality, it is imperative to employ a comprehensive and systematic approach. Andersen and Newman's Health Care Seeking Behavior Model provides a robust framework to understand and analyze the multifaceted factors that influence healthcare-seeking behaviors among expectant mothers (Kabir 2021). By utilizing this model, the study aims to identify and scrutinize the predisposing, enabling, and need-based factors that affect access to and utilization of maternal healthcare service (Mustapha and Muhibat 2030). This analytical approach ensures a thorough understanding of the barriers and facilitators within the healthcare system, ultimately guiding the development of effective interventions and policy recommendations tailored to the unique needs of this community (Tesfaye *et al.* 2018).

Seeking healthcare early can save neonatal lives and plays a crucial role in reducing neonatal deaths, whereas delays in seeking healthcare significantly contribute to neonatal mortality (Gomora Tesfaye *et al.* 2022). Predisposing characteristics encompass demographic, social, and attitudinal factors that shape health behavior, such as age, gender, education, occupation, and health beliefs (McCallion *et al.* 2013). The demographics of healthcare workers play a crucial role in understanding their knowledge, attitudes, and practices regarding stillbirth management (Mudenda *et al.* 2024). Studies Mudenda *et al.*

(2024) and Ikramullah *et al.* (2023) have shown variations in demographics among healthcare workers across different healthcare settings.

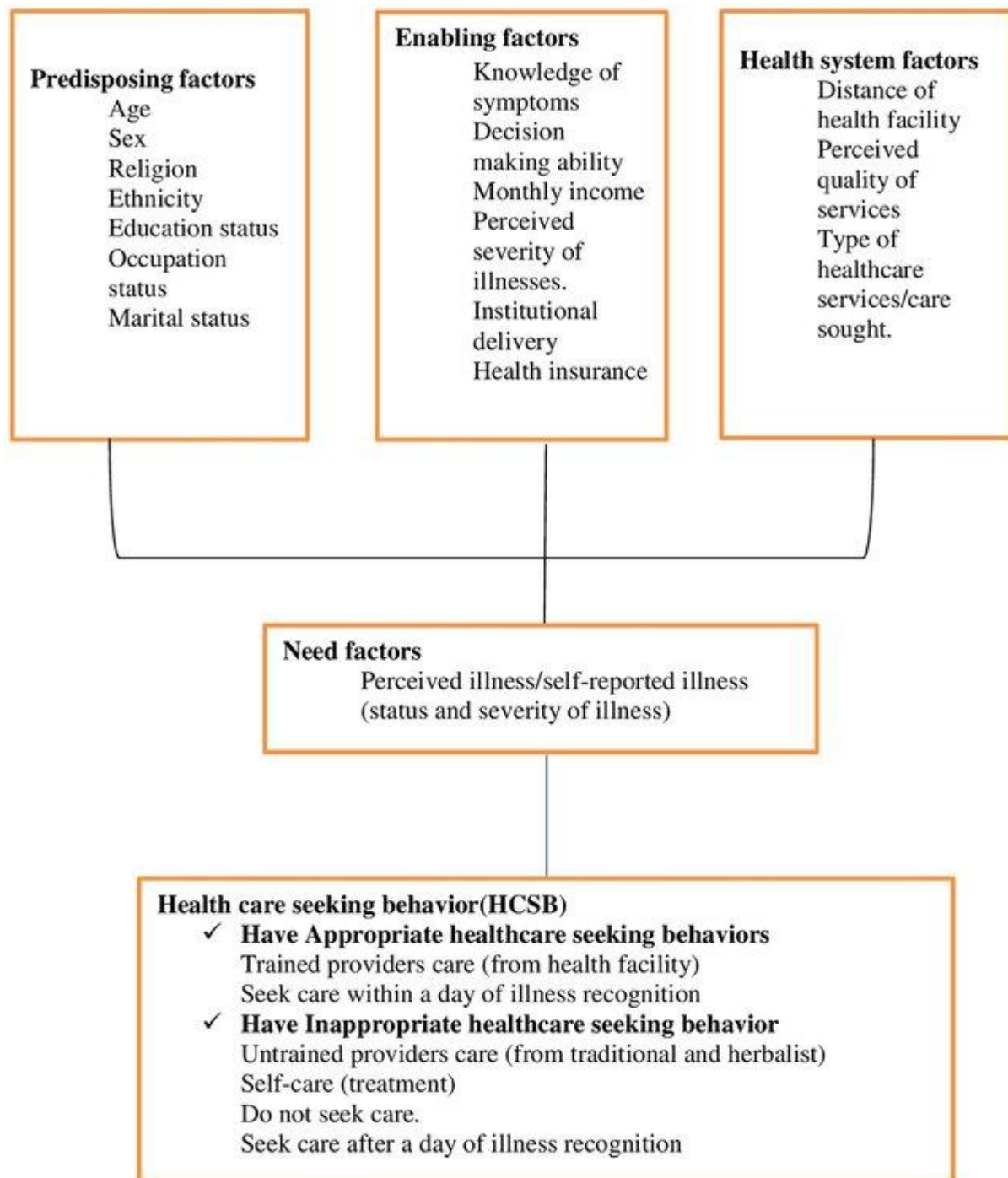


Figure 4. 3: Conceptual frame for healthcare-seeking behavior (modified Anderson and Newman model)

Source: Adapted from Tesfaye et al. (2022)

Common issues include communication difficulties, insufficient emotional support, and a lack of specialized training (Christou *et al.* 2021; Mills *et al.* 2023). Furthermore, healthcare systems often lack the resources and guidelines for adequate bereavement care (Ssegujja, Ddumba and Andipartin 2021). Interventions such as enhancing healthcare workers' communication skills, providing specialized bereavement training, and developing culturally sensitive support programs are recommended (Atkins *et al.* 2023b). Closing these gaps can improve the experiences of healthcare providers, potentially mitigating the psychological impact of stillbirths. Enabling resources plays a crucial role in facilitating access to healthcare services, particularly for vulnerable populations, and these resources include proximity to healthcare facilities, financial means, transportation, and social support systems (Nolan-Isles *et al.* 2021; Mohd Rosnu *et al.* 2022). Studies have identified various barriers and enablers to healthcare access, such as coordination of services, communication, cultural safety, and affordability (Nolan-Isles *et al.* 2021). Enabling services in community health centers has been shown to improve healthcare utilization and reduce delayed care (Martinez *et al.* 2022). Access barriers persist, especially in rural and low-income settings, including cultural beliefs, informational gaps, and logistical challenges (Mahbub *et al.* 2023; Saxena *et al.* 2023)

Healthcare workers in low-income settings such as rural districts often lack adequate training and resources to manage stillbirths effectively (van Pelt *et al.* 2020). Social stigma and poor communication between providers and bereaved parents are common issues (Choummanivong *et al.* 2020; Christou *et al.* 2021). District health management plays a crucial role in stillbirth recording and reporting, but challenges persist in data quality and standardization (Mensah Abrampah *et al.* 2024). Cultural beliefs, traditional practices, and socio-economic factors significantly influence care-seeking behaviors and contribute to stillbirth risks (Mcnojia *et al.* 2020; Christou *et al.* 2021). Healthcare system constraints, including inadequate facilities and skilled personnel, further exacerbate the problem (Ssegujja, Ddumba and Andipartin 2021). Addressing stillbirth requires a multifaceted approach, including improved training for healthcare workers, community awareness, and culturally appropriate interventions (Bedwell *et al.* 2021).

Employing Andersen and Newman's Health Care Seeking Behavior Model, the study can systematically examine the factors influencing maternal care and stillbirth management in the Lejweleputswa District Municipality. This approach ensures a comprehensive understanding of the barriers and facilitators in the healthcare system, leading to more effective interventions and policy recommendations.

4.3.4 Barriers to Deciding to Seek care for antenatal care for pregnant women in Rural Areas

Barriers to seeking antenatal care (ANC) in rural areas are numerous and include financial constraints, lack of education, and limited access to healthcare facilities (Suleman Hassen, Mulatu Teshale and Abate Adulo 2021). Cultural beliefs, traditional gender roles, and the fear of stigma also play significant roles in delaying the initiation of ANC (Maluka *et al.* 2020). The COVID-19 pandemic has further exacerbated these issues, creating additional fears of infection and disrupting healthcare services (Bankar and Ghosh 2022). Other contributing factors include a lack of decision-making power, previous

positive pregnancy outcomes without ANC, and the competition posed by traditional birth attendants (Barbi *et al.* 2021; Udenigwe *et al.* 2021a). Health system barriers such as overcrowding, long wait times, and rude service providers deter women from attending ANC early (Warri and George 2020b).

According to Nisha *et al.* (2021), cultural beliefs and practices have profound impact on maternal health-seeking behaviors in low- and middle-income countries. Traditional norms often deter women from seeking formal antenatal care (ANC), favoring home remedies or traditional birth attendants (Nisha *et al.* 2021). Lack of awareness about the importance of early ANC, fear of medical interventions, and superstitions surrounding pregnancy contribute to delayed care-seeking (Barbi *et al.* 2021). Household gender dynamics play a significant role in decision-making, with male family members often having the final say in healthcare choices (Azad *et al.* 2020). Women's limited autonomy, traditional gender roles, and cultural beliefs about pregnancy further hinder timely ANC utilization (Maluka *et al.* 2020). According to Maluka *et al.* (2020), health system factors such as rude staff behavior and shortages of healthcare providers discourage women from seeking care. Addressing these sociocultural barriers through context-specific interventions is essential for improving maternal health outcomes (Mustafa *et al.* 2020).

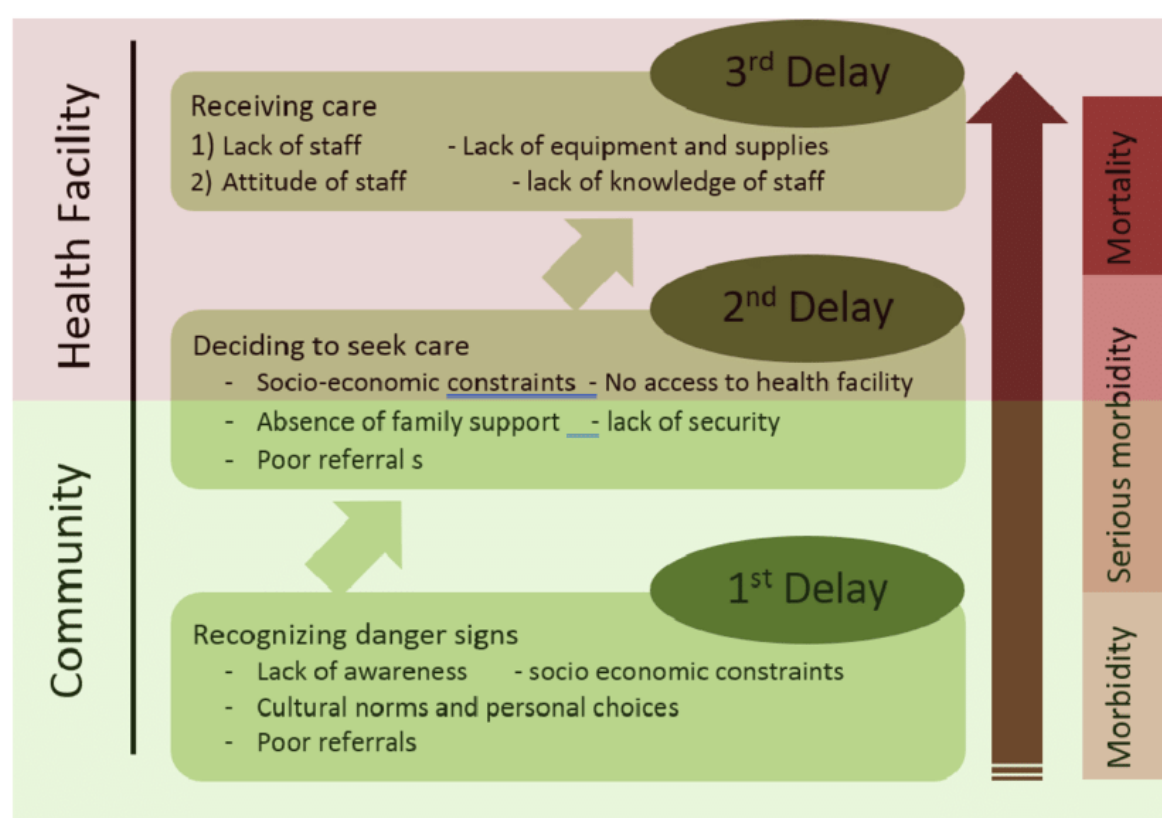


Figure 4. 4: Factors associated with delays in seeking care for maternal and newborn illnesses

Source: Adapted from Lassi *et al.* (2019)

Multiple barriers contribute to inadequate antenatal care (ANC) utilization in rural settings. Healthcare system factors include poor infrastructure, understaffing, and lack of essential supplies (Tsegaye *et al.* 2021; Chelva *et al.* 2022). Long waiting times and negative staff attitudes discourage women from

seeking care (Lusambili *et al.* 2020). According to Uldbjerg *et al.* (2020), sociocultural factors such as lack of male involvement, cultural beliefs, and women's limited autonomy also hinder ANC attendance. Financial constraints and transportation difficulties further impede access (Nisingizwe *et al.* 2020). A lack of awareness regarding the importance of antenatal care (ANC) and the fear of being judged contributes to women delaying or missing their appointments (Ayodo *et al.* 2021). Additionally, unintended pregnancies are associated with poor ANC uptake (Alanazy and Brown 2020; Ayodo *et al.* 2021). Research has indicated that the fear of undergoing a Caesarean section in a hospital setting discourages women from seeking institutional care for childbirth (Lassi *et al.* 2019). The lack of privacy at healthcare facilities and being examined in open areas are significant factors that deter women from seeking care at clinics.

Addressing these barriers requires a comprehensive approach that includes improving healthcare infrastructure and accessibility, increasing awareness and education about the benefits of antenatal care, and fostering cultural sensitivity and community engagement to shift norms and practices (Maluka *et al.* 2020). Common obstacles include lack of education, poverty, distance to health facilities, and cultural beliefs (Maluka *et al.* 2020; Laksono and Wulandari 2022). Women often face limited autonomy in patriarchal societies, with male involvement and spousal permission influencing ANC access (Chelva *et al.* 2022). Health system factors like poor infrastructure, staff shortages, and perceived low-quality care also deter women from seeking services (Nisingizwe *et al.* 2020). Addressing these barriers requires a comprehensive approach, including improving healthcare infrastructure, increasing awareness about ANC benefits, and fostering cultural sensitivity (Gamberini, Angeli and Ambrosino 2022a). Continuity of care models and strategies targeting multiple socio-ecological levels could help overcome barriers, particularly for disadvantaged women (Penman *et al.* 2023). Above all, strengthening health systems and community engagement are essential to encourage ANC utilization in rural areas.

4.3.5 Criticism of the Model

The Andersen's Behavioral Model of Health Services Utilization has been influential in understanding healthcare utilization patterns, the model has faced criticism. Critics argue that Andersen's model provides a relatively simplistic view of healthcare utilization by primarily focusing on individual-level factors such as predisposing, enabling, and need factors (Nagdev *et al.* 2023; Xin and Ren 2023a). This approach may overlook broader structural and systemic factors that also play a significant role in determining healthcare access and utilization, such as healthcare policies, institutional practices, and socio-economic disparities (Solanke *et al.* 2023). While Andersen's model does consider individual-level factors, it does not fully capture the complexity of the healthcare system and the various barriers that individuals may face in accessing care (Roh *et al.* 2023; Solanke *et al.* 2023). To gain a more comprehensive understanding of healthcare utilization, it is important to consider these broader factors that can influence access and utilization (Park and Chung 2023).

The model has been criticized for its emphasis on individual-level factors and its potential oversight of broader social determinants of health, social and economic inequalities, environmental factors, and

cultural influences that play a critical role in shaping healthcare utilization patterns and should be more prominently incorporated into the model (Nagdev *et al.* 2023). These social determinants have a significant impact on individuals' access to and utilization of healthcare services. Factors such as education level, socio-economic status, transportation availability, and community resources can all influence healthcare utilization (Roh *et al.* 2023). Additionally, cultural beliefs, language barriers, and discrimination can affect individuals' willingness and ability to seek healthcare services. The Andersen Health Care Utilization Model recognizes that the concept of need is socially constructed and differentiates between perceived and evaluated needs (Alhalaseh *et al.* 2023). Perceived need is shaped by individuals' health beliefs and their perception of the severity of their condition, whereas evaluated need provides a more objective assessment of need. While the model has some limitations, such as its treatment of health care utilization as a binary outcome and its oversight of the variety of assistance sources, including informal ones, other models of help-seeking behavior do account for the significance of various aid sources, including informal ones (Mackenzie and Pankratz 2022; Thoits 2022; Alhalaseh *et al.* 2023).

Healthcare usage is a multifaceted process influenced by several factors that can fluctuate over time. These factors encompass shifts in health conditions, significant life events, and alterations in healthcare policies. Critics argue that Andersen's Behavioral Model of Health Services Utilization might not adequately grasp the intricate nature of healthcare usage due to its static characteristics. While the model concentrates on predisposing, enabling, and need factors, it overlooks the dynamic aspect of healthcare usage (Nagdev *et al.* 2023). For instance, it may neglect to incorporate how changes in health status or life circumstances can affect an individual's choice to access healthcare services. Moreover, alterations in healthcare policies and accessibility can modify usage patterns. The model's focus on objective measures of need may overlook subjective experiences and preferences of patients in seeking health care services. Patient-centered factors, such as patient satisfaction, trust in providers, and cultural beliefs, should be more explicitly considered in Andersen's Behavioral Model of Health Services Utilization to understand healthcare utilization patterns (Xin and Ren 2023a).

Andersen's model provides a general framework for understanding healthcare utilization, but critics argue that its applicability may be limited across diverse populations with unique cultural, social, and economic contexts (Solanke *et al.* 2023; Xin and Ren 2023a). Overall, Andersen's Behavioral Model has been a valuable tool for understanding healthcare utilization, it is important to recognize its limitations and consider alternative frameworks that may provide a more comprehensive understanding of healthcare access and utilization.

4.3.6 Justification of the Model

Andersen and Newman's Health Care Seeking Behavior Model has found applications across various settings, demonstrating its effectiveness in comprehending and predicting the use of healthcare services (Malik *et al.* 2022). Employing this model has investigated the health-seeking patterns of diverse populations, such as scavengers, a tribal community in India, primary care patients dealing with depression, elderly individuals in China, and women seeking health information online (Podder *et al.*

2021; Alhalaseh *et al.* 2023). These studies have highlighted many factors influencing healthcare-seeking behavior, including financial considerations, proximity to health facilities, insurance coverage, perception of illness severity, level of knowledge, societal stigma, satisfaction with life, and psychological aspects. The model's capacity to encompass a broad spectrum of factors underscores its value in elucidating and addressing healthcare utilization patterns. The Model is advantageous in understanding the factors that influence healthcare-seeking behavior, providing a comprehensive framework for analyzing the predisposing, enabling, and need factors that shape individuals' decisions to seek healthcare (Quao and Kretchy 2022; Alhalaseh *et al.* 2023). It helps identify the various factors influencing healthcare-seeking behavior, such as self-rated severity of illness, distance to health facilities, patient classification, knowledge, stigma, and life satisfaction. By considering these factors, healthcare providers and policymakers can develop targeted interventions and health promotion campaigns to encourage appropriate healthcare-seeking behavior (Jahnke *et al.* 2022). The model also highlights the importance of raising awareness and empowering healthcare professionals to screen for specific health conditions, such as depression, to ensure that individuals receive the necessary care (Nagdev *et al.* 2023). Andersen and Newman's model provides a valuable framework for understanding and addressing healthcare-seeking behavior.

Andersen puts his efforts into building a model that determines conditions that assist or impede healthcare service utilization by people. This model is flexible and offers a strong analytical structure for discussion, and the variables are testable and applicable in diverse locations, and it is the most regularly used tool to identify factors associated with health services utilization (Andersen 1995; Alkhawaldeh *et al.* 2023). According to Alkhawaldeh *et al.* (2023) the model is a multilevel model including personal and circumstantial contributing factors of health services utilization that is extensively accepted and applied in developed nations.

The management of stillbirth is a complex issue, with a range of risk factors and behaviors influencing its occurrence. Andersen and Newman's Health Care Seeking Behavior Model can be applied to this context, as it emphasizes the role of individual and environmental factors in shaping health behaviors (Sánchez *et al.* 2021). Studies by Sánchez *et al.* (2021); (Quaresima *et al.* 2022) have all highlighted the importance of targeting modifiable risk factors, such as smoking and substance use, in stillbirth prevention. However, the challenge lies in effectively implementing behavior change interventions (Farrales *et al.* 2020). Andersen and Newman's Health Care Seeking Behavior Model has been used in several studies related to maternal and neonatal healthcare-seeking behavior and in the context of stillbirth management, the model can provide insights into the factors influencing health-seeking behavior and the utilization of health services. Studies have highlighted the importance of understanding individual explanatory models for stillbirth and the influence of local perceptions on health-seeking behavior (Tesfaye *et al.* 2022). Factors such as knowledge of neonatal danger signs, postnatal care follow-up, decision-making power, and health insurance are significantly associated with appropriate healthcare-seeking behavior for neonatal danger signs (Christou *et al.* 2023). The model can be used to identify the predisposing, enabling, and illness-level factors that determine health-seeking behavior during the antenatal, intranatal, and postnatal periods (T Priyadharsini 2018). By considering these

factors, interventions can be designed to promote care-seeking behaviors and reduce the risk of stillbirth (Pushpalata and Chandrika 2017).

4.4 CONCEPTUAL FRAMEWORK

The conceptual framework integrates the Precede-Proceed Model with Andersen and Newman's Health Care Seeking Behavior Model, creating a holistic approach to understanding and addressing the persistently high rates of stillbirths in the Lejweleputswa Municipality. This integrated framework underscores the multifaceted nature of maternal health outcomes, emphasizing the interplay between individual, systemic, and socio-economic factors. At the core, attitude towards maternal healthcare emerges as a crucial independent variable. This refers to both the attitudes of healthcare providers and pregnant women towards maternal care services. Positive attitudes can lead to better health-seeking behaviors and adherence to maternal care protocols, while negative attitudes can result in disengagement or delays in seeking care (Moshi, Kibusi and Fabian 2020). This attitude directly influences practices related to antenatal care, a vital determinant of maternal health outcomes. For example, healthcare providers who hold positive attitudes are more likely to provide consistent, empathetic care, and pregnant women who understand the importance of antenatal visits are more likely to attend them regularly. As these practices become routine, they significantly shape maternal and infant health outcomes, including the reduction of stillbirths.

Knowledge of stillbirth serves as another independent variable. Healthcare providers' understanding of the causes and prevention strategies for stillbirths plays a crucial role in improving antenatal practices. Enhanced knowledge equips providers with the skills to identify risk factors, offer relevant advice, and provide timely interventions, all of which are critical in reducing stillbirth rates (Gandhi and Page 2023). Well-informed healthcare workers are better able to screen for complications, educate pregnant women on warning signs, and act promptly when risks are identified. Thus, the depth of stillbirth knowledge among healthcare providers directly influences the quality of antenatal care practices and, by extension, maternal outcomes (Ota *et al.* 2020b). On the other hand, socio-economic factors, such as maternal age, income level, and literacy, exert a significant influence on both antenatal care practices and infant outcomes. Women with higher income and literacy levels are generally more informed about the importance of antenatal care and are better equipped to access services. Conversely, low-income women or those with limited education may face barriers such as transportation difficulties or a lack of understanding about the importance of regular check-ups, which can increase the likelihood of adverse maternal outcomes, including stillbirth.

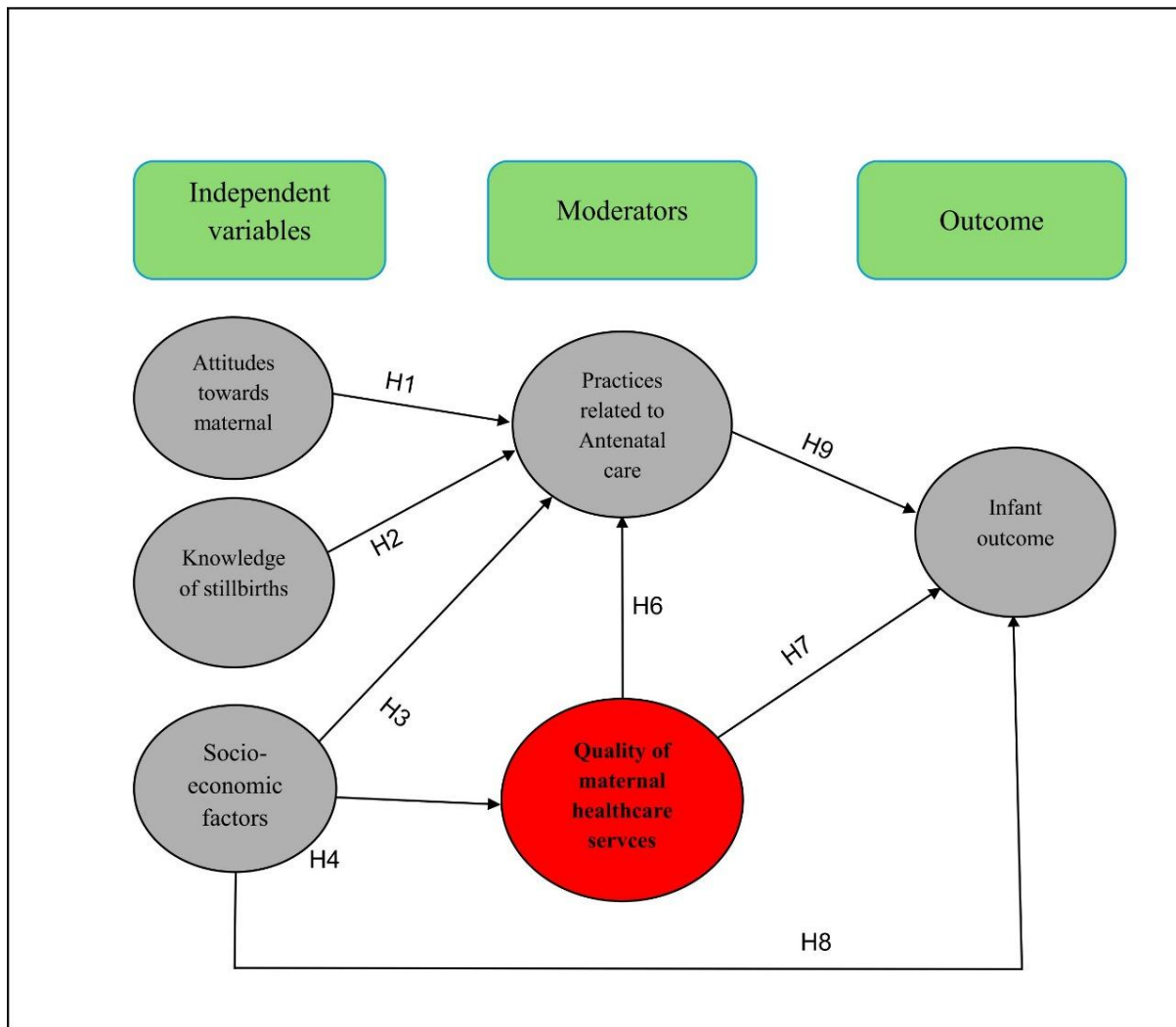


Figure 4. 5: Conceptual framework

Source: Self-generated by researcher

Within this framework, practices related to antenatal care and the quality of maternal healthcare services act as moderators that critically determine maternal and infant outcomes. Effective antenatal care practices, such as regular check-ups, proper screening for complications, and timely referrals, directly mitigate the risks of stillbirth. Meanwhile, the quality of maternal healthcare services, including the availability of skilled staff, infrastructure, and resources, enhances the efficacy of antenatal care practices. High-quality services ensure that healthcare providers can apply their knowledge effectively, while low-quality services can undermine even the best antenatal practices.

The conceptual framework provides a comprehensive understanding of the dynamic factors influencing maternal health outcomes, particularly stillbirths. From this framework, interview questions and structured questionnaires are derived, aligning with the study's objectives and research questions. These tools are designed to assess healthcare providers' attitudes, knowledge, and practices, as well as the socio-economic conditions of the community, to offer actionable insights into improving maternal care and reducing stillbirth rates in the Lejweleputswa Municipality.

4.5 THEORETICAL CONTRIBUTION OF MODELS OF THE RESEARCH

The growing recognition, in both developed and developing countries, that providing education and knowledge at the individual level is not sufficient to promote a behavior change (MacKian 2003). The application of the Precede-Proceed Model and Andersen and Newman's Health Care Seeking Behavior Model in a rural district that has not been previously utilized can bring several contributions and advantages and seek to cover the gap in stillbirth and current interventions in Lejweleputswa District Municipality. Over the years, a range of studies have explored the factors contributing to maternal mortality and stillbirths in South Africa. A study by Udjo and Lalthapersad-Pillay (2014) utilized the Growth Balance Method and the relational Gompertz model to estimate maternal mortality at national and provincial levels, identifying maternal infections and parasitic diseases as major causes. However, the model Growth Balance Method (GBM) is only used to assess fetal growth and well-being and there are other determinants of stillbirth apart from fetal-related issues. A multi-country study conducted by Ahmed *et al.* (2018) conducted, highlighted the need for intensified efforts to reduce mortality rates. According to Goldenberg *et al.* (2018) Lives Saved Tool (LiST) model estimates potential lives saved through interventions, with the latter focusing on stillbirths. This was the case from Group (2008) using the same model emphasized the importance of mortality audit data for decision-making, while Michalow *et al.* (2015) assessed the impact and cost-effectiveness of 13 interventions to prevent stillbirths and maternal and neonatal mortality. Mmusi-Phetoe (2016) identified poverty as a key determinant of maternal and neonatal mortality, and Pattinson (2003) highlighted avoidable factors and substandard care in perinatal deaths. These studies collectively underscore the need for a multi-faceted approach, including improved data collection, targeted interventions, and addressing social determinants. The Lives Saved Tool (LiST) has been criticized in the context of maternal health care in South Africa, Nkwanyana and Voce (2019) decision support tools, LiST, are not suitable for strengthening decision-making in district hospitals. This is further complicated by cultural factors, such as the perception of heavy bleeding as a cleansing process Marabele *et al.* (2020), and the effectiveness of community-based interventions in reducing maternal mortality (Orjingen and Morgan 2020). The Growth Balance Method is often used in conjunction with other diagnostic tools and assessments to provide a more comprehensive understanding of fetal growth and well-being.

A study by Taylor *et al.* (2020) used The Child Health and Mortality Prevention Surveillance (CHAMPS) Network to provide detailed data on the contributory causes of stillbirth and child mortality, highlighting the importance of specific interventions. Machine learning models have been used to identify factors associated with neonatal mortality, including birth frequency and household size in a study by (Ogalllo *et al.* 2020). However, the model is designed to investigate and understand the causes of child mortality and does not deliver good results in terms of maternal mortality prevention interventions. Spatial and Bayesian network analyses have revealed disparities in maternal mortality, with gender inequities and the proportion of skilled birth attendants identified as key determinants (Yaya, Anjorin and Adedini 2021). The importance of completing recommended antenatal care utilization has been emphasized, with disparities in coverage and determinants identified in a study by Tessema *et al.* (2021), however, this was not inclusive of cultural and demographic factors, and other variables such as post-delivery

bleeding, hypertension, and HIV, were found to contribute to maternal mortality in rural villages.

Several models and strategies have been proposed to address maternal mortality in South Africa, reflecting a multi-dimensional approach to improving maternal health outcomes. These proposals highlight diverse interventions, factors, and methodologies. Various models have been suggested to address maternal mortality in South Africa. According to Pagel *et al.* (2009) a combination of community-based drug provision and strengthening health facilities significantly reduces maternal deaths from post-partum hemorrhage and sepsis. A study by Chola *et al.* (2015) emphasizes the potential impact of scaling up family planning, particularly through promoting modern contraceptive use, to reduce both maternal and child mortality. Studies by Buor and Bream (2004) stress the significance of skilled health personnel, national economic wealth, and increased health expenditure as crucial factors in decreasing maternal mortality rates but the stillbirth remains high. Despite these recommendations, Damian *et al.* (2019) notes conflicting reports on maternal and neonatal mortality estimates in South Africa, indicating a need for more accurate estimation techniques. According to Orjine and Morgan (2020); (Bossman, Johansen and Zanaboni 2022) highlights the effectiveness of mHealth interventions and community-based approaches, respectively, in reducing maternal mortality across Sub-Saharan Africa, including South Africa.

In Lejweleputswa District Municipality, the employment of the Precede-Proceed Model and Andersen and Newman's Health Care Seeking Behavior Model in addressing stillbirth within public health management in Lejweleputswa District Municipality is significant and multifaceted. The use of the PPM can help identify the risk factors for poor postnatal outcomes, including mental health disorders, in postnatal women and their babies, with a focus on HIV (Rees *et al.* 2022). PPM was used as a theoretical framework to guide health promotion strategies to prevent chronic diseases and improve the quality of life and if it can be used for prenatal interventions as a framework it can reduce the rate of mortality drastically.

The model can aid in strengthening postnatal care to address dominant risks such as socio-economic challenges, HIV, hypertension, and mental health risks (Kim *et al.* 2022). Andersen and Newman's Health Care Seeking Behavior Model can be utilized to understand the experiences of facility managers and mental health service users in rural clinics and to identify challenges and potential solutions for integrating mental health care into routine primary health services (Rall and Swartz 2023). The Precede-Proceed Model provides a comprehensive framework that allows for a systematic assessment of the factors contributing to stillbirth, incorporating both predisposing, enabling, and reinforcing factors. Andersen and Newman's Health Care Seeking Behavior Model, with its focus on individual, environmental, and healthcare system factors, complements the Precede-Proceed Model by offering a nuanced understanding of the behavioral determinants influencing healthcare-seeking behavior related to stillbirth that will help public health managers in enforcing evidence based interventions to reduce stillbirth. Andersen and Newman's Health Care Seeking Behavior Model can be utilized to understand the experiences of facility managers and mental health service users in rural clinics and to identify challenges and potential solutions for integrating mental health care into routine primary health services.

The model provides a framework for analyzing the factors that contribute to behavioral deviations among chronic disease patients who originally intended to visit primary health care (PHC) institutions (Wu *et al.* 2023). It also highlights the challenges faced in the integration of mental health care into routine primary health services, including treatment delivery and patient experiences (Rall and Swartz 2023). By examining the factors associated with health-seeking behavior, the model can help identify the reasons why individuals seek or do not seek healthcare services, such as physical, socio-economic, cultural, and knowledge-related factors (Zgambo *et al.* 2024). Additionally, the model can be used to predict actual help-seeking behavior among individuals with depressive symptoms, considering factors such as stigma, treatment experiences, and attitudinal variables (Quao and Kretchy 2022).

Andersen and Newman's model provides a comprehensive approach to understanding and addressing healthcare-seeking behavior in various contexts. This dual-model approach facilitates a thorough examination of why individuals may or may not seek appropriate care during pregnancy. Both models emphasize community participation, encouraging the active involvement of local communities in the identification of health priorities and the design of interventions the inclusion of demographic factors in this dual model approach will help fill the gap that is there when utilizing the PPM model. The Health Care Seeking Behavior Model helps to understand the behavioral part of pregnant women from a demographic point of view. This is particularly relevant in a South African rural context, where community engagement is crucial for the success of public health initiatives.

4.6 INTEGRATION OF THE PRECEDE-PROCEED AND ANDERSEN AND NEWMAN'S HEALTH CARE SEEKING BEHAVIOR MODEL

Integrating the Precede-Proceed Model and Andersen and Newman's Health Care Seeking Behavior Model can offer a comprehensive framework to address the objectives related to stillbirth and maternal mortality in Lejweleputswa Municipality. Two theoretical frameworks that can be integrated to achieve these objectives are the Precede-Proceed Model and Andersen and Newman's Health Care Seeking Behavior Model. The synergy of these models provides a structured method to investigate the underlying causes of stillbirths, examine socio-economic influences, assess the awareness and utilization of antenatal services, analyze healthcare providers' practices, and evaluate the current state of maternal healthcare services. Table 4.1 is a diagram that combines elements of both models to address the specified objectives.

Table 4. 1: Integration of the Precede-Proceed and Andersen and Newman's Health Care Seeking Behavior Model on Stillbirth Reduction

Objective addressed through the integration of models	Precede-Proceed Model	Andersen and Newman's Health Care Seeking Behavior Model	Key Actions
a. Investigate causes of stillbirths	Phase 1 & 2 (Social & Epidemiological Assessment)	Environment, Need Factors	Identify social and epidemiological determinants.
b. Examine socio-economic factors	Phase 1 & 2 (Social & Epidemiological Assessment)	Environment, Need Factors	Analyze socio-economic impacts on care quality.
c. Assess awareness/utilization	Phase 3 (Educational/Ecological Assessment)	Predisposing, Enabling Factors	Survey knowledge and access to services.
d. Analyze healthcare provider practices	Phase 3 (Educational/Ecological Assessment)	Population Characteristics	Evaluate attitudes and practices of providers.
e. Examine maternal healthcare services	Phase 2 & 4 (Epidemiological & Policy Assessment)	Environment, Enabling Factors	Assess infrastructure, staffing, and service delivery.

Source: Self-generated by researcher

The PP model is a thorough framework for creating and assessing health interventions, especially in the realm of maternal and newborn health (King *et al.* 2014). This model has proven effective in enhancing health knowledge among diverse groups (Kim *et al.* 2022). When combined with frameworks such as Andersen and Newman's Health Care Seeking Behavior Model, it provides a comprehensive method for tackling complex health issues like stillbirths (Singh *et al.* 2022). Effective interventions frequently involve community-based strategies including training maternal health workers and offering incentives for deliveries at healthcare facilities (Satti *et al.* 2012). It is essential to address modifiable risk factors, improve the quality of antenatal care, and promote health-seeking behaviors to reduce stillbirths (Matvienko-Sikar *et al.* 2023). Systems analysis techniques, such as group model building, are useful for identifying key drivers of health system performance and pinpointing areas for improvement (Lembani *et al.* 2018).

Integrating the PP Model and Andersen and Newman's Health Care Seeking Behavior Model provides a robust framework for addressing the complex issue of stillbirths in the Lejweleputswa Municipality. These models complement each other by offering a comprehensive understanding of the determinants of health behavior and outcomes, from individual to systemic levels (Singh *et al.* 2022). By applying this integrated approach, we can develop effective interventions to reduce stillbirth rates, improve the quality of antenatal care, enhance awareness and utilization of healthcare services, and strengthen the capacity of healthcare providers. Ultimately, this synergy of theoretical frameworks holds promise for achieving significant improvements in maternal and child health in rural South Africa.

4.6.1 Investigating underlying causes and determinants of stillbirths in Lejweleputswa Municipality

Integrating the Precede-Proceed Model with Andersen and Newman's Health Care Seeking Behavior Model offers a comprehensive framework for understanding and addressing the high rates of stillbirths in Lejweleputswa Municipality. This combined approach allows the study to examine both the broader determinants of health and the specific factors that influence healthcare-seeking behaviors, providing a holistic view of the challenges and opportunities in preventing stillbirths. The integration begins by aligning the assessments from both models to create a detailed profile of the determinants of stillbirths in the municipality. The social, behavioral, and environmental assessments from the PPM model are used to identify the wider social and environmental factors that contribute to poor maternal health outcomes. These factors are then analyzed alongside the predisposing, enabling, and need factors from Andersen and Newman's model, which focuses on the specific reasons why mothers may or may not seek prenatal care (Li, Li and Jiang 2023). By combining these assessments, the study can map out a comprehensive picture of the various influences on maternal health, from systemic issues like healthcare infrastructure to individual factors like cultural beliefs and attitudes toward pregnancy.

Once the determinants are fully understood, the next step is to design targeted interventions that address both the systemic issues identified through the PPM model and the specific healthcare-seeking behaviors highlighted by Andersen and Newman's model. For instance, if the assessments reveal that limited access to healthcare facilities (an enabling factor) is a significant barrier, interventions could focus on improving transportation options or increasing the availability of local clinics. Simultaneously, educational campaigns could be developed to change attitudes and beliefs about prenatal care (predisposing factors), ensuring that more women understand the importance of regular check-ups during pregnancy. This dual approach ensures that interventions are not only addressing the practical barriers to healthcare but also the underlying attitudes and behaviors that influence whether mothers seek care.

Finally, the integration of these models enhances the evaluation process. The impact and outcome evaluation phases in the Precede-Proceed Model are enriched by incorporating measures of

healthcare-seeking behavior, as detailed in Andersen and Newman's model. This allows for a more nuanced understanding of how interventions work. For example, the study can track whether improvements in healthcare access are leading to increased prenatal care visits and whether educational campaigns are changing attitudes and behaviors in a meaningful way. By closely monitoring these outcomes, the study can make informed adjustments to the interventions, ensuring they are as effective as possible in reducing stillbirth rates.

This integrated approach provides a powerful tool for addressing the high stillbirth rates in Lejweleputswa Municipality. By combining the strengths of both models, the study can tackle both the immediate causes of stillbirths and the root social, behavioral, and systemic factors that contribute to poor maternal health. This leads to more sustainable and effective public health outcomes, ultimately improving the health and well-being of mothers and babies in the community.

4.6.2 Examining the effect of socio-economic factors on the quality of antenatal care and antepartum stillbirth

Integrating the Precede-Proceed Model with Andersen and Newman's Health Care Seeking Behavior Model offers a holistic framework for examining how socio-economic factors influence the quality of antenatal care and their subsequent impact on antepartum stillbirth rates. This integrated approach enables a comprehensive analysis beyond individual behaviors to encompass the broader socio-economic context and the structural barriers that affect maternal health outcomes. Both models underscore the significance of understanding the predisposing and enabling factors that shape healthcare behaviors. The integration allows for an in-depth exploration of socio-economic status, education, and access to healthcare services, which are critical in determining the quality and utilization of antenatal care. By combining the frameworks, the study can also consider reinforcing factors such as social and family support, which can play a crucial role in encouraging or discouraging the use of healthcare services. This comprehensive analysis helps identify not only the barriers but also the facilitators that can be leveraged to improve antenatal care and reduce stillbirths.

A key contribution of Andersen and Newman's model is the focus on the perceived need for care, which is essential in understanding why some women may not seek antenatal care even when it is accessible (Tolera, Gebre-Egziabher and Kloos 2020). Integrating this with the educational and diagnostic components of the precede phase allows for a deeper examination of women's awareness and knowledge about the importance of antenatal care. According to Zhang, Chen and Zhang (2019), this helps to identify gaps in understanding and misinformation that may lead to inadequate care-seeking behaviors. By addressing these gaps through targeted educational interventions, the study can promote greater utilization of antenatal services among at-risk populations.

The proceed phase of the PPM model aligns well with the implementation strategies outlined in Andersen and Newman's model, focusing on organizing healthcare services and developing policies to enhance the accessibility and quality of antenatal care. By identifying the socio-economic barriers, such as transportation challenges or financial constraints, the integrated approach allows for the development of targeted policies that address these obstacles. For example, policies could be designed to improve transportation to healthcare facilities or to subsidize antenatal care for low-income families, ensuring that all women have access to the care they need during pregnancy.

The integrated approach provides a robust framework for evaluating the effectiveness of interventions aimed at improving antenatal care quality and reducing antepartum stillbirth rates. This evaluation goes beyond immediate health outcomes to include an assessment of the broader socio-economic and behavioral changes resulting from the interventions. By tracking changes in healthcare-seeking behavior, access to services, and maternal health outcomes, the study can determine the impact of the interventions and make data-driven adjustments to enhance their effectiveness. This comprehensive evaluation ensures that the interventions not only address the current challenges but also lead to sustainable improvements in maternal and child health in the Lejweleputswa Municipality. Integrating the PPM Model with Andersen and Newman's Health Care Seeking Behavior Model offers a comprehensive framework for examining the socio-economic determinants of antenatal care quality and their impact on antepartum stillbirth. This approach facilitates a deeper understanding of the complex interactions between individual, social, and systemic factors, enabling the development of targeted interventions to improve maternal and child health outcomes.

4.6.3 Assessing the awareness and utilization of antenatal and obstetric services among pregnant women in the district

Integrating the PPM Model with Andersen and Newman's Health Care Seeking Behavior Model provides a comprehensive framework for assessing the awareness and utilization of antenatal and obstetric services among pregnant women in the district. Integrating the two models offers a comprehensive framework for improving antenatal and obstetric service utilization. The assessment phase of the PPM Model facilitates a thorough evaluation of the social, epidemiological, behavioral, and environmental factors that influence healthcare-seeking behavior (Ssegujja, Ddumba and Andipartin 2021). This is particularly useful when aligned with the predisposing, enabling, and need factors outlined in Andersen and Newman's model, as it provides a holistic understanding of the barriers and facilitators that affect pregnant women's access to and use of maternal health services (Tolera, Gebre-Egziabher and Kloos 2020).

During the intervention design and implementation phase, the insights gained from this assessment can be directly applied to create a targeted intervention (Nishimwe, Mchunu and

Mukamusoni 2021b). In their study Nishimwe, Mchunu and Mukamusoni (2021b) gave examples of, educational campaigns that might be developed to increase awareness and knowledge, addressing predisposing factors such as beliefs and attitudes toward healthcare. Simultaneously, initiatives aimed at improving transportation, reducing costs, or enhancing the availability of healthcare services can address enabling factors, thereby reducing practical barriers to accessing care (Parlas and Eryilmaz 2022). The evaluation phase can be observed in both models and can be used to measure the effectiveness of these interventions (Kabir 2021). This includes assessing how well the interventions increase awareness and utilization of antenatal and obstetric services and understanding the specific role that changes in predisposing, enabling, and need factors play in driving these outcomes. The integrated approach not only enhances our understanding of the complex dynamics involved in accessing maternal health services but also ensures that interventions are tailored to the unique needs and conditions of pregnant women in the district. This integrated approach holds the potential to significantly improve maternal and child health outcomes.

4.6.4 Analyzing healthcare providers' knowledge, attitudes, and practices regarding stillbirth prevention

The integration of the PPM Model with Andersen and Newman's Health Care Seeking Behavior Model provides a comprehensive framework for analyzing and enhancing healthcare providers' knowledge, attitudes, and practices (KAP) regarding stillbirth prevention. Combining the phases and constructs of these two models, the study can effectively assess individual and systemic factors that influence provider behavior. In particular, the predisposing factors which include healthcare providers' knowledge and attitudes can be thoroughly examined using the educational assessment phase of the PPM Model, informed by Andersen and Newman's framework. This allows a deeper understanding of how healthcare providers perceive stillbirth prevention and their attitudes toward implementing necessary practices. The enabling factors from both models underscore the importance of organizational resources, training opportunities, and institutional support in shaping providers' practices. This highlights how access to resources and the availability of ongoing training can influence the quality-of-care that providers deliver in preventing stillbirths. On the other side, the need factors guide the development of interventions that address the perceived gaps in practice and response to stillbirths. This aspect of the integrated model ensures that interventions are not only informed by the providers' current capabilities and resources but also by the critical areas where improvements are necessary to enhance stillbirth prevention efforts.

The integration of the PPM Model with Andersen and Newman's Health Care Seeking Behavior Model offers a robust and holistic approach to improving healthcare providers' KAP regarding stillbirth prevention. By addressing individual and systemic factors, this integrated framework supports the development of targeted, evidence-based interventions that can significantly enhance maternal and child health outcomes.

4.6.5 Examining maternal healthcare services in the Lejweleputswa District Municipality, including infrastructure, staffing, and service delivery

The merging of the PPM Model with Andersen and Newman's Health Care Seeking Behavior Model provides a comprehensive approach to examining and improving maternal healthcare services in the Lejweleputswa District Municipality. This integration allows for a detailed assessment of the various factors influencing healthcare-seeking behavior and enables the design of targeted interventions to address these factors effectively. Predisposing factors, such as cultural beliefs and education levels, play a critical role in shaping how women in the district perceive and engage with maternal healthcare services. By incorporating educational programs and community outreach initiatives into the intervention design, these predisposing factors can be addressed to improve awareness and change attitudes toward maternal health. This ensures that women are better informed about the importance of accessing healthcare services during pregnancy. Enabling factors, including healthcare infrastructure and the availability of trained healthcare providers, are essential for ensuring that services are accessible and affordable for all women in the district. The enhancement of these enabling factors such as improving healthcare facilities, increasing the number of trained professionals, and ensuring affordability of the intervention can remove practical barriers that may prevent women from seeking care. The need factors focus on raising awareness about the importance of maternal healthcare and addressing both perceived and actual needs through targeted health communication strategies. This involves creating campaigns and interventions that resonate with the community, ensuring that women understand the critical need for regular antenatal visits and skilled care during childbirth.

Bring the PPM Model with Andersen and Newman's Health Care Seeking Behavior Mode to make one solid model, this approach offers a holistic framework for identifying and addressing systemic barriers and individual behaviors that impact maternal healthcare utilization. This comprehensive strategy supports the development of more effective interventions, enhances service delivery, and ultimately leads to improved maternal health outcomes in the Lejweleputswa District Municipality.

4.7 CONCLUSION

The Precede-Proceed Model emerges as a valuable tool in maternal stillbirth literature, providing a structured and systematic approach to understanding, predicting, and addressing the multifaceted factors contributing to stillbirth. PPM presents a valuable and comprehensive framework for addressing maternal stillbirth. Various studies have applied the model to understand, predict, and intervene in the complex dynamics surrounding stillbirth within maternal healthcare. The model has demonstrated effectiveness in improving knowledge, skills, and behaviors related to prenatal care and birth preparedness, thereby contributing to the reduction of stillbirth risks. This study will implement efforts focusing on refining the model's application, considering demographic factors, and fostering collaborative efforts to overcome the challenges identified in other studies. Despite these challenges, the studies underscore the model's potential to guide tailored interventions and improve maternal healthcare outcomes related to stillbirth. Addressing the identified challenges, adapting the model, and

ensuring continuous evaluation and adaptation are crucial for maximizing its impact, and more importantly, the model addresses with study objectives.

Moving into the proceed phase, researchers can assess the policies, regulations, and organizational structures that impact stillbirth prevention efforts. Implementation strategies can then be developed based on these assessments. The model also emphasizes the importance of ongoing process, impact, and outcome evaluations to ensure the effectiveness and sustainability of the stillbirth prevention interventions. The PPM model facilitates a systematic approach for researchers to identify, analyze, and address problems and barriers, allowing for effective planning based on the identified issues. A key strength of the model lies in its emphasis on conducting thorough needs assessments at each stage and subsequently devising solutions that are specifically tailored to the prioritized and ranked concerns (Tabak 2000; Parlas and Eryilmaz 2022). Health promotion strategies should be employed by individuals, organizations, and communities as health goals can be accomplished through mutual efforts between participants and healthcare professionals (Kim *et al.* 2022). According to Kim *et al.* (2022), when healthcare professionals implement health promotion programs, they can identify the health risks or enrichment factors of participants, and theory-based health promotion programs are important to evaluate whether these factors are appropriate.

The exploration of maternal healthcare-seeking behavior in the context of stillbirth within public health management reveals critical insights into the complex dynamics influencing maternal outcomes. The analysis of various studies employing Andersen and Newman's Health Care Seeking Behavior Model sheds light on the multifaceted factors impacting maternal healthcare-seeking behavior and its implications for stillbirth prevention (Bhusal *et al.* 2024). The literature underscores the significance of understanding and addressing maternal healthcare-seeking behavior as a crucial determinant in the prevention of stillbirth. Demographic factors play pivotal roles in shaping the choices and patterns of seeking maternal healthcare (Bhusal *et al.* 2024). While the Andersen and Newman model provides a comprehensive framework for understanding healthcare-seeking behavior, it is crucial to recognize the challenges and criticisms associated with its application. Oversimplification of the decision-making process and the need to consider psychosocial and economic factors more comprehensively.

By applying these models, healthcare managers can optimize education behavioral, management procedures in hospitals, addressing challenges such as shortages of waste equipment and financial constraints (Adebisi *et al.* 2020; Price *et al.* 2021). Furthermore, the models can inform the implementation of perinatal audit programs, leading to sustained practice and improved health services to prevent future perinatal preventable deaths. Employing the dual model in Lejweleputswa District Municipality, barriers to accessing healthcare in a South African rural district can be identified and addressed through the application of models that provide a comprehensive approach to understanding and managing stillbirth within the context of public health (Adebisi *et al.* 2020). These models can lead to improved care-seeking behaviors, improved maternal healthcare management, and ultimately reduce stillbirth rates. Inadequacy surrounding maternity care services and health education in Lejweleputswa District Municipality is reflected in the perception of perceived professional healthcare support (PPHS)

based on trust or stigma of the medical system. The dual model approach will help with the development of targeted health education and health promotion campaigns aimed at promoting appropriate healthcare-seeking behavior based on the specific factors identified in the models.

The Precede-Proceed Model provides a systematic and comprehensive approach to health program planning. It allows for a detailed assessment of healthcare workers' experience, especially on pregnant women's needs and the factors influencing health behaviors. By integrating this model, the planning process becomes more thorough, addressing both the predisposing, enabling, and reinforcing factors that contribute to maternal mortality health issues. The Precede-Proceed Model emphasizes the importance of tailoring interventions to the specific needs and characteristics of the target population. In a Lejweleputswa District Municipality, which may have unique demographic, socio-cultural, economic, and environmental factors, this model allows for developing interventions that are more likely to be accepted and effective. Andersen and Newman's Health Care Seeking Behavior Model focuses on understanding the individual and contextual factors influencing healthcare utilization. Applying this model alongside the PPM Model provides a holistic understanding of the determinants of health-seeking behavior. This dual approach can uncover barriers and facilitators at both the community and individual levels. The Precede-Proceed Model encourages evidence-based decision-making by incorporating data and information into the planning process. This ensures that interventions are grounded in empirical evidence, making them more likely to succeed. Andersen and Newman's Model similarly encourages the use of evidence to understand health-seeking behaviors.

The ultimate advantage is the potential for improved health outcomes in the Lejweleputswa District Municipality. Through a systematic and evidence-based planning process, interventions can be designed to address the specific determinants of health issues and health-seeking behaviors, leading to positive changes in health indicators. Both models support the development of sustainable interventions. By considering the broader determinants of health and involving healthcare workers in the planning process, interventions are more likely to be culturally appropriate and accepted. This increases the likelihood of sustained positive health outcomes over the long term. The application of the Precede-Proceed Model and Andersen and Newman's Health Care Seeking Behavior Model in a rural district offers a holistic, evidence-based, and community-centered approach to health program planning. This can lead to tailored interventions that are more likely to be successful and sustainable in addressing the unique health challenges of the rural population.

Chapter 5: Methodology

5.1 INTRODUCTION

This study is on enhancing South African maternal care within the public health system, focusing on the issue of stillbirths in the Lejweleputswa District Municipality. The study aims to investigate and understand the factors contributing to stillbirths within the context of maternal healthcare in the Lejweleputswa District Municipality, particularly within the public health system. The objectives: are to investigate the underlying causes and determinants of stillbirths making Lejweleputswa Municipality experience the highest stillbirth rate and examine the effect of socio-economic factors on the quality of antenatal care and its influence on antepartum stillbirth. To assess the awareness and utilization of antenatal and obstetric services among pregnant women in the district, to analyze the knowledge, attitudes, and practices of healthcare providers regarding stillbirth prevention, and to examine the current state of maternal healthcare services in the Lejweleputswa District Municipality, including infrastructure, staffing, and service delivery.

This chapter introduces the research methodology and design utilized by the researcher to gather data pertinent to the study objectives. Conducted in the Lejweleputswa District Municipality in Welkom, the chapter delves into the selection of the population and sample. Additionally, it elaborates on the sampling methods employed for the study. Issues concerning ethical considerations; confidentiality; anonymity; limitations; reliability; and validity were also discussed at length in this chapter. It was imperative to explain how these issues were going to be observed during data collection to enable the participants to make informed decisions as to whether to participate in the study. This section elucidates the research methodology and design utilized by the researcher to gather data pertinent to the study objectives. Set within the Lejweleputswa District Municipality in Welkom, it delves into the population and sample selection, as well as the sampling techniques employed. Furthermore, ethical considerations including confidentiality, anonymity, limitations, reliability, and validity are extensively discussed, detailing how these issues will be observed during data collection to ensure informed participant decision-making regarding study participation. Additionally, the chosen method for analyzing the results is explained.

5.2 RESEARCH PHILOSOPHY

Research philosophy and paradigms play a crucial role in shaping qualitative and quantitative research approaches and outcomes. Researchers need to understand their ontological, epistemological, and methodological stances to effectively position their studies (Bhattarai 2021). These philosophical underpinnings influence how researchers approach problems and conduct their investigations (Winahyu and Piaseu 2023). The choice of research paradigm, whether positivist, interpretivist, or pragmatic, affects the research design and methodology (Handema *et al.* 2023).

Research philosophy forms the foundation for knowledge development in academic studies, guiding research approaches and methodologies (Muhaise *et al.* 2020). It encompasses ontological,

epistemological, and axiological considerations that shape how researchers investigate social phenomena (Handema *et al.* 2023). The research philosophy underpinning public health management often integrates elements of positivism and interpretivism, aligning with a pragmatic approach (Komolafe and Irinoye 2019).

The types of research philosophy include positivism, pragmatism, realism, and interpretivism (Thornhill, Lewis and Saunders 2009). Each research philosophy has a certain ontology (what assumptions are being made about reality), an epistemology (how knowledge is created, and what truths can be established), and an axiology (how values influence the perception and interpretation of realities) (Saunders et al., 2009:119). According to Ponterotto (2005: 126), also includes rhetorical structure (formulation of the report) and methodology as part of the philosophy.

Table 5. 1: Research Philosophy

Philosophy	Ontology (Nature of Reality)	Epistemology (Nature of Knowledge)	Methodology
Positivism	Objective, External Reality	Observable, Measurable Facts	Experiment, Survey, Statistical analysis
Interpretivism	Social Constructed Reality	Multiple Perspectives	Interviews, Case Studies, Ethnography
Critical Realism	Reality exists, but our knowledge is partial	Understanding underlying mechanisms	Mixed Method (Qualitative and Quantitative)
Pragmatism	Reality is both objective and subjective	Knowledge is constructed through actions	Mixed Method, Depending on Research Questions

Source: Self-generated by researcher

5.2.1 Positivism

Positivism, a research philosophy rooted in the 19th-century work of Auguste Comte, emphasizes scientific methods and objectivity (Ali, Shah and Shah 2021). According to Mustofa *et al.* (2023), it is based on the belief in an objective reality that can be empirically measured. Positivists prioritize

objectivity and the testing of hypotheses, focusing on data that can be quantified and phenomena that can be measured (Maretha 2023). This approach has been widely applied in the natural and social sciences, including health research (Pathak and Thapaliya 2022). However, positivism has been criticized for its lack of consideration for cultural and historical contexts and for overlooking ethical considerations and values (Mustofa *et al.* 2023). Critics contend that it fails to capture the essence of human experience and the complexities of the lived world (Laroussi, 2022). Despite these criticisms, positivism continues to be influential, particularly in digital research, where its focus on empirical observation aligns with the large volumes of data generated by digital technologies (Ayeni, Saman and Kasimu 2019; Mustofa *et al.* 2023).

Key Characteristics:

- Objective reality
- Deductive reasoning
- Quantitative methods
- Focus on hypothesis testing

5.2.2 Interpretivism

Interpretivism emphasizes subjectivity and views reality as socially constructed (Ali, Shah and Shah 2021). According to Ali, Shah and Shah (2021), while positivism focuses on studying social systems as independent entities, interpretivism examines social reality as a socio-cultural universe. Interpretivism is often considered more suitable for social sciences due to its emphasis on understanding human behavior and social phenomena. However, it faces criticism for potential bias and neglect of ideological influences (Pulla and Carter 2018; Irshaidat 2022). Some argue that a balanced approach incorporating both positivist and interpretivism perspectives may be beneficial for understanding complex social structures (Pulla and Carter 2018).

Interpretivism offers a powerful alternative to positivism, providing a framework for understanding the complex, subjective nature of human experience (Ali, Shah and Shah 2021). While it faces challenges related to subjectivity and generalizability, the strengths of interpretivism in providing in-depth, contextualized insights make it an invaluable approach in fields where understanding human behavior and experience is paramount (Darby, Fugate and Murray 2019).

Key Characteristics:

- Subjective reality
- Inductive reasoning
- Qualitative methods
- Focus on understanding the meaning

5.2.3 Critical Realism

Critical realism (CR) offers a philosophical framework that acknowledges an objective reality while

recognizing the influence of social and cultural contexts on our understanding (Coleman 2021). According to Coleman (2021), It proposes a stratified ontology comprising empirical, actual, and real domains. CR supports mixed-methods research, combining qualitative and quantitative approaches to explore deeper layers of reality (Mukumbang 2023). Researchers using CR often employ retroduction to identify causal mechanisms underlying observable events (Allana and Clark 2018). This approach is particularly useful in studying complex social phenomena and evaluating interventions (Koopmans and Schiller 2022). According to Koopmans and Schiller (2022), CR provides a middle ground between positivism and constructivism, allowing researchers to examine both subjective experiences and objective structures. Despite its potential, practical guidance on applying CR in research methodologies is still developing (Haris and Nasri 2023).

Key Characteristics:

- Reality exists but is imperfectly understood
- Emphasis on causal mechanisms
- Mixed methods approach
- Focus on explaining phenomena

5.2.4 Pragmatism

Pragmatism is a research philosophy centered on practical application and solving real-world problems (Kelly and Cordeiro 2020). It advocates for methodological flexibility, allowing researchers to select methods based on their research questions rather than strictly following specific paradigms (Maarouf 2019). According to Izu *et al.* (2020), pragmatism is frequently linked with mixed methods research, which integrates both qualitative and quantitative approaches. This philosophy aims to produce actionable knowledge and highlights the connection between experience, understanding, and action (Gillespie, Glăveanu and de Saint Laurent 2024). It views knowledge as an objective reality shaped by human experience (Kibria and Hasan). While pragmatism is often seen as an ideal paradigm for mixed research, critics argue that it may emphasize flexibility at the expense of clear principles, potentially leaving researchers without adequate guidance (Hampson and McKinley 2023). Nevertheless, pragmatism remains a widely adopted approach for tackling complex social issues in research (Dillon and O'Brien 2018).

Key Characteristics:

- Reality is multiple and dynamic
- Practical focus
- Combination of methods
- Focus on problem-solving

5.2.5 Research Philosophy Perspective of the Study

This study adopts a pragmatic research philosophy, a choice rooted in the belief that a flexible and results-oriented approach is the most effective way to address complex issues. As a philosophy, pragmatism emphasizes the practical application of research and the importance of using multiple

methods to understand a problem comprehensively. By integrating both quantitative and qualitative methods, this study acknowledges that while numerical data can reveal patterns and trends, it is equally important to understand the contextual and human factors that influence these patterns (Maarouf 2019). This dual approach allows the study to derive actionable insights that are both grounded in empirical evidence and sensitive to the nuances of real-world contexts (Shan 2022).

The decision to adopt a pragmatic philosophy is particularly justified in the context of maternal health research, where the complexity of the issues at hand often defies simplistic or single-method approaches. Pragmatism supports the idea that truth and knowledge are not static but evolve through practical experience and application (Kelly and Cordeiro 2020). In this study, the use of questionnaires to gather quantitative data is complemented by semi-structured interviews that explore the social, cultural, and organizational factors affecting maternal health outcomes. This combination of methods ensures that the research not only identifies key statistical trends but captures the underlying factors that contribute to these trends, leading to more effective and contextually relevant interventions (Yvonne Feilzer 2010).

The researcher aligns most closely with a pragmatic research philosophy. This perspective is grounded in the belief that, in some situations, absolute truths can be derived from empirical data, which justifies the inclusion of a quantitative element in the study through questionnaires. Simultaneously, the researcher acknowledges the importance of considering the social context, leading to the integration of a qualitative component via semi-structured interviews. Pragmatism, a philosophical movement originating in late 19th century America, emphasizes the practical consequences of ideas and actions (Korte and Mercurio 2017). Founded by Charles Sanders Peirce, it was further developed by William James and John Dewey (Galily 2023). In policy-making, pragmatism offers a framework for addressing complex social problems through evidence-informed decision-making and continuous learning (Sanderson 2009).

The researcher strongly aligns with pragmatic research philosophy, emphasizing the practical application of ideas and the value of using diverse methods to understand complex issues (Gillespie, Glăveanu and de Saint Laurent 2024). According to Gillespie, Glăveanu and de Saint Laurent (2024), this philosophy is based on the belief that, in certain situations, objective truths can be identified through empirical data. This belief underpins the study's inclusion of a quantitative component, utilizing questionnaires to gather measurable data (King 2022). However, pragmatism also recognizes the importance of context and the subjective nature of human experiences (Kelly and Cordeiro 2020). Therefore, the study incorporates a qualitative component through semi-structured interviews, allowing for a deeper exploration of social contexts and individual perspectives (Kelly and Cordeiro 2020; King 2022).

Pragmatism, a philosophical movement that emerged in late 19th century America, was initially founded by Charles Sanders Peirce and later expanded by thinkers like William James and John Dewey. This philosophy prioritizes the practical consequences of ideas and actions, viewing truth as what works best in each context (Korte & Mercurio, 2017). Dewey emphasized the importance of learning through

experience and adapting ideas based on their outcomes, making pragmatism highly relevant in fields that deal with real-world problems and evolving situations.

In healthcare research, pragmatism supports mixed-methods approaches and patient-oriented research, emphasizing the importance of context and practical outcomes (Long, McDermott and Meadows 2018). According to Long, McDermott and Meadows (2018), this paradigm is particularly relevant for addressing complex health challenges, such as maternal health, where empirical data must be considered alongside social determinants. Moreover, pragmatism encourages continuous learning and adaptation, recognizing that solutions must be flexible to remain effective in the face of changing circumstances (Sanderson 2009). This approach is particularly pertinent in maternal health research, where the interplay between empirical data and the social determinants of health must be carefully considered to develop effective interventions (Long, McDermott and Meadows 2018).

Pragmatism allows researchers to combine quantitative and qualitative methods, providing a holistic understanding of healthcare challenges (DiOrio and Crivelli-Kovach 2014). This approach is valuable in exploring maternal mortality, where both statistical trends and individual experiences are crucial (Lowe, Rod and Hwang 2020). The pragmatic philosophy emphasizes practical strategies to mitigate social issues and views knowledge as an objective reality realized through human experience (Doyle, Brady and Byrne 2009). According to Imran (2024), in maternal health, this approach can inform quality improvement methods, such as facility-based death reviews and clinical audits. By adopting pragmatic research methodologies, researchers can better understand the multifaceted factors influencing maternal mortality, including health risks, social/environmental factors, and policy issues (Souza *et al.* 2024a). This holistic approach enhances the study's relevance and applicability, particularly in complex and variable contexts like public health.

5.3 RESEARCH APPROACHES

Research approaches are foundational to the research process, reflecting underlying philosophies and guiding methodologies, with the two primary approaches inductive and deductive serving distinct purposes in research design (Haque 2022). According to Woiceshyn and Daellenbach (2018), research approaches guide the entire research process and reflect underlying philosophical perspectives.

Inductive and deductive approaches are essential in research methodologies across various fields. Inductive research begins with specific observations and develops broader generalizations, while deductive research starts with a theory and tests specific hypotheses (Kim 2021). These approaches can be utilized in both qualitative and quantitative data analysis (Galli 2019). A comparison of reasoning between the deductive and inductive approaches is illustrated in figure 5.1.

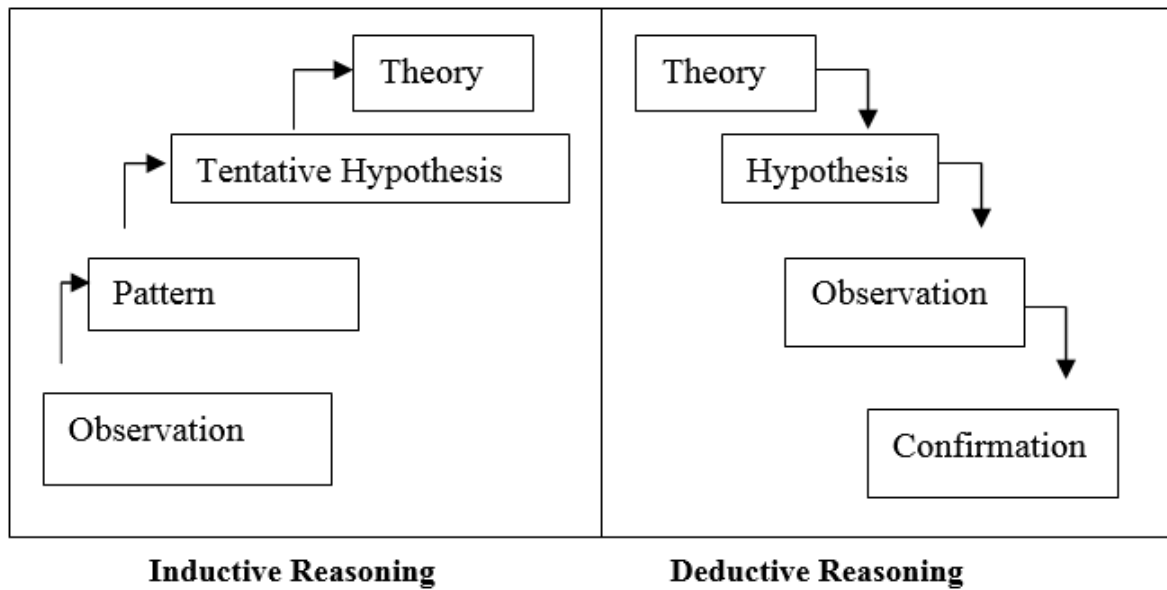


Figure 5. 1: Deductive and Inductive Reasoning

Source: Adapted from Aliyu et al. (2015)

5.3.1 Deductive Approach

The deductive approach is a top-down method that begins with a theory or hypothesis and then tests this through empirical observation (Hyde 2000). According to Hyde (2000), deductive reasoning starts with general theories and tests them against empirical data, aligning well with pragmatism's focus on applying established theories to new contexts. In this approach, researchers start with a general idea and narrow it down to a more specific conclusion by collecting data that either supports or refutes the hypothesis (King 2022). The deductive approach is particularly strong in studies where existing theories can be applied to predict outcomes or explain relationships between variables (Pearse 2019).

5.3.2 Inductive Approach

The inductive approach is a bottom-up method where the researcher begins with observations and uses these to develop new theories or insights (Eisenhardt 1989; Jebreen 2012). This approach is closely aligned with interpretivist philosophies, emphasizing understanding the meanings and experiences of participants (Corbin 2017). This approach is particularly useful in exploratory research where there is little pre-existing theory, and the goal is to develop new insights or theories based on the collected data (Krueger et al. 2024) .

5.3.3 Research Approach for the Study

The study adopts a deductive approach, a methodological choice that is guided by the need to test existing theories and hypotheses within the specific context of maternal health. Deductive reasoning begins with a general theory or hypothesis and then narrows down to more specific observations or

cases to test the validity of the original theory (Hyde 2000). In this study, the deductive approach is used to assess whether established theories about maternal mortality and healthcare interventions hold within the unique environment of the public health system in South Africa, specifically within the Lejweleputswa District Municipality. This approach is particularly appropriate because it allows the researcher to apply well-established frameworks to a new context, thereby contributing to both theory validation and practical application (Singh *et al.* 2022). According to Singh *et al.* (2022), this process enhances the rigor of the research, as it involves structured data collection and analysis procedures aimed at confirming or refining theoretical propositions.

Moreover, the deductive approach is justified in this study because it facilitates the identification of specific variables that influence maternal mortality and allows for the measurement of their impact in a controlled manner (Ellis, Schummers and Rostoker 2011). This method provides clarity and precision, as the researcher can directly test the relationships between identified variables and outcomes, leading to more definitive conclusions. By adhering to a deductive approach, the study not only contributes to the existing body of knowledge by confirming or challenging theoretical predictions but also offers practical insights that can inform policy and intervention strategies in maternal health care.

5.4 Research Strategy

The study employed a Case Study Design, this strategy focuses on a detailed investigation of maternal health within a specific geographic location (Lejweleputswa District Municipality). Concentrating on this case, the research aims to understand the unique factors affecting maternal health outcomes in this district, including healthcare practices, policies, and local challenges. The study adopts a mixed-methods approach, combining quantitative and qualitative techniques. This allows for both breadth (through statistical analysis) and depth (through in-depth interviews). The strategy ensured that numerical data from questionnaires was complemented by rich, contextual insights from interviews or focus groups.

Random Sampling was utilized for quantitative data to ensure that the sample is representative of the broader population, reducing selection bias and allowing for generalizable findings. On the other hand, purposive Sampling was employed for qualitative interviews to ensure that key informants. Those with specific experiences or knowledge about maternal health were selected to provide detailed, experienced, and relevant insights.

5.5 Research Choice

Research choice is the framework or plan that guides the methods and procedures for data collection and analysis in a research study (Wisenthige 2023). According to Wisenthige (2023), it involves determining the approach, methods, and techniques that will be used to address the research questions and objectives. The research design is developed after establishing the background, rationale, problem statement, research questions, and study objectives (Somasundaran 2022). It outlines the activities and techniques for collecting data to obtain responses to research questions (Chen and Baptista Nunes 2023). The design is influenced by factors such as the nature of the research question, assumptions,

ethical considerations, and practicalities (Debor and Debor 2018). According to Debor and Debor (2018), a research design aims to provide accurate and unbiased research insights. It can be qualitative, quantitative, or a mix of both, and can be fixed or flexible.

Research design refers to the framework or sequence of activities followed by researchers to collect information and answer research questions (Manfredi and Costi 2023). According to Manfredi and Costi (2023), it involves making decisions about the sources of data, the timing and methods of data collection, and the data analysis. The choice of research design is influenced by factors such as the novelty of the research question, the level of study and explanation, epistemological and ontological assumptions, characteristics of data sources, data analyzability, piloting results, and practical considerations (Wisenthige 2023). Different types of research designs include experimental designs, pre-experimental designs, true experimental designs, and quasi-experimental designs (Chen and Baptista Nunes 2023). Research designs can be categorized into quantitative, qualitative, and mixed methods designs, each with strengths and applications (Chen and Baptista Nunes 2023; Gieg 2023). Metatheoretical and theoretical approaches can guide the research design for a specific study and can be structured using a matrix of analysis that considers various foreign policy dimensions (Chen and Baptista Nunes 2023).

5.5.1 The Convergent Parallel Design

The convergent parallel design (CPD) is a mixed-methods research approach that involves collecting both quantitative and qualitative data concurrently, to merge or converge the two data types during the analysis (Hatta *et al.* 2020). This design allows for the exploration of complex research questions that cannot be fully answered by using a single research design (Krysa *et al.* 2023). It is beneficial for examining the relationships between different variables, as it combines the strengths of both quantitative and qualitative approaches (Sharma *et al.* 2023b). The convergent parallel design involves using quantitative instruments, such as questionnaires, to collect numerical data, and qualitative methods, such as interviews or thematic analysis, to gather in-depth insights (Mutsagondo 2022). The data collected from both approaches are then analyzed together to provide a comprehensive understanding of the research question (Palinkas 2022a). According to Palinkas (2022a), this design is especially relevant in implementation science, where the complexity of the phenomena under investigation requires a multi-faceted approach. According to Creswell (2011), the use of the convergent parallel design and he believes that this design allows the researcher to:

- Collect quantitative and qualitative data concurrently.
- Analyze the two data sets separately; and
- Mix the two databases by merging the results during interpretation.

The function of the CPD as explained by the cited authors is demonstrated in Figure 5.2 below.

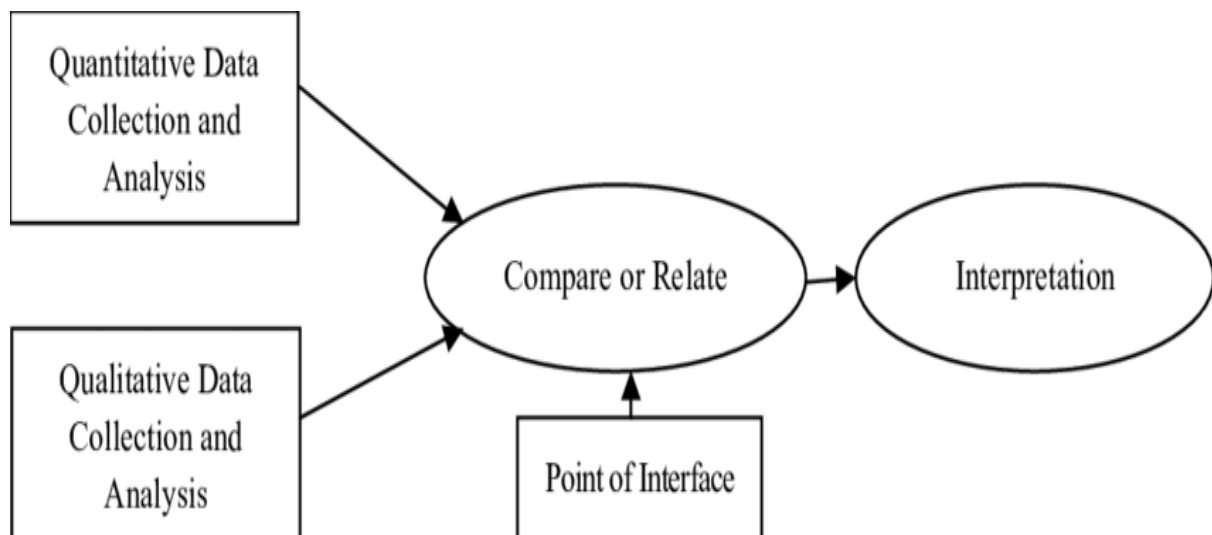


Figure 5. 2: Convergent parallel design

Source: Adapted from Creswell (2011)

5.5.1.1 Advantages of using convergent parallel mixed methods

The convergent parallel design is a research approach that is useful for exploring complex phenomena or research questions that cannot be adequately addressed using either quantitative or qualitative methods alone (Abel *et al.* 2022). The convergent parallel design is particularly beneficial when studying topics that require a comprehensive understanding and when multiple perspectives need to be considered (Hatta *et al.* 2020). According to Yammine *et al.* (2021), CPD allows researchers to gather rich and diverse data, which can lead to a more comprehensive understanding of the research topic. By using this design, researchers can integrate different types of data and gain a more holistic view of the phenomenon under investigation (Fünfroeken, Vogt and Wieker 2021).

By combining quantitative and qualitative data, researchers can gain a more comprehensive understanding of the research problem (Pratama and Mukhlis 2023). Quantitative data provide numerical and statistical insights, while qualitative data offer rich, detailed descriptions and explanations (Tachikawa and Kunii 2022). This integration of data allows researchers to explore the phenomenon under study from multiple perspectives, enhancing the validity and reliability of their findings (Kara 2023a). CPD allows for a comprehensive understanding of a research topic by combining quantitative and qualitative data (Vanstone *et al.* 2023). By integrating different types of data, convergent parallel mixed methods can enhance the validity and reliability of the findings (Veziroglu-Celik *et al.* 2023). The CPD allows for the exploration of complex relationships and the identification of patterns or trends that may not be apparent through a single method (Johnston *et al.* 2023) .

Triangulation is a research method that involves using multiple sources of data to increase the reliability and validity of research findings. The convergent parallel design, which combines quantitative and

qualitative methods, allows researchers to triangulate findings from different sources (Suleimanova and Fomina 2019). According to Suleimanova and Fomina (2019), this design helps to establish consistency or convergence between the quantitative and qualitative results, which enhances confidence in the study's conclusions. The use of triangulation in qualitative research can help minimize the weaknesses of qualitative studies and produce robust findings and conclusions (Tuzzo and Braga 2022). Triangulation can involve comparing results from different types of research, such as qualitative and quantitative studies, to identify convergence, complementarity, or divergence in the findings (Ajemba and Arene 2022b). The use of mixed methods approaches, such as integrating qualitative and quantitative data, can lead to a more holistic and nuanced understanding of complex theoretical frameworks (Wallwey and Kajfez 2023).

Integrating multiple data sources and methods can enhance the validity of research findings by providing a more robust and well-rounded analysis (Denteneer *et al.* 2020). By corroborating findings across different data types, researchers can strengthen the validity of their interpretations (Webb and Demeyere 2023). It also highlights the importance of carefully justifying every aspect of a psychometric test validation study, considering factors such as sample groups, sample sizes, test metrics, and covariate inclusions (Engelhardt *et al.* 2019).

5.5.2 Mixed methods of data collection

Mixed methods research involves the strategic combination of qualitative and quantitative methods for data collection, analysis, and interpretation (Wallwey and Kajfez 2023). It is a research approach that integrates both qualitative and quantitative research within a single study (Burzlaff, Carbon and Metzner 2023). The fundamental criteria for conducting qualitative and quantitative research must be followed when conducting mixed-methods research (Palinkas 2022a). The methods of data collection involve using both qualitative and quantitative approaches to gather and analyze data, this approach allows for a more comprehensive understanding of the research topic by combining different types of data and analysis techniques (Cataldo *et al.* 2020). According to Cataldo *et al.* (2020), the use of simulated search engine results pages in combination with multiple data collection methods is effective in studying participants' information behavior.

In mixed methods research, the researcher needs to clarify the research questions, sampling method, data collection technique, and data analysis approach (Hall and Harvey 2018). The researcher should specify whether the research questions involve both qualitative and quantitative aspects (Lisboa and Julio 2019). The sampling method used should be clearly stated, whether it is purposive sampling, quota sampling, snowball sampling, or another method (Tuckerman, Kaufman and Danchin 2020). The data collection technique employed should be described, whether it is interviews, focus groups, or the use of instruments (Jalali 2013). The process of data analysis should also be explained whether it involves interpretively linking qualitative and quantitative data sets or using transformation processes such as qualitzing and quantitizing (Sandelowski 2000; Mezmir 2020).

5.5.3 Triangulation Method

Triangulation is a research method that involves using multiple approaches or sources of data to enhance the credibility of a study (Kowalski, Mrdjenovich and Redman 2023). According to Kowalski, Mrdjenovich and Redman (2023), it is a well-established practice in social sciences and has recently been applied in linguistics as well. Triangulation can be used in various ways, such as combining theoretical, data, and methodological triangulation, or using investigator triangulation (Suleimanova and Fomina 2019). In qualitative research, triangulation is particularly important for minimizing the weaknesses of the study and producing robust findings and conclusions (Ajemba and Arene 2022a).

There are various explanations relating to an understanding of the concept of “Triangulation”. Other definitions of triangulation describe it as a concept that refers to the practice of applying multiple approaches or different sources of data to gather and analyze data to enhance the credibility of a research study (Kowalski, Mrdjenovich and Redman 2023). Triangulation is just another term for mixed methods (Wilson 2014). Furthermore, Wilson (2014) emphasized that triangulation in mixed methods involves:

- Using more than one method to gather data.
- Using different sources of data collection.
- Using several people (more than one) in the data gathering and analysis process; and
- Approaching data with various theories or perspectives in mind to extend the possibilities of producing knowledge.

Triangulation involves using both quantitative and qualitative research methods to examine data from different sources or groups, leading to a greater understanding of the phenomenon of interest (Donkoh and Mensah 2023). According to Donkoh and Mensah (2023); (Kowalski, Mrdjenovich and Redman 2023), it is a valuable tool in both quantitative and qualitative research, as it allows for the integration of multiple perspectives and the development of complementary analysis. Triangulation helps to minimize biases and distortions in interpretations, ensuring the validity and robustness of research findings (Ajemba and Arene 2022a). By considering a phenomenon from different angles, triangulation enhances the completeness of research and provides deeper insights (Suleimanova and Fomina 2019). In the field of social sciences, qualitative research in particular benefits triangulation, as it allows researchers to appreciate the unique aspects of phenomena through diverse viewpoints (Santos *et al.* 2020). Overall, triangulation is a valuable approach that can be applied in both quantitative and qualitative research to enhance understanding and validity (Tran 2015).

5.5.4 Quantitative method of data collection

Quantitative methods of data collection involve gathering numerical data and analyzing it statistically to reach conclusions (Sukmawati 2023). These methods are commonly used in research studies to measure variables, test hypotheses, and identify patterns or relationships (Kara 2023b). Researchers should have a grasp of both quantitative and qualitative data analysis methods as most projects will involve both to some degree (Wallwey and Kajfez 2023). Quantitative research employs research

designs that deal with the issue of causation and statistics that deal with the issue of chance (York 2022). Quantitative data analysis is a systematic process of collecting and evaluating measurable and verifiable data. It involves the statistical analysis of quantitative data to assess and interpret the information gathered (Perera, Nayak and Nguyen 2022). This analysis can be done using various methods such as descriptive and inferential statistics, frequency distributions, measures of central tendency and variability, parametric and non-parametric tests, and bivariate statistics (Kara 2023b). The main steps in the quantitative analysis include sampling, sample pretreatment, laboratory treatment, laboratory assay, calculation, and results (Perera, Nayak and Nguyen 2022). It also involves evaluating analytical data, assessing errors, accuracy, and precision, and expressing data using statistical tests and confidence intervals (Saini and Pipil 2023). Quantitative research methods are particularly useful for answering "how much" or "how many" questions and for generalizing findings to a larger population (Thakur 2022). They require the collection of large amounts of data, which can be efficiently managed using data collection management methods and apparatus (Sukmawati 2023).

The primary objective of a quantitative research analyst is to numerically represent a hypothetical scenario (Ali 2020). Typically, this task is undertaken by scholars who possess expertise in quantitative analysis methods, whether through manual calculations or with the aid of computer tools (Cowles 2005). This method entails posing inquiries regarding a particular subject and subsequently examining the responses. (Fowler Jr 2013) outlined the survey methodology for acquiring information about a population. It is commonly employed to gather data concerning demographics, opinions, and behaviors. Surveys also serve to ascertain consumer preferences, identify necessary services, and inform policy development. Additionally, (Fowler Jr 2013) elaborates that various techniques can be utilized to collect numerical data.

- Interview-based surveys, which could be personal face-to-face interviews and telephone interviews.
- Questionnaire-based surveys, such as mail/postal surveys, systematic observation, and web-based surveys.

The survey method can be conducted in four distinctive categories: personal interviews, telephone interviews, mail surveys, and web-based (internet) surveys (Ali *et al.* 2022a; Petkov 2022). These data collection survey methods provide different ways to contact research participants and gather information (Domede and Dinkelman 2022).

➤ **Personal interviews**

Personal interviews involve conducting face-to-face conversations with participants to gather detailed information about their experiences, perspectives, beliefs, or behaviors (Sperber *et al.* 2023). According to Sperber *et al.* (2023), researchers can access a broader segment of social movement participants and probe the biographies, motivations, emotions, and meanings of activists' actions. Personal interviews are also valuable in understanding the experiences of patients, nurses, and healthcare professionals, as well as how decisions are made and the aspects of existing interventions (Toft, Lindberg and Hörberg 2021). Geographical barriers, logistic

challenges, and emergency conditions have led to the utilization of online chat interviews as an alternative way of collecting data (Blee and McDowell 2013). However, offline, or in-person interviews are still viewed more positively than online education, as they provide social connection, learning engagement, content delivery, and time and space for effective vocational general practitioner education (Gunawan, Marzilli and Aungsuroch 2022).

Personal interviews have several advantages such as allowing direct and personal communication with the interviewee, which is important in fields such as public health management, insurance business, and medical practice (Yusoff 2020; Žarković 2020). They provide an opportunity to establish a connection and rapport with the interviewee, enabling a deeper understanding of their needs, concerns, and personality traits (Sessions 2009). Face-to-face interviews offer a personal touch, fostering empathy, warmth, and a connection that digital methods cannot replicate (Alpert 2023). Compared to other approaches, they are more flexible, facilitating detailed discussions, inquiries, and clarifications (Peasgood *et al.* 2023). Furthermore, they permit the utilization of visual aids, such as nonverbal cues like eye contact, facial expressions, and body language, enhancing communication and comprehension (Molina-Téllez *et al.* 2023). Moreover, face-to-face interviews are inclusive as they do not necessitate high literacy levels, broadening accessibility to a wider audience (Rowen *et al.* 2022). Lastly, they afford opportunities to elucidate concepts and ensure patients' active participation in their healthcare (Bavelas 2005).

➤ **Surveys**

Survey data collection is a quantitative research method that involves systematically gathering information from a sample of individuals or organizations using a standardized questionnaire or survey instrument. There are different survey data collection methods:

Telephone surveys: Telephone surveys are conducted using the telephone to collect data (Dutwin and Buskirk 2021). The question format for these surveys differs from personal interviews, and the questions need to be easily understood (Wu *et al.* 2020). The time limit for a telephone interview is typically around 10 to 15 minutes, which can limit the amount of data that can be collected (Olson, Smyth and Ganshert 2019).

Mail surveys: Mail surveys are an effective and inexpensive method of collecting information about a population. They involve sending questionnaires to respondents' postal addresses, which they fill in and post back to the interviewer. However, there are drawbacks to this method, it may not reach everyone in the target audience, limiting the representativeness of the survey results (Menold 2016). Additionally, mail surveys may have low response rates, as not all recipients may choose to participate. Despite these limitations, mail surveys can still provide valuable data, especially when combined with techniques such as personalization and social norms messaging in the invitation letter, which have been shown to increase response rates (Desselle 2002). According to Shough and Yates (2002), while mail surveys have their drawbacks, they can be a cost-effective option for collecting information from a population.

Web-based surveys: Web-based surveys have revolutionized the way data is collected, offering two main methods: computer-aided interview-administered surveys and computer-aided self-administered surveys (Liu *et al.* 2022). These surveys have advantages over traditional methods, such as increased accessibility and privacy. The versatility and potential of web-based surveys have been explored in diverse research contexts. For instance, Liu *et al.* utilized web-based cognitive tests to assess cognitive performance across different internet device types (Phoo *et al.* 2023). In their study, Phoo *et al.* (2023) devised an audio computer-assisted self-interview (ACASI) application with illustrated pictures to address literacy barriers during survey administration. According to Papautsky *et al.* (2022) communication and decision-making practices concerning non-medical switching to biosimilar trastuzumab, employing web-based surveys to gather patient and oncologist experiences. Similarly, Fang *et al.* (2021) compared the internal consistency of a web-based survey with a traditional questionnaire survey in pediatrics, underscoring the feasibility of web-based surveys in this domain.

The benefits of employing web-based surveys encompass rapid and effortless distribution of questionnaires, convenient provision of feedback to participants, cost efficiency, precise targeting of individuals, respondent convenience, reduced interviewer bias, automated data collection and analysis, and minimized instances of incomplete questionnaires (Wu *et al.* 2020). Web-based surveys have disadvantages such as confidentiality concerns, lack of anonymity, the potential for junk mail, sampling error, and limited internet access (Campbell *et al.* 2022; Grimaccia *et al.* 2023). These surveys can be conducted through structured interviews or self-completion questionnaires in the form of email or web-based surveys (Campbell *et al.* 2022).

Email surveys: Email surveys are a type of survey where a fixed questionnaire is emailed to participants as an attachment (Chowdhury, Oakkas and Ahmmed 2022). These questionnaires are user-friendly and allow respondents to simply put an "x" as their response (Khalifa 2019). Email surveys are recommended due to their convenience for both respondents and researchers (Brown 2009). Questionnaires can be sent and returned as attachments, streamlining the process (Alutto and Dodder 1969). This method accommodates open-ended questions where respondents provide written answers (Christley 2016). Email surveys offer a practical approach to online data collection (Hunt, Shlomo and Addington-Hall 2013). They offer advantages such as reduced time and cost, ease of data entry, flexible formatting options, and the ability to capture additional response-set information (Granello and Wheaton 2004).

5.5.5 Qualitative method of data collection

Qualitative research methods involve collecting data through various techniques such as interviews, observation, focus groups, and video statements (Lahiri ; Lau and Bratby 2023). These methods aim to explore complex phenomena, understand people's experiences and perspectives, and create change (Flynn 2023). Data collection in qualitative research can be done through participant observation, semi-structured interviews, and focus groups, with tools like field diaries and audio recordings (Larsen 2023). According to Mihas (2023), visual methods like diagrams and photo elicitation are emerging approaches

in qualitative research. It is focused on understanding why something happens, rather than just what happens (Lahiri ; Denny and Weckesser 2022). Qualitative researchers ask questions about the reasons behind people's actions, such as "Why did you choose to do that?" instead of simply asking about their actions (Greckhamer and Cilesiz 2022). This approach allows for a deeper understanding of human behavior and the underlying processes and mechanisms that drive it (Carter 2023).

5.5.6 Research Choice Perspective of the Study

The study employed the Convergent Parallel Design, a mixed methods research approach that allows for the simultaneous collection and analysis of quantitative and qualitative data. In this design, quantitative and qualitative data are gathered independently but concurrently, and the results are then compared and integrated to provide a comprehensive understanding of the research problem (Stern *et al.* 2021). According to Stern *et al.* (2021), this approach is useful in studies where the researcher seeks to corroborate findings from different types of data, ensuring that the strengths of one method can offset the weaknesses of the other.

In this study, the Convergent Parallel Design is justified because it provides a balanced perspective on the complex issue of maternal care and stillbirths within the public health system. The quantitative data, likely gathered through structured questionnaires, offers measurable insights into patterns, prevalence, and correlations, such as the effectiveness of current maternal care practices in reducing stillbirths. On the other hand, the qualitative data, collected through interviews or focus groups, captures the nuanced experiences, attitudes, and perceptions of healthcare workers and mothers, providing context to the statistical findings.

By converging these two types of data, the study can identify what is happening in maternal care but also why it is happening, leading to a deeper understanding of the factors influencing maternal health outcomes in the Lejweleputswa District Municipality. This design enhances the validity of the research by cross-verifying results, and it allows for a more holistic approach to addressing the public health challenge of maternal mortality and stillbirths (Tsawe and Susuman 2014).

5.6 TIME HORIZONS

The Time Horizons layer represents the temporal aspect of the research design, categorized into cross-sectional and longitudinal studies (Saunders *et al.* 2015). Cross-sectional studies collect data at a single point in time, while longitudinal studies involve repeated measurements over time (Johnson 2010). According to Heap and Waters (2019), the choice between these designs depends on the research question and available resources (Heap & Waters, 2019). The selection of an appropriate time frame is crucial for data collection and can influence sample size, sampling technique, and data analysis methods (Miller and Salkind 2002).

Researchers emphasize the importance of selecting appropriate time horizons based on research objectives and practical considerations (Butler *et al.* 2022). The choice between cross-sectional and longitudinal approaches impacts data analysis techniques, sampling methods, and the ability to capture

temporal dynamics in various fields, including tourism and supply chain management (Maier *et al.* 2023).

5.6.1 Cross-Sectional Time Horizon

Cross-sectional studies are observational studies that collect data at a single point in time, providing a snapshot of a population or phenomenon (Zuleika 2022). According to Wang and Cheng (2020), they are widely used in medicine, public health, and criminology to measure prevalence, analyze health characteristics, and describe populations. Cross-sectional studies are relatively inexpensive, time-efficient, and easy to conduct compared to other study designs (Setia 2016). They are useful for establishing preliminary evidence and planning future research (Zuleika 2022). However, cross-sectional studies have limitations, including the inability to establish causal relationships and potential selection bias (Johnson 2010). Despite these drawbacks, cross-sectional studies remain valuable for measuring prevalence, understanding health determinants, and describing population features, making them an essential tool in various research fields (Wang and Cheng 2020).

5.6.2 Longitudinal Time Horizon

Longitudinal studies involve collecting data over an extended period to observe changes or developments over time (Nielsen 2021; Laird 2022). These studies are valuable for tracking trends, examining causal relationships, and evaluating long-term impacts (Wang *et al.* 2017). According to Wang *et al.* (2017), they can take various forms, including panel studies, cohort studies, and time-series analyses. However, conducting longitudinal studies can be challenging due to costs and publication difficulties (Dormann and Guthier 2018). Effective longitudinal research requires careful consideration of theoretical concepts, research design, sample selection, measurement timing, and analytical approaches (Diefendorff, Lee and Hynes 2021). Despite challenges, longitudinal studies remain crucial for understanding complex phenomena and providing valuable insights across various fields (Chintagunta and Labroo 2020).

5.6.3 Time Horizons Linkage to the Study

The time horizon of this study spanned over five weeks, from early 9 September to mid-October 2025, during which both quantitative and qualitative data collection activities were conducted. This time frame was carefully chosen to align with operational schedules at primary healthcare facilities and ensure optimal availability of healthcare professionals without disrupting service delivery. A cross-sectional time horizon was adopted, as the research sought to gather data at a single point in time rather than following participants longitudinally (Creswell & Creswell, 2018). The five-week duration allowed for the administration of surveys to a representative sample of healthcare workers and in-depth interviews with selected participants across approximately 29 facilities in the Lejweleputswa District.

This design aligns with best practices in public health research, where short but intensive data collection periods are often employed to capture timely insights while minimizing recall bias and logistical costs (Bryman, 2016). Furthermore, the timeframe was approved by the Institutional Research Ethics Committee (IREC), ensuring that all ethical standards and practical considerations, such as informed

consent and data confidentiality, were upheld throughout the study period (Israel & Hay, 2006). The chosen time horizon was therefore both methodologically sound and contextually appropriate for the aims and scope of the study.

5.7 TECHNIQUES AND PROCEDURES

The Techniques and Procedures section is crucial for explaining how research objectives are translated into actionable methods, it outlines specific techniques for data collection, analysis, and interpretation (Ali *et al.* 2022b). According to Ali *et al.* (2022b), it ensures reproducibility and allows other researchers to assess or apply different models to the data. Key components include research design, sampling, instruments, data collection procedures, analysis methods, and ethical considerations (Tabuena, Hilario and Buenaflor 2021). Research designs can be qualitative, quantitative, or mixed methods (Vebrianto *et al.* 2020; Tabuena, Hilario and Buenaflor 2021). According to Tabuena, Hilario and Buenaflor (2021), the methodology should be robust enough to reproduce results and provide a systematic approach to research execution. Proper selection of research techniques is essential, particularly for novice researchers (Elshater and Abusaada 2022). Understanding methodology is critical for conducting accurate, verifiable, and replicable research (Garg 2016).

5.7.1 Research Design

The research adopted a case study design with a Convergent Parallel Design approach. This combination allows for an in-depth examination of maternal health factors in the Lejweleputswa District Municipality, incorporating both statistical analysis and qualitative insights. This combination of methods allows for a more nuanced exploration of the issue, as it leverages the strengths of both quantitative and qualitative data simultaneously (Khunou and Manyisa 2022). The convergent parallel mixed methods design is increasingly used in health research, combining quantitative and qualitative data collection and analysis simultaneously (Tsawe and Susuman 2014; Khunou and Manyisa 2022). This approach allows for in-depth exploration of complex issues, such as maternal health factors, malnutrition, and COVID-19 responses (Matlala *et al.* 2022; Adhikari and Timsina 2024). Case studies are particularly valuable for examining real-life settings in health services research (Crowe and Sarma 2022).

5.7.2 Sampling method

Sampling in research refers to the process of selecting participants or cases for a study (Narayan, Sinha and Singh 2023). It involves choosing a sampling strategy to determine the number of participants or cases to be included in the study, which is known as the sample size (Lee and Landers 2022). The goal of sampling is to draw meaningful research conclusions and make accurate statistical inferences about a population (Das *et al.* 2022). The selection of an appropriate sample size is crucial for the quality of research findings, as it affects both statistical power and accuracy (Nanjundeswaraswamy and Divakar 2021). In quantitative research, sampling techniques can be categorized into probability and non-

probability methods (Sarker and AL-Muaalemi 2022). Probability sampling techniques aim to provide a representative sample by giving all individuals in the population an equal chance of being selected. According to Sarker and AL-Muaalemi (2022), non-probability sampling techniques, on the other hand, do not provide equal chances of selection and are often used when probability sampling is not feasible. The choice of sampling techniques should be guided by research objectives, the study scope, and the availability of a sampling frame (Mariyappa, Murthy and Vedamurthy 2021). According to QuestionPro (2021) views sampling as a method for selecting individual participants to draw statistical inferences from and to estimate the characteristics of the entire population. Moreover, it elaborates that market research encompasses two categories of sampling, known as probability sampling and non-probability sampling.

5.7.2.1 Probability sampling

Probability sampling techniques include random sampling, stratified sampling, systematic sampling, and cluster sampling (Narayan, Sinha and Singh 2023). These techniques are used to ensure that the sample is a true representation of the population, allowing for valid inferences to be made (Das *et al.* 2022). Probability sampling methods ensure that every member of the population has an equal chance of being selected for the study, thereby enhancing the representativeness of the sample (Stratton 2023). According to Stratton (2023), common probability sampling techniques include true-random, quasi-random, and nonrandom sampling procedures.

- **True-random sampling:** True-random sampling involves randomly selecting each unit of the population, allowing for direct estimation of population characteristics from the sample (Narayan, Sinha and Singh 2023). Quasi-random sampling, on the other hand, does not allow for direct estimation of population characteristics, but only indirect estimation (Mulisa 2022).
- **Simple random:** Simple random sampling is a method of selecting individuals from a population where each member has an equal chance of being chosen (Ahmad *et al.* 2023). This method is suitable when the population is relatively homogeneous (Hirschauer, Grüner and Mußhoff 2022). Simple random sampling is a widely used method in research studies due to its simplicity and unbiased nature. It ensures that each member of the population has an equal chance of being included in the sample, making it representative of the entire population (Bauman 2023). In a study, Bauman (2023) as cited in Ghauri, Grønhaug and Strange (2020), is in favor of simple random sampling because of its advantages, which include:
 1. “A complete frame (a list of all units in the whole population) is needed.
 2. In some studies, such as surveys by personal interviews, the costs of obtaining the sample can be high if the units are geographically widely scattered; and
 3. The standard errors of estimators can be high.”
- **Stratified sampling:** Stratified sampling is a method that divides a population into distinct subgroups or strata based on certain characteristics and then selects samples randomly from each stratum (Muili *et al.* ; Nguyen *et al.* 2021b). This approach ensures representation from all relevant

subgroups within the population (Nguyen *et al.* 2021b). The use of stratified sampling aims to reduce the variance between strata and improve the accuracy of estimators (Zaman 2021). Various techniques, such as K-mean cluster analysis and calibration estimation approaches, have been explored to optimize the stratification process and enhance the efficiency of estimators (Haron 2022). Overall, stratified sampling, when properly implemented, can significantly improve the accuracy and efficiency of sampling processes in diverse research contexts (Jauslin, Eustache and Tillé 2021).

- **Cluster sampling:** Cluster sampling is a method where a population is divided into unique clusters that represent a diverse group (Lao and Dryver 2022). This sampling technique is useful when the characteristic of interest is sparsely distributed but highly aggregated. (Lao and Dryver 2022) as cited in Taherdoost (2016) the agreement in this method, the population is divided into clusters, and then random samples of those clusters are taken. All these samples are used in the final analysis.
- **Systematic sampling:** Systematic sampling is a method of selecting every *n*th member from a population list (Khan *et al.* 2020). According to Khan *et al.* (2020), it is efficient and straightforward, but it may introduce bias if there is a periodic pattern in the list. The diagonal systematic sampling design is a modification of the conventional systematic sampling design that is more precise when population units follow a linear trend (Azeem 2022). It has been found that the diagonal systematic sampling scheme provides more efficient estimates of finite population proportion compared to simple random sampling and linear systematic sampling, especially for small sample sizes (Pandey and Shukla 2022).

5.7.2.2 Non-Probability Sampling

Non-probability sampling techniques include convenience sampling and purposive sampling (Memon *et al.* 2023a). According to Mulisa (2022), nonrandom sampling techniques, such as nonprobability methods, do not allow for direct or indirect estimation of population characteristics. Non-probability sampling methods, commonly used in public health management research, include volunteer sampling and nonresponse sampling (Li *et al.* 2023). According to Li *et al.* (2023), volunteer sampling involves collecting data from individuals who self-select to participate, often through methods like social media and web surveys. Nonresponse sampling occurs when participants in a study do not respond at later follow-up time points, leading to potential selection bias and nonresponse bias (Kalton 2023).

- **Convenience sampling:** Convenience sampling involves selecting individuals who are readily accessible or convenient to recruit for a study (Narayan, Sinha and Singh 2023). However, this method may introduce bias as it does not ensure the representativeness of the population (Savitsky *et al.* 2022). Nonprobability (convenience) samples are increasingly used to reduce estimation variance and increase effective sample size, but estimation of population quantities from convenience samples can result in bias due to differences in the distribution of variables of interest (Das *et al.* 2022).
- **Purposive sampling:** Purposive sampling involves selecting participants based on specific criteria relevant to the research objectives. Researchers deliberately choose individuals who possess certain characteristics or experiences of interest (Weinrib 2024). This sampling method

allows for targeted recruitment, but it may not capture the diversity of the population (Andrade 2021).

- **Quota sampling:** Quota sampling is a non-random sampling technique used to obtain a representative sample for a survey. It combines stimulating, encouraging, and restrictive functional effects to achieve a balance between the general regulatory and protective legal impact of the state on public relations (Fefferman *et al.* 2023). In the field of sample surveys, quota sampling is used to substitute missing data through a procedure called imputation, which uses available data to replace missing values (Harris *et al.* 2023). However, it is important to note that the terms "random" and "representative" are often used improperly and interchangeably, despite there being no logical nexus or causal relationship between the two concepts (Thakur and Shukla 2022).
- **Snowball sampling:** Snowball sampling, also known as the referral sampling technique is a technique used when the population is unknown and scarce (Dragan and Isaic-Maniu 2022). The researcher selects the first individual and asks them to recommend other individuals who fit the required sample. Snowball sampling is commonly used in sampling designs on human populations, where respondents are asked to share the questionnaire with their social ties (Rup, Bajic and Mekki 2022). It is considered biased, but the magnitude of the bias depends on the sampling design and features of the target population (Cantone and Tomaselli 2022). Hybrid Probabilistic-Snowball Sampling Designs (HPSSD) aim to reduce bias by oversampling the first stage of the snowball (Cantone and Tomaselli 2022; Dragan and Isaic-Maniu 2022). According to Dragan and Isaic-Maniu (2022), the performance of snowball sampling can be improved by adjusting the estimates of HPSSD.

5.7.2.3 Sampling Strategies for the Study

Sampling is the method used to select a subset or sample from a population to make observations and draw inferences about the entire population (Khan 2020). According to Lee and Landers (2022), there are two sampling techniques: non-probability and probability. Non-probability sampling does not give all individuals in the population an equal chance of being selected, while probability sampling gives all individuals an equal chance of being selected (Turner 2020).

In this study, random sampling was employed for the quantitative data collection to ensure that everyone within the target population has an equal chance of being selected. This approach enhances the generalizability of the findings, allowing the study to capture a broad, representative sample of healthcare workers or other relevant participants in the Lejweleputswa District. Utilizing random sampling, the research aims to reduce selection bias, ensuring that the quantitative data reflects a diverse cross-section of experiences and perceptions related to maternal health interventions, thus contributing to statistically valid and reliable results (Marabele *et al.* 2020; Mweshi and Sakyi 2020).

For the qualitative interviews, purposive sampling was used to strategically select participants who have specific insights or experiences related to maternal healthcare. This method ensures that individuals with the most relevant knowledge, such as healthcare professionals, policymakers, or mothers who

have experienced maternal health services, are included in the study (Denieffe 2020). According to Denieffe (2020), purposive sampling allows the research to focus on participants who can provide rich, detailed, and context-specific data. This approach is particularly useful for exploring complex issues, such as the effectiveness of healthcare interventions and the challenges faced in delivering maternal care in the district (Denieffe 2020). Combining these sampling methods enables the study to balance broad statistical findings with in-depth qualitative insights.

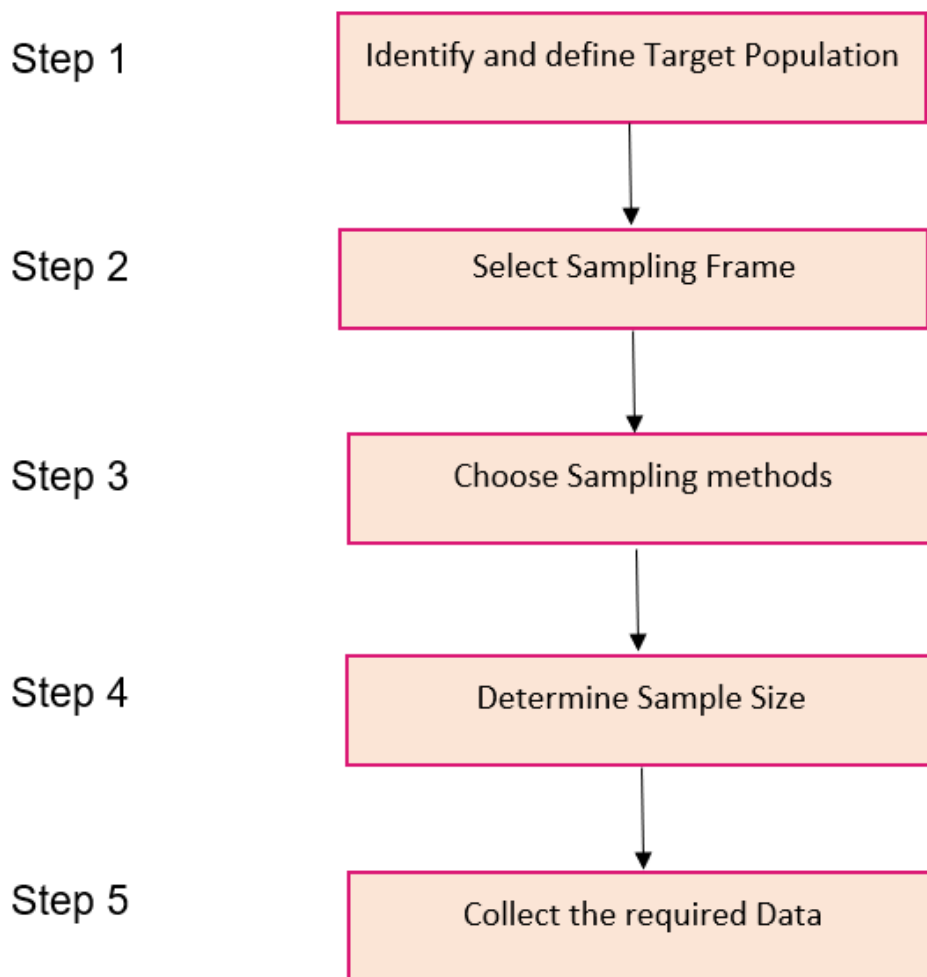


Figure 5. 3: Stages of sampling techniques

Source: Adapted from Analytics Vidhya (2019)

5.7.3 Population

A population is defined as the total membership of a defined class of people, objects, or events, while a target population is a population of interest to which a researcher intends to apply the research results (Willie 2022). The population represents the entire group of people, events, activities, or things of interest that the researcher expects to investigate (Casteel and Bridier 2021). In this study, samples were taken from the Lejweleputswa municipality district. The target population can be understood as

the full set of cases from which samples are taken (Tipton 2022). Therefore, the researcher aimed to enhance South African maternal care within the public health system focusing on stillbirths in the Lejweleputswa District Municipality. This study is conducted in the Lejweleputswa District Municipality, The Lejweleputswa District Municipality is a Category C municipality situated in the north-western part of the Free State.

The district makes up almost a third of the province and consists of the following five local municipalities, with approximately 18 towns (Allanridge, Boshof, Bothaville, Brandfort, Bultfontein, Dealesville, Hennenman, Hertzogville, Hoopstad, Odendaalsrus, Soutpan, Theunissen, Ventersburg, Verkeerdevlei, Virginia, Welkom, Wesselsbron and Winburg) distributed throughout Masilonyana, Tokologo, Tswelopele, Matjhabeng, and Nala, (Municipalities of South Africa 2023).

5.7.4 Target population

The target population in research refers to the specific group of individuals that the researcher wants to study and makes inferences about (Willie 2022). It is important to differentiate between the population and the target population, as the target population is derived from the population of interest and forms the basis of the research study (Chiu and Dahabreh 2022). In some cases, researchers may use novel methods to extend causal inferences from a trial to a target population, but conditioning on treatment in the target population can introduce bias and change the estimand of the analysis (Chiu and Dahabreh 2022).

A sample is a subset of individuals, units, and elements with specific characteristics that the researcher intends to investigate (Basti and Madadzadeh 2021). The sample population consisted of one interview per healthcare facility that works with deliveries until saturation is reached. For the qualitative part, a purposive sample of 32 participants was drawn from this population. The participants were selected based on their active engagement in maternal healthcare delivery and their first-hand experience with stillbirth cases, ensuring data saturation and thematic depth. For the quantitative component, facility-level data on maternal health outcomes were reviewed to validate and triangulate the qualitative insights.

This population and sampling framework reflects qualitative research best practices, which emphasize information-rich cases over numerical representativeness, allowing the study to gain nuanced insights into the human and systemic factors influencing maternal outcomes (Patton, 2015).

During the fieldwork phase of this study, several contextual challenges necessitated the expansion of the sample size and the inclusion of additional healthcare facilities across the Lejweleputswa District Municipality. Among the key challenges were:

3. Service delivery protests, which led to the temporary closure or limited accessibility of several public health facilities.
4. Persistent human resource shortages across the district, particularly in maternal health services, which meant that some facilities had few or no staff available for participation during the data collection period.

Given these realities, it became necessary to broaden the number of facilities contacted to reach a sufficient and diverse pool of healthcare professionals actively involved in maternal care and stillbirth-related cases. The decision to increase the sample size was thus a methodological imperative to ensure the credibility, richness, and diversity of qualitative insights, which are central to robust thematic analysis (Patton, 2015).

Consequently, the final sample was drawn from more than half of the operational maternal healthcare facilities in the district, including both clinics and hospitals, as well as the Lejweleputswa District Municipality Office, which plays a strategic role in overseeing and coordinating maternal health services. The facilities accessed included:

- Hospitals: Bongani Regional Hospital, Nala District Hospital, Thusanong Hospital.
- Clinics and CHCs: Albert Luthuli Memorial Clinic, Allanridge Clinic, AM Kruger Clinic, Boithusong Clinic, Bophelong Clinics (Allanridge, Odendaalsrus, Welkom), Geneva Clinic, Hani Park Clinic, Hennenman Clinic, Kgotsong Clinics (Bothaville, Welkom), K-Maile Clinic, Leratong Clinic, Matjhabeng Clinic, Mmamahabane Clinic, OR Tambo Clinic, Phedisanang Clinic, Phomolong Clinic, Thabong Clinic, Tshepong Clinics (Welkom, Verkeerdevlei), Tshwaraganang Clinic, Virginia Clinic, and Welkom Clinic.

By diversifying the facility sample and including representatives from different levels of the healthcare system, including district managers, midwives, obstetricians, gynecologists, CHW team leaders, facility managers, and maternal unit managers, the study ensured that data reflected both clinical and managerial perspectives. This adaptive sampling approach aligns with the principles of qualitative inquiry, which prioritize information-rich cases and context-driven decision-making over rigid adherence to sample size formulas (Creswell & Poth, 2018). Furthermore, it enhanced the validity and transferability of findings, particularly about service delivery realities in under-resourced, rural district health systems.

The target sample for this study is twofold, firstly quantitative data was collected from 358 healthcare workers across selected public healthcare facilities. The sample size was calculated using the Raosoft sample size calculator with a 5% margin of error, 95% confidence level, a total population of 5225, and a response distribution of 50%. Thus, a total of 358 responses was sufficient to produce robust results whose inferences would be reliable.

Secondly, the researcher interviewed at least twenty (32) participants (healthcare workers, who are midwives, accounting officers from the district office responsible for Health, obstetricians, maternity unit managers, and gynecologists), while a minimum of twenty (32) targeted, data will be collected until saturation is reached. This is consistent with many qualitative studies where saturation can be used to identify the appropriate sample size (Hennink and Kaiser 2022).

Study Site

The study was conducted in the Lejweleputswa District Municipality, located in the Free State Province of South Africa. This district comprises five local municipalities—Matjhabeng, Masilonyana, Tswelopele, Nala, and Tokologo—and is predominantly rural and semi-urban, with significant public health challenges, especially in maternal healthcare. The study site included the Lejweleputswa District Health Office and a total of 34 public healthcare facilities, consisting of 6 hospitals—Bongani, Mohau, Nala, Winburg, Katleho, and Thusanong—and 28 primary healthcare clinics, including Albert Luthuli Memorial Clinic, Allanridge Clinic, Boithusong Clinic, Hennenman Clinic, Tshepong Clinic, and others. These facilities provide maternal and child health services to a diverse population and were selected based on their involvement in antenatal care, intrapartum services, and postnatal follow-up. The site was ideal for investigating stillbirth-related challenges due to its high burden of maternal health concerns, staffing shortages, and infrastructural disparities.



Figure 5.5 Lejweleputswa District Municipality (DC18)

Source: Adopted from Lejweleputswa 2020

Study Context

Lejweleputswa District Municipality, located in the northwestern region of South Africa's Free State Province, spans approximately 32,287 square kilometers (Lejweleputswa, 2022). Bordered by the North

West Province, the Thabo Mofutsanyana and Fezile Dabi District Municipalities, the Mangaung Metropolitan Municipality, the Xhariep District to the south, and the Northern Cape Province to the west, the district encompasses five local municipalities: Matjhabeng, Tswelopele, Nala, Masilonyana, and Tokologo. Lejweleputswa is predominantly rural, with its socio-economic foundations rooted in agriculture and mining (Lejweleputswa, 2022; Matjhabeng, 2022).

A major concern in this district is the persistent fragility of the healthcare system, characterized by chronic underfunding, understaffing, and dilapidated infrastructure (Malakoane et al., 2020; Abrahams, Thani & Kahn, 2022). These systemic deficiencies severely limit the capacity of healthcare facilities to provide essential maternal health services—including antenatal care (ANC), skilled delivery attendance, and emergency obstetric care—resulting in high rates of stillbirth and maternal mortality (Asamani et al., 2022). Malakoane et al. (2020a) highlights that the shortage of healthcare professionals is particularly severe, with many clinics lacking enough midwives, nurses, and doctors. This challenge is exacerbated by the fact that rural healthcare workers often face excessive workloads and insufficient resources, which compromises the quality and responsiveness of care.

Lejweleputswa District comprises a total of 36 public health facilities, including hospitals, community health centers, and clinics. For the purposes of this study, 29 facilities were included in the sampling frame. Purposive and logistical considerations guided the selection: facilities were chosen based on their provision of maternal and antenatal care services and their accessibility during the five-week data collection period (from 9 September 2024). Several facilities had to be excluded due to closures resulting from service delivery protests, operational disruptions, or a complete lack of relevant maternal health services. The inclusion of 29 facilities was intended to ensure data credibility, breadth of representation across the district, and to overcome sampling limitations posed by infrastructural and staffing constraints.

5.7.5 Measuring Instruments

Questionnaires are vital tools for data collection in survey research across multiple fields (Preston 2020). According to Preston (2020), their purpose is to obtain information about respondents' characteristics, attitudes, and behaviors through structured questions. Crafting an effective questionnaire is essential to minimize errors and ensure high-quality research outcomes (Taherdoost 2022). According to Taherdoost (2022), this process involves defining research objectives, choosing appropriate question types, and constructing the questionnaire. Proper development and validation of questionnaires are crucial for achieving reliable survey results (Smeds 2022). Researchers need to be aware of potential sources of error, such as survey design, question formulation, interviewer effects, and respondent characteristics (Sha and Gabel 2020; Smeds 2022). The cognitive process involved in answering survey questions includes comprehension, information retrieval, judgment formation, and response provision (Sha and Gabel 2020). Questionnaires can be administered through various methods, such as mail, in-person, online, and telephone surveys (Preston 2020).

For the quantitative data collection, questionnaires were designed to allow respondents to express their

opinions using options such as 1 = Agree and 2 = Disagree, 1= Yes, and 0= No. These questionnaires were emailed to participants, along with an invitation letter that included instructions on what needed to be done and the survey submission deadlines. Invitations to participate and consent letters were sent to the intended participants one month before the start of the interviews, ensuring they had ample time to plan their schedules for the study. As part of the qualitative data collection, face-to-face interviews were conducted at various locations convenient for the participants.

5.7.6 Data analysis

Data analysis is a process of collecting all the information, analyzing it, finding patterns and trends, and using it to make informed decisions (Kelley 2022). According to Singh, Singh and Singh (2022). Data analysis is a comprehensive process involving data collection, analysis, interpretation, and visualization, essential for informed decision-making in various fields. Data analysis employs sophisticated techniques to uncover patterns and trends, while data visualization transforms complex datasets into easily understandable visual representations (Singh, Singh and Prabha 2022).

5.7.5.1 Quantitative Data Analysis

Quantitative data analysis is about analyzing data that can be converted into numbers without losing its meaning (Jansen and Warren 2020). According to Jansen and Warren (2020); (Kotronoulas *et al.* 2023) the technique encompasses two statistical methods descriptive statistics and inferential statistics. Descriptive statistics assist researchers in summarizing and understanding the characteristics of the data set, while inferential statistics are used to make predictions or generalizations about the broader population based on the sample data (Kotronoulas *et al.* 2023). Statistical analysis software packages such as SPSS, Stata, R, and SAS are extensively utilized across various fields for data analysis and managing missing data (El-Saeiti and Ben-Farag 2023). SPSS is the most frequently used software, especially in observational and experimental studies, whereas Stata is commonly employed for systematic reviews and meta-analyses (Masuadi *et al.* 2021). Quantitative data analysis involves the use of mathematical techniques to analyze numerical data, with results typically presented in tables and graphs (El-Saeiti and Ben-Farag 2023; Kara 2023b). This method encompasses various statistical tools such as frequency distributions, measures of central tendency (like mean, median, and mode), measures of variability, and parametric tests like t-tests and ANOVA (Mahsin 2022).

The researcher aimed to understand the sample's attitudes, behaviors, opinions, and other variables related to the research problem. To achieve this, the study adopted a descriptive statistics approach to analyze numerical data, providing a better understanding of the sample's views. The survey results were entered into the SPSS statistical software package (Version 29), where the required statistical tests were performed. Graphs and charts were used to analyze and present the data.

5.7.5.2 Qualitative Data Analysis

Qualitative data analysis involves extracting meaningful information from diverse sources such as interview transcripts, audio recordings, and documents (Parfenova Lucerne 2024). According to

Parfenova Lucerne (2024) recent innovations include automated systems and machine learning algorithms that enhance the efficiency of identifying themes and patterns. Traditional methods typically involve transcribing and coding interviews, while alternative approaches like audio analysis and mind mapping can streamline the process (Khokhar *et al.* 2020; Fearnley 2022). The analysis usually encompasses data reduction, display, and interpretation, employing techniques such as thematic analysis and content analysis (Mezmir 2020). According to Lemon and Hayes (2020), to enhance trustworthiness, researchers will have to employ data analysis triangulation using software like NVIVO. These tools facilitate efficient organization, coding, and analysis of large (Lemon and Hayes 2020) qualitative datasets. These methods aim to transform collected data into useful information through themes, in line with Harding's explanation of qualitative data analysis (Harding and Whitehead 2013).

The main objective of this study is to enhance South African maternal care within the public health system focusing on stillbirths in the Lejweleputswa District Municipality. In this study, interviews were conducted with healthcare workers, midwives, accounting officers from the district office responsible for Maternal Healthcare, obstetricians, maternity unity managers, and gynecologists. This study used thematic analysis as this method was found to be relevant to the study's aims and objectives to learn about people's experiences and views on the determinants for non-compliance with procurement and contract management guidelines. The qualitative data generated from the interviews were transcribed and analyzed by the researcher by employing the use of a thematic approach to convert it to the NVIVO software.

5.7.5.3 Quantitative Pre-testing

According to Hashim *et al.* (2022), pilot testing is a crucial step in research, particularly for questionnaire-based studies, to ensure validity, reliability, and practicability. It helps refine data collection instruments, reduces bias, and prepares researchers psychologically for the main study (Tate *et al.* 2023). Pilot studies can reveal necessary modifications to questionnaires and provide insights into sample size calculations for the main study (Menon *et al.* 2021). Conducting a proper pilot study can significantly enhance the quality of research, especially for novice researchers, by identifying potential challenges and confirming the effectiveness of data collection instruments (Rahmah, Shuhidan and Yahaya 2022).

Pilot testing for this study was conducted on 5 participants who were surveyed as part of the pilot study. The sample included a mix of midwives, Community Health Work Team Leaders, obstetricians, gynecologists, maternal ward managers, and district health department accounting officers.

Midwives: 2

Obstetrician: 1

Community Health Work Team Leaders: 1

Maternal Ward Managers: 1

5.7.5.4 Qualitative pre-testing

The researcher conducted a pre-test interview with two participants:

2 Midwife

Pre-testing assisted the researcher in getting input on the applicability and relevance of the developed questions. There were no problems with interview questions; hence there were no changes. Participants involved in pre-testing were purposively selected and requested in writing. The content of the request letters that were sent out included clear information that the pre-testing would not form part of the actual study and that participation in pre-testing was voluntary, with no remuneration.

5.7.7 Delimitations/scope

The study was conducted in The Lejweleputswa District Municipality in the Free State Province, within the Department of Health. The categories of individuals were healthcare workers, who are midwives, accounting officers who are local area managers from the district office responsible for Health, obstetricians, maternity ward managers, and gynecologists.

5.7.8 Validity and Reliability

According to Spence, Fontem and Feltman (2023), validity and reliability are important aspects of research that determine the quality of the research. Validity refers to how well an instrument measures what it intends to measure, while reliability concerns the consistency and accuracy of the data obtained (Mariel *et al.* 2021; ARSLAN 2022). Researchers use various measures to assess validity and reliability, such as test-retest reliability, interrater reliability, and internal consistency (Sadik 2019). These measures help ensure that the research findings are trustworthy and can be replicated in different circumstances (Salleh, Sulaiman and Gloeckner 2023). Validity and reliability are particularly important in qualitative research, where concepts like credibility, transferability, dependability, and confirmability are used as equivalents to internal validity, external validity, internal consistency reliability, and external reliability (Ahmed and Ishtiaq 2021). According to Ahmed and Ishtiaq (2021), researchers can use techniques like the Corrected Item to Total Correlation method and Cronbach's Alpha method to assess validity and reliability.

In a study Middleton (2019) emphasizes that validity and reliability in research about the overall quality of the study. She elaborates that reliability refers to the consistency of a measurement, whereas validity is focused on demonstrating the accuracy of a measurement, as outlined in Table 5.2.

Table 5. 2 Validity vs Reliability

Reliability vs Validity		
	Reliability	Validity
What does it tell you?	The extent to which the results can be reproduced when the research is repeated under the same conditions.	The extent to which the results measure what they are supposed to measure.

How is it assessed?	By checking the consistency of results across time, across different observers, and across parts of the test itself.	By checking how well the results correspond to established theories and other measures of the same concept.
How do they relate?	A reliable measurement is not always valid: the results might be reproducible, but they're not necessarily correct.	A valid measurement is generally reliable: if a test produces accurate results, it should be reproducible.

Source: Adapted from Middleton (2019)

Table 5.2 illustrates that validity and reliability are essential aspects regarding the credibility of the research. Given that this study utilized a mixed method of data collection, the researcher needed to provide detailed explanations on how validity and reliability were ensured within each qualitative, quantitative, and mixed-method component.

5.7.7.1 Validity and reliability (qualitative research)

Validity and reliability are important factors in qualitative studies, and researchers need to demonstrate the credibility, transferability, dependability, and confirmability of findings (Harley 2023; Spence, Fontem and Feltman 2023). To enhance credibility, researchers can use design elements and validation strategies such as triangulation, negative case analysis, reflexive practices, and managing subjectivity (ARSLAN 2022). Participants can also be actively engaged in validation through member reflections, prolonged interaction with the researcher, or collaboration in different phases of the research (Salleh, Sulaiman and Gloeckner 2023). According to Firdaus, Aksar and Gong (2024), internal consistency is an important measure of reliability, and Cronbach's Alpha is commonly used to assess it. Reliability and validity are two distinct concepts in assessment. Reliability refers to the consistency and stability of the measurement, while validity refers to the extent to which the measurement accurately measures what it is intended to measure (Bhattacharya *et al.* 2023). However, according to Oyama and Murayama (2023), a lack of reliability can compromise the overall validity of a test. If a survey is not reliable, it cannot be validated effectively. On the other hand, validity is concerned with assessing whether the selected methodology and methods allow the researcher to measure the intended constructs accurately (Oyama and Murayama 2023).

5.7.7.1 Validity and reliability (quantitative research)

In quantitative research, validity and reliability are crucial concepts that ensure the accuracy and consistency of the research findings. These two principles guarantee that the study's measurements are credible, replicable, and meaningful within the context of the research objectives (Andrade 2018). According to Andrade (2018), validity refers to the extent to which a research instrument or method accurately measures what it is intended to measure. In this study on maternal health factors in the Lejweleputswa District Municipality, validity is essential to ensure that the quantitative tools such as surveys and questionnaires truly capture the relevant aspects of maternal health, such as the quality of care, access to services, or healthcare workers' knowledge. There are several types of validity to consider. Content Validity ensures that the measurement tool covers all relevant aspects of the topic (William 2024). For example, a survey on maternal health includes questions about antenatal care, postnatal services, and healthcare worker support. Construct Validity checks whether the instrument truly measures the concept it is intended to measure (Mahapatra *et al.* 2020; Ranganathan, Caduff and Frampton 2024). If the research seeks to measure healthcare quality, the questions must align with recognized indicators of healthcare quality (Ranganathan, Caduff and Frampton 2024). External Validity addresses the generalizability of the findings. If the sample is representative of the larger population in the district, then the results can be applied more broadly to similar contexts (Mahapatra *et al.* 2020). According to Mahapatra *et al.* (2020), ensuring validity in this study involves using well-established, tested instruments and carefully designing questions to align with the research goals. Pre-testing or piloting the survey with a small group before full data collection can help identify any potential issues with validity (Sadik 2019).

Reliability refers to the consistency of the measurement, meaning that if the study were repeated under similar conditions, it would yield similar results. In quantitative research, a reliable instrument produces stable and consistent outcomes over time (Du 2010; William 2024). According to William (2024), reliability is crucial in ensuring that the data collected is dependable and not influenced by random errors or temporary external factors. Test-retest reliability involves administering the same test to the same group at different points in time to check for consistency in responses (Du 2010). Internal Consistency assesses whether the items within a survey or questionnaire that are intended to measure the same concept yield consistent results (Hajjar 2018). Inter-rater reliability involves multiple researchers or data collectors, inter-rater reliability ensures that they all interpret and record responses in the same way (Roberts and Priest 2006; Hajjar 2018).

To ensure reliability in this study steps such as standardizing data collection procedures, training data collectors, and using established scales and instruments are employed (Roberts and Priest 2006). Conducting reliability tests, such as Cronbach's alpha, helped determine the internal consistency of the survey (Izah, Sylva and Hait 2023). According to Izah, Sylva and Hait (2023), validity, and reliability are foundational to the credibility of the quantitative component of this research. Validity ensures that the study measures the correct constructs, while reliability ensures that these measurements are consistent and replicable (Heale and Twycross 2015). Together, they contribute to the overall robustness and

trustworthiness of the research findings.

5.7.8 Ethical Considerations

This study adhered strictly to established ethical principles, including obtaining informed consent, ensuring voluntary participation, maintaining confidentiality, and upholding the right to withdraw without penalty. Ethical clearance was obtained from the relevant institutional ethics review board before commencement. Participant recruitment began on October 7, 2024, and lasted for five weeks. The recruitment process was conducted by the principal researcher with the assistance of four trained research assistants. Participants were healthcare professionals involved in maternal care, recruited directly from 34 public health facilities and the Lejweleputswa District Health Office. Each potential participant was approached in person, provided with detailed information sheets outlining the purpose and scope of the research, and given consent forms to sign and return.

Data collection was conducted on-site at each facility, where participants completed structured questionnaires designed to capture quantitative insights related to maternal health service delivery and stillbirth management. The principal researcher personally oversaw all data collection activities to ensure consistency and adherence to ethical standards. The research assistants facilitated the distribution and retrieval of questionnaires, while a professional statistician was engaged to ensure data quality, support instrument reliability testing, and assist with quantitative data analysis. The data were anonymized before analysis, and all records were securely stored to protect participant privacy. This ethically grounded approach ensured that all research processes respected the rights and dignity of participants, while also enhancing the study's credibility and scientific integrity.

The study disclosed all the information about the research to potential participants, and privileged information should not be divulged; the personal information of respondents should be hidden. The study will maintain the credibility of the results by minimizing the risk of bias and ensuring the degree of confidence in the data, its interpretation & procedures. The research will comply with any research ethics guidelines of IREC and FREC and will only be conducted after it has been given clearance. The DUT standard invitation to participate in the research project or informed consent will be used (DUT, 2016). Participants in this study were informed that the researcher is guided and working under the ethical framework University 8. Gatekeeper letters, issued by the Department of Health in the Free State Province, along with the necessary forms, were provided. Participants were informed that they reserved the right to request withdrawal from the study if they felt that ethical issues were not adequately addressed by the researcher. Voluntary participation was emphasized, and consent letters were issued. The Institutional Research Ethics Committee (IREC) issued ethical clearance with Ethical Clearance number IREC 056/24, which is responsible for evaluating, approving, and monitoring research involving humans, animals, and the environment. It does so by following accepted research ethical guidelines as laid out by the Department of Health of South Africa and the Declaration of Helsinki (DUT 2024). According to DUT (2024), the aim is to protect the rights and welfare of research participants, animals, and the environment by adhering to the principles of beneficence, justice, and respect for persons,

especially vulnerable populations, animals, and the environment. Ethical conduct protects both the researcher and the participants; researchers need to obtain ethical clearance before commencing with the research. The study is in category 2 which deals with health-related and will follow the IREC guidelines that are laid out by the DoHSA.

A study by Jacobs (2020), emphasized the importance of conducting research ethically and the author believed that when the research is conducted ethically, its results would be acceptable and could be used for future studies. According to Johnkennedy, Chidozie and Promise (2023), while encouraging research ethical behavior, they believe that researchers should be guided by the core ethical principles when conducting research, which is respect, welfare, and justice. They add that there are several factors why ethical research is important, namely

- Ethical research promotes the research aims of the research being conducted.
- It promotes values such as confidence, liability, respect, and objectivity in conducting research.
- Ethical research encourages accountability and ensures that researchers can be held responsible for their behavior while conducting a study.
- The ethical behavior of the researcher could assist them in receiving funding for the phenomenon being studied. Ethical research also assists researchers in gaining support from the public; and
- Conducting ethical research helps in promoting principles and standards like social responsibility, human rights, and compliance with health and safety regulations.

Confidentiality

In this study, ensuring the confidentiality of participants was paramount, particularly when dealing with sensitive topics such as maternal health and healthcare provision. According to Hoft (2021), confidentiality refers to the obligation to protect participants' personal information from unauthorized access or disclosure. To uphold this, all identifiable data will be anonymized, with participants assigned unique identification codes rather than using their real names (Hoft 2021). The following measures were taken to ensure confidentiality:

- Data Encryption: All electronic data will be stored in encrypted files, accessible only to the research team. Hard copies of any data will be securely locked away.
- Anonymization: Identifiable information such as names, job titles, and locations were removed from the datasets used for analysis, ensuring that participants could not be traced back to their responses.
- Confidential Agreements: Participants will sign a confidentiality agreement during the informed consent process, which guarantees that their data will only be used for research purposes and not shared with third parties.
- Limited Access: Access to raw data will be restricted to the principal investigator and designated members of the research team, ensuring that unauthorized personnel cannot view sensitive information.

Implementing confidentiality measures, the research protects participants' privacy and encourages

open, honest participation, which is essential for gathering authentic insights, especially in qualitative interviews (Surmiak 2018).

Informed Consent

Informed consent is a critical ethical consideration that ensures participants voluntarily agree to take part in the study after being fully informed about the research objectives, procedures, potential risks, and their rights (Xu *et al.* 2020). The following steps were taken to ensure that informed consent is properly obtained:

- Clear Information: Participants were provided with an information sheet that clearly explained the purpose of the study, the nature of their participation, and the type of data being collected.
- Voluntary Participation: Participants were informed that their involvement in the study is entirely voluntary, and they have the right to withdraw at any stage without any negative consequences.
- Written Consent: Written consent forms were collected from each participant, ensuring they had read and understood the information provided and agreed to the terms.
- Ongoing Consent: In the case of qualitative interviews, participants were reminded that they could refuse to answer any questions or stop the interview at any point without giving a reason.

The participants were carefully selected because of the potential contribution that was required. Therefore, there were no volunteers. Participants in the study were informed and assured before the commencement of data collection that the researcher was guided and working under Durban University of Technology's ethical frameworks. The researcher was transparent about the research purpose and its application. Although the purpose of the study and the participants' involvement were made clear, participants were also given the consent form, which specified that the participants reserve the right to withdraw from the study if they thought that ethical issues were not met by the researcher.

This study was conducted under the principles of the Durban University of Technology, which conform to the ethical requirements of the National Health Act of 2003 (Republic of South Africa 2003). It is vital to note that the Durban University of Technology has a strong set of standardized principles to ensure respect for the participants' rights; the integrity of the study involving human subjects; and general principles for data accessibility and confidentiality. In line with the University's ethical consideration requirements, this study has fully complied with all set ethical issues as prescribed by the University. Furthermore, the researcher committed herself to uphold ethical considerations by submitting a personal ethical declaration.

5.8 CONCLUSION

In this chapter, the researcher outlined the research design and methodology utilized in the study to obtain data pertinent to the study's objectives. The mixed method of data collection is important for balancing the shortfalls of qualitative and quantitative data and providing clarity and full coverage in the research design (El Kurd 2022). The convergent parallel design, as a mixed method, is used to provide

a comprehensive analysis of the research problem (Battista and Torre 2023). According to El Kurd (2022), mixed methods research (MMR) combines qualitative and quantitative data collection and analysis within a single study or research project. MMR is a complex approach that is particularly useful for exploring complex research questions and examining relationships between variables (Sharma *et al.* 2023c). It allows for the integration of multiple ontological, epistemological, and axiological standpoints (Palinkas 2022b). The integration of quantitative and qualitative data can be used to answer the same question through convergence or transformation or to answer related questions through complementarity of focus (Sciberras and Dingli 2023). The timing and process of integrating data and analysis in mixed methods research require careful consideration.

The choice to employ the convergent parallel design as a component of the mixed-methods data collection approach in this study was motivated by the researcher's aim to conduct a thorough analysis of the phenomenon under investigation. Semi-structured interviews were utilized to gather qualitative data, while web-based surveys were employed to collect quantitative data. As noted in the introduction, this study took place within the Lejweleputswa District Municipality. In this chapter, the researcher described the process of selecting both the population and the sample, including the sampling methods used. Given that the sample consisted of individuals who were acquainted with each other, the researcher had to approach data collection in a diplomatic manner. Therefore, it was crucial for the researcher to carefully inform participants about the ethical considerations involved in the study, such as confidentiality, anonymity, limitations, reliability, and validity.

Chapter 6: Presentation and Analysis of Quantitative Data

6.1 INTRODUCTION

This chapter presents a detailed analysis of the quantitative data collected for the study, which seeks to enhance South African maternal care within the public health system by exploring the case of stillbirths in the Lejweleputswa District Municipality. The study involved responses from 263 healthcare professionals, providing insights into their knowledge of stillbirths, attitudes towards antenatal care, practices related to maternal health, the quality of maternal health services, and infant outcomes. Inferential analyses were conducted to explore the influence of demographic factors, including gender, race, marital status, profession, education, and the number of children, on knowledge, attitudes, and practices related to maternal and infant health. Regression analysis was performed to identify the relationships between the constructs outlined in the conceptual model.

Additionally, factor analysis, including exploratory factor analysis (EFA) and confirmatory factor analysis (CFA), was conducted to validate the proposed model. Structural equation modeling (SEM) was applied to test the path relationship in the measurement model.

6.2 RESPONSE RATE ANALYSIS

The study assesses ways of enhancing South African maternal care within the public health system by exploring a case of stillbirths in the Lejweleputswa District Municipality. The researcher successfully retrieved 263 administered questionnaires, resulting in a response rate of approximately 73.5% (Table 6.1). In survey research, the response rate, also known as the completion or return rate, is calculated by dividing the number of completed questionnaires by the total distributed, usually expressed as a percentage. A response rate of at least 50% is considered adequate for analysis and reporting, while 60% is regarded as good and 70% or higher is considered excellent (Holtom et al. 2022). Thus, the response rate in this study significantly surpasses these benchmarks, providing a strong foundation for credible analysis and ensuring that the findings accurately reflect the views of the respondents.

Table 6. 1: Response Rate Analysis

Source: Self-generated by author

Total number of questionnaires distributed	Numbers of questionnaires returned/responded n (%)	Number of questionnaire non-responded n (%)
358	263 (73.5%)	95 (26.5%)

6.3 DEMOGRAPHIC CHARACTERISTICS

Table 6.2 provides detailed information about the demographic background and their various professional categories. The majority of the respondents were female, accounting for 82.9% (n=218), while males comprised 15.2% (n=40). A small percentage, 1.9% (n=5), chose not to disclose their gender. This skewed distribution highlights the predominance of females in the study sample, which may align with the context of the research or the professions under consideration.

In terms of the age group distribution, the data suggests that the largest proportion (46.0%) falls within the 35–44 years age group. The 55–64 years age group, comprising 40.3% of the respondents, follows closely. The smallest group, comprising 13.7% of the participants, is the 25–34 years age group. This distribution highlights that the majority of respondents are middle-aged adults, with a smaller representation from younger individuals.

Respondents represented a broad range of educational backgrounds. The largest group, 39.2% (n=103), had a diploma, followed by 32.7% (n=86) with a PhD. Additionally, 12.5% (n=33) had a master's degree, 11.0% (n=29) had a bachelor's degree, and 4.6% (n=12) had an honors degree. This distribution reflects a highly educated cohort, with significant representation of individuals with advanced qualifications.

In terms of marital status, nearly half of the respondents, 47.1% (n=124), were married, while 43.7% (n=115) reported being single. Smaller proportions included widowed (4.2%, n=11), divorced (3.4%, n=9), and separated individuals 1.5% (n=4). These figures indicate a balanced mix of marital statuses within the sample.

Professionally, the majority of respondents identified as belonging to "other" categories 55.5% (n=146), which could include a various healthcare-related or non-healthcare roles. Midwives constituted 25.5% (n=67); nurses made up 14.4% (n=38), while general doctors and gynecologists accounted for smaller proportions at 4.2% (n=11) and 0.4% (n=1), respectively. This distribution highlights the diverse professional landscape of the sample, with midwives and nurses being prominent groups.

The racial composition was predominantly Black, with 93.9% (n=247) identifying as such. Colored and White respondents accounted for 3.0% (n=8) of respondents each. This overwhelming representation of Black individuals reflects the demographic context of the study region.

More than half of the respondents, 57.0% (n=150), reported having no children. Among those with children, 24.7% (n=65) had one child, 13.7% (n=36) had two children, and 4.6% (n=12) had more than three children. This finding suggests a significant proportion of the sample were either childless or had smaller family sizes.

Respondents displayed varying levels of professional experience. The largest group, 46.8% (n=123), had over 10 years of experience, indicating a seasoned workforce. Additionally, 17.9% (n=47) had between 5 and 8 years of experience, 17.5% (n=46) had 0 to 2 years of experience, 11.4% (n=30) had

8 to 10 years of experience, and 6.5% (n=17) had 2 to 5 years of experience. This reflects a wide range of experience levels, with substantial representation from both seasoned and relatively new professionals.

Overall, the demographic and professional profiles of the respondents reveal a diverse and predominantly female cohort, with a significant proportion holding advanced educational qualifications and extensive work experience. The racial composition aligns with the regional context, and the data provide valuable insights into the backgrounds of healthcare professionals, enabling meaningful analysis and interpretation within the scope of the study.

Table 6. 2: Demographic Characteristics of respondents

Source: Field Survey, 2024

Variables	Frequency=263	Percent=100
Gender		
Male	40	15.2
Female	218	82.9
Prefer not to say	5	1.9
Age group		
25–34 years	36	13.7
35–44 years	121	46.0
55–64 years	106	40.3
Education level		
Diploma	103	39.2
Bachelors	29	11.0
Honors	12	4.6
Masters	33	12.5
PhD	86	32.7
Marital status		

Single	115	43.7
Married	124	47.1
Separated	4	1.5
Divorced	9	3.4
Widowed	11	4.2
Profession		
Nurse	38	14.4
Midwife	67	25.5
Gynaecologist	1	0.4
General Doctor	11	4.2
Other	146	55.5
Race		
Black	247	93.9
Colored	8	3.0
White	8	3.0
Number of children		
None	150	57.0
1	65	24.7
2	36	13.7
More than 3	12	4.6
Work experience		
0 to 2 years	46	17.5
2 to 5 years	17	6.5

5-8 Years	47	17.9
8–10 yes	30	11.4
10 years and above	123	46.8

6.4 RELIABILITY OF RESEARCH INSTRUMENT

For every research, reliability and validity of the research instrument are critical. The reliability of the summative questions was assessed using the Cronbach's alpha test, as proposed by George and Mallery (2019). The Cronbach's alpha is a measure of internal consistency, or how closely related a set of items is as a group (Amirrudin, Nasution and Supahar 2021). This test yields a scale that encompasses an unweighted total of the items. The typical interpretation of Cronbach's alpha (α) is as follows: a value greater than 0.8 suggests high (excellent) dependability, while values falling between 0.5 and 0.8 indicate moderate (acceptable) reliability. Conversely, results yielding α values below 0.5 indicate low reliability (Ekolu and Quainoo 2019). As presented in Table 4.3, the general knowledge scale (GK2–GK10) consisted of nine items and demonstrated good reliability ($\alpha = .856$). This evidence suggests that the scale effectively measured respondents' general knowledge, demonstrating strong internal consistency. Similarly, the Knowledge of Stillbirth construct also consisted of 10 items (KS1–KS10) and yielded a Cronbach's alpha score of 0.862. This suggests excellent reliability, reflecting the scale's robustness in assessing respondents' understanding of stillbirth-related concepts. Attitude Towards Maternal Healthcare (AT1–10), with ten items, indicated acceptable reliability ($\alpha = .793$). Socio-economic Factors (SF1–10) measures with 10 items had a Cronbach's alpha score of 0.804, demonstrating good internal consistency in evaluating the influence of socio-economic factors on maternal and infant health. Practices Related to Antenatal Care (P1–10) measured with 10 items, had excellent reliability ($\alpha = .890$), indicating that the items are highly consistent in capturing respondents' views on practices related to antenatal care. The Quality of Maternal Health Services construct consisted of 10 items and had a Cronbach's alpha score of 0.780, signifying acceptable reliability. This finding suggests the scale reliably measures respondents' perceptions of maternal health services. Infant Outcome (IF1–10), comprising 10 items, had a Cronbach's alpha score of 0.764, indicating acceptable reliability and reasonable consistency in assessing infant outcomes.

The Cronbach's alpha scores across all constructs ranged from 0.764 to 0.890, signifying acceptable to excellent reliability. These results suggest that the scales used in the study are internally consistent and reliable for measuring their respective constructs, ensuring the validity of the study's findings. Constructs measuring knowledge and practices (General Knowledge, Knowledge of Stillbirth, and Practices Related to Antenatal Care) demonstrated the highest reliability, while those addressing perceptions and outcomes (Quality of Maternal Health Services and Infant Outcome) showed acceptable but slightly lower scores.

Table 6. 3: Cronbach's alpha values

Source: Self-generated by author

Numbers	Construct	Scales	Number of items	Cronbach's alpha score
1	General knowledge	GK2–10	9	0.856
2	Knowledge of stillbirth	KS1–10	10	0.862
3	Attitude Towards Maternal Healthcare	AT1–10	10	0.793
4	Socio-economic Factors	SF1–10	10	0.804
5	Practices Related to Antenatal Care	P1–10	10	0.890
6	Quality of Maternal Health Services	Q1–10	10	0.780
7	Infant Outcome	IF1–10	10	0.764

6.5 NORMALITY OF THE CONSTRUCTS

The assumption of normality is crucial in deciding between parametric and non-parametric tests. Parametric tests are based on the premise that data samples follow a normal distribution. The Kolmogorov-Smirnov (K-S) and Shapiro-Wilk (S-W) tests are commonly used to assess whether each construct's data conforms to a normal distribution. When these tests indicate a violation of the normality assumption, as shown in Table 6.4, non-parametric tests are often recommended. However, many statisticians argue that parametric tests remain valid and reliable even when normality is not strictly met, especially with sufficiently large sample sizes, as supported by the central limit theorem (Hogg et al., 2013). This theorem states that regardless of the population's distribution, the sampling distribution of the mean approaches normality as the sample size increases (commonly $n > 30$). The central limit theorem justifies the approximation of normality in sample means, thereby validating the use of parametric tests such as t-tests and ANOVAs in this study with over 100 respondents (Schmider et al., 2010).

Table 6. 4: Normality tests

Source: Self-generated by author

	Kolmogorov-Smirnov ^a			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
General knowledge	.099	263	<.001	.977	263	<.001
Knowledge stillbirth	.129	263	<.001	.956	263	<.001
Attitude maternal care	.111	263	<.001	.970	263	<.001
Socio-economic factors	.096	263	<.001	.986	263	.010
Practices Antenatal care	.118	263	<.001	.919	263	<.001
Quality Maternal services	.125	263	<.001	.951	263	<.001
Infant outcome	.115	263	<.001	.957	263	<.001
a. Lilliefors Significance Correction						

Source: Self-generated by author

6.6 AGGREGATED VIEW OF THE CONSTRUCT ITEMS

This section addresses the scoring patterns of the respondents with respect to seven factors related to ways to enhance South African maternal care within the public health system in the Lejweleputswa District Municipality. Respondents were asked to share their thoughts on each of the items listed under each factor. Questions were asked using a 5-point Likert scale with the options “strongly agree, agree, neither agree nor disagree, disagree, and strongly disagree”. The section presents the frequency distribution of responses. The responses used a bar graph.

6.6.1 General Knowledge

Figure 6.1 illustrates the distribution of healthcare professionals based on the number of years they have served in maternal healthcare. The data reveals that the majority of professionals, 51.0%, have been serving for 8 to 10 years, indicating a workforce with a strong foundation of experience in maternal healthcare. A notable 19.0% of professionals have 5 to 8 years of experience, representing a substantial segment that has likely developed considerable skills and expertise. Meanwhile, those with more than a decade of experience account for 15.6% of the respondents. Conversely, individuals with less

experience exhibit smaller percentages. Professionals with 0 to 2 years of service make up only 6.8%, while those with 2 to 5 years of experience account for 7.6%.

Overall, the distribution reflects a workforce dominated by experienced professionals, with fewer newcomers joining the field.

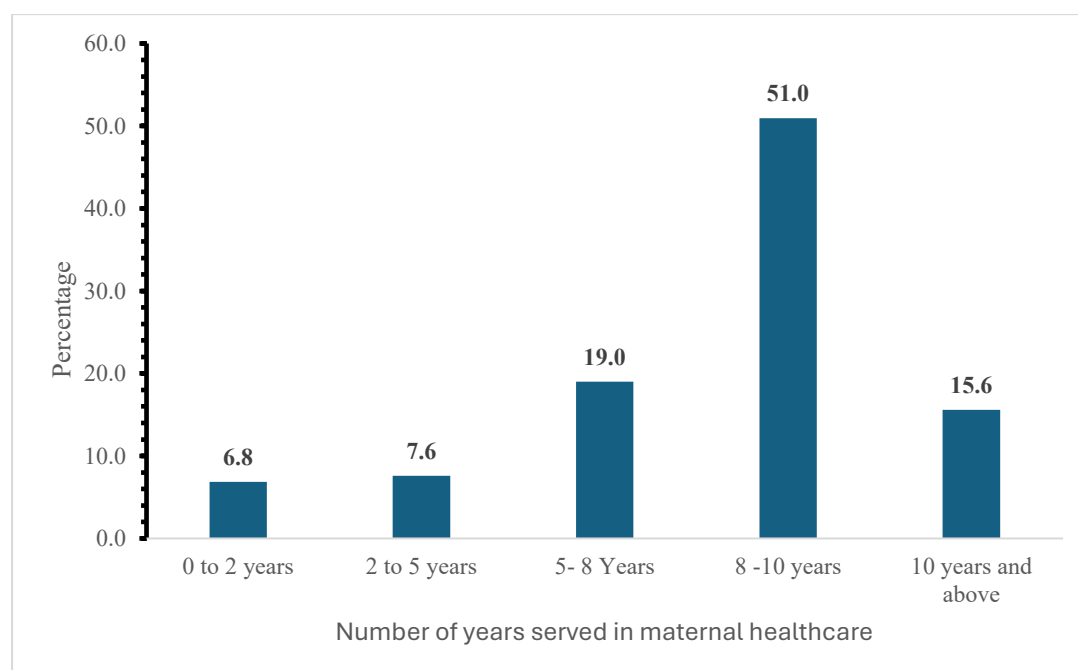


Figure 6. 1: Number of years served by respondents in maternal healthcare

Figure 6.2 details the responses gathered from the respondents on their general knowledge of stillbirth. The general knowledge was measured with nine items (GK2–GK10). The findings from the responses indicate a generally positive perception among healthcare workers about their roles, confidence, and the adequacy of resources related to stillbirth prevention. These are detailed below:

GK2: A majority of respondents agreed that their facility provides adequate information, education, and communication materials to educate clients about stillbirth prevention. Specifically, of the 78.7% of respondents, 50.2% agreed and 28.5% strongly agreed with this statement, while only 4.5% disagreed or strongly disagreed. This indicates that most healthcare workers feel their facilities offer sufficient resources for client education.

GK3: Most healthcare workers (81.8%) reported that they regularly provide information to pregnant women about stillbirth prevention during antenatal check-ups, with 48.3% agreeing and 33.5% strongly agreeing. Only 5.0% disagreed or strongly disagreed, demonstrating that client education is a routine and prioritized practice for the majority.

GK4: Confidence in screening pregnant women for stillbirth risk factors during antenatal care (ANC) visits was high; of the nearly 87.4% who agreed, 39.5% agreed and 47.9% strongly agreed with this

statement. This indicates that most healthcare providers feel well-equipped to assess and identify risk factors, a critical component of stillbirth prevention.

GK5: There was a strong consensus on the importance of training programs for healthcare providers in improving stillbirth outcomes; of the 78.3% who agreed, 38.4% agreed and 39.9% strongly agreed. Only 9.1% disagreed or strongly disagreed. This highlights the perceived necessity of ongoing professional development in this area.

GK6: Educating men about antenatal care and stillbirth risks was considered essential for reducing maternal and infant mortality; of the 59.3% of respondents who agreed, 36.1% strongly agreed and 23.2% agreed. However, a notable proportion (36.5%) were neutral or disagreed, suggesting that male involvement in antenatal care remains a challenging area that requires additional focus and effort.

GK7: Familiarity with the guidelines for preventing and managing stillbirth yielded mixed responses; of the 52.1% agreeing, 39.2% strongly agreed and 12.9% agreed that they knew these guidelines, and 42.2% were neutral, disagreed, or strongly disagreed. This points to variability in guideline dissemination and highlights the need for improved access to this critical knowledge.

GK8: Updating knowledge on stillbirth prevention through training and workshops was reported by 63.1% of respondents, who agreed (46.4%) or strongly agreed (16.7%). However, 33.5% were neutral, disagreed, or strongly disagreed, indicating gaps in continuous professional development opportunities for some healthcare workers.

GK9: Confidence in knowing the specific steps to take if a pregnant woman is at high risk for stillbirth was relatively high, with 63.9% in agreement. Of the 63.9%, 46.0% agreed and 17.9% strongly agreed. Nevertheless, 35.1% were neutral, disagreed, or strongly disagreed, suggesting that clarity in procedural training could be improved.

GK10: Perceptions of the adequacy of training provided to healthcare workers on stillbirth prevention at their facility varied. Of the 57.8% agreeing, 41.8% strongly agreed, and 16.0% agreed, with 37.3% being neutral, disagreeing, or strongly disagreeing. This highlights disparities in the quality and availability of training programs across facilities.

Overall, the responses indicate that healthcare workers generally feel confident and supported in their efforts to prevent stillbirth. However, there are areas for improvement, particularly in guideline familiarity, ongoing training opportunities, and engaging men in antenatal care.

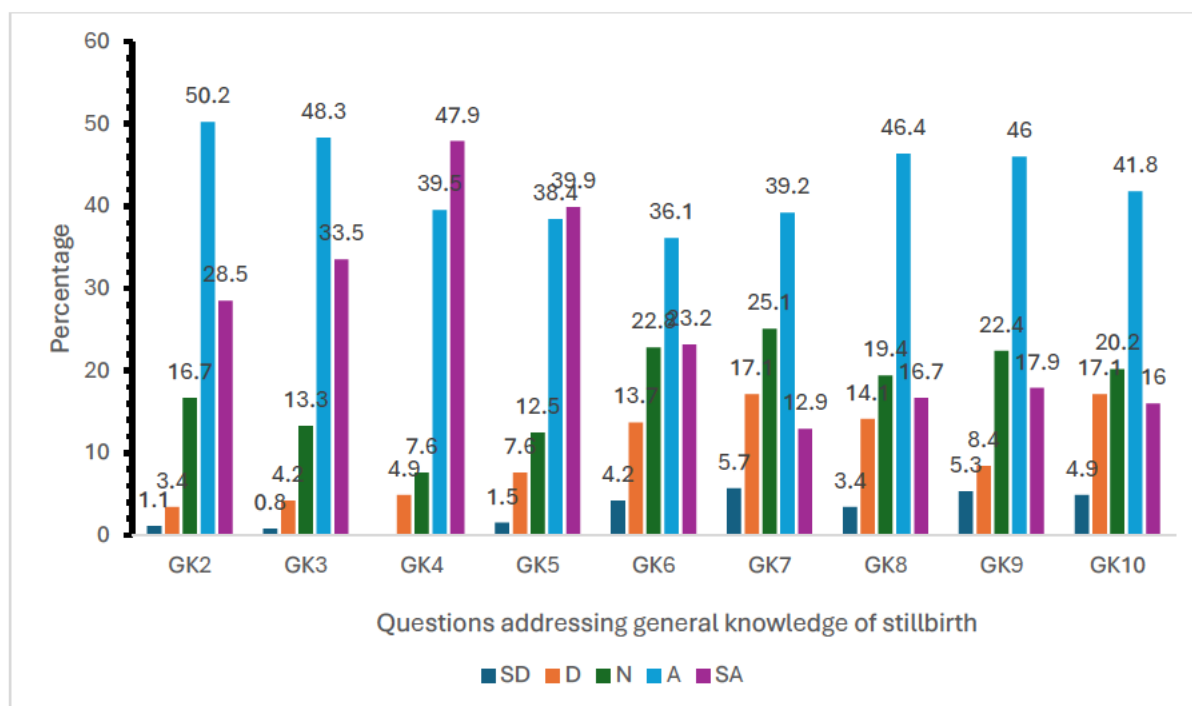


Figure 6. 2: Response to questions addressing general knowledge of stillbirth

6.6.2 Knowledge of stillbirth

This category subsection assesses healthcare providers' understanding of stillbirth causes, prevention strategies, and their role in reducing stillbirth rates. Knowledge of stillbirth was measured with ten items (KS1–KS10); the responses are detailed as follows:

KS1 (Maternal age and stillbirth): The data reveals that most respondents agree that maternal age plays a role in the causes of stillbirth. Specifically, 49% agreed and 19.4% strongly agreed, making up a significant majority of 68.4%. Only a small percentage disagreed (8%) or strongly disagreed (0.8%), while 22.8% were neutral. This percentage suggests a strong recognition of maternal age as a contributing factor to stillbirth.

KS2 (Obesity and stillbirth): Perceptions about obesity as a cause of stillbirth were mixed. While 37.6% agreed and 14.8% strongly agreed (52.4% combined), 16% disagreed, and 0.4% strongly disagreed. A considerable proportion (31.2%) remained neutral, indicating some uncertainty or variability in opinions regarding this risk factor.

KS3 (Diabetes and stillbirth): A majority of respondents identified diabetes as a cause of stillbirth, with 47.5% agreeing and 24% strongly agreeing, making up 71.5%. Only 7.2% disagreed or strongly disagreed, while 21.3% were neutral. This finding indicates a strong consensus among healthcare workers on the role of diabetes as a risk factor.

KS4 (Smoking and stillbirth): There was strong agreement that smoking during pregnancy leads to stillbirth. A combined 82.5% agreed, with 47.1% agreeing and 35.4% strongly agreeing, while only a

combined 4.6% disagreed or strongly disagreed. A smaller proportion (12.9%) were neutral, reflecting a general awareness of this modifiable risk factor.

KS5 (Hypertension and stillbirth): Hypertension was widely recognized as a cause of stillbirth, with 41.1% agreeing and 39.2% strongly agreeing, yielding a total of 80.3%. Only a combined 3.1% disagreed or strongly disagreed, and 16.7%, were neutral. This highlights a strong consensus on the impact of hypertension on stillbirth outcomes.

KS6 (Awareness of pre-eclampsia symptoms): Awareness of pre-eclampsia symptoms (e.g., high blood pressure, swelling, protein in urine) was high among respondents, with 42.2% agreeing and 49.4% strongly agreeing, yielding a total of 91.6%. Only 6.8% were neutral, and 1.5% disagreed. This demonstrates a robust understanding of pre-eclampsia signs among healthcare workers.

KS7 (Confidence in identifying pre-eclampsia signs): Most respondents felt confident in identifying early warning signs of pre-eclampsia, with 38.8% agreeing and 44.5% strongly agreeing (83.3%). Only 2.7% disagreed, while 14.1% were neutral. This result indicates a high level of confidence among healthcare workers in detecting this condition.

KS8 (Impact of timely pre-eclampsia detection): Respondents strongly believed that timely detection of pre-eclampsia can significantly reduce the risk of stillbirth. A combined 88.6% agreed, with 44.9% agreeing and 43.7% strongly agreeing, while only 9.9% were neutral and 1.5% disagreed. This highlights the importance placed on early intervention.

KS9 (Awareness of placental abruption symptoms): Awareness of placental abruption symptoms (e.g., vaginal bleeding, abdominal pain, contractions) was high, with 54.8% agreeing and 30.8% strongly agreeing, yielding a total of 85.6%. Only 11.4% were neutral, and 0.8% disagreed, demonstrating widespread awareness of these symptoms.

KS10 (Impact of early detection of placental abruption): There was strong agreement that early detection of placental abruption can significantly reduce maternal and fetal risks. A combined 88.2% agreed, with 47.5% agreeing and 40.7% strongly agreeing, while only 11.8% were neutral. This result underscores the value of early identification and management.

The above responses indicate a high level of awareness and confidence among healthcare workers regarding the causes and early detection of risk factors like pre-eclampsia, placental abruption, and lifestyle-related risks (e.g., smoking, obesity). However, neutral responses in some areas (e.g., obesity and diabetes) suggest opportunities for further education and consensus-building in addressing specific risk factors for stillbirth.

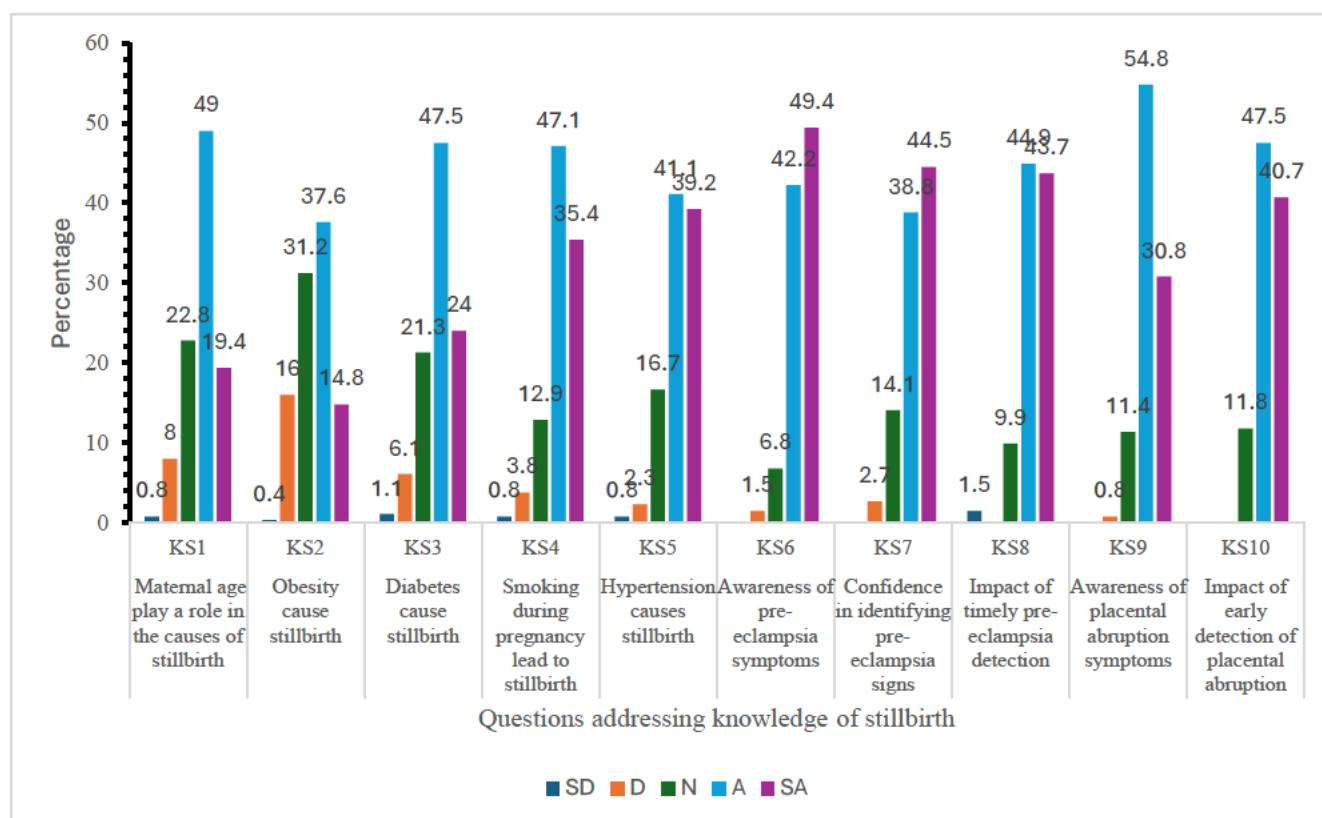


Figure 6. 3: Responses to the questions addressing knowledge of stillbirth

6.6.3 Attitude towards Maternal Healthcare

This category evaluates the attitudes of healthcare workers toward maternal healthcare services and their impact on stillbirth prevention. Attitudes towards maternal healthcare were measured with ten items (AT1–AT10); the responses are detailed as follows:

AT1 (Regular antenatal check-ups can significantly reduce the risk of stillbirth): A significant majority of respondents (55.5% strongly agree and 36.5% agree, totalling 92%) believe that regular antenatal check-ups can effectively reduce the risk of stillbirth. Only 6.1% were neutral, while 1.5% disagreed and 0.4% strongly disagreed. This pattern indicates widespread confidence in the role of antenatal care in mitigating stillbirth risks.

AT2 (Compassionate care improves engagement with antenatal care): Nearly all respondents supported the idea that providing compassionate care encourages pregnant women to engage with antenatal care services, with 47.5% agreeing, and 47.1% strongly agreeing totalling 94.6%. Only 3.8% were neutral, while a minimal 1.1% disagreed, and 0.4% strongly disagreed. This finding reflects a near-universal recognition of the importance of compassion in healthcare.

AT3 (Cultural beliefs influence health-seeking behavior): The majority of respondents (54.4% agree and 22.8% strongly agree) believe cultural beliefs significantly influence health-seeking behaviour in this community, making up 77.2% overall. Some respondents remained neutral (12.9%), while a small proportion (6.8% disagreed and 3% strongly disagreed) showed less alignment. This finding highlights the acknowledged impact of cultural context on antenatal care engagement.

AT4 (Addressing stillbirth concerns during ANC visits): A combined 87.4% of respondents (39.5% strongly agree and 47.9% agree) believe it is important to address women's concerns about stillbirth during every ANC visit; 7.6% were neutral, and a combined minority disagreed (4.6%) and strongly disagreed (0.4%). This finding demonstrates a strong consensus about the necessity of tackling stillbirth-related concerns during routine care.

AT5 (Healthcare workers' attitudes influence antenatal care): Most respondents (41.1% strongly agree and 45.6% agree, totalling 86.7%) felt that healthcare workers' attitudes can encourage or discourage pregnant women from continuing care. Neutral responses accounted for 8.7%, while a small proportion (4.6%) disagreed. This finding underscores the critical role of healthcare workers' attitudes in promoting continued antenatal care.

AT6 (Improved healthcare attitudes improve pregnancy outcomes): A vast majority (45.6% strongly agree and 41.4% agree, totalling 87%) believe that improving healthcare attitudes can lead to better pregnancy outcomes. Neutral responses accounted for 12.9%, with no disagreement recorded, suggesting a clear understanding of the importance of positive attitudes in healthcare delivery.

AT7 (Efforts to change negative attitudes towards antenatal care): Similarly, 88.6% of respondents (41.1% strongly agree and 47.5% agree) supported the need for more efforts to change negative attitudes toward antenatal care in the community. Neutral responses (11.4%) highlight a minor area of variability, with no disagreement recorded. This suggests a shared commitment to fostering positive attitudes.

AT8 (Motivation to seek antenatal care regularly): Most respondents (51.3% agree and 31.2% strongly agree, totalling 82.5%) believe pregnant women in the community are motivated to seek antenatal care regularly. Neutral responses accounted for 12.9%, with minimal disagreement, with 3.8% disagreeing and 0.8% strongly disagreeing, indicating general optimism about women's commitment to antenatal care.

AT9 (Understanding the importance of recommended ANC visits): A majority (51% agreeing and 20.2% strongly agreeing, totalling 71.2%) feel pregnant women understand the importance of attending all recommended ANC visits. Neutral responses (20.9%), minimal disagreement (7.2%), and strong disagreement (0.8%) suggest room for improving awareness or addressing barriers to attendance.

AT10 (Attitudes toward antenatal care influence maternal health services): Most respondents (53.2% agree and 31.2% strongly agree, totalling 84.4%) believe attitudes toward antenatal care influence the

overall quality of maternal health services. Neutral responses (11.8%), minimal disagreement (3%), and strong disagreement (0.8%) reflect a broad consensus on the connection between attitudes and service quality.

The responses highlight a strong consensus among healthcare workers about the importance of regular antenatal care, compassionate attitudes, and addressing cultural beliefs to improve maternal health outcomes. While neutral responses suggest areas for further education and interventions, the overall positivity indicates a shared commitment to enhancing antenatal care engagement and service quality.

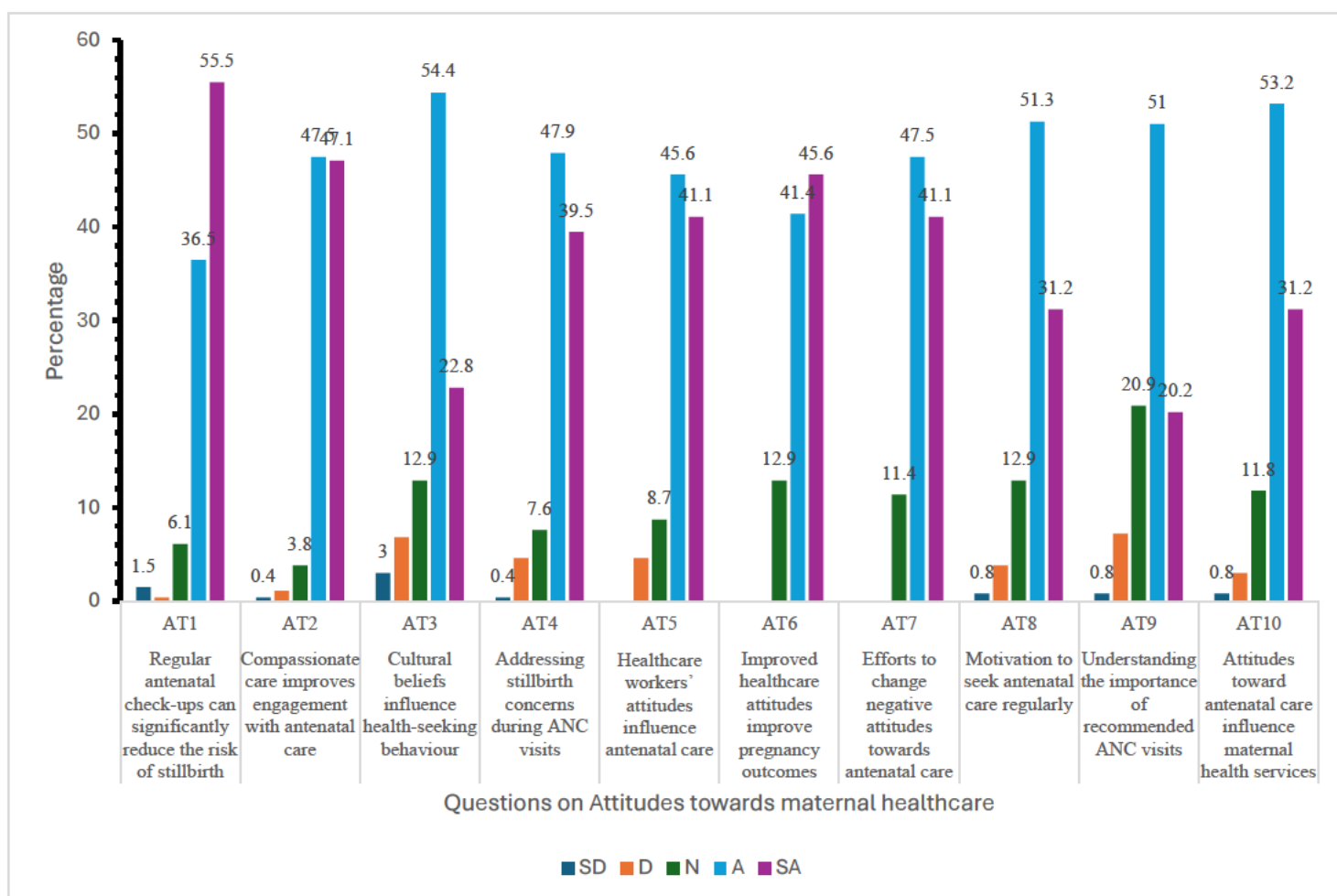


Figure 6. 4: Response to questions addressing attitudes towards maternal healthcare

6.6.4 Socio-economic Factors

These questions (SF1–SF10) assess the impact of socio-economic conditions (income, education, etc.) on the ability to access maternal care services and reduce stillbirth. The findings are detailed as follows:

SF1 (Women with higher education levels are more likely to attend regular antenatal care visits): A majority of respondents (39.2% agree, 33.1% strongly agree, totalling 72.3%) believe higher education levels among women positively impact antenatal care attendance. Neutral responses (12.2%) and disagreement (12.5% disagree and 3% strongly disagree) highlight some variability, suggesting that while education is important, other factors may also influence attendance.

SF2 (Low-income women face more barriers to accessing quality antenatal care services): Responses show mixed perceptions. While 51.7% (33.1% agree and 18.6% strongly agree) believe low-income women face barriers, a significant proportion disagreed (27.8%) and strongly disagreed (5.7%), with 14.8% remaining

neutral. This pattern reflects differing views on whether income is a major determinant or if other factors also contribute to accessibility challenges.

SF3 (Lack of transportation is a major factor preventing women from attending antenatal check-ups): Opinions are divided, with 51% (36.9% agreeing and 14.1% strongly agreeing) attributing attendance challenges to transportation issues; 34.2% (24.7% disagreeing and 9.5% strongly disagreeing) and 14.8% neutral responses suggesting transportation may not be the sole barrier.

SF4 (Women from poorer households are less likely to seek maternal health care compared to higher-income households): The majority (32.7% agree, 18.3% strongly agree, totalling 51%) associate lower-income status with reduced maternal healthcare access. Neutral responses (22.8%) and disagreement (17.1% disagree and 9.1% strongly disagree) suggest a nuanced view, indicating that socio-economic factors interact with other barriers.

SF5 (Income level significantly impacts whether women can afford adequate nutrition during pregnancy): A strong consensus (49% agree and 27.4% strongly agree, totalling 76.4%) exists on the impact of income on nutritional affordability during pregnancy. Minimal disagreement (10.6%) and neutral responses (8.4%) suggest widespread recognition of financial constraints as a critical determinant.

SF6 (Higher educational attainment among women leads to better awareness of stillbirth risk factors): Most respondents (48.3% agree and 27.8% strongly agree, totalling 76.1%) agree that education increases awareness of stillbirth risk factors. Neutral responses (15.2%) and minimal disagreement (8.4%) underscore the belief that education significantly enhances maternal health knowledge.

SF7 (Increased financial support for pregnant women would significantly improve antenatal care attendance): A vast majority (51.7% agree and 21.7% strongly agree, totalling 73.4%) believe financial support would enhance attendance. Neutral responses (16.3%) and minimal disagreement (7.2% disagree, 3% strongly disagree) reflect general agreement on the role of economic interventions.

SF8 (Educational programs have successfully improved maternal care and stillbirth prevention knowledge): Most respondents (41.8% agree, 23.6% strongly agree, totalling 65.4%) recognize the success of educational programs, though neutral responses (28.5%) indicate variability in their perceived effectiveness. Only 6.1% disagreed, suggesting overall optimism about these initiatives.

SF9 (Socio-economic inequality contributes to disparities in antenatal care service utilization): A majority (47.9% agree, 10.6% strongly agree, totalling 58.5%) attribute disparities in antenatal care utilization to socio-economic inequality. Neutral responses (27.4%) and disagreement (12.5% disagree and 1.5% strongly disagree) highlight some divergence in views, suggesting that inequality is one of several contributing factors.

SF10 (Income and employment status influence maternal health outcomes): Most respondents (49% agree, 21.3% strongly agree, totalling 70.3%) agree that income and employment status affect maternal health outcomes. Neutral responses (14.1%) and minimal disagreement (10.6% disagree and 4.9% strongly disagree) indicate strong alignment with this statement.

In summary, the above response suggests that higher education is widely considered a key factor in improving antenatal care attendance and awareness of stillbirth risk factors. Income and financial support are acknowledged as critical determinants of maternal healthcare access and outcomes, including antenatal care and nutrition. While transportation and socio-economic inequality are perceived as significant barriers, there is variability in the extent to which respondents see these factors as the primary issues. Respondents broadly support financial and educational interventions to improve maternal care, reflecting optimism about their potential impact.

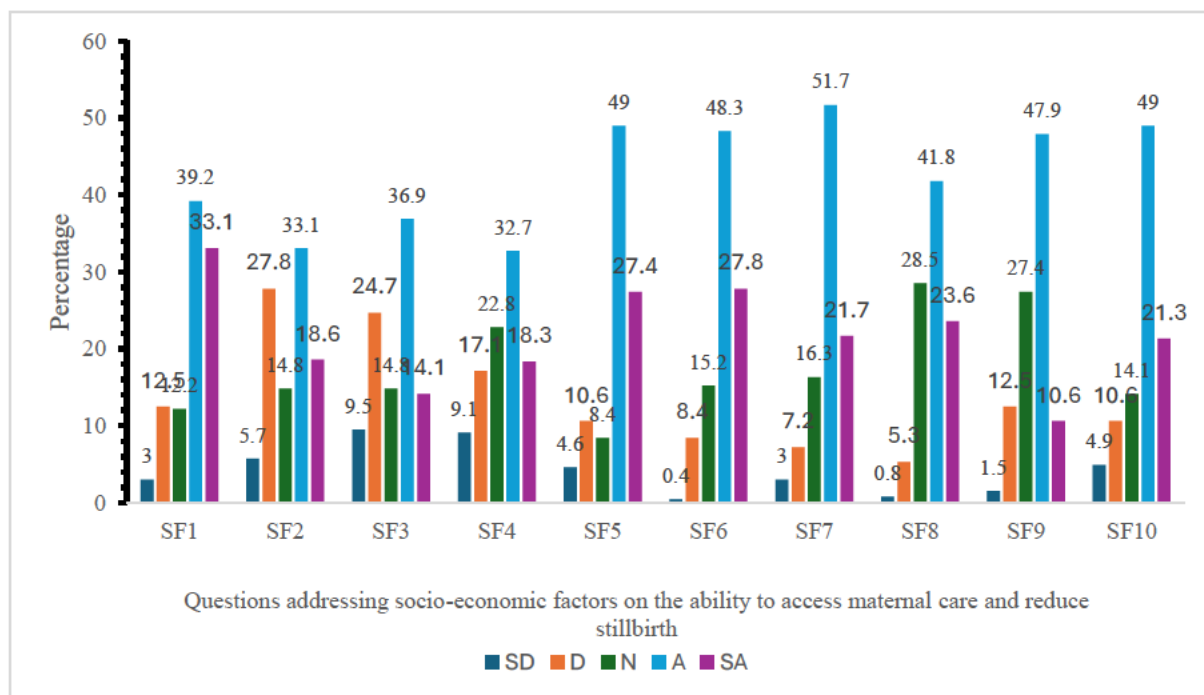


Figure 6. 5: Responses on the impact of socio-economic factors on the ability to access maternal care and reduce stillbirth

6.6.5 Practices Related to Antenatal Care

Questions P1–P10 evaluate healthcare workers' practices during antenatal care visits and how they affect stillbirth outcomes. The responses gathered from the respondents are detailed as follows:

P1 (Antenatal care visits play a critical role in preventing stillbirths): A strong majority (38% agree, 51.3% strongly agree, totalling 89.3%) believe antenatal care visits are critical for stillbirth prevention. Only 3.8% disagreed, and 6.8% were neutral, suggesting broad recognition of the importance of antenatal care in reducing stillbirth risks.

P2 (I always inform pregnant women about the importance of attending all their scheduled ANC visits): Most respondents (36.1% agree, 57% strongly agree, totalling 93.1%) affirmed consistently informing pregnant

women about attending ANC visits. Minimal neutral (5.3%) and disagreement (1.5%) responses reflect a strong commitment among respondents to this practice.

P3 (Early detection of warning signs during antenatal care helps prevent stillbirths): An overwhelming majority (35% agree, 58.6% strongly agree, totalling 93.6%) believe in the critical role of early detection in preventing stillbirths. Minimal neutral (4.9%) and disagreement (1.5%) responses emphasize widespread acknowledgment of early detection's value.

P4 (Regular ANC visits are promoted and encouraged at this health facility): Most respondents (38% agree, 57.4% strongly agree, totalling 95.4%) indicated that regular ANC visits are actively promoted at their facility. Neutral (3.8%) and disagreement (0.8%) responses were minimal, highlighting a strong focus on encouraging ANC attendance.

P5 (I provide information on the symptoms and warning signs that require urgent medical attention): A majority (37.3% agree, 50.2% strongly agree, totalling 87.5%) reported providing information about urgent symptoms. Neutral responses (10.3%) and disagreement (2.3%) suggest some variability in practice or perceived gaps in implementation.

P6 (There is a structured system in place for referring high-risk pregnancies to specialized care): Most respondents (40.3% agree, 45.2% strongly agree, totalling 85.5%) agree there is a structured referral system for high-risk pregnancies. However, 12.2% neutral and 2.3% disagreement responses indicate room for improvement in ensuring robust referral systems.

P7 (A minimum of four ANC visits is required for normal pregnancies without complications): While a majority (48.7% agree, 25.9% strongly agree, totalling 74.6%) agreed with this standard, 13.7% were neutral and 11.7% (6.8% disagree, 4.9% strongly disagree) expressed differing views, suggesting potential gaps in knowledge or differing guidelines followed in practice.

P8 (Antenatal care practices in this facility meet the standard guidelines for reducing maternal and infant mortality): A majority (51% agree, 31.2% strongly agree, totalling 82.2%) believe their facility's practices align with standard guidelines. However, 12.9% neutral and 4.9% disagreement responses point to areas where adherence to guidelines may need strengthening.

P9 (I always advise pregnant women to follow a proper nutrition and exercise plan during pregnancy): Most respondents (41.4% agree, 46.8% strongly agree, totalling 88.2%) consistently provide advice on nutrition and exercise. Minimal disagreement (1.1%) and neutral responses (10.6%) highlight a well-implemented practice, with some variability in approach.

P10 (Regular monitoring of fetal growth during ANC visits is critical for detecting potential stillbirth risks): An overwhelming majority (37.3% agree, 50.6% strongly agree, totalling 87.9%) recognize the importance of fetal growth monitoring. Minimal neutral (10.6%) and disagreement (1.5% disagree, 0.4% strongly disagree) responses reinforce its acknowledged significance.

Respondents overwhelmingly agree on the critical role of ANC visits, early detection, fetal monitoring, and proper maternal advice in preventing stillbirths and improving maternal and infant health outcomes. While most respondents reported structured systems and guideline adherence, neutral and disagreement responses suggest some perceived gaps in practice or room for system improvements. High levels of agreement regarding promoting ANC visits, providing essential information, and advising on nutrition and exercise suggest well-implemented practices. Items such as the "minimum of four ANC visits" and "referral systems" revealed slight variability, indicating potential inconsistencies in knowledge or practices across facilities.

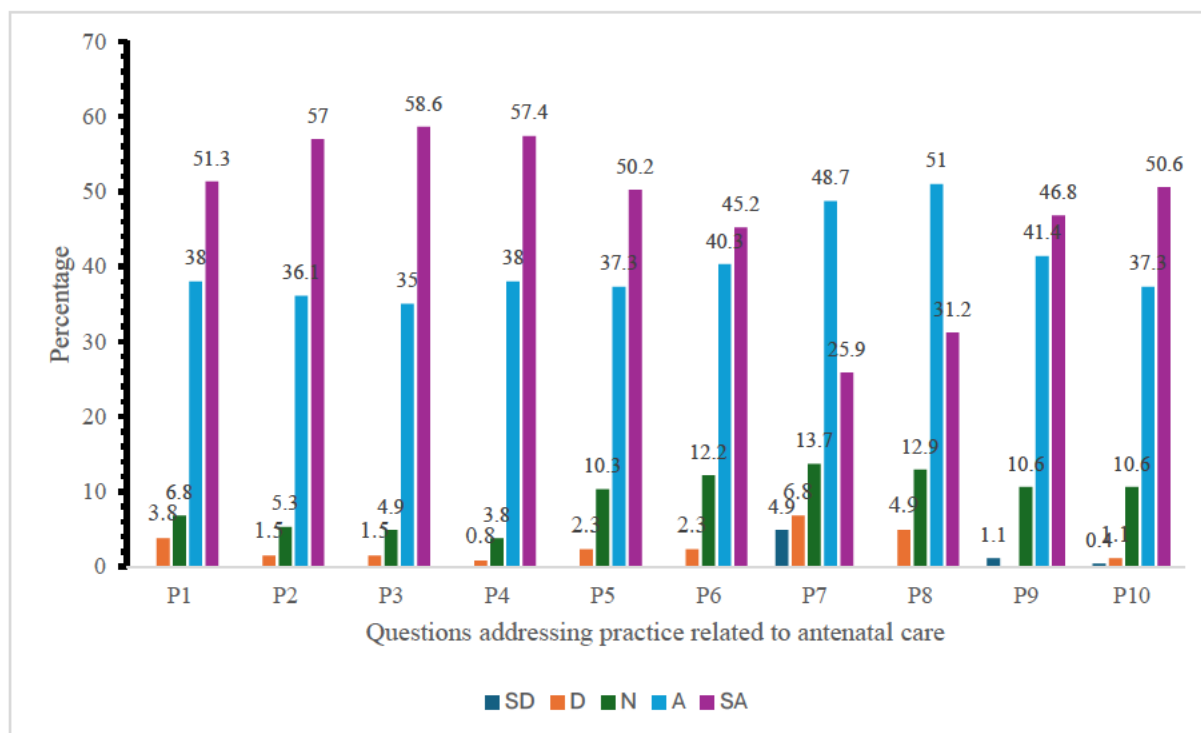


Figure 6. 6: Responses on practices related to antenatal care

6.6.6 Quality of Maternal Health Services

This section assesses the quality of maternal healthcare services available, focusing on service provision, staff competence, and overall healthcare infrastructure. The quality of maternal health services was assessed with ten items (Q1–Q10). The responses are summarized below:

Q1 (The maternal healthcare services in this facility meet the standard required for reducing stillbirths): A majority (51.3% agree, 25.1% strongly agree, totalling 76.4%) believe that the maternal healthcare services meet the required standards for reducing stillbirths. However, 15.6% are neutral, and 8% (7.6% disagree, 0.4% strongly disagree) expressed dissatisfaction, indicating areas for potential improvement in service quality.

Q2 (We have sufficient staff to handle the volume of maternal care cases at this facility): A notable 45.6% of respondents disagreed with having sufficient staff (20.5% strongly disagree, 25.1% disagree), while only 35.4%

felt the staffing levels were adequate (27% agree, 8.4% strongly agree). A significant proportion (19%) were neutral, highlighting a critical staffing challenge that may affect service delivery and maternal outcomes.

Q3 (Access to quality maternal healthcare services is critical in preventing stillbirths): A strong majority (45.2% agree, 39.5% strongly agree, totalling 84.7%) affirmed the importance of quality maternal healthcare services in preventing stillbirths. Neutral responses (7.6%) and disagreement (7.6% total) suggest near-universal acknowledgment of access as a critical factor.

Q4 (I believe that poor-quality maternal services are responsible for adverse pregnancy outcomes like stillbirths): Most respondents (44.9% agree, 27.8% strongly agree, totalling 72.7%) linked poor-quality services to adverse outcomes. However, 17.5% were neutral, and 9.9% (5.7% disagree, 4.2% strongly disagree) did not fully agree, indicating differing perspectives or experiences regarding the root causes of stillbirths.

Q5 (The healthcare infrastructure at this facility is adequate to support safe and effective maternal care): A majority (46.4% agree, 14.8% strongly agree, totalling 61.2%) indicated the facility's infrastructure is adequate. However, 20.2% were neutral, and 18.6% (12.9% disagree, 5.7% strongly disagree) reported concerns about infrastructure adequacy, signaling room for infrastructure improvement.

Q6 (After each antenatal consultation, women are provided with clear information on when to return for follow-up visits): An overwhelming majority (33.1% agree, 58.2% strongly agree, totalling 91.3%) reported that women receive clear follow-up instructions after consultations. Minimal neutral (5.3%) and disagreement (3.4%) responses reflect consistent adherence to communication practices.

Q7 (The antenatal care provided at this facility includes comprehensive screening for risk factors associated with stillbirth): A large majority (48.3% agree, 36.9% strongly agree, totalling 85.2%) confirmed comprehensive screening for stillbirth risk factors. Neutral responses (9.5%) and minimal disagreement (5.3%) suggest this practice is well-integrated, though with slight room for improvement.

Q8 (In case of maternal complications, timely interventions are always carried out to prevent adverse outcomes, including stillbirths): A majority (44.5% agree, 33.1% strongly agree, totalling 77.6%) agreed that timely interventions are carried out for complications. However, 19.8% were neutral, and 2.7% (2.3% disagree, 0.4% strongly disagree) expressed reservations, suggesting potential variability in response to complications.

Q9 (Communication between healthcare providers ensures that maternal cases are handled effectively and on time): Most respondents (47.9% agree, 25.9% strongly agree, totalling 73.8%) highlighted effective communication among providers. However, 21.3% were neutral, and 4.9% (3.4% disagree, 1.5% strongly disagree) indicated gaps in communication, pointing to a need for improvement in team coordination.

Q10 (Women who experience high-risk pregnancies receive adequate support and counselling from healthcare professionals): A significant majority (57% agree, 33.8% strongly agree, totalling 90.8%) believed that high-risk pregnancies receive adequate support and counselling. Only 9.1% (5.7% neutral, 3.4% disagree) suggested gaps in support services, reflecting strong but not universal practice in this area.

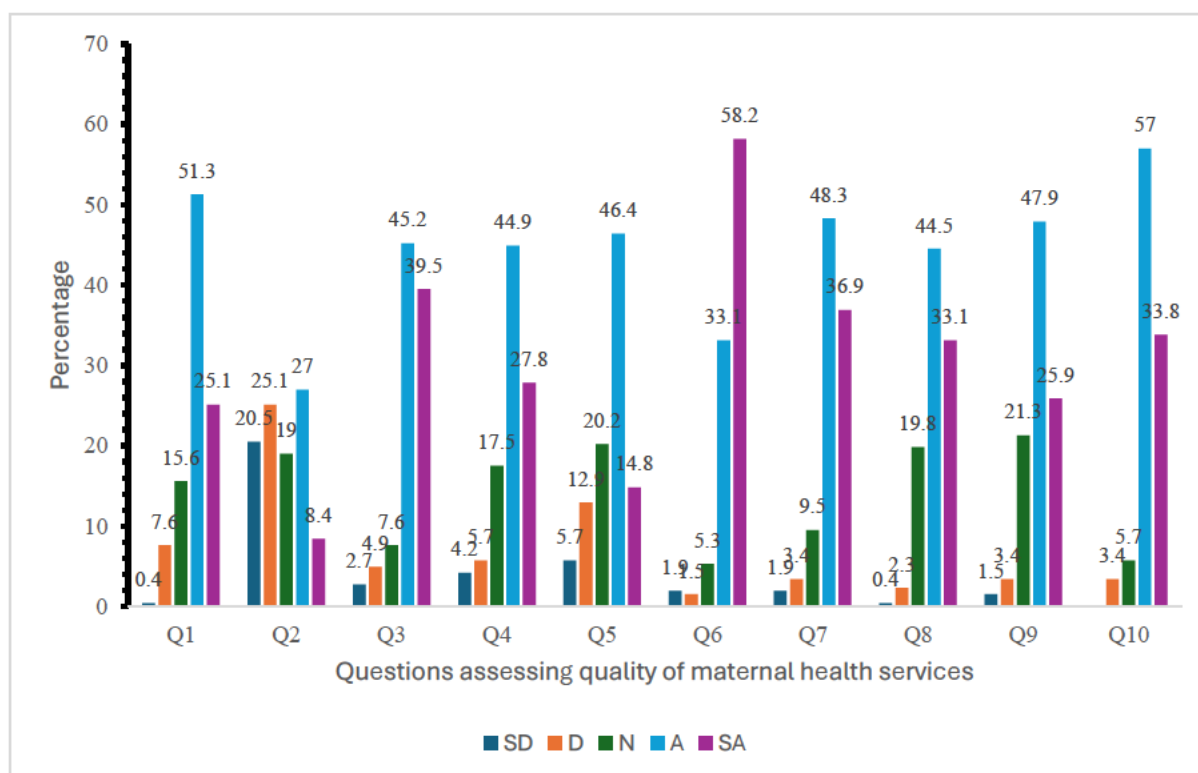


Figure 6. 7: Responses to the statement assessing the quality of maternal health services

6.6.7 Infant outcome

This section details the responses to infant outcomes. The responses were gathered with 10 items (IF1–IF10). The findings reveal a predominantly positive perception of maternal healthcare practices, guidelines, and interventions. Regarding current maternal health practices (IF1), 57.8% agreed and 27% strongly agreed totalling of 84.8% of respondents agreeing that these practices effectively reduce maternal mortalities, highlighting confidence in the existing approaches. A significant number (86.3%) of respondents agree (49%) or strongly agree (37.3%), suggesting a consensus on the need for improving maternal practices (IF2). Neutral responses (11.8%) reflect some hesitation, while disagreement was very low. Similarly, the majority expressed a favourable view of the existing *Guidelines for Maternity Care in South Africa* (IF3), with 51.3% agreeing and 34.6% strongly agreeing—totalling 85.9%—that these guidelines improve maternal outcomes. At the same time, there is room for enhancement, as 73.4% of respondents agreed (46%) or strongly agreed (27.4%) that updates to these guidelines (IF4) are needed to further increase positive outcomes.

The current healthcare infrastructure was perceived as somewhat effective, with 68.4% of respondents agreeing (53.2%) or strongly agreeing (15.2%) that it supports safe and effective delivery and maternal care (IF5). However, there is a strong call for improvement, as 84.4% of respondents agreed (54.4%) or strongly agreed (30%) that enhancements to the infrastructure (IF6) are required to better support maternal care.

In terms of handling complicated pregnancies and reducing adverse outcomes (IF7), 67.7% of respondents (46% agreed and 21.7% strongly agreed) expressed confidence in their abilities (IF7). However, an even greater percentage (90.9%) agreed (52.5%) or strongly agreed (38.4%) that healthcare providers need additional confidence and support (IF8), suggesting a proactive approach to capacity-building with minimal neutrality (8.4%) and negligible disagreement.

The effectiveness of current interventions in reducing the occurrence of stillbirths was acknowledged by 74.9% of respondents (58.2% agreed and 16.7% strongly agreed) (IF9). Furthermore, a vast majority (57.8% agreed and 28.5% strongly agreed, totalling 86.3%) that improvements to these interventions (IF10) are necessary to achieve even better outcomes. Neutrality (11.4%) is minimal, with very little disagreement.

Overall, the findings (IF1–IF10) underscore a positive perception of maternal healthcare systems, guidelines, and interventions while emphasizing a collective drive for continuous improvement. This dual acknowledgment of current strengths and future opportunities highlights the commitment of healthcare stakeholders to advancing maternal and neonatal health outcomes.

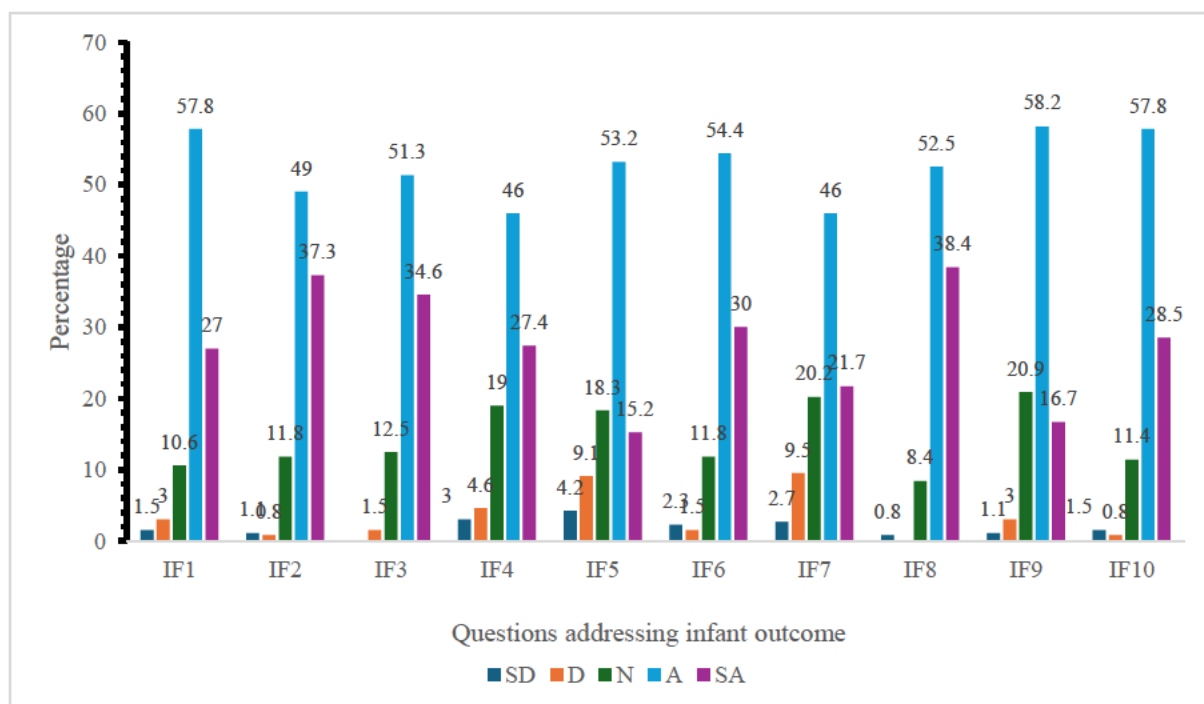


Figure 6. 8: Responses on questions addressing infant outcome

6.7 Composite assessment of the constructs

A series of one-sample t-tests were conducted to examine various aspects of maternal healthcare and related factors. The analysis was done to gain insights into whether the level of agreement or disagreement was significantly different from the neutral midpoint of 3.00 on a five-point Likert scale. The results shown in Table

6.5 indicate that all constructs were rated significantly higher than the midpoint, suggesting that respondents tended to agree with the items.

General Knowledge: Respondents demonstrated relatively high levels of general knowledge about maternal healthcare, with a mean score of 3.79 (SD=0.66, $t(262)=91.380$, $p<.001$). The moderate effect size ($d=0.67$) suggests a notable level of awareness, exceeding neutral expectations.

Knowledge of Stillbirth: Awareness of stillbirth was notably high, with participants scoring an average of 4.08 (SD=0.54, $t(262)=122.974$, $p<.001$). The moderate effect size ($d=0.54$) further underscores the significant level of knowledge in this area.

Attitude Towards Maternal Healthcare: Attitudes towards maternal healthcare were very positive, reflected in a mean score of 4.18 (SD=0.47, $t(262)=144.236$, $p<.001$). The effect size was medium ($d=0.47$), highlighting meaningful positivity among participants.

Socio-economic Factors: Perceptions of the impact of socio-economic factors were moderately positive, with a mean score of 3.64 (SD=0.65, $t(262)=90.735$, $p<.001$). The moderate effect size ($d=0.65$) indicates these factors are considered impactful but not overwhelmingly so.

Practices Related to Antenatal Care: Practices related to antenatal care were rated very positively, with a mean score of 4.31 (SD=0.54, $t(262)=128.894$, $p<.001$). The medium effect size ($d=0.54$) indicates substantial adherence to recommended antenatal practices.

Quality of Maternal Health Services: Participants rated the quality of maternal health services favourably, with a mean score of 3.90 (SD=0.54, $t(262)=117.985$, $p<.001$). The medium effect size ($d=0.58$) reflects significant satisfaction with the services provided.

Infant Outcome: Positive perceptions were also observed regarding infant outcomes, with a mean score of 4.01 (SD=0.47, $t(262)=139.325$, $p<.001$). The moderate effect size reflects meaningful positive perceptions ($d=0.47$).

The findings highlight consistently favourable perceptions across all examined aspects of maternal healthcare, with particularly strong knowledge and practices related to maternal and antenatal care. The statistical significance ($p<.001$) in all domains confirms these results are meaningful, while the varying effect sizes illustrate differences in the magnitude of participants' perceptions across specific aspects.

Table 6. 5: Composite assessment of the mean and standard deviation for the constructs

Source: Self-generated by author

	N	Mean	Std. Deviation	t-value	Df	P value	Cohen's d
General knowledge	263	3.79	.67	91.380	262	<.001	.67
Knowledge of stillbirth	263	4.08	.54	122.974	262	<.001	.54
Attitude Towards Maternal Healthcare	263	4.18	.47	144.236	262	<.001	.47
Socio-economic Factors	263	3.64	.65	90.735	262	<.001	.65
Practices Related to Antenatal Care	263	4.31	.54	128.894	262	<.001	.54
Quality of Maternal Health Services	263	3.90	.54	117.985	262	<.001	.54
Infant Outcome	263	4.01	.47	139.325	262	<.001	.47

Source: Self-generated by author

6.8 ASSESSING THE CAUSE-AND-EFFECT RELATIONSHIP IN THE PROPOSED MODEL

The study used standardized linear regression analysis to define the interrelationship among the items within two sub-constructs of a model (Sekaran & Bougie, 2016:315). This analysis allows for the determination of how well items within the two sub-constructs predict a desired outcome. Linear regression analysis was carried out, given a significance level of $p < 0.0005$, to determine the cause-and-effect relationship as proposed in the conceptual model of the study, with $n = 263$. The yielded results are presented as follows:

6.8.1 Normality assumptions and linearity check

For each hypothesis tested, the assumptions of the normality of residuals, linearity, and homoscedasticity were carefully examined to ensure they were not violated. Normality was evaluated using descriptive analysis, with skewness values falling within the acceptable range of +1 to -1, as defined by Al-Qeisi (2009), eliminating the need for data transformation. Residual analysis was further conducted using a normal probability P-P plot to assess the regression standardized residuals (Pallant, 2016). The P-P plot confirmed that the residuals closely followed the expected cumulative probabilities of a normal distribution, thereby validating the normality assumption. This conclusion enhances the reliability of the regression analysis in predicting the "Infant Outcome" variable.

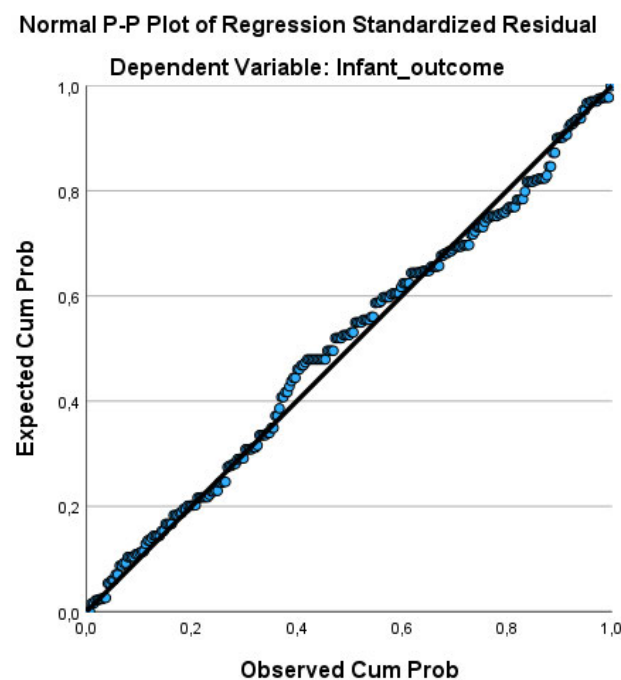


Figure 6. 9: Normal P-P Plot of Regression Standardized Residual

The assumptions of linearity, homoscedasticity, and independence of errors in the regression model were assessed using the residual scatter plot for the sample (Figure 4.10). The plot showed that the data points were randomly distributed without a distinct curved pattern, indicating that the assumption of linearity was met (Saunders et al., 2016). Additionally, the residuals were evenly spread across the predicted values, suggesting that the variance of residuals was approximately constant, thereby satisfying the homoscedasticity assumption. This consistency in variance between the independent and dependent variables further supports the assumption of homoscedasticity (Everitt & Skrondal, 2010). Moreover, the absence of clustering or systematic patterns in the residuals confirmed the independence of errors in the regression model.

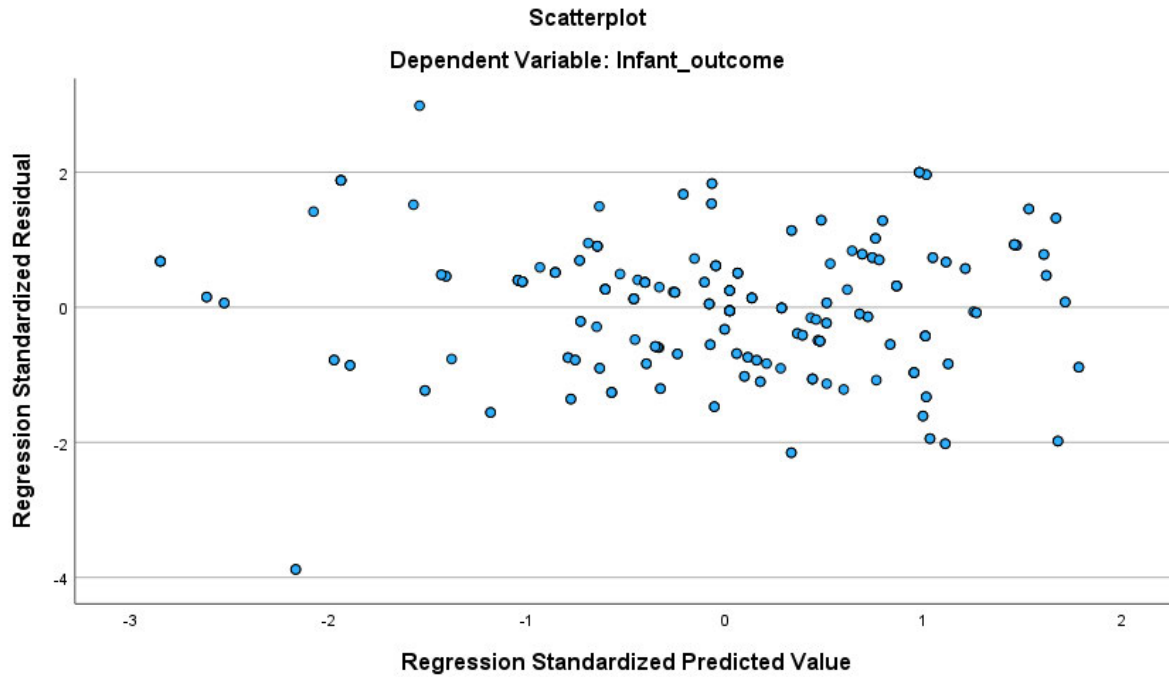


Figure 6. 10: Assumption of linearity and homoscedasticity

The final assumption regarding collinearity or multicollinearity, which requires the absence of significant correlations between independent variables, was evaluated. According to Saunders et al. (2016:549), correlations of 0.90 or higher typically indicate collinearity. The correlation analysis showed no excessively high bivariate relationships. Additionally, as recommended by Pallant (2016:276) and Saunders et al. (2016:549), the tolerance coefficient and variance inflation factor (VIF) values were examined to identify potential collinearity issues. A tolerance coefficient below 0.10 is considered indicative of collinearity, while a VIF value greater than 10.0 signals multicollinearity. The results, as presented in Table 6.6, showed that all tolerance coefficients exceeded the minimum threshold of 0.10, and all VIF values were well below 10.0. This confirmed that the multicollinearity assumption was not violated, allowing all independent variables to be included in the regression model. With this validation complete, the hypotheses outlined in Chapter Six were tested using inferential analyses, including multiple regression, exploratory factor analysis (EFA), confirmatory factor analysis (CFA), and structural equation modeling (SEM).

Table 6. 6: Tolerance and VIF Distribution of Independent Variables

Source: Self-generated by author

Coefficients ^a			
Model		Collinearity Statistics	
		Tolerance	VIF
1	(Constant)		
	Knowledge stillbirth	.595	1.681
	Attitude maternal care	.606	1.650
	Socio-economic factors	.637	1.571
	Practices Antenatal care	.409	2.445
	Quality Maternal services	.564	1.772
a. Dependent Variable: Infant outcome			

6.8.2 Impact of Knowledge of Stillbirth on Antenatal Care Practices

The analysis tested the hypothesis (H1) that "Knowledge of stillbirth (KS) significantly predicts "Practices related to antenatal care" (P). As shown in Table 6.6, the results revealed a moderate positive correlation between KS and P, with a correlation coefficient (R) of 0.571, indicating that greater knowledge of stillbirth is associated with better antenatal care practices. The coefficient of determination ($R^2 = 0.325$) suggests that approximately 32.5% of the variation in antenatal care practices can be explained by knowledge of stillbirth. The F-statistic confirmed that the regression model is statistically significant ($F(1; 262) = 125.950, p < .001$). The regression coefficient ($\beta = 0.571$) indicates that for every one-unit increase in knowledge of stillbirth, antenatal care practices improve by 0.571 units, implying that KS is a significant predictor of P.

The regression equation for this relationship is $P = 1.965 + (0.571 * KS)$.

Table 6. 7: The impact of knowledge of stillbirth on antenatal care practices

Hypothesis	DV	IV	R	R ²	F	df1; df2	p-value	B (regression coefficient)	t	p-value
H1	P	KS	0.571	.325	125.950	1; 262	<.001	.571	11.223	<.001

Note: P = Practices related to antenatal care; KS=Knowledge of stillbirth

6.8.3 The Influence of Attitudes toward Maternal Care on Practices Related to Antenatal Care

The analysis for Hypothesis H2 examined the relationship between attitudes toward maternal care (ATT) as the independent variable and practices related to antenatal care (P) as the dependent variable (Table 6.8). The results indicate a significant and positive association, with a correlation coefficient (R) of 0.600, suggesting a moderate to strong relationship between the two variables. The coefficient of determination (R²) is 0.360, meaning that 36.0% of the variance in practices related to antenatal care can be explained by attitudes toward maternal care. The F-statistic value of $F(1; 262) = 146.496$, $p < 0.001$) confirms that the model is statistically significant. The regression coefficient ($\beta = 0.600$; $p < 0.001$) indicates that for every one-unit increase in positive attitudes toward maternal care, practices related to antenatal care improve by 0.600 unit, implying that attitudes toward maternal care significantly and positively influence practices related to antenatal care.

The regression equation for this relationship is $P = 1.419 + (0.600 * ATT)$.

Table 6. 8: The Influence of Attitudes toward Maternal Care on Practices Related to Antenatal Care

Hypothesis	DV	IV	R	R ²	F	df1; df2	p-value	B (regression coefficient)	T	p-value
H2	P	ATT	0.600	.360	146.496	1; 262	<.001	.600	12.104	<.001

Note: P = Practices related to antenatal care; ATT=Attitudes towards maternal care

6.8.4 The Influence of Socio-economic Factors on Practices Related to Antenatal Care

The hypothesis (H3) examines the impact of socio-economic factors on practices related to antenatal care. As shown in Table 6.9, the regression analysis reveals a statistically significant relationship between these variables, as evidenced by an R-value of 0.521, indicating a moderate positive correlation. The R² value of 0.272 suggests that approximately 27.2% of the variance in practices related to antenatal care can be explained by

socio-economic factors. The F-statistic of ($F(1; 262) = 97.299$, $p < 0.001$) confirms the model's overall fit. The regression coefficient ($\beta = 0.521$) indicates that for every unit increase in socio-economic factors, practices related to antenatal care improve by 0.521 units. The t-value of 9.864 further supports the strength of this relationship, with a corresponding p-value of less than 0.001, highlighting the statistical significance of the predictor variable. The regression equation for this relationship is $P = 2.731 + (0.521 * SF)$.

These findings underscore the critical role that socio-economic factors play in shaping antenatal care practices, suggesting that improving socio-economic conditions could positively influence maternal healthcare behaviors.

Table 6. 9: The Influence of Socio-economic Factors on Practices Related to Antenatal Care

Hypothesis	DV	IV	R	R ²	F	df1; df2	p-value	B (regression coefficient)	t	p-value
H3	P	SF	.521	.272	97.299	1; 262	<.001	.521	9.864	<.001

Note: P = Practices related to antenatal care; SF=Socio-economic factors

6.8.5 Impact of Practices Related to Antenatal Care on Quality of Maternal Health Services

The fourth hypothesis (H4) examined the relationship between practices related to antenatal care (P) and the quality of maternal health services (Q). As shown in Table 6.10, the findings revealed a strong positive correlation, with a correlation coefficient (R) of 0.635, indicating a significant association between these variables. The coefficient of determination (R²) was 0.403, signifying that 40.3% of the variance in the quality of maternal health services could be attributed to the practices related to antenatal care. The measured F-value ($F(1; 262) = 176.222$, $p < 0.001$) demonstrates that the model was statistically significant. The regression coefficient ($\beta = 0.635$, $p < 0.001$) indicates that a one-unit improvement in antenatal care practices corresponds to a 0.635-unit increase in the quality of maternal health services, implying that practices of antenatal care are a significant predictor of the quality of maternal health services. The regression equation for this relationship is $Q = 1.196 + (0.635 * P)$.

Table 6. 10: Impact of Practices Related to Antenatal Care on Quality of Maternal Health Services

Hypothesis	DV	IV	R	R ²	F	df1; df2	p-value	B (regression coefficient)	T	p-value
H4	Q	P	.635	.403	176,222	1; 262	<.001	.635	13,275	<.001

Note: P = Practices related to antenatal care; Q=Quality of Maternal health services

6.8.6 The Influence of Socio-economic Factors on the Quality of Maternal Health Services

The analysis assessed the influence of socio-economic factors (SF) on the quality of maternal health services (Q). As shown in Table 6.11, the results indicated a statistically significant relationship, with a correlation coefficient (R) of 0.465 and a coefficient of determination (R^2) of 0.216. Socio-economic factors can explain 12.6 % of the variance in the quality of maternal health services. The F-statistic (1; 262) = 71.943; $p < 0.001$) confirms the model's overall significance. The regression coefficient ($\beta = 0.465$, $p < 0.001$) suggests that socio-economic factors significantly and positively impact the quality of maternal health services. This means that higher levels of socio-economic factors are associated with better quality of maternal health services. The regression equation for this relationship is $Q = 2.506 + (0.465 * SF)$.

Table 6. 11: The Influence of Socio-economic Factors on the Quality of Maternal Health Services

Hypothesis	DV	IV	R	R^2	F	df1; df2	p-value	B (regression coefficient)	t	p-value
H5	Q	SF	.465	.216	71.943	1; 262	<.001	.465	8.482	<.001

Note: Q=Quality of Maternal health services; SF=Socio-economic factors

6.8.7 The Impact of Practices Related to Antenatal Care on Infant Outcomes

The regression analysis tested the hypothesis (H6) that practices related to antenatal care (P) significantly predict infant outcomes (IF). As shown in Table 6.12, the results demonstrated a strong positive relationship between antenatal care practices and infant outcomes, as indicated by the correlation coefficient ($R = 0.605$). The coefficient of determination $R^2 = 0.366$ revealed that approximately 36.6% of the variance in infant outcomes is explained by practices related to antenatal care. The F-statistic (1; 262) = 150.569; $p < 0.001$) confirms the model's overall significance. The regression coefficient ($\beta = 0.605$; $p < 0.001$) was significant, confirming that improved practices related to antenatal care are strongly associated with better infant outcomes, highlighting the critical role of antenatal care practices in promoting neonatal health. The regression equation for this relationship is $IF = 1.766 + (0.605 * FC)$.

Table 6. 12: The Impact of Practices Related to Antenatal Care on Infant Outcomes

Hypothesis	DV	IV	R	R^2	F	df1; df2	p-value	B (regression coefficient)	t	p-value
H6	IF	P	.605	.366	150.569	1; 262	<.001	.605	12.271	<.001

Note: IF=Infant outcome; P = Practices related to antenatal care

6.8.8 The Relationship between the Quality of Maternal Health Services and Infant Outcomes

The hypothesis (H7) evaluates the relationship between the quality of maternal health services (IV) and infant outcomes (DV). As shown in Table 6.13, the results demonstrate a strong positive correlation, with an R value of 0.503, indicating a substantial relationship between the two variables. The coefficient of determination ($R^2=0.253$) reveals that 25.3% of the variance in infant outcomes can be explained by the quality of maternal health services. The F-statistic ($1; 262$) = 88.244; $p<0.001$) confirms the model's overall significance. The regression coefficient ($\beta=0.503$; $p<0.001$) was significant, confirming that the quality of maternal health services is strongly associated with better infant outcomes, highlighting the significant role that the quality of maternal health services plays in promoting better infant outcomes. Efforts to improve maternal health services are likely to yield measurable benefits for infant health and well-being. The regression equation for this relationship is $IF = 2.303 + (0.503 * Q)$.

Table 6. 13: The Relationship between the Quality of Maternal Health Services and Infant Outcomes

Hypothesis	DV	IV	R	R^2	F	df1; df2	p-value	B (regression coefficient)	t	p-value
H7	IF	Q	.503	.253	88.244	1; 262	<.001	.503	9.394	<.001

Note: IF=Infant outcome; Q=Quality of Maternal health services

6.8.9 The Influence of Socio-economic Factors on Infant Outcomes

The regression analysis for Hypothesis H8 examines the relationship between socio-economic factors (SF) and infant outcomes (IF). As shown in Table 6.14, the analysis reveals a strong positive correlation between these variables, with a correlation coefficient (R) of 0.590, indicating a moderate to strong relationship. The coefficient of determination (R^2) 0.348, suggests that socio-economic factors account for approximately 34.8% of the variance in infant outcomes. The F-statistic value ($1; 262$) = 139.463; $p<0.001$ confirmed the model's overall significance. The regression coefficient ($\beta = 0.590$; $p<0.001$) further demonstrates that socio-economic factors positively and significantly influence infant outcomes. The regression equation for this relationship is $IF = 2.469 + (0.590 * SF)$.

Table 6. 14: The Influence of Socio-economic Factors on Infant Outcomes

Hypothesis	DV	IV	R	R^2	F	df1; df2	p-value	B (regression coefficient)	t	p-value
H8	IF	SF	.590	.348	139.463	1; 262	<.001	.590	11.809	<.001

Note: IF=Infant outcome, SF=Socio-economic factors

6.8.10 Summary of the hypotheses

Table 6.14 summarizes the tested hypotheses as provided in the proposed model. The results collectively highlight the critical influence of socio-economic factors, knowledge, attitudes, antenatal practices, and quality of services on maternal and infant health outcomes. The strongest influence was observed between practices related to antenatal care and quality of maternal health services ($\beta=0.635$; $p<0.001$), while the lowest was observed between socio-economic factors and quality of maternal health services ($\beta=0.465$; $p<0.001$). All hypotheses were supported, emphasizing the interconnected nature of these variables in promoting optimal maternal and infant care outcomes.

Table 6. 15: Summary of hypotheses predictors of aspects of maternal healthcare and related factors

Hypothesis	DV	IV	R ²	F	df1; df2	p- value	B (regression coefficient)	t	p- value	Decision
H1	P	KS	.325	125.950	1; 262	<.001	.571	11.223	<.001	Accepted
H2	P	ATT	.360	146.496	1; 262	<.001	.600	12.104	<.001	Accepted
H3	P	SF	.272	97.299	1; 262	<.001	.521	9.864	<.001	Accepted
H4	Q	P	.403	176.222	1; 262	<.001	.635	13.275	<.001	Accepted
H5	Q	SF	.216	71.943	1; 262	<.001	.465	8.482	<.001	Accepted
H6	IF	P	.366	150.569	1; 262	<.001	.605	12.271	<.001	Accepted
H7	IF	Q	.253	88.244	1; 262	<.001	.503	9.394	<.001	Accepted
H8	IF	P	.366	150.569	1; 262	<.001	.605	12.271	<.001	Accepted

Source: Self-generated by author

6.9 RELATIONSHIP BETWEEN GENDER, RACE AND CONSTRUCTS

A one-way ANOVA test was applied to test the difference between the respondents' demographic characteristics and the constructs as proposed in the conceptual framework. The data in Table 6.16 suggests that male respondents generally reported slightly higher mean scores for "Attitudes towards antenatal care (ATT)" (M=4.24, SD=0.45) compared to females (M=4.18, SD=0.47). There was, however, no significant difference (P=0.118). On the other hand, female respondents showed slightly higher mean scores in "Knowledge of stillbirth (KS)" (M=4.10, SD=0.51), "Practices related to maternal health (P)" (M=4.35, SD=0.52), and "Quality of maternal health services (Q)" (M=3.94, SD=0.49). Participants who selected "Prefer not to say" had significantly lower scores across most categories. Significant differences were found in "Knowledge of stillbirth" (F=6.893,

$p=0.001$), "Quality of maternal healthcare services" (24,406, $p<0.001$), "Socio-economic factors" ($F=3.863$, $p=0.022$), and "Practices related to maternal health" ($F=11.371$, $p<0.001$).

In terms of age group, respondents aged 55–64 years reported the highest mean scores for "Practices related to maternal health" ($M=4.34$, $SD=0.43$), "Quality of maternal health services" ($M=3.99$, $SD=0.52$), and "Socio-economic Factors" ($M=3.83$, $SD=0.59$). Significant differences were observed in "Socio-economic Factors" ($F=7.761$, $p<0.001$), with higher scores among older age groups. Older participants appear to have more positive attitudes and practices regarding maternal health.

Regarding race, White respondents consistently reported the highest mean scores across categories, notably in "Attitudes towards antenatal care" ($M=4.83$, $SD=0.19$) and "Knowledge of stillbirth" ($M=4.45$, $SD=0.38$), "Socio-economic factors" ($M=4.75$, $SD=0.27$), "Practices related to maternal health (P)" ($M=5.00$, $SD=0.00$), "Quality of maternal health services (Q)" ($M=4.75$, $SD=0.27$), and "Infant outcome" ($M=4.73$, $SD=0.28$). Colored respondents scored high in "Knowledge of stillbirth" ($M=4.43$, $SD=0.35$), while Black respondents scored moderately in most categories. Significant differences ($p<0.001$) were observed in all categories, suggesting that race plays a significant role in perceptions and practices regarding maternal health.

Regarding level of education, respondents with higher education levels (e.g., Honors) showed the highest scores in "Knowledge of stillbirth" ($M=4.60$, $SD=0.42$), "Attitudes towards antenatal care" ($M=4.65$, $SD=0.28$), "Socio-economic Factors" ($M=4.48$, $SD=0.38$), "Practices related to maternal health" ($M=4.85$, $SD=0.22$), "Quality of maternal health services" ($M=4.25$, $SD=0.53$), and "Infant outcome" ($M=4.50$, $SD=0.37$). PhD holders reported comparatively lower scores, possibly due to smaller sample sizes or other contextual factors. Education significantly impacts attitudes, knowledge, and practices, with highly educated individuals demonstrating better engagement in maternal health practices ($p<0.001$).

Regarding marital status, divorced respondents scored the highest across most categories, especially in "Attitudes towards antenatal care" ($M=4.39$, $SD=0.37$). Widowed respondents also reported high scores for "Quality of maternal health services" ($M=4.17$, $SD=0.38$), "Knowledge of stillbirth" ($M=4.44$, $SD=0.58$), "Practices related to maternal health" ($M=4.64$, $SD=0.38$), and "Infant outcome" ($M=4.26$, $SD=0.37$). Marital status significantly affects maternal health-related attitudes and practices ($p<0.001$).

Regarding profession, gynecologists reported the highest scores across most categories, particularly in "Knowledge of stillbirth" ($M=4.90$), "Socio-economic factors" ($M=4.60$), and "Practices related to maternal health" ($M=4.50$). Midwives showed strong scores in "Attitudes towards antenatal care" ($M=4.44$, $SD=0.37$), "Practices related to maternal health" ($M=4.62$, $SD=0.37$), and ($M=4.04$, $SD=0.48$). Significant differences ($p<0.001$) indicate that healthcare professionals' roles influence their perceptions and practices related to maternal health.

In terms of experience, respondents with over 10 years of experience reported the highest scores in most categories, particularly in "Attitudes towards antenatal care" ($M=4.36$, $SD=0.37$). Those with 0-2 years of experience reported lower scores, suggesting less familiarity or engagement with maternal health practices. Significant differences were observed in "Knowledge of stillbirth" ($p=0.021$) and "Practices related to maternal health" ($p=0.013$), highlighting the role of experience in shaping knowledge and practices.

In terms of number of children, respondents with two children had the highest scores in most categories, particularly "Practices related to maternal health" ($M=4.57$, $SD=0.39$) and "Quality of maternal health services" ($M=4.26$, $SD=0.38$). Those with no children or more than three children scored lower, indicating a potential influence of personal maternal health experiences. Significant differences were observed in "Knowledge of stillbirth" ($p=0.012$) and "Practices related to maternal health" ($p=0.006$), reinforcing the role of parental experience in shaping maternal health attitudes.

Demographics such as gender, age, race, education, marital status, profession, experience, and number of children significantly influence perceptions, attitudes, and practices related to maternal health. These findings emphasize the need for targeted interventions addressing the specific needs of diverse demographic groups to improve maternal health outcomes.

Table 6. 16: Relationship between race, gender and the extracted constructs

Source: Self-generated by author

Demographics	Knowledge of stillbirth (KS)		Attitudes towards antenatal care (ATT)		Socio-economic factors (SF)		Practices related to maternal health (P)		Quality of maternal health services (Q)		Infant outcome (IF)	
	M	SD	M	SD	M	SD	M	SD	M	SD	M	SD
Gender												
Male	4.07	.62	4.24	.45	3.61	.56	4.25	.50	3.89	.51	4.04	.30
Female	4.10	.51	4.18	.47	3.66	.65	4.35	.52	3.94	.49	4.01	.49
Prefer not to say	3.22	.49	3.78	.18	2.86	.80	3.24	.76	2.38	.63	3.54	.54
<i>F value</i>	6.893		2.157		3.863		11.371		24.406		2.662	
<i>Sig.</i>	.001		.118		.022		<.001		<.001		.072	
Age group												
25–34 years	4.00	.55	4.16	.45	3.54	.76	4.32	.52	3.83	.49	3.96	.44
35–44 years	4.05	.58	4.17	.49	3.51	.63	4.29	.63	3.88	.56	3.96	.53
55–64 years	4.14	.48	4.20	.46	3.83	.59	4.34	.43	3.99	.52	4.08	.39

F value	1.196		.188		7.761		.253		1.029		2.342	
Sig.	.304		.829		<.001		.777		.359		.098	
Race												
Black	4.06	.54	4.15	.46	3.59	.62	4.29	.54	3,89	.52	4.00	.46
Colored	4.43	.35	4.53	.21	4.10	.68	4.35	.59	3,60	.39	3.65	.18
White	4.45	.38	4.83	.19	4.75	.27	5.00	.00	4,75	.27	4.73	.28
F ratio	3.841		11.040		16.037		6.955		12,347		12.929	
Sig.	.023		<.001		<.001		.001		<.001		<.001	
Level of Education												
Diploma	4.22	.50	4.29	.48	3.70	.62	4.39	.56	3.88	.61	3.96	.46
Bachelors	4.31	.51	4.36	.42	3.83	.69	4.55	.48	4.08	.51	4.189	.72
Honors	4.60	.42	4.65	.28	4.48	.38	4.85	.22	4.25	.53	4.50	.37
Masters	3.84	.44	4.02	.36	3.38	.64	4.08	.42	3.92	.32	3.87	.39
PhD	3.86	.50	3.98	.42	3.49	.59	4.16	.53	3.82	.49	4.00	.35
F value	13.292		12.039		9.309		8.964		2.640		5.834	
Sig	<.001		<.001		<.001		<.001		.034		<.001	
Marital status												
Single	3.95	.53	4.09	.44	3.42	.65	4.12	.62	3.73	.58	3.88	.47
Married	4.17	.52	4.28	.44	3.84	.61	4.48	.42	4.05	.46	4.12	.44
Separated	4.00	.00	3.03	.15	4.00	.00	4.20	.00	4.10	.00	4.10	.00
Divorced	4.13	.60	4.39	.37	3.70	.53	4.21	.29	3.70	.43	3.81	.41
Widowed	4.44	.58	4.17	.54	3.51	.62	4.64	.38	4.17	.38	4.26	.37

F value	3.992		10.138		7.183		8.567		7.427		5.586	
Sig	.004		<.001		<.001		<.001		<.001		<.001	
Profession												
Nurse	4.30	.44	4.37	.48	3.54	.81	4.43	.50	3.91	.47	3.98	.52
Midwife	4.37	.38	4.44	.37	3.98	.58	4.62	.37	4.04	.48	4.16	.45
Gynaecologist	4.90	.	4.10	.	4.60	.	4.50	.	4.00	.	4.40	.
General Doctor	4.50	.40	4.35	.39	3.81	.59	4.49	.41	3.86	.46	4.06	.47
Other	3.85	.52	4.00	.44	3.49	.58	4.13	.56	3.84	.57	3.94	.45
F value	19.987		14.592		8.231		12.437		1.659		5.586	
Sig	<.001		<.001		<.001		<.001		.160		<.001	
Experience												
0 to 2 years	4.15	.60	3.98	.50	3.52	.67	4.25	.65	3.78	.74	3.92	.53
2 to 5 years	4.15	.45	3.96	.61	3.58	.82	4.19	.42	3.87	.39	3.97	.37
5–8 Years	3.88	.55	4.03	.42	3.53	.60	4.12	.49	3.79	.51	3.92	.52
8–10 yes	3.96	.61	4.09	.51	3.56	.58	4.32	.76	3.91	.48	3.95	.45
10 years and above	4.15	.49	4.36	.37	3.76	.64	4.43	.44	4.00	.48	4.10	.42
F value	2.950		10.376		1.872		3.224		2.174		2.194	
Sig	.021		<.001		.116		.013		.072		.070	
Number of children												
None	4.02	.59	4.20	.45	3.53	.72	4.28	.61	3.83	.57	3.94	.47
1	4.14	.38	4.17	.46	3.70	.47	4.31	.40	3.88	.46	4.06	.45
2	4.29	.57	4.13	.61	4.01	.55	4.57	.39	4.26	.38	4.27	.40

More than 3	3.82	.36	4.15	.29	3.60	.49	4.02	.39	3.83	.49	3.81	.38
F value	3.718		.214		5.789		4.241		6.791		6.210	
Sig	.012		.886		<.001		.006		<.001		<.001	

6.10 THEORETICAL RESULTS AND MODEL VALIDATION

The proposed model, hereafter known as the measurement model (MM), was validated by performing factor analysis. Both exploratory factor analysis and confirmatory analysis were performed. The results are detailed in the subsequent subsections.

6.10.1 Exploratory factor analysis

Exploratory factor analysis making use of principal component with varimax rotation was applied to 60 items. The Kaiser-Meyer-Olkin (KMO) measure and Bartlett's Test of Sphericity were conducted to assess the suitability of the data for factor analysis. As shown in Table 6.17, the KMO Measure of Sampling Adequacy was 0.803, which exceeds the commonly accepted threshold of 0.6. This indicates that the sample size and the strength of relationships among variables are sufficient to perform factor analysis. Bartlett's Test of Sphericity produced a highly significant result ($\chi^2 = 3796.226$, $df=300$, $p<0.001$), confirming that the correlation matrix is not an identity matrix. This result demonstrates that there are significant correlations among the variables, further supporting the appropriateness of factor analysis. In summary, the KMO value and Bartlett's test results indicate that the dataset is adequate for factor analysis, with strong intercorrelations among variables suitable for dimension reduction techniques.

Table 6. 17: KMO and Bartlett's Test

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.803
Bartlett's Test of Sphericity	Approx. Chi-Square	3796.226
	df	300
	Sig.	<.001

Source: Self-generated by author

Table 6.18 presents the results of a Principal Component Analysis (PCA), highlighting the proportion of variance in the dataset explained by each extracted component. Using eigenvalues greater than 1, all factors that have values above 1 were retained. The first six components have eigenvalues greater than 1, indicating they contribute significantly to explaining the total variance in the dataset. The PCA identified six key components

that explain 68.073% of the total variance in the dataset. Rotation redistributes the variance among these components, improving interpretability without reducing the cumulative explanatory power. This suggests that the dataset can be effectively summarized by these six components while retaining most of the original information.

Table 6. 18: Total variance explained in the extracted factors

Source: Self-generated by author

Component	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	7.625	30.500	30.500	7.625	30.500	30.500	3.475	13.900	13.900
2	2.881	11.525	42.025	2.881	11.525	42.025	3.317	13.269	27.169
3	2.226	8.905	50.929	2.226	8.905	50.929	2.826	11.304	38.473
4	1.493	5.973	56.902	1.493	5.973	56.902	2.612	10.447	48.920
5	1.485	5.939	62.841	1.485	5.939	62.841	2.557	10.229	59.149
6	1.308	5.232	68.073	1.308	5.232	68.073	2.231	8.924	68.073
7	.963	3.850	71.923						
8	.821	3.283	75.206						
9	.755	3.021	78.226						
10	.691	2.763	80.989						
11	.634	2.536	83.526						
12	.548	2.190	85.716						
13	.489	1.954	87.670						
14	.461	1.843	89.513						
15	.389	1.557	91.070						

Component	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
16	.345	1.380	92.450						
17	.322	1.290	93.739						
18	.284	1.135	94.875						
19	.250	1.001	95.876						
20	.221	.883	96.759						
21	.205	.819	97.578						
22	.186	.744	98.322						
23	.175	.700	99.022						
24	.141	.564	99.587						
25	.103	.413	100.000						
Extraction Method: Principal Component Analysis.									

The rotation, using the Varimax method, simplifies the interpretation by maximizing the variance explained by each factor while maintaining orthogonality (Table 6.19). This approach ensures that each component represents a clear and interpretive dimension of the data.

Table 6. 19: Rotated component matrix

Rotated Component Matrix ^a						
	Component					
	1	2	3	4	5	6
KS1						.718
KS2						.795

Rotated Component Matrix ^a						
	Component					
	1	2	3	4	5	6
KS3						.751
AT4	.825					
AT5	.849					
AT6	.834					
AT7	.815					
SF1					.618	
SF2					.763	
SF3					.783	
SF4					.663	
P2		.765				
P3		.873				
P4		.855				
P5		.678				
P6		.518				
Q7			.636			
Q8			.796			
Q9			.731			
Q10			.632			
IF2				.664		
IF4				.709		

Rotated Component Matrix^a						
	Component					
	1	2	3	4	5	6
IF6				.626		
IF8				.532		
IF10				.759		
Extraction Method: Principal Component Analysis.						
Rotation Method: Varimax with Kaiser Normalization.						
a. Rotation converged in 7 iterations.						

Table 6.20 presents a summary of the factor analysis results, highlighting the identified constructs, items included in each construct, and the variance extracted. Given that certain items were dropped, the internal reliability was reassessed using Cronbach's alpha.

Factor (Attitude towards Maternal Healthcare (ATT)): This construct includes items AT4, AT5, AT6, and AT7. It explains 13.9% of the total variance in the dataset. The reliability of the construct, measured by Cronbach's alpha, is 0.735, indicating acceptable internal consistency. This construct reflects respondents' attitudes toward maternal healthcare, which is a significant contributor to the overall variance.

Factor 2 (Practices Related to Antenatal Care (P)): Items P2, P3, P4, P5, and P6 define this construct. It accounts for 13.27% of the total variance, making it a major factor. Cronbach's alpha is 0.885, signifying high reliability and consistency in measuring practices related to antenatal care.

Factor 3 (Quality of Maternal Health Services (Q)): This construct includes items Q7, Q8, Q9, and Q10. It explains 11.30% of the total variance and has a Cronbach's alpha of 0.770, showing good reliability. This construct evaluates the perceived quality of maternal health services.

Factor 4 (Infant Outcome (IF)): Items IF2, IF4, IF6, IF8, and IF10 load onto this construct. It accounts for 10.45% of the total variance, with a Cronbach's alpha of 0.767, indicating reliable measurement. This construct captures factors related to infant outcomes.

Factor 5 (Socio-economic Factors (SF)): Included items SF1, SF2, SF3, and SF4; this construct explains 10.23% of the total variance. The Cronbach's alpha is 0.774, reflecting good internal reliability. It measures the influence of socio-economic factors on maternal and infant health.

Factor 6 (Knowledge of Stillbirth (KS)): This construct includes items KS1, KS2, and KS3, accounting for 8.92% of the total variance. Cronbach's alpha is 0.735, indicating acceptable reliability. It reflects participants' knowledge about stillbirth-related information and services.

In summary, the six constructs together explain a significant portion of the total variance in the data, with individual contributions ranging from 8.92% to 13.9%. All constructs exhibit acceptable-to-high reliability, as indicated by Cronbach's alpha values above 0.7. These findings suggest that the identified constructs are well-defined and reliable measures of the variables under investigation. This analysis provides a robust framework for understanding the factors influencing maternal and infant health outcomes.

Table 6. 20: The reliability of the extracted constructs and variance

Factor	Construct	Items included	Variance extracted	Cronbach's alpha
1	Attitude Towards Maternal Healthcare (AT)	AT4–AT7	13.900	.735
2	Practices Related to Antenatal Care (P)	P2–P6	13.269	.885
3	Quality of Maternal Health Services (Q)	Q7–Q10	11.304	.770
4	Infant Outcome (IF)	IF2,4, 6, 8 and 10	10.447	.767
5	Socio-economic Factors (SF)	SF1–SF4	10.229	.774
6	Knowledge of Stillbirth (KS)	KS1–KS3	8.924	.735

Source: Self-generated by author

6.10.2 Model fitness

Confirmatory factor analysis (CFA) was conducted on the extracted factors to assess their validity. Prior to performing the CFA, the measurement model (MM) was evaluated for its overall fit. According to Shrestha (2021), it is advisable to use multiple fit indices to evaluate model fitness, as relying on a single index may be limiting. The fit of the MM was assessed using three fit indices, which provide an indication of how well the observed data align with the proposed model. The first assessment of the MM resulted in a poor fit (Addendum 1). Socio-economic factors and knowledge of stillbirth were removed from the MM to improve the fitness. The revised MM is presented in Figure 4.11.

As shown in Table 4.18, the fitness indices yielded the following results: chi-square = 267.112, degrees of freedom (df) = 79, $p < 0.001$, $\chi^2 / df = 3.156$, CFI = 0.729, and IFI = 0.733. Based on Hu and Bentler's (1999) recommendations, it is reasonable to say that MM has adequate model fit.

The χ^2 / df ratio (p-value) evaluates how well the model reproduces the observed covariance matrix. In this case, a ratio of 3.156 with a p-value less than 0.001 suggests a reasonable model fit, as ratios below five are typically

considered acceptable. However, the low p-value ($p < 0.001$) implies a significant deviation between the model and observed data, which is often attributed to large sample sizes and does not necessarily indicate poor model fit.

The Incremental Fit Index (IFI) measures the improvement in fit when comparing the hypothesized model to a null model. The IFI value was 0.913, which exceeds the threshold of 0.90, indicating a good fit. This result suggests that the model performs well compared to a null (independence) model. Similarly, the Comparative Fit Index (CFI), another incremental fit measure, had a CFI value of 0.912, indicating that the model provides a reasonably good fit to the data.

Root Mean Square Error of Approximation (RMSEA): The RMSEA value was 0.095, which exceeds the commonly accepted threshold of 0.08. Root Mean Square Residual (RMR): The RMR value was 0.042, reflecting a good fit since smaller values (closer to zero) indicate better alignment between the observed and predicted data.

The χ^2 / df ratio, IFI, and CFI suggest that the model demonstrates an acceptable level of fit, with the IFI and CFI exceeding the ideal thresholds. However, the RMSEA indicates a need for improvement, as it is slightly above the recommended range. The low RMR value further supports the conclusion that the model is a reasonable representation of the observed data.

Table 6. 21: Model fitness indices for the MM

Source: Self-generated by author

Fit indices	Fit values	Criteria
χ^2 / df (p-value)	3.381(<.001)	<5
IFI	0.913	>.9
CFI	0.912	>.9
RMSEA	0.095	<0.08
RMR	0.042	

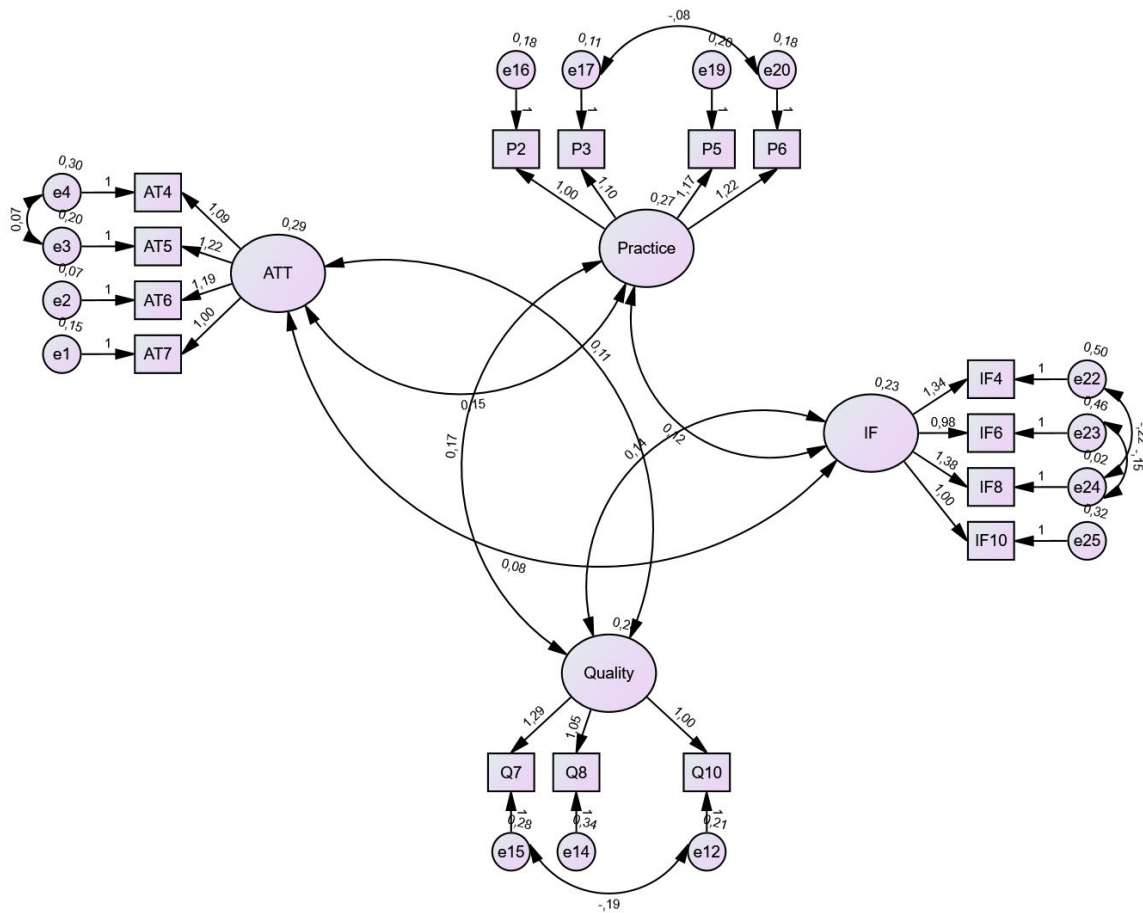


Figure 6. 11: SEM model

6.10.3 Convergent and discriminant validity of the model

Confirmatory factor analysis was performed to assess the quality of the measurement model by evaluating both convergent and discriminant validity. Table 6.21 outlines the composite reliability, convergent validity, and discriminant validity of the model. Convergent validity refers to the extent to which a construct correlates positively with other measures of the same construct (Hair et al., 2020). This was evaluated using standardized loadings, composite reliability (CR), and average variance extracted (AVE). CR, which measures the internal consistency or reliability of latent constructs in a structural equation model (SEM), ranged from 0.770 to 0.962, demonstrating acceptable reliability. All constructs demonstrated high reliability, with CR values ranging from 0.793 to 0.896, exceeding the acceptable threshold of 0.7. This result indicates that the latent constructs were measured consistently.

Average Variance Extracted (AVE). AVE values, which measure the proportion of variance captured by the constructs relative to measurement error, ranged from 0.538 to 0.684. All constructs surpassed the threshold of 0.5, supporting adequate convergent validity.

Discriminant validity examines the distinctiveness of a construct from others within the model (Hair et al., 2020). It was assessed using the maximum shared variance (MSV), which represents the highest correlation between

a construct and any other within the model. For sufficient discriminant validity, the MSV should be lower than the AVE for each construct (Fornell and Larcker, 1981). MSV values ranged from 0.284 to 0.389. For all constructs, the MSV was lower than the corresponding AVE, indicating sufficient discriminant validity, as each construct is more closely related to its own measures than to other constructs.

Additionally, the maximum correlation with heterotrait (MaxR(H)) was used to measure how strongly a construct correlates with other constructs not related to the target construct. MaxR(H) values were between 0.799 and 0.962, all above the threshold of 0.7. This data further supports discriminant validity, showing that the constructs are distinct from one another.

Inter-construct correlations: The diagonal values in the correlation matrix represent the square root of the AVE for each construct, which is greater than the inter-construct correlations. This observation reinforces the model's discriminant validity. For instance, "ATT" has the highest correlation with "Practice" (0.549), but the square root of its AVE (0.827) exceeds this value. "Quality" has its highest correlation with "Practice" (0.624), but its AVE square root (0.749) is also higher. Similar patterns were observed for "Practice" and "IF," supporting their distinctiveness.

In summary, the constructs exhibit strong reliability, adequate convergent validity, and sufficient discriminant validity, confirming the robustness of the measurement model.

Table 6. 22: Composite reliability, average variance extracted, and maximum shared square values

	CR	AVE	MSV	MaxR(H)	ATT	Quality	Practice	IF
ATT	0.896	0.684	0.301	0.919	0.827			
Quality	0.793	0.562	0.389	0.799	0.391	0.749		
Practice	0.891	0.672	0.389	0.895	0.549	0.624	0.820	
IF	0.816	0.538	0.284	0.962	0.309	0.533	0.478	0.733

Note: ATT= Attitude towards Maternal Healthcare; Quality= Quality of Maternal Health Services; IF= Infant Outcome; Practice= Practices Related to Antenatal Care

6.10.4 Path analysis

The measurement model was subsequently converted into a path model to depict the relationships among the latent variables. Structural Equation Modeling (SEM) was employed to assess the proposed interactions between these variables. Figure 6.12 displays the SEM with estimated standardized relationships. The fit indices for the model are as follows: chi-square = $\chi^2 = 267.536$ degrees of freedom (df) = 81, $p < .001$, $\chi^2/df = 3.344$, CFI = 0.912, IFI = 0.913, RMSEA=0.095, and RMR=0.041 indicating that the measurement model is acceptable. Consequently, it was determined that the model aligns well with the actual data.

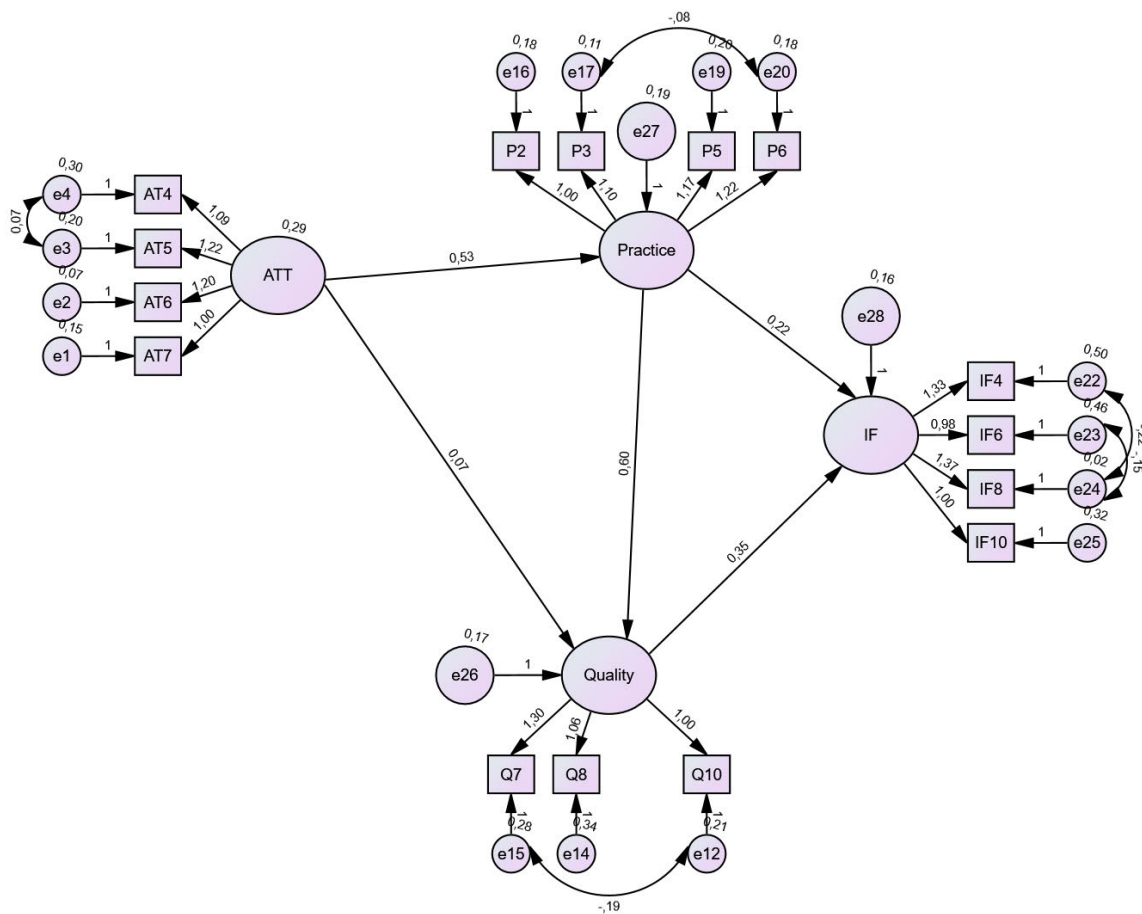


Figure 6. 12: Revised path analysis of MM

Note: $\chi^2 = 267.536$, $df = 81$, $p < .001$, $\chi^2 / df = 3.344$, CFI = 0.912, IFI = 0.913, RMSEA=0.095, RMR=0.041

Table 6.23 details the path estimate in the revised MM. The results of the hypothesis testing using Structural Equation Modeling (SEM) are summarized as follows:

Table 6. 23: Path analysis and estimate of reworked hypotheses

Hypotheses	Independent		Dependent	Standardized coefficient B	S.E.	Critical ratio (C.R)	P	Decision
H1	Practice	<---	ATT	.551	.067	8.014	***	Accepted
H2	Quality	<---	Practice	.587	.082	7.256	***	Accepted
H3	Quality	<---	ATT	.070	.066	1.045	.296	Rejected
H4	IF	<---	Practice	.240	.070	3.185	.001	Accepted
H5	IF	<---	Quality	.386	.084	4.164	***	Accepted

Note: ATT= Attitude towards Maternal Healthcare; Quality= Quality of Maternal Health Services; IF= Infant Outcome; Practice= Practices Related to Antenatal Care.

The result suggests that the path from Attitude towards Maternal Healthcare (ATT) to Practice was positive and significant ($\beta = 0.551$, $p < 0.001$), implying that ATT strongly influences Practice. Thus, the hypothesis (H1) is accepted. Likewise, the path from Practice related to antenatal care to Quality of Maternal Health Services (Quality) was positive and significant ($\beta = 0.587$, $p < 0.001$), demonstrating that improved Practice positively impacts Quality. This supports the acceptance of this hypothesis (H2).

On the contrary, the relationship between ATT and Quality was not significant ($\beta = 0.070$, S.E. = 0.066, C.R. = 1.045, $p = 0.296$). As the p-value exceeds the threshold for significance, this hypothesis (H3) is rejected, indicating that ATT does not directly influence Quality in this model. A significant positive relationship was observed between Practice and Infant Outcome (IF) with a β of 0.240, S.E. of 0.070, and C.R. of 3.185. The p-value (0.001) confirms the hypothesis (H4), suggesting that improved Practice has a positive effect on IF.

Similarly, the path from Quality and IF was positive and significant ($\beta = 0.386$, $p < 0.001$), highlighting the strong influence of Quality on IF. This supports the acceptance of hypothesis (H5). The results indicate that ATT significantly influences Practice (H1), and Practice significantly impacts both Quality (H2) and IF (H4). Additionally, Quality plays a crucial role in determining IF (H5). However, ATT does not have a direct effect on Quality (H3). These findings provide insights into the interrelationships among the variables and emphasize the importance of Practice and Quality in influencing maternal healthcare outcomes.

6.10 CONCLUSIONS

The chapter presents the analysis of the data gathered on the study that aims to assess ways of enhancing South African maternal care within the public health system by exploring a case of stillbirths in the Lejweleputswa District Municipality. Data were gathered from 263 respondents drawn from the health profession. The perceptions of the respondents on knowledge of stillbirths, attitudes towards antenatal care, practices related to maternal health care, quality of maternal health care services, and infant outcome were gathered. Both descriptive and inferential statistical analyses were applied to present the data. The Cronbach's alpha score reveals moderate to good reliability of all the constructs measured.

The findings revealed that there was general agreement on the maternal healthcare services among the respondents, with practices related to antenatal care having the highest mean score agreement. The ANOVA results revealed that demographics such as gender, race, marital status, profession, education, and number of children significantly influence knowledge, attitudes, and practices related to

maternal and infant health. The regression analysis indicated a significant relationship between the tested constructs proposed in the conceptual model. The relationship between antenatal care practices and the quality of maternal health services was the strongest. Factor analysis making use of both EFA and CFA was performed to validate the proposed model. The PCA identified six key components in the model that explain 68.073% of the total variance in the dataset. CFA revealed both had acceptable fit and achieved good convergent and discriminant validity. The SEM analysis revealed that practices related to antenatal care and quality of maternal health services predict infant outcomes. The next chapter provides the qualitative data analysis.

Chapter 7: Presentation and Analysis of Qualitative Data

7.1 INTRODUCTION

This section presents an outline of the data analysis conducted in the study, which aims to explore the underlying causes and determinants of stillbirths, particularly in the Lejweleputswa District Municipality, which records the highest stillbirth rate. The study further examines the socio-economic factors affecting the quality of antenatal care and their influence on antepartum stillbirths, as well as the awareness and utilization of antenatal and obstetric services among pregnant women in the district. Additionally, the research investigates healthcare providers' knowledge, attitudes, and practices regarding stillbirth prevention and assesses the state of maternal healthcare services, including infrastructure, staffing, and service delivery. The study ultimately seeks to develop a model that addresses the risk factors contributing to stillbirth.

To achieve these objectives, the researcher employed qualitative methods, gathering data through in-depth interviews with 32 key stakeholders, including healthcare providers, nurses, and midwives involved in maternal health services. These interviews were conducted face-to-face, ensuring an interactive dialogue that allowed participants to share their perspectives on the challenges and opportunities related to stillbirth prevention. The conversations were recorded electronically, transcribed, and subsequently analyzed to ensure the integrity, trustworthiness, and reliability of the data.

Thematic analysis, facilitated by NVivo, was selected as the primary analytical method due to its systematic approach, adaptability, and ability to categorize qualitative data into meaningful themes and subthemes. The transcriptions were imported into QSR NVivo 15 software to aid in organizing coded data according to the themes and subthemes derived from the interview guide. This systematic grouping of data allowed for objective comparisons aligned with the study's focus.

The chosen analytical approach adhered to Spencer's (2011) recommendation for qualitative research, which emphasizes striking a balance between allowing the data to speak for itself and structuring it based on theoretical models and concepts. Additionally, Saldana (2015) suggests that a provisional list of codes should be determined beforehand to align with the study's conceptual framework. Consequently, the study's overarching themes were predetermined deductively to guide data collection and analysis, while the subthemes emerged inductively from the participants' responses. This methodological rigor ensured a comprehensive exploration of the determinants of stillbirth and provided insights into potential interventions to mitigate the issue within the Lejweleputswa District Municipality.

7.2 THEME 1: CAUSES AND DETERMINANTS OF STILLBIRTHS

Maternal healthcare remains a critical component of public health systems worldwide, as it directly influences maternal and child mortality rates, two key indicators of a nation's health status (Souza et al., 2024). Analyzing individual explanatory models for stillbirths and the factors influencing health service utilization, such as predisposing, enabling, and need factors, customized interventions can be developed to tackle the root causes and enhance health-seeking behaviors (Atkins et al., 2023).

Table 7. 1: Causes and determinants of stillbirth

Theme	Subtheme	Categories
Causes and Determinants of Stillbirths	1.1: Primary factors contributing to the high stillbirth	Clinical and Medical Conditions Maternal and Lifestyle Factors Antenatal Care Socio-economic Factors Healthcare System Challenges Cultural and Behavioral Factors
	Subtheme 1.2: Common clinical or health-related conditions contributing to stillbirths	Maternal Health Conditions Infections Lifestyle and Behavioral Factors Placental and Fetal Complications Structural and Systemic Issues
	Subtheme 1.3 Measures of Addressing Risks of Stillbirth During Antenatal Care	Maternal Health Education Early and Consistent Antenatal Care (ANC) Referral to Higher-Level Care Comprehensive Health and Safety Measures Patient-Centered Care

Source: Self-generated by author

7.2.1 Subtheme: Primary factors contributing to the high stillbirth

South Africa, a nation renowned for its rich history and natural beauty, continues to grapple with significant challenges in its healthcare system, particularly in maternal and child health (Yuningsih, Yohandoko and Pirdaus 2024). The analysis of participant responses identified several key factors contributing to the high stillbirth rates in the Lejweleputswa District Municipality (Table 7.1). These factors are categorized into clinical and medical conditions, maternal and lifestyle factors, antenatal care, socio-economic influences, healthcare system challenges, and cultural and behavioral factors. By examining the underlying causes of stillbirths and identifying gaps in the provision of maternal care in this district, the study sheds light on the specific obstacles that continue to hinder the achievement of better health outcomes for mothers and their babies.

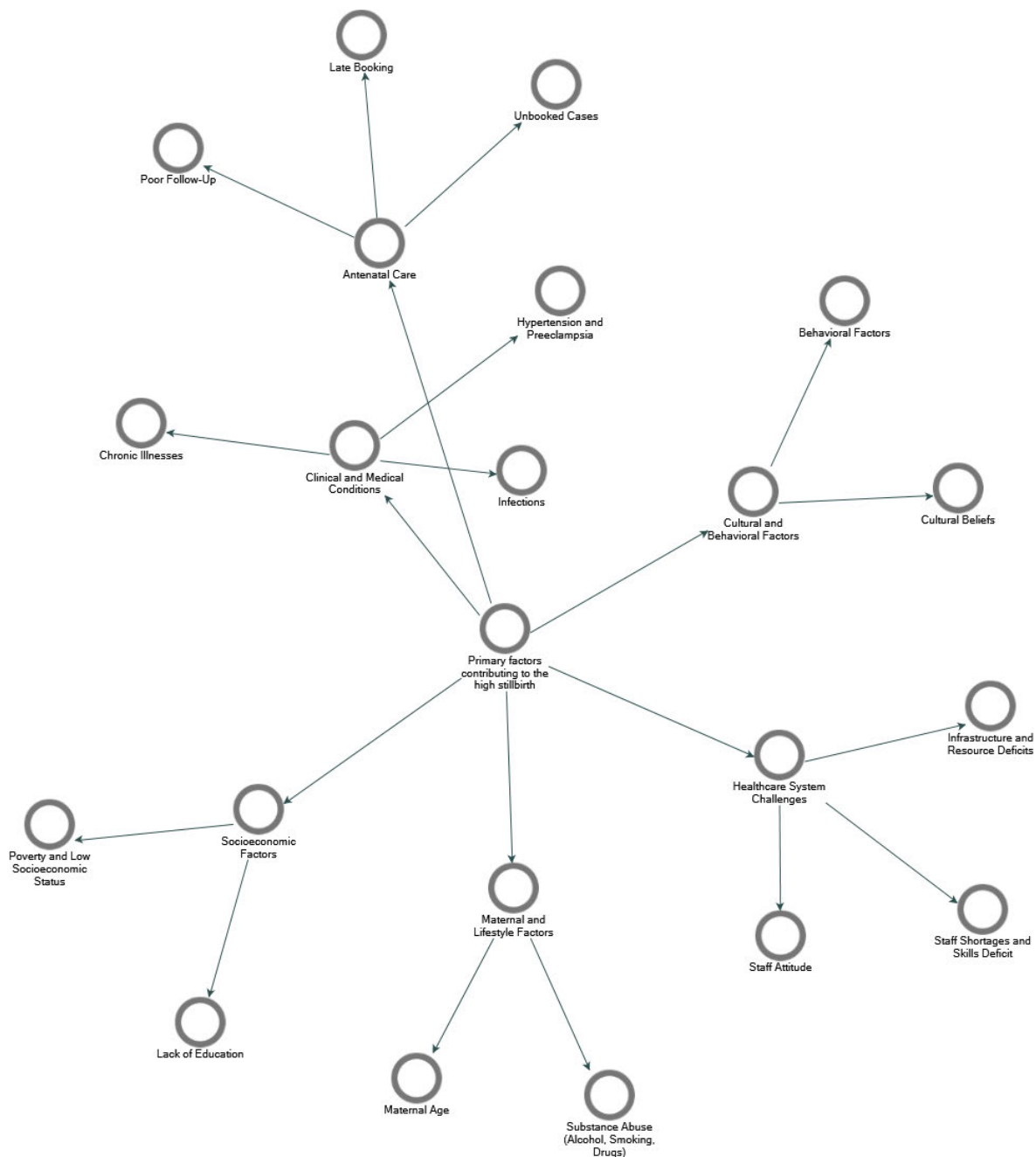


Figure 7. 1: Visualizing primary factors contributing to stillbirths

Source: Self-generated by author

(a) Clinical and medical conditions

- Hypertension and preeclampsia**

Hypertension and preeclampsia are major contributors to adverse pregnancy outcomes, including stillbirths (Hlongwane et al., 2022). Preeclampsia is associated with placental insufficiency, fetal growth restriction (FGR), and increased perinatal mortality (Magee et al., 2022). Participants in this study emphasized that poor management of hypertension during pregnancy leads to fetal distress and stillbirth, a finding consistent with research showing that undiagnosed or untreated hypertensive disorders increase the risk of intrauterine fetal demise (Abalos et al., 2021).

Hypertension, including pregnancy-induced hypertension (PIH) and preeclampsia, was identified as a leading cause of stillbirths. Poor management of these conditions was frequently noted.

*"Poor management of hypertension in pregnancy when the client has booked before 20 weeks."
(Participant 7)*

"Uncontrolled PIH and HIV." (Participant 4)

"Hypertension disorder of pregnancy." (Participant 10)

- Infections**

Infections, including maternal, placental, and fetal infections, were identified as contributing factors to stillbirth. Previous studies confirm that infections such as syphilis, malaria, bacterial vaginosis, and intrauterine infections significantly increase the risk of fetal death (Goldenberg et al., 2019). A systematic review by Lawn et al. (2020) found that nearly 10% of stillbirths worldwide are attributed to maternal infections, further reinforcing the findings of this study.

"Fetal infection or placental infection." (Participant 5)

"Antenatal infection." (Participant 10)

"Unexplained infection." (Participant 19)

- Chronic Illnesses**

Chronic conditions such as diabetes, obesity, and HIV were highlighted as risk factors for stillbirth. Uncontrolled diabetes mellitus leads to macrosomia, fetal hypoxia, and congenital anomalies that can result in intrauterine death (Balsells et al., 2022). Similarly, maternal HIV infection with low CD4 counts has been associated with placental insufficiency and stillbirth (Cohan et al., 2023). This aligns with evidence suggesting that pregnant women with chronic diseases require close monitoring to mitigate stillbirth risks (Ncube et al., 2022).

"Clinical and medical-related conditions such as hypertension/diabetes mellitus." (Participant 1)

"HIV with low CD4 count." (Participant 32)

(b) Maternal and Lifestyle Factors

- Substance Abuse (Alcohol, Smoking, Drugs)

Substance abuse, particularly alcohol consumption and smoking during pregnancy, emerged as a significant risk factor. Research has shown that alcohol consumption during pregnancy is linked to fetal alcohol syndrome and intrauterine growth restriction (IUGR), both of which increase stillbirth risks (Popova et al., 2019). Smoking has been found to cause placental abnormalities and fetal hypoxia, leading to increased perinatal mortality (Marufu et al., 2021).

"Abuse of alcohol during pregnancy." (Participant 3)

"Smoking during pregnancy." (Participant 6)

"Substance abuse including alcohol." (Participant 24)

- Maternal Age

Both advanced maternal age (>35 years) and teenage pregnancies (<20 years) were identified as risk factors for stillbirths. Studies have shown that advanced maternal age is associated with an increased risk of chromosomal abnormalities, preeclampsia, and gestational diabetes, all of which contribute to fetal demise (Lean et al., 2022). Teenage pregnancies, on the other hand, are linked to higher risks of cephalopelvic disproportion (CPD) and preterm labor, which increase perinatal mortality (Neal et al., 2023).

"Maternal age less than 16 and older than 37." (Participant 25)

"Maternal age falling pregnant above 35 years." (Participant 29)

(c) Antenatal Care

- Late Booking

Late initiation of ANC and unbooked pregnancies were repeatedly mentioned as contributing factors to stillbirths. Evidence shows that delayed ANC limits opportunities for timely screening and intervention for pregnancy complications (Moller et al., 2022).

"Late bookings for antenatal care by pregnant women." (Participant 1)

"Late booking at facilities." (Participant 8)

- Unbooked Cases

Furthermore, many women shared that they did not attend antenatal care, increasing risks of stillbirth due to undiagnosed or untreated complications. Research by Duku et al. (2021) in South Africa also found that unbooked pregnancies are associated with a threefold increase in the risk of stillbirth.

"Unbooked antenatal cases." (Participant 1)

"Unbooked cases." (Participant 27)

- Poor Follow-Up

Poor adherence to antenatal visits and follow-up care was identified as another concern. Regular ANC visits allow for monitoring fetal development and identifying complications early (Lumbanraja et al., 2023). When pregnant women do not attend scheduled ANC visits, conditions such as hypertension, infections, and fetal growth restrictions go undetected, leading to increased stillbirth rates.

"Poor antenatal follow-up." (Participant 10)

"Poor adherence for patients on Rx (e.g., HTP Rx)." (Participant 23)

(d) Socio-economic Factors

The socio-economic challenges in Lejweleputswa are deeply intertwined with broader systemic inequalities within South Africa's healthcare system (Lejweleputswa 2022). The findings from the transcribed data reflects these challenges, which are captured below:

- Poverty and Low Socio-economic Status

Poverty was highlighted as a major determinant of limited access to healthcare services, resulting in delayed ANC bookings and poor pregnancy outcomes. Studies have shown that low-income women are more likely to experience inadequate nutrition, poor health literacy, and reduced access to quality obstetric care, all of which contribute to higher stillbirth rates (Milton et al., 2022; Willie and Maqbool 2023).

"Low socio-economic status whereby women from low-income backgrounds have limited access to quality healthcare." (Participant 6)

"Poverty." (Participant 32)

- Lack of Education

Limited education regarding pregnancy risks and ANC importance was noted as a key factor in stillbirths. The finding resonates with Kotzee et al. (2024b), who found that lack of health education is a critical factor contributing to the high rates of stillbirth and maternal mortality in Lejweleputswa. A lack of knowledge about danger signs in pregnancy leads to delays in seeking care (Medicare and Services 2020; Sen et al., 2023). Studies have reported that many women in rural districts, particularly those from disadvantaged backgrounds, have limited knowledge about the importance of antenatal care and the potential risks associated with pregnancy (Maluka et al., 2020; Tabiri et al., 2024). The study found that educating women about safe pregnancy practices significantly reduced perinatal mortality (Christou et al., 2020).

"Lack of education amongst pregnant women." (Participant 1)

"Lack of education to pregnant clients about factors that can lead to stillbirth." (Participant 22)

(e) Healthcare System Challenges

As reported in the literature, rural areas in the Free State Province, including Lejweleputswa, are marked by poorly equipped healthcare facilities and a chronic shortage of skilled healthcare personnel, creating significant obstacles to providing adequate maternal care (Sportlight 2021). Healthcare services in the district are marked by chronic underfunding, shortages of medical personnel, and inadequate infrastructure (Malakoane et al., 2020a; Abrahams, Thani and Kahn 2022). Aligning with these challenges, the observed transcribed data reveal:

- Staff Shortages and Skills Deficit

Previous research conducted in the district revealed a critical challenge of underfunding, shortages of medical personnel, and inadequate infrastructure (Malakoane et al., 2020; Abrahams, Thani and Kahn 2022). Consistent with this, a shortage of skilled healthcare providers, particularly in midwifery and antenatal care, was cited as a challenge. Research by Kruk et al. (2022) found that maternal mortality and stillbirth rates are directly linked to the availability and competence of healthcare workers. The shortage of midwives in rural areas leads to inadequate monitoring of pregnancies, increasing the risk of undiagnosed complications.

"Shortage of skilled professionals at antenatal facilities as well as delivering sites." (Participant 1)

"Skills shortage of midwifery." (Participant 20)

- Infrastructure and Resource Deficits

According to Baloyi (2021), rural healthcare facilities often lack the same level of funding, infrastructure, and skilled healthcare personnel as those in urban centers, leading to significant disparities in the quality of care available to pregnant women. Participants highlighted the lack of essential medical equipment and transport delays as major barriers to quality maternal care. Studies confirm that poor infrastructure and a lack of critical resources, such as functional ultrasound machines, lead to undetected fetal distress and growth abnormalities (Malakoane et al., 2020; Souza et al., 2024). Transport shortages also prevent timely referrals of high-risk pregnancies, resulting in avoidable stillbirths. However, in the district, essential healthcare infrastructure, including modern medical equipment, reliable transport for emergencies, and adequately staffed clinics, is severely lacking (Kruk et al., 2018).

"Sonar broken now and then." (Participant 15)

"Inaccessibility of delivery site due to unavailability of EMS cars." (Participant 9)

- Staff Attitude

Negative attitudes from healthcare staff were mentioned as deterrents to timely ANC booking. Previous research suggests that poor communication and disrespectful maternity care discourage women from seeking ANC services, leading to increased perinatal risks (Bohren et al., 2019).

"Staff attitude is also a contributing factor that leads to patients opting to book late for antenatal care." (Participant 1)

(f) Cultural and Behavioral Factors

Cultural beliefs and practices surrounding pregnancy and childbirth also play a significant role in shaping women's health-seeking behaviors (Aynalem, Melesse and Bitewa 2023).

- Cultural Belief

As reported in the literature, traditional beliefs and cultural practices may also play a role in discouraging women from accessing formal healthcare services, further compounding the problem (Msuya 2020). Consistent with this, traditional beliefs and practices, such as the use of herbal remedies (muthi), were identified as contributors to pregnancy complications. A study by Mogawane et al. (2021) found that some traditional herbs used to induce labor can cause uterine rupture or fetal distress, increasing the likelihood of stillbirth. Equally concerning is that the reliance on traditional care, coupled with limited access to formal healthcare, can lead to delayed treatment and increase the risk of adverse outcomes, including stillbirth (Felisian et al., 2023).

"Cultural beliefs, e.g., using muti concoctions to accelerate the progress of labor." (Participant 1)

- Behavioral Factors

Participants share that some women were reported to ignore danger signs in pregnancy or be uncooperative during antenatal visits, making it difficult for healthcare providers to offer timely interventions. Research supports the notion that behavioral factors, such as delays in seeking care despite recognizing warning symptoms, contribute to stillbirths (Say et al., 2021).

"Pregnant women reacting late on danger signs in pregnancy." (Participant 4)

"Antenatal clients not cooperative in maternal ward." (Participant 22)

The above analyses indicate that a combination of clinical, lifestyle, socio-economic, healthcare system, and cultural factors cause stillbirths in the Lejweleputswa District Municipality. Hypertensive disorders, infections, substance abuse, late ANC bookings, poverty, healthcare resource shortages, and harmful cultural practices all play significant roles. These findings align with global and South African research highlighting the need for improved maternal healthcare services, enhanced ANC access, and targeted interventions to address both medical and social determinants of stillbirth. For example, it is reported in the literature women who are undernourished during pregnancy are more likely to experience complications such as anemia, gestational hypertension, and infections, all of which can increase the likelihood of stillbirth (Willie and Maqbool 2023).

7.2.2 Subtheme: Common clinical or health-related conditions contributing to stillbirths

Stillbirth remains a major global public health concern, with maternal health conditions, infections, behavioral factors, and healthcare system challenges playing significant roles in fetal demise (Lawn et al., 2016). This subtheme identifies several clinical and health-related factors contributing to stillbirth, including maternal health conditions, infections, lifestyle behaviors, placental and fetal complications, and systemic healthcare barriers.

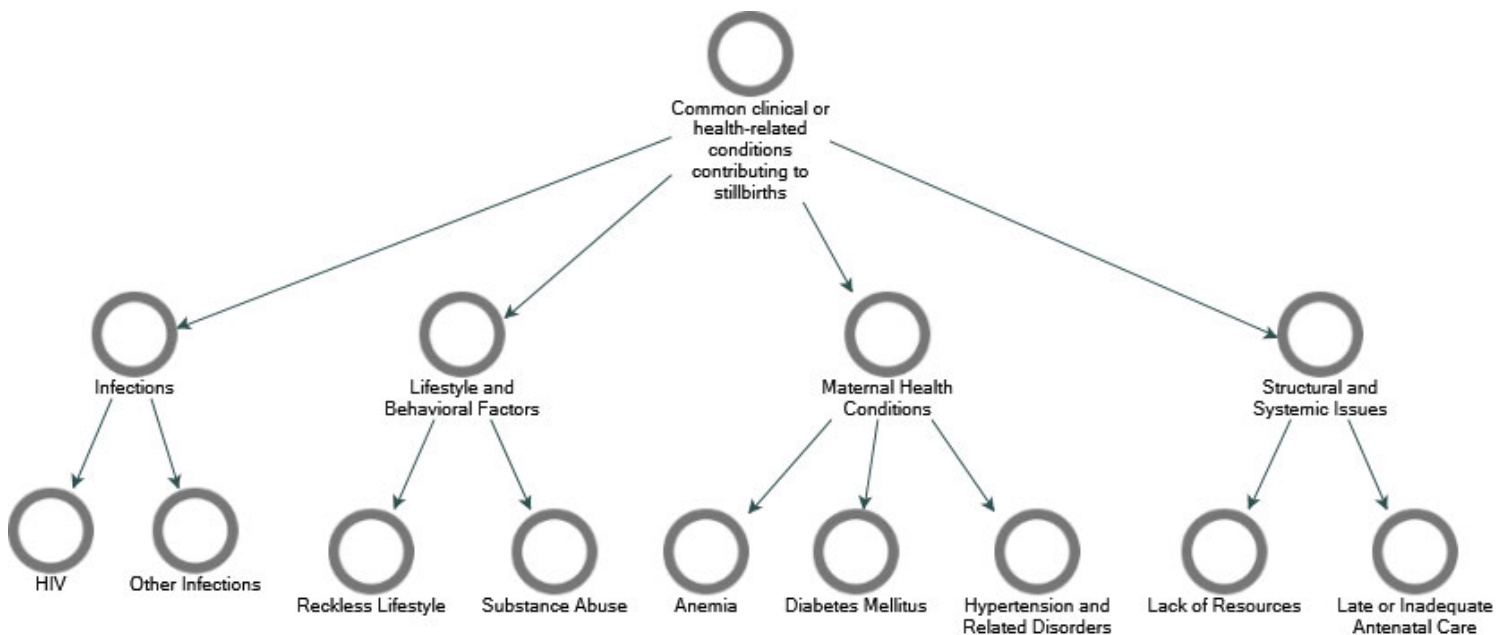


Figure 7. 2: Visualizing the common clinical or health-related conditions contributing to stillbirths

Source: Self-generated by author

(a) Maternal Health Conditions

- Hypertension and Related Disorders

Research on stillbirth problems in South Africa has identified various factors contributing to this issue. These include sociodemographic factors such as rural residence, low education, and early marriage, as well as medical conditions like hypertension and diabetes (Madhi et al., 2019). The transcribed data consistently cited hypertension, pre-eclampsia, and eclampsia as the leading clinical factors contributing to stillbirths. Poor management of these conditions can compromise placental perfusion, leading to restricted oxygen and nutrient supply to the fetus. Hypertensive disorders of pregnancy, including gestational hypertension, pre-eclampsia, and eclampsia, are among the most significant risk factors for stillbirths (Say et al., 2014). These conditions lead to placental insufficiency, which restricts fetal oxygen and nutrient supply, increasing the risk of intrauterine fetal death (Goldenberg et al., 2011).

"Hypertension/pre-eclampsia/eclampsia." (Participant 1)

"Hypertension." (Participant 3)

"Pre-eclampsia." (Participant 5)

"High blood pressure." (Participant 20)

Poor management of hypertension exacerbates fetal distress and increases perinatal mortality (von Dadelszen et al., 2013). Participants emphasized that inadequate control of hypertension often results in stillbirth:

"Hypertension—if uncontrolled or not treated (pre-eclampsia)." (Participant 32)

The above statement aligns with research findings indicating that hypertensive disorders contribute to approximately 16% of stillbirths worldwide, with higher prevalence in low-resource settings (Reddy et al., 2010).

- Diabetes Mellitus

Uncontrolled diabetes during pregnancy is another major contributor to stillbirths. Pregestational and gestational diabetes can result in macrosomia, congenital anomalies, and placental insufficiency, which heighten fetal distress and mortality (McCance et al., 2019). Hyperglycemia affects fetal metabolism, leading to intrauterine growth complications and an increased likelihood of stillbirth (Flenady et al., 2011). The participants' statements reflect this risk:

"Diabetes—if uncontrolled and not treated." (Participant 32)

Studies indicate that stillbirth rates among women with diabetes are up to five times higher than in non-diabetic pregnancies, especially when glycemic control is poor (Murphy et al., 2011). As such, many pregnancy-related complications, such as pre-eclampsia, gestational diabetes, and infections, require timely medical intervention to prevent severe consequences (Jiang et al., 2022).

- Anemia

Women who are undernourished during pregnancy are more likely to experience complications such as anemia, gestational hypertension, and infections, all of which can increase the likelihood of stillbirth (Willie and Maqbool 2023). Anemia, particularly severe maternal anemia, reduces oxygen delivery to the fetus, which can impair fetal growth and increase the likelihood of stillbirth (Black et al., 2013). The participants identified anemia as a major concern:

"Anemia." (Participant 5)

"Anemia in pregnancy." (Participant 10)

"Severe anemia" (Participant 25)

Evidence suggests that maternal hemoglobin levels below 7 g/dL significantly increase stillbirth risk due to hypoxia-induced fetal distress (Kumar et al., 2018). The prevalence of undernutrition among pregnant women in Ethiopia is associated with residing in rural areas, having low educational status, a history of multiple births,

anemia, and intestinal parasitic infections (Kumera et al., 2018). The prevalence of anemia is a critical concern as espoused by the participants.

(b) Infections

- HIV

Untreated HIV infections, particularly in cases of poor antiretroviral adherence, significantly contribute to stillbirth risk (Calvert & Ronsmans, 2013). Women with high viral loads and low CD4 counts have increased risks of opportunistic infections, preterm labor, and stillbirths (Brocklehurst & French, 1998). This aligns with participant observations.

"HIV defaulters complicating into TB/ST's." (Participant 4)

"HIV disease with unsuppressed viral load." (Participant 10)

"HIV with low CD4 count." (Participant 32).

The untreated HIV infection observed from the transcribed data may be associated with the substantial gaps in preventing HIV infection among pregnant mothers, infants, children, and adolescents residing in high HIV-burden countries, including South Africa (Sam-Agudu, Folayan and Haire 2020).

- Other Infections

Beyond HIV, bacterial infections such as syphilis and *E. coli* are also major contributors to stillbirths. Untreated maternal infections can lead to placental inflammation (chorioamnionitis) and congenital infections that compromise fetal survival (Gonzalez-Gonzalez et al., 2021). According to Sikhosana et al. (2022), infections like syphilis and HIV, when untreated, significantly increase the risk of stillbirth. Studies indicate that congenital syphilis increases stillbirth risk by up to 40% if untreated (Newman et al., 2013), which supports participant observations.

"Congenital syphilis." (Participant 1)

"Maternal infection like syphilis and HIV." (Participant 7)

*"Bacterial infections before and after rupture of membranes—*E. coli*." (Participant 32)*

(c) Lifestyle and Behavioral Factors

- Substance Abuse

Maternal substance abuse, including alcohol, tobacco, and illicit drugs, is strongly linked to stillbirth risk (Bayih et al., 2021). Prenatal exposure to these substances can cause fetal hypoxia, placental abruption, and low birth weight, all of which increase stillbirth rates (Flenady et al., 2011). Participants consistently highlighted alcohol and smoking as significant concerns.

"Alcohol usage." (Participant 1)

"Usage of alcohol and smoking by pregnant women." (Participant 8)

"Alcohol abuse." (Participant 24)

Studies indicate that smoking increases stillbirth risk by 47%, while heavy alcohol consumption can double the likelihood of fetal death (McCowan & Horgan, 2009).

- Reckless Lifestyle

Unhealthy dietary habits and inadequate maternal nutrition can lead to fetal growth restriction and placental dysfunction, contributing to stillbirths (Black et al., 2013). Malnutrition, both undernutrition and obesity, has been linked to higher rates of fetal distress and perinatal mortality (Christian et al., 2015). This aligns with the perspective held by the participants:

"Inadequate diet can lead to stillbirth." (Participant 29)

Micronutrient deficiencies, particularly in iron, folate, and vitamin D, have been associated with poor pregnancy outcomes, including stillbirths (Muthayya, 2009).

(d) Placental and Fetal Complications

- Placental Issues

Placental abruption, where the placenta detaches prematurely from the uterus, leads to severe fetal hypoxia and is a major cause of stillbirth (Tikkanen, 2011). Participants emphasized placental complications as a primary factor:

"Placenta abruption—Separation of placenta from the womb." (Participant 32)

Research shows that placental abruption contributes to 10–15% of stillbirth cases, particularly among women with pre-eclampsia and hypertensive disorders (Ananth & Kinzler, 2010).

- Fetal Issues

FGR and IUGR result from placental insufficiency, which leads to inadequate fetal nutrition and oxygenation, increasing the likelihood of intrauterine death (Resnik, 2002). The participants acknowledged these conditions.

"Intrauterine growth restriction." (Participant 18)

"FGR (Fetal Growth Retardation) or IUGR (Intrauterine Growth Retardation)." (Participant 32)

Research suggests that IUGR is present in nearly 50% of stillbirth cases, making it a critical factor in fetal loss (Gordijn et al., 2016).

(e) Structural and Systemic Issues

- Late or Inadequate Antenatal Care

Delayed or inadequate antenatal care prevents early detection and management of high-risk pregnancies, contributing to adverse outcomes like stillbirths. Late bookings and inadequate prenatal care prevent early detection of maternal and fetal complications, increasing the risk of stillbirths (Lincetto et al., 2018). The participants highlighted this issue:

"Not booking early for ANC." (Participant 9)

"Late bookings with high viral load." (Participant 21)

Participant 32: "Lack of ANC." (Participant 32)

Studies indicate that early and consistent antenatal care reduces stillbirth rates by identifying and managing high-risk pregnancies (McClure et al., 2007).

- Lack of Resources

Limited healthcare resources, such as broken medical equipment and shortages of skilled professionals, hinder proper maternal and fetal monitoring (Gonzalez et al., 2021; Asamani et al., 2022). This conclusion was emphasized by the participants below.

"Medical conditions, if left untreated, can relate to stillbirth." (Participant 3)

"Sonar broken now and then." (Participant 15)

Poor healthcare infrastructure, particularly in low-resource settings, significantly contributes to high stillbirth rates (Lawn et al., 2016).

The findings from the above analyses highlight that common clinical and health-related conditions such as hypertensive disorders, diabetes, infections, and placental abnormalities are major contributors to stillbirths. Lifestyle factors such as substance abuse and poor maternal nutrition further exacerbate the risks. Additionally, structural barriers, including delayed antenatal care and inadequate healthcare resources, compound the problem. The finding corroborates Souza et al. (2024), who found that the high rates of stillbirth and maternal mortality in the region are the result of a combination of socio-economic, healthcare system, and clinical determinants.

7.2.3 Subtheme: Measures addressing risks of stillbirth during antenatal care

The previous subthemes highlight the factors contributing to stillbirths in the districts. It was uncovered that both socio-economic factors and maternal and behavioral factors are risks associated with stillbirths. The prevention of stillbirth requires a multifaceted approach that includes maternal education, early and consistent antenatal care (ANC), referrals for high-risk pregnancies, comprehensive health measures, and patient-centered care. These measures ensure timely detection and management of risk factors, ultimately improving maternal and fetal outcomes (Figure 7.3).

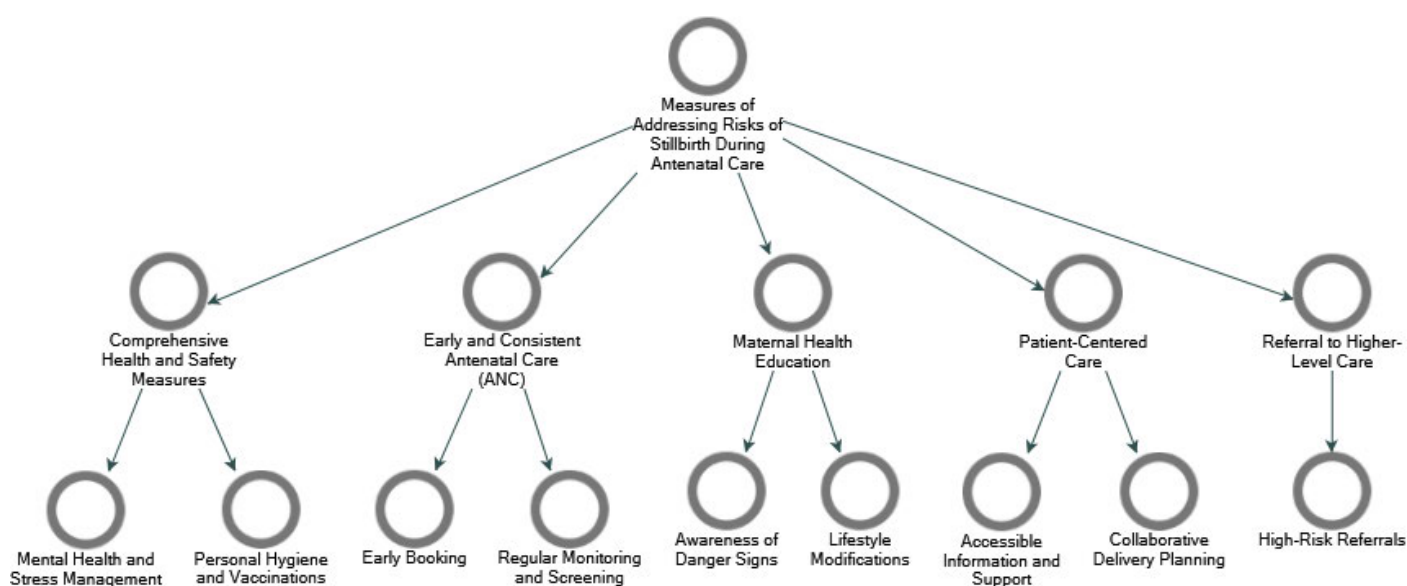


Figure 7. 3: Visualizing Measures of Addressing Risks of Stillbirth during Antenatal Care

Source: Self-generated by author

(a) Maternal health Education

- Awareness of danger signs

Education about danger signs in pregnancy, such as reduced fetal movements, vaginal bleeding, and severe headaches, plays a critical role in empowering expectant mothers to seek timely medical attention. Studies have shown that increased awareness of danger signs is associated with improved maternal healthcare-seeking behavior and a reduction in perinatal mortality (Pattinson et al., 2019). Participants emphasized the importance of educating mothers about danger signs during pregnancy, such as reduced fetal movement. This empowers mothers to seek prompt medical attention when risks arise.

“Teaching on danger signs.” (Participant 2)

“Give health education on each visit.” (Participant 16)

“Educate about fetal movement monitoring.” (Participant 19)

“Health education about danger signs in pregnancy.” (Participant 10)

A systematic review by Berhan and Berhan (2016) highlighted that inadequate knowledge of obstetric danger signs leads to delays in seeking medical care, which contributes to adverse pregnancy outcomes, including stillbirths. Providing structured health education during ANC visits improves maternal knowledge and encourages early reporting of complications (McClure et al., 2021).

- Lifestyle Modifications

Unhealthy lifestyle habits such as alcohol use, smoking, and poor dietary intake have been linked to increased risks of stillbirth (Flenady et al., 2011; Bayih et al., 2021). Lifestyle interventions, including smoking cessation programs and dietary counseling, have been found to reduce adverse pregnancy outcomes (Lassi et al., 2020). The participants shared this position by suggesting mothers be educated about the importance of a healthy lifestyle, including dietary recommendations, avoiding harmful substances, and adopting safe behaviors to reduce stillbirth risks.

“Avoid alcohol in pregnancy, stop smoking, avoid substance abuse.” (Participant 5)

“Encourage healthy eating, exercise, and avoiding illegal drugs.” (Participant 32)

Sleep position, particularly from the second trimester onwards, also plays a role, as maternal supine sleeping has been associated with an increased risk of stillbirth due to reduced placental perfusion (Gordon et al., 2015). This could have potentially influenced the view of Participant 32, who said that:

“Advise mothers to sleep on their side after 28 weeks of pregnancy.” (Participant 32)

Educating mothers about optimal sleep positions and avoiding harmful substances can significantly reduce stillbirth risk (Heazell et al., 2021). This is particularly helpful when one considers the fact that third-trimester stillbirth rates in sub-Saharan Africa are approximately ten times that in developing countries (Bvochora et al., 2022).

(b) Early and Consistent Antenatal Care

- Early Booking

Early ANC registration is essential for identifying and managing high-risk pregnancies. The World Health Organization (WHO) recommends that pregnant women initiate ANC within the first trimester to allow early detection and intervention for potential complications (WHO, 2020). Participants note that early booking for ANC is emphasized as critical for identifying and managing risk factors early in pregnancy. This may connect to the concern that late antenatal care booking has been associated with a higher risk of stillbirths (Aggarwal et al., 2023).

“Encourage early bookings by pregnant mothers.” (Participant 20)

“Booking before 20 weeks.” (Participant 13)

“Start early on treatment and early referral for high-risk clinics.” (Participant 14)

Research by Kearns et al. (2019) suggests that late ANC bookings contribute to increased perinatal mortality due to undetected and unmanaged maternal health conditions. Early ANC booking thus facilitates the initiation of preventive measures such as folic acid supplementation, malaria prophylaxis (in endemic areas), and early screening for infections like HIV and syphilis (Blencowe et al., 2016). Encouraging early ANC visits remains a crucial strategy in preventing stillbirths.

- Regular Monitoring and Screening

Previous scholars, such as Salam and Akinyemi (2022), underscore the importance of ongoing monitoring and evaluation of maternal and child healthcare services. Consistent with their work, the participant advises on regular monitoring of fetal movements and maternal vitals, and conducting diagnostic tests help detect complications early, allowing for timely interventions.

“Regular fetal movement monitoring, fetal growth scans, [and] BP monitoring.” (Participant 6)

“Screening of high-risk pregnancies.” (Participant 10)

“Check vital signs at every visit.” (Participant 23)

Continuous monitoring of fetal growth, maternal blood pressure, and glucose levels during ANC visits helps identify pregnancy complications early. Research indicates that routine fetal movement monitoring and ultrasound assessments contribute to a significant reduction in stillbirth rates (Stacey et al., 2011). Regular ANC visits allow for early detection and intervention for hypertension, gestational diabetes, and intrauterine growth restriction (IUGR), which are major contributors to stillbirth (McCowan et al., 2021).

(c) Referral to Higher-Level Care

- High-Risk Referrals

According to Gizamba et al. (2022), barriers to accessing healthcare services in rural areas include limited availability of testing equipment, unaffordable transport costs, longer waiting times, and delayed referral. Participants emphasized the need to refer high-risk pregnancies to advanced care facilities where specialized interventions can be provided.

“Prompt referral to next level of care.” (Participant 11)

“Refer all pregnant women with medical and surgical conditions to higher level of care.” (Participant 1)

“Referral to high level of care for [a risky] pregnancy.” (Participant 28)

Timely referral of high-risk pregnancies to specialized healthcare facilities is a critical measure in reducing stillbirths. High-risk conditions such as pre-eclampsia, diabetes, and fetal growth restriction require specialized management that may not be available at primary healthcare levels (Goldenberg et al., 2018). Delayed referral has been associated with poor maternal and fetal outcomes, particularly in resource-limited settings (Vogel et al., 2018). A study by Lawn et al. (2016) found that improving referral systems and ensuring efficient transportation to higher-level facilities significantly reduce perinatal mortality. Strengthening referral pathways and ensuring healthcare workers recognize high-risk pregnancies early is essential in addressing preventable stillbirths.

(d) Comprehensive health and safety measures

- Personal hygiene and vaccinations

Lack of knowledge and incorrect practices regarding genital hygiene increase the risk of infection; women can be protected from these infections by teaching correct genital hygiene behaviors through health education based on recognized models (Parlas and Eryilmaz 2022). The transcribed data suggests that encouraging proper hygiene practices and ensuring mothers receive necessary vaccinations can help prevent infections that could lead to stillbirth, as reflected in the statements below:

“Getting the flu vaccine.” (Participant 32)

“Emphasize personal hygiene.” (Participant 32)

“Prepare food safely (washing hands, fruits, and vegetables).” (Participant 32)

Maintaining good hygiene and receiving recommended vaccinations during pregnancy are important preventive measures against infections that contribute to stillbirth. Maternal infections such as syphilis, rubella, and bacterial infections are major risk factors for adverse pregnancy outcomes (Mullany et al., 2020). WHO guidelines recommend routine maternal vaccinations, including influenza and tetanus vaccines, to prevent infections that may lead to pregnancy complications (WHO, 2020).

- Mental health and stress management

Stillbirth remains a significant issue in South Africa, with risk factors including socio-economic challenges, HIV, hypertension, and mental health disorders (Hlongwane, Pattinson and Bergh 2023). Participants suggest that addressing mental health and reducing stress are integral parts of antenatal care, contributing to better maternal and fetal health outcomes.

“Teaching about mental health during pregnancy (depression).” (Participant 32)

“Reduce stress.” (Participant 17)

Maternal mental health has been increasingly recognized as an important factor in pregnancy outcomes. High levels of stress, anxiety, and depression during pregnancy have been associated with increased risks of preterm birth and stillbirth (Grote et al., 2018). Psychological interventions such as counseling and social support programs improve maternal well-being and reduce pregnancy-related complications (Redshaw & Henderson, 2016).

(e) Patient-centered care

Patient-centeredness of care is one of the six key dimensions of healthcare quality, in addition to safety, effectiveness, timeliness, efficiency, and equity (Corrigan et al., 2001). Reports on fertility care confirm that, apart from effective medical treatment, women also appreciate patient-centered care (Dancet et al., 2010; van Empel et al., 2011). The transcribed data highlights the importance of collaborating with women in delivery planning as well as ensuring accessible information and support.

- Collaborative delivery planning

Collaborative care, including shared decision-making between healthcare providers and pregnant women, enhances adherence to ANC recommendations and improves outcomes. Collaborating with mothers to create delivery plans and coordinating ANC visits with other appointments improves patient compliance and preparedness, as mentioned by some of the participants.

“Discuss and record the delivery plan with the pregnant women.” (Participant 1)

“Aligning ANC visits with chronic visits so that patients do not default.” (Participant 23)

Individualized birth planning, which includes discussions about delivery preferences and potential risks, ensures that expectant mothers are well-prepared for labor and delivery (Dowswell et al., 2015).

- Accessible information and support

Ensuring equitable access to ANC services through patient-centered approaches, such as flexible appointment scheduling and transportation assistance, enhances maternal compliance with care (Perrin et al., 2021). Studies have shown that barriers such as transportation challenges and healthcare facility overcrowding contribute to poor ANC attendance and adverse pregnancy outcomes (Tawfik et al., 2019). According to the views of some participants, ensuring accessibility to antenatal care through transport arrangements and never turning away patients ensures consistent care for all.

“Arrange own transport.” (Participant 27)

“Never return any ANC patients.” (Participant 15)

The above finding aligns with the systematic review by Van den Berg et al. (2018) that patients valued being appraised as urgent instead of being added to the queue before being seen by a clinician. By prioritizing patient-centered approaches, healthcare systems can improve ANC coverage and reduce stillbirth rates, particularly in low-resource settings.

Based on the above analyses, one could deduce that addressing the risks of stillbirth during antenatal care requires a comprehensive approach that includes maternal education, early ANC visits, routine monitoring, high-risk referrals, infection prevention, mental health support, and patient-centered care. Existing literature supports these measures, demonstrating that structured ANC interventions significantly reduce stillbirth rates. Ensuring that these strategies are implemented effectively can contribute to improved maternal and fetal health outcomes, ultimately reducing the burden of stillbirths globally.

7.3 THEME 2: SOCIO-ECONOMIC FACTORS IMPACTING ANTENATAL CARE

Socio-economic factors play a significant role in shaping ANC utilization and maternal health outcomes. The participants' responses highlight the complex interplay between maternal age, education, income, access to healthcare, and cultural beliefs in determining the timing and frequency of ANC visits. The findings align with existing literature on maternal health disparities, which emphasize that socio-economic challenges often lead to

inadequate ANC attendance, increasing the risk of adverse pregnancy outcomes, including stillbirth. Table 7.2 illustrates the emerged theme, subthemes, and categories.

Table 7. 2: Theme and subthemes for socio-economic factors impacting antenatal care

Theme	Subtheme	Categories
Socio-economic factors impacting antenatal care	Maternal age	Teenage pregnancy Advanced maternal age (AMA)
	Education level	Low education level Higher education level
	Income level	Low income High income
	Access to healthcare	Transport Challenges Rural and Farm Areas
	Cultural and Behavioral Factors	Stigma and Judgment Ignorance and Negligence

Source: Self-generated by author

7.3.1 Subtheme: Maternal age

- Teenage Pregnancy

The data transcribed suggests that teenage pregnancy is strongly linked to delayed ANC attendance, largely due to stigma, fear of judgment from healthcare providers, and a lack of awareness regarding pregnancy risks. The data also reveal that adolescent mothers often conceal their pregnancies, leading to late or missed ANC visits. This is consistent with research by Yakubu and Salisu (2018), who found that pregnant teenagers delay seeking maternal healthcare due to embarrassment, lack of support, and limited reproductive health knowledge. Moreover, adolescents face a higher risk of complications such as preterm birth, low birth weight, and stillbirth due to their biological immaturity (Neal et al., 2020).

*"Teenagers often hide the pregnancy, visiting the ANC provider at an advanced stage in pregnancy."
(Participant 4)*

"Most kids fall pregnant while they are young and don't understand what's going on and sometime, they hide the pregnancy which then causes them not to book for their ANC visit." (Participant 8)

"Teenage pregnant girls do not attend antenatal clinic(s), as they are afraid of clinic/hospital staff's attitude of judging them as they are still young (stigmatization)." (Participant 32)

- Advanced maternal age (AMA)

Advanced maternal age is associated with higher risks of complications such as stillbirth and delayed ANC attendance. Participants revealed that older mothers (≥ 35 years) exhibit delayed ANC attendance due to fear of stigmatization, while physiologically, they face higher risks of pregnancy complications, including stillbirth, gestational hypertension, and diabetes (Lean et al., 2017). AMA pregnancies often require early and specialized ANC to mitigate these risks (Laopaiboon et al., 2014). However, in low-resource settings, older women may also delay ANC visits due to socio-cultural beliefs, financial constraints, and competing household responsibilities, further exacerbating the risks associated with AMA pregnancies (Rosenberg et al., 2020).

"Women over 35 years have higher chances of stillbirth." (Participant 6)

"Advanced-aged women avoid coming to clinics early enough." (Participant 9)

"The elderly...got lots of kids at home...the uterus cannot hold it." (Participant 30)

7.3.2 Subtheme: Education level

- Low education level

From the observed data, participants shared that women with low education levels tend to delay or avoid ANC visits due to limited understanding of its importance, increasing risks for complications.

"Uneducated ladies tend to shy away from attending clinics." (Participant 12)

"Women with lower education levels may not receive adequate prenatal care, increasing the risk of stillbirth." (Participant 6)

A lack of awareness about the importance of ANC leads to delayed attendance, increasing the risk of complications, as indicated by Participant 30's response.

"Lack of education regarding pregnancies and its high-risk factors." (Participant 30).

Previous studies confirm that maternal education is a strong predictor of ANC utilization; uneducated women are more likely to miss essential check-ups, resulting in undiagnosed pregnancy complications (Singh et al., 2019). Additionally, inadequate maternal education is associated with limited knowledge of danger signs in pregnancy, leading to preventable stillbirths (Fagbamigbe & Idemudia, 2016).

- Higher Education Level

Conversely, higher education levels are associated with increased ANC utilization. Participant 5 shared that educated women are more likely to understand the benefits of ANC, adhere to medical recommendations, and make informed decisions regarding their pregnancies. The following perspectives shed light on these views:

"Women who are more educated are more likely to attend ANC visits than those who are less educated." (Participant 5)

"Women with higher socio-economic status, because of their education, are more likely to make health-conscious lifestyle decisions." (Participant 32)

Studies have shown that educated women are more proactive in adopting healthy behaviors, such as proper nutrition, regular ANC visits, and avoiding harmful substances (Fagbamigbe & Idemudia, 2016).

7.3.3 Subtheme: Income level

- Low income

From the transcribed data, it was gathered that economic constraints limit access to quality ANC services, with financial barriers preventing women from attending regular ANC check-ups. Participants highlighted that transportation costs, lack of resources in public healthcare facilities, and the inability to afford private care contribute to inadequate ANC attendance. This is supported by research from Gabrysch and Campbell (2009), which found that low-income women in developing countries are more likely to experience poor pregnancy outcomes due to limited ANC access. Additionally, economic deprivation is linked to poor maternal nutrition, inadequate prenatal care, and a higher likelihood of stillbirth (Lawn et al., 2016).

"Women from low-income backgrounds have limited access to quality healthcare." (Participant 6)

"Those with low incomes struggle with taxi fees, so they decide to attend only when they have means of transport." (Participant 18)

"Some clinics do not have enough medication for their pregnant journey." (Participant 32)

- High income

By contrast, it was uncovered that women with higher income levels have better access to ANC services, particularly in private healthcare settings, where quality services, including advanced obstetric care, are available. Participant 4 noted that:

"Income level determines if the pregnant lady can visit an advanced obstetrician or an ANC clinic locally." (Participant 4)

A similar view was also echoed by Participant 30 who said:

"If I got money, I got medical aid; I go to private where [there] are enough resources for them to be cared for." (Participant 30)

The above statements align with previous studies that higher income facilitates access to the necessary medical tests, proper nutrition, and specialized care, leading to improved maternal and neonatal outcomes (Say & Raine, 2007).

7.3.4 Subtheme: Access to healthcare

- Transport challenges

Transportation barrier significantly affect ANC access, particularly for women living in rural and remote areas. Some of participants interviewed identified a lack of transport as a major reason for missed ANC visits. Research by Moyer & Mustafa (2013) supports this finding, noting that transportation difficulties contribute to delays in ANC attendance and emergency obstetric care, increasing maternal and neonatal risks.

"Lack of transport." (Participant 19)

"Clients who are ignorant about their healthcare even when given simple instructions." (Participant 11)

- Rural and Farm Areas

In addition to transportation challenges, it was uncovered that women in rural and farm areas face additional challenges, including limited healthcare infrastructure, shortage of skilled birth attendants, and discontinued mobile healthcare services. Participants shared that:

"Most people around are from farms, and they cannot access maternal healthcare." (Participant 8)

"Mobile services to all farms stopped." (Participant 15)

Studies indicate that rural women are less likely to receive adequate ANC services due to geographical constraints and healthcare disparities (Doctor et al., 2018). The discontinuation of mobile services, as mentioned by participants, exacerbates these challenges by further reducing access to timely and essential ANC services.

7.3.5 Subtheme: Cultural and behavioral factors

This subtheme identified cultural and behavioral factors like stigma and ignorance as a barrier to adequate maternal healthcare services.

- Stigma and judgment

Participant 32 revealed that the fear of judgment from healthcare providers discourages many women—especially teenagers and older mothers—from seeking ANC services.

"Teenage pregnant girls do not attend antenatal clinic, as they are afraid of clinic/hospital staff's attitude of judging them." (Participant 32)

Participant 12 alleged that: "Uneducated ladies tend to shy away from attending clinics as well as old ladies for fear of being judged" (Participant 12)

From the above, it is reasonable to say that stigmatization by health professionals can create a hostile environment, leading to poor maternal healthcare-seeking behavior. This aligns with findings by Bohren et al. (2019), which highlight that disrespect and mistreatment in maternity care settings discourage ANC attendance, particularly among young and unmarried women.

- Ignorance and negligence

Besides the fear of being judged, it is evident from the transcribed data that a lack of maternal health awareness contributes to poor ANC utilization. Participants noted that some pregnant women ignore ANC recommendations due to a lack of knowledge or negligence. Research by Titaley et al. (2010) indicates that women with limited maternal health literacy are less likely to recognize pregnancy complications, increasing the risk of adverse outcomes, including stillbirth. Addressing this requires targeted health education interventions to improve maternal knowledge and encourage ANC attendance.

"Most pregnant women are health ignorant." (Participant 8)

"Clients who are ignorant and with less maternal literacy." (Participant 14)

Drawing from the above narratives in this theme, the findings of this study emphasize that socio-economic factors significantly impact ANC utilization, ultimately influencing maternal and neonatal health outcomes. Figure 4 visually demonstrates these factors. Addressing barriers such as teenage pregnancy stigma, financial constraints, healthcare inaccessibility, and maternal health literacy gaps is essential for improving ANC attendance and reducing stillbirth risks.

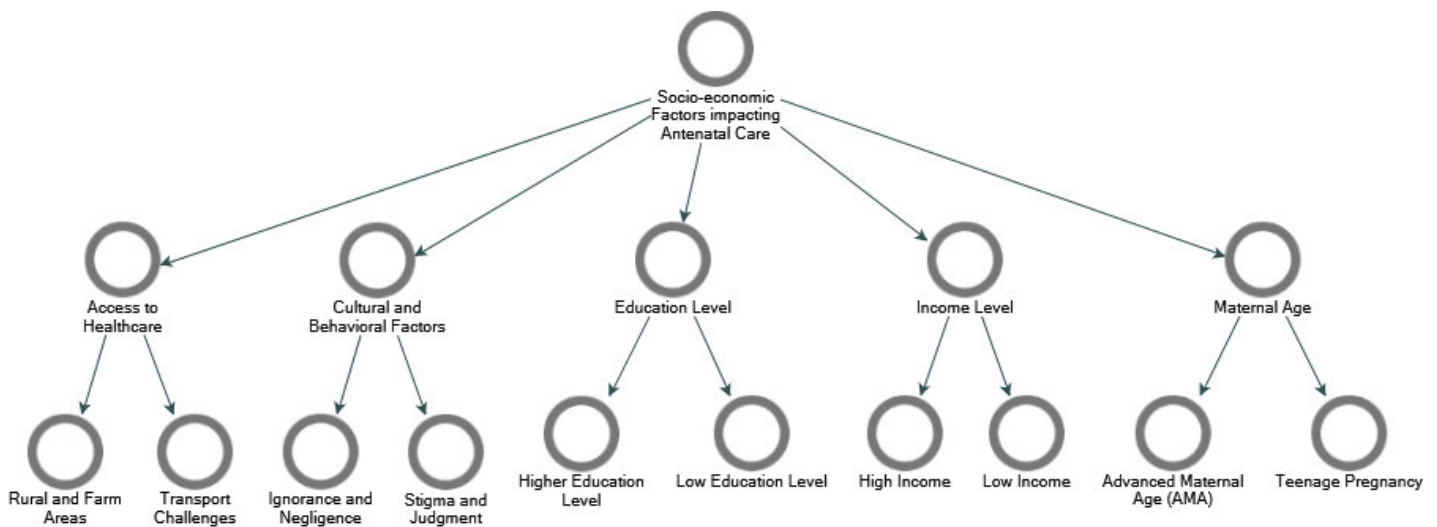


Figure 7. 4: Socio-economic factors impacting antenatal care

Source: Self-generated by author

7.4 THEME 3: SOCIO-ECONOMIC CHALLENGES AFFECTING MATERNAL HEALTHCARE OUTCOMES

This theme explores how various socio-economic challenges influence maternal healthcare outcomes, drawing from the perspectives of participants. The uncovered subthemes and categories are shown in Table 7.4.

Table 7. 3: Socio-economic challenges affecting maternal healthcare outcomes

Theme	Subtheme	Categories
Socio-economic challenges affecting maternal healthcare outcomes	Economic challenges	Poverty Transport challenges
	Educational barriers	Low education levels
	Cultural and social factors	Cultural beliefs and barriers Diet and food insecurity Teenage pregnancy
	Accessibility challenges in rural and informal areas	Rural and informal settlements
	Psychological and emotional factors	Mental health

Source: Self-generated by author

7.4.1 Subtheme: Economic challenges

- Poverty

Poverty remains a major determinant of maternal healthcare outcomes, affecting access to ANC, quality of services, and overall maternal well-being. Financial constraints force many pregnant women to delay or completely miss ANC visits. For example, Participant 6 shared that lack of transport significantly contributes to pregnant women defaulting on adherence, while Participant 23 noted that lack of income presents a difficulty for pregnant women to seek help.

*"Lack of transport money leads to pregnant women defaulting on adherence to ANC visits."
(Participant 6)*

*"Those with low or no income find it difficult to seek help in time when risk factors are identified."
(Participant 23)*

Furthermore, evidence from the transcribed data suggests that women in rural or farming communities often travel long distances to healthcare facilities, which further exacerbates disparities in maternal care.

"People that are staying in farms where the mobile clinic does not go will either come once to the facility or in advanced pregnancy with complications." (Participant 21)

Studies have consistently shown that financial instability leads to lower utilization of ANC services, contributing to increased maternal mortality rates (Say & Raine, 2007). Research by Onarheim et al. (2016) found that poor maternal health outcomes are significantly associated with income disparities, as poverty limits access to healthcare resources, nutritious food, and essential medications. Unemployment exacerbates these issues, leaving many unable to prioritize maternal healthcare needs. This is reflected in the statement below:

"Unemployment—other patients have to travel more than 10 km to access health facilities." (Participant 29)

- Transport challenges

Equally, the transcribed data uncovered that transport barriers prevent many pregnant women, particularly in low-income and rural areas, from accessing maternal healthcare. Some of the participants consistently noted that transport challenges influences antenatal visits.

"Patients missing clinic appointments at referral [the] hospital as they have no transport." (Participant 10)

"Farm patients don't book due to transport; they will say they don't have money." (Participant 16)

Dependence on unreliable public transportation or emergency medical services (EMS) leads to delayed care and, in severe cases, home deliveries without professional assistance.

"No private transport available to the hospital once the patient is in labor results in home deliveries." (Participant 4)

Studies confirm that long travel distances and poor transportation infrastructure contribute to higher maternal morbidity and mortality (Gabrysch & Campbell, 2009).

7.4.2 Subtheme: Educational barriers

- Low Education Levels

Education plays a crucial role in shaping maternal health-seeking behaviors. Low literacy levels contribute to poor understanding of pregnancy-related complications and the importance of ANC visits. Women with limited education may not recognize danger signs, leading to delays in seeking medical intervention (Babalola & Fatusi, 2009).

"Lack of education impacts negatively on maternal healthcare outcomes as patients are unable to read important information provided on danger signs." (Participant 1)

"Low education level and illiteracy prevent understanding of risk factors and necessary actions." (Participant 6)

Additionally, language barriers further hinder understanding of medical advice, as observed by Participant 13:

*"Some clients don't understand the language in the maternity case record, which is written in English."
(Participant 13)*

According to Fagbamigbe and Idemudia (2016), maternal education significantly influences ANC utilization, as educated women are more likely to recognize health risks and act proactively.

7.4.3 Subtheme: Cultural and social factors

Cultural misconceptions and fear of judgment discourage women from seeking antenatal care. Social stigmas surrounding pregnancy, especially among grand multiparous women or teenagers, lead to delayed or missed clinic visits, increasing the risk of preventable complications.

- Cultural beliefs and barriers

Participants share that cultural norms and traditional beliefs can negatively impact maternal healthcare-seeking behavior. For example, Participant 3 alleged that in many communities, misconceptions about ANC and hospital-based deliveries lead to delays in seeking medical care.

"Late antenatal visit because they think the medication given during pregnancy will make the belly grow bigger." (Participant 3)

Participant 12 attributes the lack of antenatal visit to fear of being judged.

"Grand multiparous women do not come to clinics for fear of being judged." (Participant 12)

The above findings align with the notion that cultural taboos, fear of judgment, and preference for traditional birth attendants often contribute to poor maternal outcomes (Gele et al., 2019). Similarly, a study by Bohren et al. (2019) highlights that stigma and discrimination from healthcare providers discourage women from seeking maternal healthcare, reinforcing existing disparities.

- Diet and food insecurity

From the transcribed data, it is evident that maternal malnutrition, particularly among low-income women, contributes to adverse pregnancy outcomes, including preterm birth, low birth weight, and increased maternal morbidity. Food insecurity limits access to essential nutrients, which are crucial for fetal development and maternal health (Black et al., 2013).

"Not eating a well-balanced diet due to poverty." (Participant 27)

"Poor diet contributes to pregnancy complications and poor outcomes." (Participant 8)

"Diet is affected by food insecurity, leading to poor maternal health outcomes." (Participant 6)

Research by Victora et al. (2015) confirms that maternal undernutrition is a leading cause of poor pregnancy outcomes, with long-term effects on both mother and child.

- Teenage pregnancy

Teen pregnancy is associated with increased risks of complications such as preeclampsia, eclampsia, and low birth weight due to biological immaturity and lack of adequate ANC (Yakubu & Salisu, 2018). Consistent with this, participants shared that many teenage mothers delay ANC visits due to stigma, lack of knowledge, and fear of judgment from healthcare providers. These are reflected below:

"[A] high rate of teenage pregnancy, with most presenting at advanced stages of pregnancy, makes it difficult to manage preventable conditions." (Participant 1)

"Teenage pregnancy is associated with preeclampsia and eclampsia." (Participant 2)

"Teenage pregnancy where the patient did not respond to absent fetal movements for a week." (Participant 10)

The above finding agrees with a systematic review by Neal et al. (2012), who suggest that adolescent pregnancies are linked to increased risks of maternal and neonatal morbidity, emphasizing the need for targeted interventions.

7.4.4 Subtheme: Accessibility Challenges in Rural and Informal Areas

- Rural and informal settlements

From the analyzed data, it was gathered that women in rural and informal settlements face significant barriers to healthcare access, including long distances to health facilities, poor infrastructure, and inadequate mobile clinic services. Limited healthcare access contributes to delayed ANC attendance, home births, and preventable maternal deaths (Doctor et al., 2018).

"Patients living in informal settlements can't reach clinics, and even ambulances can't access their homes due to poor roads." (Participant 22)

"Farm patients encounter transport problems and are often not allowed time off by farmers." (Participant 9)

"Mobile clinics do not reach people in rural areas, limiting access to maternal healthcare." (Participant 21)

Research by Kruk et al. (2016) found that rural residence is a key determinant of maternal health disparities, with limited healthcare facilities contributing to worse outcomes. This supports the views expressed by some of the interviewed participants.

7.4.5 Subtheme: Psychological and emotional factors

- Mental health

Poor mental health during pregnancy is associated with increased risks of preterm birth, low birth weight, and poor neonatal outcomes (Lancet Global Health, 2020). From the transcribed data, it is evident that maternal mental health issues, including depression and anxiety, are exacerbated by socio-economic challenges, lack of support, and financial stress.

"Increase in depression and other pregnancy complications." (Participant 5)

According to Howard et al. (2014), maternal depression is a significant yet often overlooked factor influencing maternal and infant health, underscoring the importance of integrating mental health support into ANC services. Figure 5 depicts the socio-economic challenges affecting maternal healthcare outcomes.

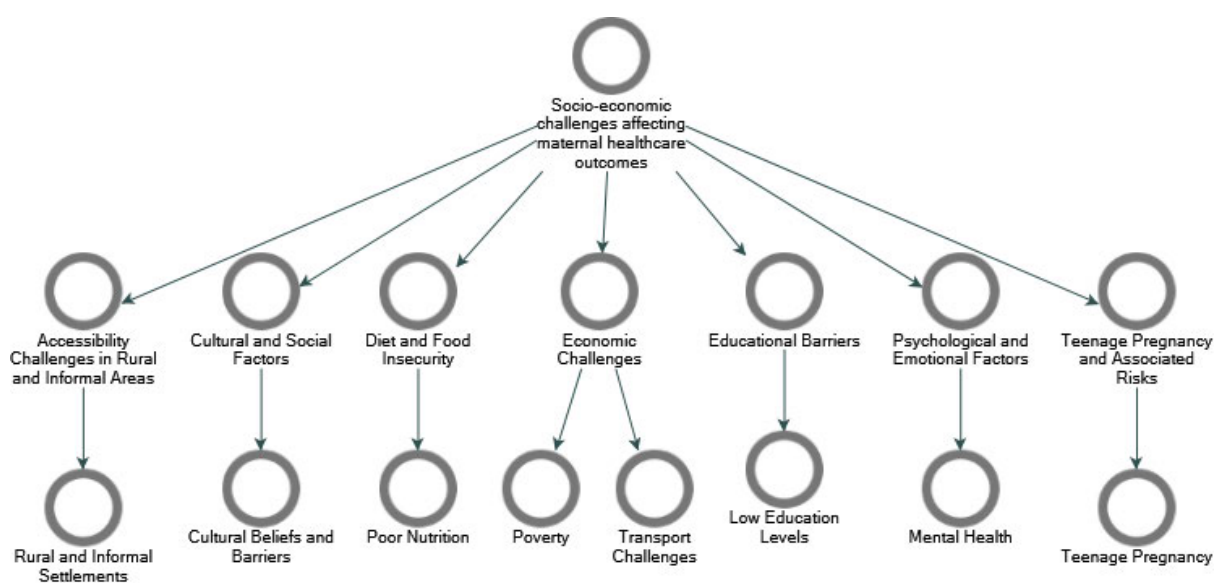


Figure 7. 5: Visualizing socio-economic challenges affecting maternal healthcare outcomes

Source: self-generated by author

7.5 THEME 4: AWARENESS AND UTILIZATION OF ANTENATAL AND OBSTETRIC SERVICES

Awareness and utilization of antenatal and obstetric services are critical in ensuring positive maternal health outcomes. This theme explores how knowledge, access, and systemic challenges impact the use of maternal healthcare services. Although many pregnant women are aware of available services, barriers such as inadequate healthcare resources, a lack of motivation, and negative attitudes toward the healthcare system influence their engagement with antenatal care. Table 7.4 highlights the subthemes and categories uncovered for the awareness and utilization of antenatal and obstetric services.

Table 7. 4: Awareness and utilization of antenatal and obstetric services

Theme	Subtheme	Categories
Awareness and utilization of antenatal and obstetric services	Awareness of antenatal and obstetric services	High awareness of services Awareness with limited access Awareness with ignorance or lack of motivation Contribution of health education and CHWs Variability in awareness and service quality
	Challenges pregnant women face accessing antenatal and obstetric services	Systemic and logistical challenges Resource shortages Geographic and financial barriers Attitudes and experiences Socio-economic and cultural challenges Healthcare system failures

Source: Self-generated by author

7.5.1 Subtheme: Awareness of antenatal and obstetric services

Figure 7.6 shows the subthemes under the theme awareness of antenatal and obstetric services. At a glance, it is evident that there is mixed awareness of antenatal and obstetric services in the community.

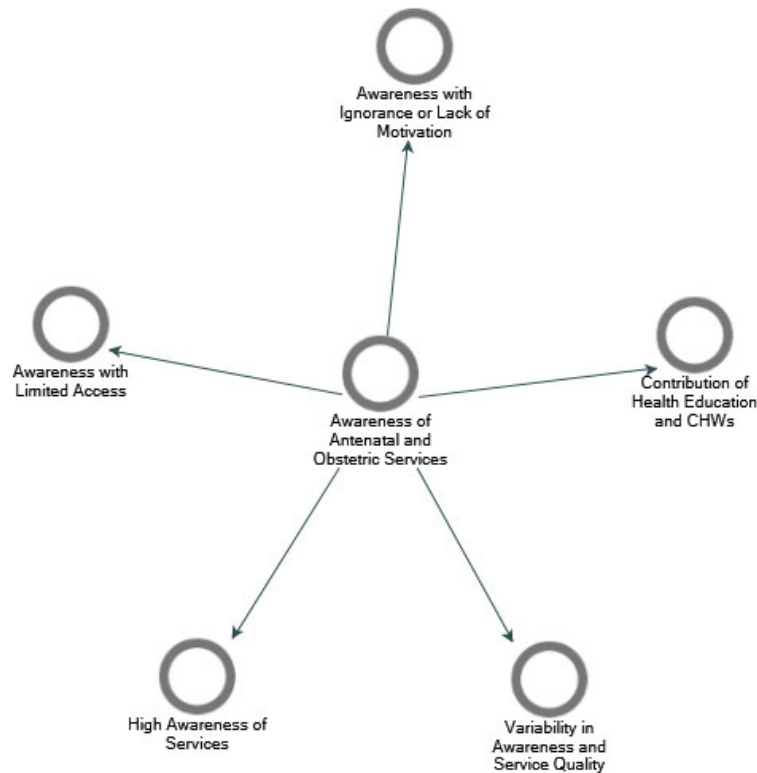


Figure 7. 6: Visualising the awareness of antenatal and obstetric services Source: Self-generated by author

- High awareness of services

Most participants indicated that pregnant women in the community are highly aware of antenatal and obstetric services. This heightened awareness can be attributed to ongoing health education initiatives, including household visits by community health workers (CHWs) and national campaigns like Pregnancy Awareness Week. High awareness is essential, as studies have shown that knowledge of maternal health services positively influences early booking and antenatal care attendance (Kyei-Nimakoh et al., 2017).

"Pregnant women are aware of the antenatal care services that are offered at the PHC facilities and where to seek obstetric services." (Participant 1)

"On a scale of 1–10, they are 10 aware." (Participant 2)

"They are very aware." (Participants 3, 7, 18)

"Pregnant women in the community are well aware of ANC and obstetric services provided." (Participant 4)

"They are aware that all clinics can provide basic antenatal care." (Participant 10)

"They are fully aware." (Participants 13, 17, 25)

"A lot of pregnant women are aware, as there is an increased number in early bookings." (Participant 23)

Research by Simkhada et al. (2008) suggests that awareness of antenatal services is a key determinant of maternal healthcare utilization. Increased knowledge about available services encourages early antenatal care (ANC) visits, which are linked to improved pregnancy outcomes. A study in South Africa by Nhemachena et al. (2020) also found that community health education programs significantly increase ANC attendance.

- Awareness with limited access

Despite high awareness, many women face systemic challenges that limit their ability to access antenatal care. Participants highlighted barriers such as staff shortages, poor referral systems, and long waiting times as factors that discourage pregnant women from fully utilizing ANC services. These findings align with studies indicating that supply-side factors, such as understaffing and inadequate healthcare infrastructure, contribute to delays in seeking maternal healthcare (Pell et al., 2013).

"They are aware but restricted by other factors to access health/antenatal services." (Participant 6)

"Services are available, and patients are aware of it, but reports of Primary Health Care shortages to attend them." (Participant 19)

"They are aware but frustrated by lack of nurses in facilities because they are not helped on time." (Participant 24)

"The referral system also contributes to the bad attitude." (Participant 30).

According to the WHO (2016), even when women are aware of maternal health services, access barriers—such as financial constraints, long travel distances, and poor service delivery—can negatively impact service utilization. Similarly, Okedo-Alex et al. (2019) found that, despite increased awareness, challenges to healthcare system efficiency and resource availability limit the effectiveness of maternal health interventions.

- Awareness with ignorance or lack of motivation

Some participants reported that, despite being aware of antenatal services, certain women fail to attend ANC due to ignorance or a lack of motivation. This highlights a behavioral aspect in maternal health-seeking practices, where awareness does not always translate into action. Socio-economic and cultural factors often influence motivation levels, as some women may not perceive ANC as necessary, especially if they have had previous uncomplicated pregnancies.

"Fully aware, but they are ignorant." (Participants 14, 20)

"They are very aware but lack the motivation to practice it." (Participant 8)

"They are aware but just lack education." (Participant 22)

Thaddeus and Maine's (1994) "Three Delays Model" explains that the first delay in maternal health is the decision to seek care, which is influenced by awareness, cultural beliefs, and perceived need for healthcare. A study by Adamu (2011) in Nigeria found that, despite awareness, some women viewed ANC as unnecessary unless complications arose. These findings emphasize the need for behavior change communication strategies to complement awareness campaigns.

- Contribution of health education and CHWs

Community health workers and health education initiatives play a crucial role in increasing awareness and promoting ANC utilization. Participants acknowledged that CHWs visit households, conduct awareness campaigns, and provide health education during ANC visits. These efforts contribute to early ANC bookings and better maternal health outcomes. These are demonstrated in the following excerpts:

"CHWs visit households and support pregnant clients." (Participant 4)

"Health education during antenatal visits." (Participant 27)

"CHWs also do awareness campaigns in the community." (Participant 23)

"Our community health workers must strengthen their efforts to educate them at their respective households." (Participant 22)

A study by Le Roux *et al.* (2020) and Lassi *et al.* (2016) found that CHWs are instrumental in increasing maternal health service utilization, especially in rural areas. Their role in providing household-level education and support significantly improves ANC attendance and maternal health outcomes. Additionally, Ssetaala *et al.* (2022) demonstrated that targeted maternal health education interventions lead to increased early ANC attendance and better birth preparedness.

- Variability in awareness and service quality

While awareness is generally high, variations exist across different communities. Participants noted that negative attitudes toward healthcare services, driven by understaffing and poor service delivery, sometimes deter women from utilizing maternal healthcare.

"The problem is they just have bad attitude towards the maternal healthcare provided, and most of it is caused by the shortage of midwives and staff." (Participant 30)

"Pregnant women are treated according to high clinic levels, and they are aware." (Participant 29)

A systematic review by Turner *et al.* (2021) found that poor healthcare experiences, including long waiting times, provider shortages, and disrespectful treatment, contribute to maternal healthcare hesitancy. Improving healthcare worker availability and ensuring respectful maternity care can enhance service utilization and maternal health outcomes (Kruk *et al.*, 2018). Addressing these service quality issues may be essential to ensure that awareness translates into utilization. Participant 26 suggests health talks as a means of addressing the perceived negative image of health workers.

"Health talks on a daily basis." (Participant 26)

From the above narrative, it is evident that while awareness of antenatal and obstetric services is generally high, systemic barriers, lack of motivation, and service delivery issues hinder full utilization. Strengthening the healthcare system through improved staffing, efficient referral processes, and behavior change interventions is essential in improving maternal service attendance in the community.

7.5.2 Subtheme: Challenges pregnant women face accessing antenatal and obstetric services

South Africa's maternal healthcare and stillbirth rates face complex challenges, encompassing issues like the management of hypertensive disorders in pregnancy, the detection of fetal growth restriction, and the provision of high-risk care (Pattinson, Hlongwane and Vannevel 2019). Access to antenatal and obstetric services is critical for ensuring positive maternal and fetal health outcomes. However, several systemic, logistical, financial, and sociocultural challenges hinder the effective utilization of these services (Figure 7.7). The findings from participants reveal a complex interplay of institutional barriers, socio-economic constraints, and healthcare system inefficiencies that limit access to antenatal care. The information below provides contextualized discussion of the challenges supported by relevant literature.

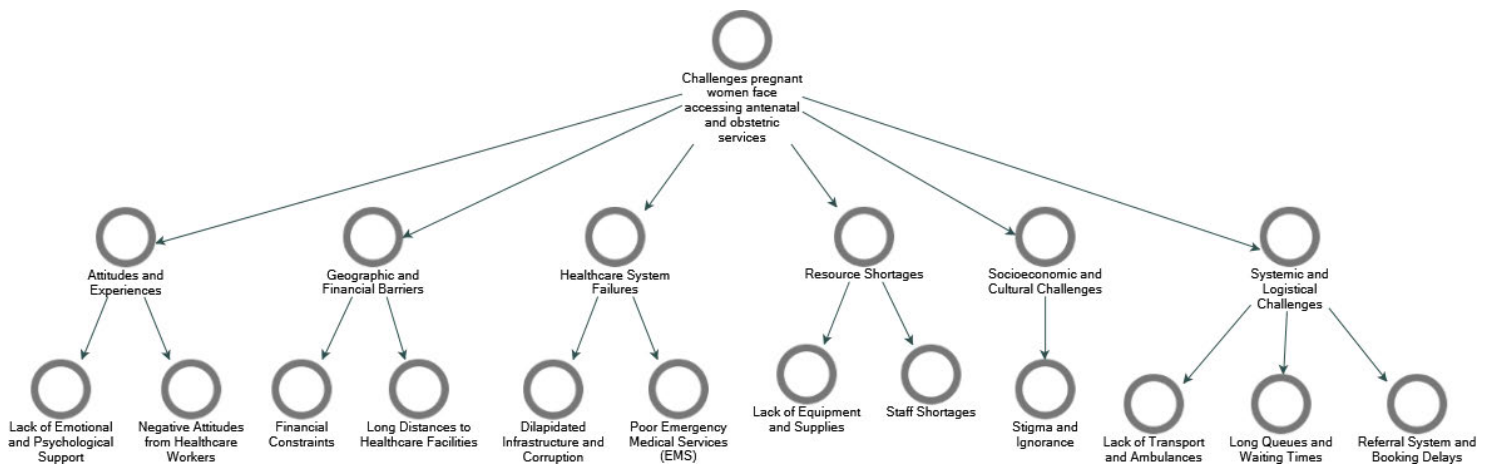


Figure 7. 7: Challenges pregnant women face assessing antenatal and obstetric services

Source: Self-generated by author

(a) Systemic and Logistical Challenges

- Long Queues and Waiting Times

The shortage of healthcare professionals, particularly midwives, coupled with an increasing patient load, results in overcrowding at healthcare facilities. From the observed data, some of the participants shared that pregnant women often face extended waiting times, discouraging them from attending follow-up visits.

"There are long ques at the clinic." (Participant 3)

"Long waiting ques and shortage of midwives." (Participant 20)

"Overcrowding." (Participant 32)

Research supports these findings, showing that long waiting times significantly impact ANC attendance. A study by Baron and Kaura (2021) found that excessive waiting times in the Western Cape lead to delays in seeking antenatal care and increase the risk of pregnancy-related complications. Tshabalala et al. (2020) also found that maternal health services in South Africa struggle with staffing shortages, which contribute to long queues and delays in service delivery.

- Referral system and booking delays

An inefficient referral system and the use of appointment-based bookings limit timely access to ANC. Participants noted that some facilities require prior bookings, delaying care for high-risk pregnancies. This aligns with the WHO's (2016) recommendations that advocate for timely referrals and efficient service delivery to prevent maternal and fetal complications. Research by Ngwenya et al. (2021) affirms that delays in the referral process, often due to administrative inefficiencies, result in poor maternal health outcomes.

"There are facilities that use an appointment system to book pregnant women before accessing antenatal care." (Participant 1)

"Delays in maternal and ANC booking." (Participant 26)

- Lack of transport and ambulances

Limited access to transport, particularly in rural areas, restricts pregnant women from reaching healthcare facilities. Participants disclosed that transport to reach health facilities is not available. A lack of dedicated obstetric ambulances further exacerbates the problem, increasing risks for both mother and child. According to Dahab and Sakellariou (2020a); Ezeanochie and Jahonga (2024), transportation difficulties are a leading factor in maternal mortality, particularly in low-resource settings where emergency obstetric services are not readily available.

"There is no ambulance dedicated for obstetrics services." (Participant 1)

"Transport to reach the services." (Participant 13)

(b) Resource Shortages

- Staff shortages

A recurring theme in participant responses is the shortage of skilled healthcare personnel. The demand for midwives and obstetricians exceeds supply, leading to overburdened healthcare workers and inadequate patient care. Report by (Nove et al. 2021b) indicated that a lack of trained healthcare workers in maternal health services is a global challenge, leading to poor health outcomes and increased maternal mortality rates. This agrees with the notion that South Africa is facing a critical shortage of human resources in maternal healthcare,

leading to high maternal mortality rates and inadequate access to essential services for pregnant women (Mlotshwa and Sibiya 2023). The shortage of skilled staff, including midwives, is a significant factor contributing to this problem (Okeke & Ngunyulu 2023). This conclusion is further supported by the following statements:

"Shortage of staff resulting for them to long waiting time." (Participant 7)

"Shortage of skilled staff (e.g., midwife)." (Participant 23)

- Lack of equipment and supplies

The South African healthcare system faces significant challenges due to infrastructure deficits, which hinder the delivery of quality care and exacerbate existing issues (West et al., 2021). According to West et al. (2021), these deficits are particularly pronounced in rural areas, where providers struggle to define and deliver quality care due to inadequate clinic structure and resources. Consistent with this, it was gathered that healthcare facilities often lack essential equipment, medications, and proper infrastructure, limiting their ability to provide adequate ANC. Broken equipment and medication shortages prevent early detection and management of pregnancy complications. According to Mohlala *et al.* (2023), resource shortages in maternal health services contribute to high morbidity and mortality rates in South Africa, emphasizing the need for strengthened healthcare infrastructure.

*"Most equipment are broken and makes it difficult to identify problems in pregnant women."
(Participant 21)*

"Lack of medication." (Participant 32)

(c) Geographic and Financial Barriers

- Long distances to healthcare facilities

According to the transcribed data, it was observed that many pregnant women, particularly those in rural areas, travel long distances (sometimes over 60 km) to access ANC services. Studies by Steinbrook *et al.* (2021); Dotse-Gborgbortsi *et al.* (2022), and Kyei-Nimakoh *et al.* (2017) found that geographical barriers contribute to delays in seeking antenatal care, increasing the risk of pregnancy-related complications. The WHO (2019) also stresses that access to maternal healthcare should be improved in underserved areas to ensure universal health coverage.

"There are areas that have no obstetric services; pregnant women are transported for over 60 to 70 kilometers." (Participant 1)

"Geographic challenges—distance to healthcare facilities." (Participant 6)

- Financial constraints

The cost of transportation and other healthcare-related expenses discourages women from seeking antenatal care, as shared by Participant 6. Economic hardships, particularly in low-income communities, further prevent regular attendance at ANC clinics. A study by Mekonnen and Asrese (2020) found that financial constraints are

a key determinant of ANC utilization, with affordability playing a crucial role in whether women access maternal health services.

"Lack of transport money (financial challenges)." (Participant 6)

(d) Attitudes and Experiences

- Negative attitudes from healthcare workers

Disrespectful and abusive behavior from healthcare workers discourages pregnant women from seeking ANC services. Some participants highlighted verbal abuse and mistreatment, which aligns with findings from Mapumulo *et al.* (2021), who reported that mistreatment of women during childbirth is a widespread issue in healthcare settings, leading to mistrust and reduced healthcare utilization.

"Bad attitude from midwives due to fatigue from shortages of staff and even insults from the community." (Participant 8)

"Attitude of receptionist and some nurses." (Participant 22)

From a behavioral perspective, the attitudes of healthcare providers can influence ANC services utilization. Positive attitudes can lead to better health-seeking behaviors and adherence to maternal care protocols, while negative attitudes can result in disengagement or delays in seeking care (Tesfaye *et al.* 2020).

- Lack of emotional and psychological support

Pregnant women often experience anxiety and emotional distress, yet ANC services fail to offer adequate psychological support, as shared by Participant 32. Studies by Wittkowski *et al.* (2020) show that lack of emotional support during pregnancy contributes to poor maternal mental health, emphasizing the need for integrated psychological care in ANC services.

"Lack of emotional and psychological support." (Participant 32)

(e) Socio-economic and Cultural Challenges

- Stigma and ignorance

Societal stigma surrounding pregnancy, particularly among adolescents and unmarried women, prevents some from accessing ANC. Cultural beliefs and myths further discourage women from seeking care. Research by Michael, Nwokocha and Agbana (2023); Michael (2024) in Nigeria found that sociocultural norms, including gender roles and stigma, significantly affect ANC attendance. Similarly, Erasmus, Knight and Dutton (2020) observed that cultural barriers remain a critical challenge in improving maternal health outcomes in South Africa.

"Stigma around pregnancy and childbirth (socio and cultural challenges)." (Participant 6)

(f) Healthcare System Failures

- Poor emergency medical services (EMS)

According to the transcribed data, it was evident that delayed EMS responses, and a lack of dedicated obstetric ambulances contribute to maternal health complications. A study by Musafaah *et al.* (2023) found that efficient emergency transportation plays a crucial role in reducing maternal mortality. Many countries have seen a decline in maternal mortality rates, owing to improved access to skilled healthcare professionals, better antenatal and postnatal care, and enhanced emergency obstetric services (Sahoo *et al.*, 2021; Syed *et al.*, 2022).

"Delays of EMS when called out." (Participant 9)

"Poor EMS response during emergencies." (Participant 23)

- Dilapidated infrastructure and corruption

From the literature, factors such as lack of policy awareness among health managers, poor infrastructure, and human resource challenges have been identified as barriers to implementing quality standards in health facilities (Matahela, Adekola and Mavhandu-Mudzusi, 2023). Infrastructure challenges, such as poor sanitation, overcrowding, and broken medical equipment, hinder the quality of ANC services. Participants also expressed concerns about corruption, which the misuse of funds meant for improving maternal health services. According to Naher *et al.* (2020), corruption in healthcare systems leads to inefficiencies, further exacerbating challenges in maternal healthcare.

"Dilapidated infrastructure." (Participant 24)

"Corruption of our leaders who steal monies meant to improve facilities." (Participant 24)

The above narratives highlight significant barriers to accessing antenatal and obstetric services, including systemic inefficiencies, financial constraints, geographical challenges, and negative experiences within healthcare facilities. While awareness of ANC services is high, the actual utilization is hindered by these barriers. Strengthening healthcare infrastructure, increasing staffing levels, improving referral systems, and addressing sociocultural barriers are crucial in enhancing maternal healthcare outcomes.

7.6 THEME 5: HEALTHCARE PROVIDERS' KNOWLEDGE, ATTITUDES, AND PRACTICES

Table 7.5 shows the subthemes and categories uncovered for the theme exploring healthcare providers' knowledge, attitudes, and practices.

Table 7. 5: Healthcare providers' knowledge, attitudes, and practices

Theme	Subtheme	Categories
Healthcare providers' knowledge, attitudes, and practices	Knowledge and understanding of stillbirth prevention strategies	High level of knowledge and confidence Moderate to average knowledge Poor or limited knowledge Preventative measures for stillbirth
	Impact of attitudes and behaviors on stillbirth prevention	Positive attitudes and behaviors to improve maternal care Negative attitudes as a barrier to maternal health services Effect of staff burnout and shortages on attitudes
	Measures of improving knowledge of stillbirths	Need for staff support and continuous training Training, workshops, and knowledge sharing
	Steps to preventing stillbirth during antenatal care	Early detection and screening Health education and awareness Maternal and fetal monitoring Communication and support systems

Source: Self-generated by author

7.6.1 Subtheme: Knowledge and Understanding of Stillbirth Prevention Strategies

This subtheme highlights the varying levels of knowledge and confidence among healthcare providers regarding stillbirth prevention strategies. The responses range from high confidence and expertise to moderate understanding and a recognition of the need for continuous learning, while some participants expressed limited knowledge.

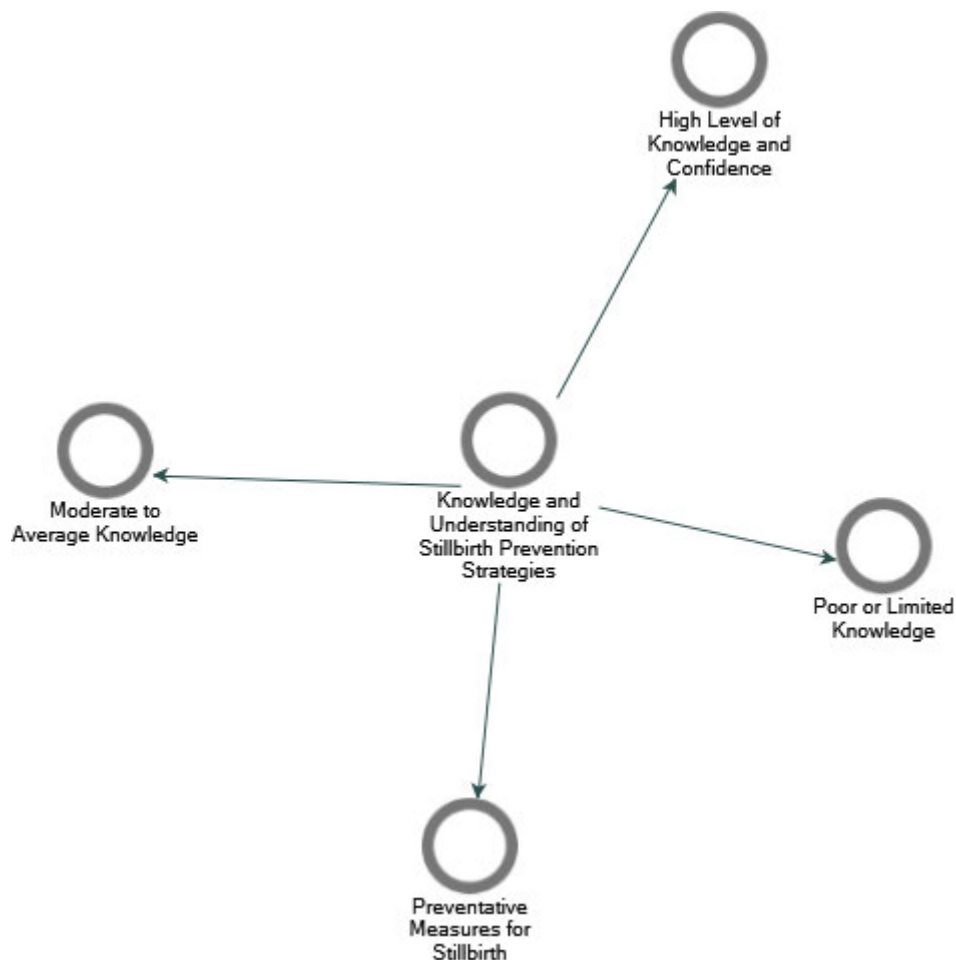


Figure 7. 8: Visualizing knowledge and understanding of stillbirth prevention strategies

Source: Self-generated by author

- High level of knowledge and confidence

Healthcare providers with extensive experience in maternal care expressed confidence in their knowledge of stillbirth prevention. Some participants expressed a high level of confidence in their knowledge of stillbirth prevention strategies, often citing training, experience, and adherence to guidelines as factors contributing to their expertise. Their expertise is often attributed to formal training, postgraduate qualifications, and adherence to clinical guidelines.

"I am highly knowledgeable of stillbirth prevention strategies and have experience in maternal care services." (Participant 1)

"[I] am very aware, and we are well trained and follow guidelines and proper referral channels for high-risk pregnancy." (Participant 7)

"Very good; I am well trained." (Participant 19)

"I'm confident in what to do when we are faced with complications; I have been well trained, and I have a postgraduate." (Participant 30)

"Knowledge is enough." (Participant 28)

The above narrative aligns with the findings of Ota *et al.* (2020b), who emphasize that healthcare professionals with specialized training in maternal and neonatal care are more effective in preventing stillbirth through early risk identification and appropriate interventions. Furthermore, Goldenberg *et al.* (2020) suggest that well-trained healthcare workers who follow established protocols significantly reduce stillbirth rates, particularly in low-resource settings where preventable maternal complications contribute to high mortality rates. The confidence expressed by some participants suggests that training and education efforts have positively impacted their competence in stillbirth prevention.

- Moderate to average knowledge

Several participants acknowledged that their knowledge was satisfactory but not comprehensive, indicating a need for continuous professional development. This is consistent with research by Atkins *et al.* (2023c), which highlights that while healthcare providers may have foundational knowledge of stillbirth prevention, gaps remain due to evolving guidelines, new evidence, and the complexity of high-risk pregnancies.

"Fair, working in a maternal ward exposes you to many cases. That said, many cases elucidated the complexity of stillbirth, and hence, there is always more to learn." (Participant 10)

"Average to good." (Participant 20)

"Knowledge is satisfactory and above average. Continuous workshops and updated guidelines are needed." (Participant 23)

"I think it's fair but still need more knowledge." (Participant 8)

The above narrative suggests that healthcare workers who frequently manage maternal cases may gain experiential knowledge; however, reliance solely on experience without ongoing training can lead to outdated practices (Flenady *et al.*, 2019). The suggestion for regular workshops and updated guidelines which aligns with recommendations by the WHO (2023), emphasizes the need for structured refresher courses to ensure healthcare providers remain informed about best practices for stillbirth prevention. This assertion is supported by some of the participants.

"I think I still need a bit of knowledge, especially when handling complicated deliveries." (Participant 25)

"[I] am not a specialist in that field, but maybe if all professionals can be periodically in-service trained about preventative strategies of stillbirth." (Participant 22)

- Poor or limited knowledge

A small number of participants admitted to having poor knowledge of stillbirth prevention, highlighting a critical gap in training and education. This finding is concerning, as Christou *et al.* (2021) state that inadequate knowledge among healthcare professionals contributes to missed opportunities for early interventions, leading to preventable stillbirths.

"20% poor." (Participant 17)

"Poor." (Participant 26)

Lack of specialized training and limited exposure to high-risk pregnancies may contribute to knowledge gaps. Blencowe *et al.* (2022) suggest that in-service training programs and continuous professional development opportunities are crucial in equipping healthcare workers with the skills needed to manage maternal complications effectively.

- Preventative measures for stillbirth

Some participants outlined key preventative measures for stillbirth, including monitoring vital signs, providing health education, ensuring proper nutrition, and promoting antenatal care attendance. These responses align with evidence-based practices recommended by Flenady *et al.* (2019), who emphasize that regular monitoring of fetal movements, timely management of infections, and improved maternal nutrition significantly reduce stillbirth risks.

"Monitoring of vital signs regularly with visits and immediate referral." (Participant 27)

"Health education and encouragement of good attendance to clinic—educating them on understanding the risk in pregnancy and prevention measures." (Participant 5)

"Strongly around 50%—Nutrition (protein supplements), prevention and management of infections (HIV, diarrhea)." (Participant 32)

"Giving relevant information to clients and answering clients' concerns." (Participant 11)

According to Tamunu, Ponidjan and Nagara (2022), increased awareness among pregnant women through health education and proper antenatal care attendance leads to better pregnancy outcomes. Strategies such as maternal vaccinations, nutritional supplementation, and early screening for hypertensive disorders are recognized as essential components of stillbirth prevention (WHO, 2023).

The findings from the above narrative suggest that while some healthcare providers are highly knowledgeable about stillbirth prevention, others experience knowledge gaps that could affect patient outcomes. The need for continuous training, structured in-service education, and adherence to updated clinical guidelines is evident. Strengthening maternal healthcare systems through capacity-building programs and knowledge-sharing initiatives can bridge these gaps, ultimately improving maternal and neonatal health outcomes.

7.6.2 Subtheme: Impact of Attitudes and Behaviors on Stillbirth Prevention

This subtheme explores how the attitudes and behaviors of healthcare providers influence stillbirth prevention. The findings reveal that positive attitudes encourage maternal healthcare engagement, while negative attitudes act as barriers to care (Figure 7.9). Additionally, the role of empathy, compassion, and systemic issues such as burnout and staff shortages are discussed.

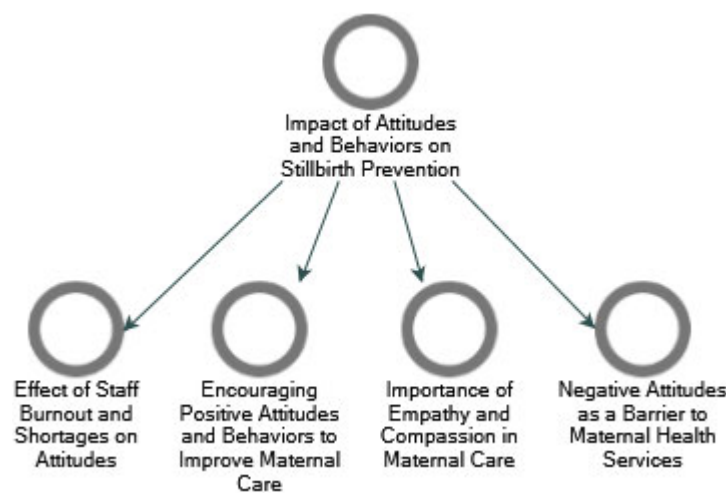


Figure 7. 9: Visualizing the impact of attitudes and behavior on stillbirth prevention

Source: Self-generated by author

- Positive attitudes and behaviors to improve maternal care

From the observed transcribed data, many of the participants emphasized that positive attitudes among healthcare providers significantly impact pregnant women's willingness to seek maternal care early and attend ANC visits regularly. This aligns with Renfrew et al. (2014), who found that respectful and compassionate maternity care leads to higher ANC attendance, timely medical interventions, and ultimately better pregnancy outcomes.

"Good attitude of healthcare professionals can help reduce stillbirths because pregnant women will freely access health services without fear and being ridiculed by healthcare providers." (Participant 1)

"Attitude and behavior are important because it will invite the patient to come to the healthcare facility." (Participant 3)

"Positive attitudes create an enabling environment; mothers will come even when they experience challenges; they will seek help early." (Participant 2)

"A welcoming attitude will help make women come regularly for scheduled ANC visits, and in that early detection of potential complications can be easily identified." (Participant 23)

"Good communication with ANC clients helps that mothers attend clinic well and are open about the problems they encounter." (Participant 9)

From the above narrative, it is agreeable to say that a welcoming healthcare environment encourages open communication between pregnant women and providers, facilitating the early detection of complications. WHO (2023) highlights that effective provider-patient relationships improve maternal health-seeking behavior, reducing the risk of complications that could lead to stillbirth. Kruk et al. (2018) also argue that perceived quality of care—including kindness, respect, and clear communication—is a significant determinant of whether pregnant women return for follow-up visits. Thus, training programs focusing on patient-centered care and communication can enhance healthcare providers' interactions with pregnant women, thereby increasing maternal healthcare utilization and reducing stillbirth risks.

Participants strongly emphasized that healthcare providers must demonstrate empathy, compassion, and kindness to foster trust and engagement among pregnant women. Research by (Mills *et al.* 2022a) highlights that empathetic maternity care improves maternal confidence, reduces anxiety, and enhances adherence to medical advice, ultimately reducing stillbirth risks.

"It is important for midwives to treat clients with compassionate care, respect, and a friendly manner so that they are open and honest about their maternal conditions." (Participant 7)

"Healthcare providers should display empathy and compassion, positive communication, and cheerfulness." (Participant 32)

"Healthcare workers must be more sympathetic. Pregnant women referred as high risk must not be returned." (Participant 15)

"Healthcare providers should be kind and friendly to patients and show them love so that patients are not scared to come to the clinic." (Participant 29)

A study by Mills *et al.* (2022a) also found that when healthcare providers communicate in a respectful and compassionate manner, pregnant women are more likely to disclose concerns, leading to timely interventions. The importance of treating women with dignity is further reinforced by WHO (2023), which states that respectful maternity care should be an essential component of healthcare services to promote positive health-seeking behaviors. Thus, integrating patient-centered care models in maternal health services can help improve provider-patient relationships, enhance care quality, and encourage continuous healthcare engagement.

- Negative attitudes as a barrier to maternal health services

Several participants indicated that negative attitudes among healthcare providers discourage pregnant women from seeking necessary medical care, leading to delayed interventions and increased risks of stillbirth. This aligns with Mengesha *et al.* (2020), who reported that disrespectful and abusive maternity care is a major reason why women avoid or delay seeking maternal health services.

*"Negative attitude of healthcare providers towards pregnant women discourages continued care."
(Participant 6)*

"Attitudes and behavior of healthcare providers are key in reducing the stillbirth rate. Poor attitudes and behavior make clients not visit clinics." (Participant 4)

"Our clients regard our clinics as a nuisance. The sooner they finish, the better. That's why they book for maternal care so late." (Participant 22)

*"Bad attitude of healthcare providers undermines the culture of safety within the clinic or hospital."
(Participant 32)*

When healthcare workers exhibit unwelcoming behaviors, patients may perceive healthcare facilities as hostile, resulting in poor engagement with ANC services. According to Sewpaul *et al.* (2021) mistreatment by healthcare workers, including neglect, rudeness, and dismissiveness, discourages pregnant women from seeking timely medical assistance. Interventions such as compassionate care training and workplace accountability measures should be implemented to mitigate poor provider attitudes. Freedman *et al.* (2020) suggest that policies ensuring respectful maternity care can significantly improve maternal health outcomes and encourage healthcare utilization.

- Effect of staff burnout and shortages on attitudes

Several participants highlighted the role of staff burnout, resource shortages, and poor working conditions in shaping negative attitudes among healthcare providers. Shah *et al.* (2021) report that healthcare workers experiencing burnout are more likely to exhibit reduced patience, compassion fatigue, and irritability, which negatively affects patient interactions and healthcare outcomes.

"Attitude is bad due to burnout. Staff morale is very low due to [the] shortage. Political unwillingness to improve healthcare services leads to bad attitudes of healthcare workers." (Participant 24)

*"Frustration when you don't have resources is major, and bad infrastructure leads to bad attitudes."
(Participant 19)*

"Shortages of skills lead to burnout, so nurses will miss danger signs." (Participant 28)

*"One day healthcare providers are nice, and the following day they have a bad attitude towards patients because it is influenced by staff shortages and overworked midwives who are burned out."
(Participant 30)*

Burnout is often linked to understaffing, heavy workloads, and inadequate resources, factors that contribute to healthcare worker stress. Wright et al. (2020) argue that chronic stress among maternity care providers leads to emotional exhaustion, negatively impacting service delivery and patients' experiences.

7.6.3 Subtheme: Measures of improving knowledge of stillbirths

The findings highlight the critical need for continuous training, staff support, and knowledge-sharing initiatives to improve healthcare providers' competence in stillbirth prevention. Participants emphasized that ongoing education and training enhance knowledge, attitudes, and skills, ultimately improving maternal healthcare quality and reducing stillbirth rates. The discussion below integrates existing literature to contextualize these findings.

- Need for staff support and continuous training

Healthcare providers work under high-pressure conditions, facing challenges such as staff shortages, burnout, and emotional distress. Participants noted that without adequate support, healthcare workers struggle to maintain positive attitudes, which in turn affects maternal care quality. Literature supports this by highlighting that staff burnout and emotional exhaustion contribute to decreased job satisfaction and negative patient outcomes (Delgado et al., 2021). Continuous debriefing sessions and psychological support are essential to help healthcare providers process traumatic experiences, particularly when dealing with stillbirth cases (Renfrew et al., 2019).

"Healthcare providers need debriefing because they work under pressure, with staff shortages and an increasing number of patients." (Participant 16)

"Maybe if all professionals can be periodically in-service trained about preventative strategies of stillbirth, it will improve attitudes and patient care." (Participant 22)

"If healthcare workers receive continuous workshops and updates on guidelines, it can help improve attitudes and knowledge." (Participant 23)

"Commitment plus concern regarding stillbirth plus addressing shortages encourage healthcare providers to give higher-level care and to advocate for their patients." (Participant 10)

In-service training programs play a crucial role in ensuring that healthcare providers remain updated on best practices for stillbirth prevention. Studies show that healthcare workers with frequent training in maternal and neonatal care demonstrate better clinical decision-making and are more likely to follow evidence-based guidelines (Salam et al., 2022). Moreover, structured mentorship programs and peer support groups can foster resilience among staff, mitigating the effects of workplace stress and enhancing professional commitment (Kirkpatrick et al., 2020).

- Training, workshops, and knowledge sharing

Participants highlighted the importance of regular training workshops to reinforce knowledge about stillbirth prevention strategies. Continuous professional development through training has been widely recognized as a critical factor in improving maternal and neonatal health outcomes (Bhutta et al., 2020). Training programs focusing on stillbirth prevention, such as identifying fetal distress, managing high-risk pregnancies, and improving patient-provider communication, have been found to significantly reduce adverse maternal and fetal outcomes (Goldenberg et al., 2020).

"I have been trained in a range of areas related to stillbirth prevention." (Participant 6)

"Trainings are done and workshops where staff is trained about stillbirth and how to prevent it." (Participant 29)

"As a midwife student, I have learned a lot of things from staff. They are very helpful and always willing to share knowledge with students." (Participant 18)

Knowledge-sharing within healthcare teams also enhances learning and retention of critical maternal health guidelines. Participants acknowledged that mentorship from experienced midwives positively impacts professional growth. According to Okonofua et al. (2021), mentorship and interdisciplinary collaboration in maternal care settings improve the adoption of lifesaving interventions, particularly in resource-constrained environments.

7.6.4 Subtheme: Steps to preventing stillbirth during antenatal care

The findings highlight the crucial role of ANC in preventing stillbirths through early detection, education, routine monitoring, and strong communication between healthcare providers and pregnant women. These preventive strategies align with global recommendations for improving maternal and fetal health outcomes. These are further visualized in Figure 7.10.

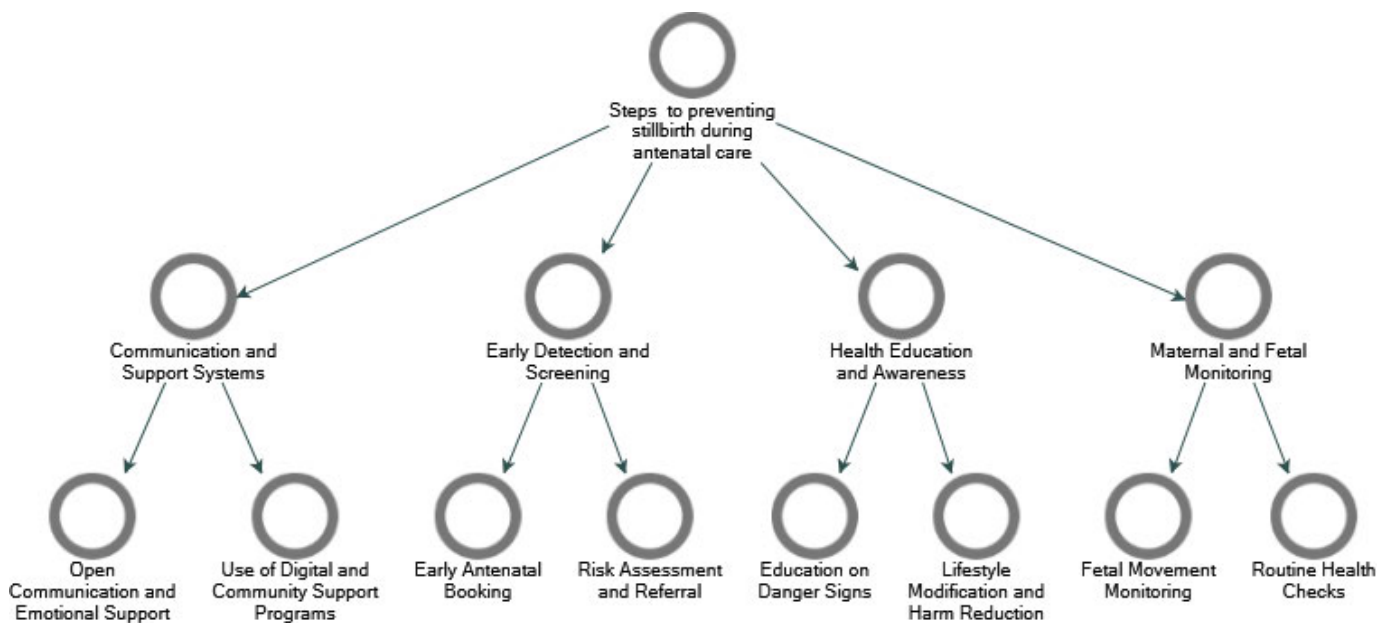


Figure 7. 10: Visualising steps to preventing stillbirth during antenatal care

Source: Self-generated by author

(a) Early Detection and Screening

- Early antenatal booking

Early antenatal booking is essential for identifying pregnancy-related complications and implementing timely interventions to improve maternal and fetal outcomes. From the transcribed data, participants suggest early antenatal booking as steps to preventing stillbirth. The WHO recommends that pregnant women initiate antenatal care within the first 12 weeks of pregnancy to facilitate early screening for conditions such as hypertension, diabetes, and infections (WHO, 2020).

“Pregnancy screening for all women of childbearing age to ensure early booking to antenatal care that will lead to good maternal outcomes.” (P1)

“Promoting early booking (less than 20 weeks).” (P23)

“Encourage early booking plus consistent antenatal care.” (P10)

“Early antenatal screening using BANC.” (P28)

“Book antenatal patients.” (P5)

Studies indicate that late antenatal booking (beyond 20 weeks) is associated with higher risks of stillbirth due to undiagnosed maternal conditions (McClure et al., 2021). Early booking and consistent follow-up visits allow for

routine monitoring of fetal development and maternal health, reducing the likelihood of adverse pregnancy outcomes (Tay et al., 2019).

- Risk assessment and referral

It is evident from the transcribed data that systematic risk assessments during ANC play a pivotal role in identifying high-risk pregnancies. Some of the participants suggested identifying high risks patient in time and referring them to higher levels of care. Conditions such as pre-eclampsia, gestational diabetes, and infections can be detected early, allowing for timely referral to specialized care (Lawn et al., 2021). Research highlights that structured risk assessment models, such as the Basic Antenatal Care (BANC) approach, improve the identification of high-risk pregnancies and optimize maternal health interventions (Moodley et al., 2020).

“Medical and surgical screening of all pregnant women presenting at antenatal care services to exclude risks involved in order to refer to [a] higher level of care.” (P1)

“Early detection of any risk factors in current and previous pregnancies, referring high-risk clients in time to higher levels of care.” (P4)

“Booking [in]to [a] high-risk clinic early.” (P15)

“Early identification of high-risk pregnancies.” (P10)

“Detection of abnormalities earlier and refer to high-risk.” (P5)

Early referral to higher-level care facilities ensures that women with complex pregnancies receive specialized management, which significantly reduces the risk of stillbirth (Goldenberg et al., 2020). Implementing a standardized referral system improves continuity of care, particularly in resource-limited settings where specialist services may not be readily available (Bhutta et al., 2020).

(b) Health Education and Awareness

- Education on danger signs

Health education on pregnancy-related danger signs empowers women to seek medical attention promptly. This might have influenced the suggestion from some participants that health education should prioritized teaching pregnant women on how to identify danger signs. Studies show that pregnant women who are aware of warning signs, such as decreased fetal movements, severe headaches, or vaginal bleeding, are more likely to seek emergency care, thereby reducing stillbirth risks (Say et al., 2021).

“Health education to clients on signs of danger and placental abruption.” (P7)

“Education on danger signs in pregnancy with each visit.” (P4)

“Teaching them about signs of labor and danger signs during pregnancy.” (P22)

Educational interventions delivered during ANC visits have been found to improve maternal knowledge and health-seeking behaviors (Hofmeyr et al., 2019). Effective health education should be tailored to the literacy

levels of pregnant women and reinforced at every ANC visit to enhance retention and adherence (Soltani et al., 2020).

- Lifestyle modification and harm reduction

Lifestyle factors such as smoking, alcohol consumption, and poor nutrition significantly impact pregnancy outcomes. Participants suggested educating patients on the harmfulness of smoking, and alcohol consumption. Smoking during pregnancy has been linked to intrauterine growth restriction, placental abruption, and stillbirth (Flenady et al., 2020). Similarly, alcohol consumption increases the risk of fetal growth abnormalities and stillbirth (Patra et al., 2021).

“Health education on smoking, alcohol intake.” (P11)

“No smoking and use of alcohol during pregnancy.” (P2)

“Education on lifestyle modification (diet, stopping smoking and drinking).” (P23)

“Educate a pregnant mother about nutrition.” (P32)

Nutrition education during pregnancy is crucial in reducing maternal and fetal complications. Micronutrient deficiencies, particularly iron and folate, contribute to adverse outcomes, including stillbirth (Black et al., 2020). Implementing structured nutritional counseling as part of ANC visits can improve dietary practices and pregnancy outcomes (Christian et al., 2020).

(c) Maternal and Fetal Monitoring

- Routine health checks

Participants suggested routine health checks for pre-eclampsia, blood pressure, and HIV. Regular maternal health checks, including blood pressure monitoring, urine tests, and diabetes screening, are essential for detecting conditions that could lead to stillbirth. Hypertensive disorders, such as pre-eclampsia, contribute to a significant proportion of stillbirths, making blood pressure monitoring a critical component of ANC (Hutcheon et al., 2021).

“Monitoring through checking vital signs.” (P30)

“Regular tests of patients (RPR, HIV, TB, urine, vital signs) on every visit.” (P23)

“Check signs of pre-eclampsia.” (P22)

“Blood pressure monitoring.” (P6)

Screening for infections (HIV, syphilis, tuberculosis) and other medical conditions can reduce complications associated with stillbirth. A study by Blencowe et al. (2021) found that integrating infection screening into ANC reduced stillbirth rates by 20% in low-resource settings. Implementing standardized ANC protocols ensures that all pregnant women receive comprehensive monitoring throughout their pregnancy (McClure et al., 2021).

- Fetal movement monitoring

Another health education proposal is fetal movement monitoring—a valuable tool in detecting fetal distress. Studies show that decreased fetal movements are often a precursor to stillbirth, emphasizing the importance of educating pregnant women on kick counting and reporting abnormalities (Stacey et al., 2019).

“Encourage the use of the kick chart.” (P10)

“Give health education on fetal movements every visit.” (P16)

“Health education on the importance of filling in the kick chart and report[ing] any abnormalities to the clinic.” (P12)

“Regular fetal movement monitoring.” (P6)

Kick charts and digital tools designed for fetal movement tracking have been successfully implemented in several maternal health programs, resulting in earlier detection of fetal distress and timely interventions (Warland & O'Brien, 2020). Encouraging pregnant women to use these tools enhances their engagement in fetal health monitoring, potentially reducing the incidence of stillbirth.

(d) Communication and Support Systems

- Open communication and emotional support

Effective communication between healthcare providers and pregnant women fosters trust and encourages adherence to care.

“Giving pregnant women all the knowledge they need during pregnancy and to know all the danger signs and where to go when they experience certain danger.” (P3)

“Being friendly all the time. Be a good listener. Share knowledge with patients and explain in easy terms.” (P18)

“Good monitoring and examination of the mother. Open communication about problems.” (P9)

- Use of digital and community support programs

Effective communication between healthcare providers and pregnant women fosters trust and encourages adherence to ANC recommendations. Two of the participants suggested registering pregnant women on program that ensures access to information on pregnancy. Research highlights that women who receive compassionate, patient-centered care are more likely to attend ANC appointments and follow medical advice (Downe et al., 2019).

“Registering pregnant women on [the] MomConnect program to access more information about the pregnancy journey and delivery.” (P1)

“Involvement in clinic committees.” (P8)

Emotional support is particularly important for women experiencing pregnancy-related anxiety. Studies show that stress and anxiety during pregnancy are associated with poor fetal outcomes, underscoring the need for healthcare providers to adopt a supportive and empathetic approach during ANC visits (Grote et al., 2020). Digital tools, such as the MomConnect program in South Africa, play a crucial role in disseminating pregnancy-related information to women. MomConnect has been instrumental in improving maternal health knowledge, increasing ANC attendance, and promoting adherence to medical advice (Barron et al., 2019). Community involvement in maternal health programs enhances support networks for pregnant women. Studies indicate that engaging community health workers, traditional birth attendants, and local maternal support groups can significantly improve health-seeking behaviors and pregnancy outcomes (Moyer et al., 2020).

The above narratives underscore the importance of a multi-faceted approach to stillbirth prevention during antenatal care. Early detection through timely ANC booking, systematic risk assessment, routine maternal and fetal monitoring, and strong communication and support systems is critical in reducing stillbirth rates. Integrating digital health tools and community support programs further enhances maternal engagement and adherence to ANC recommendations. These findings align with global maternal health strategies advocating for comprehensive ANC interventions to improve pregnancy outcomes and reduce stillbirth risks.

7.7 THEME 7.6: MATERNAL HEALTHCARE SERVICES

Table 7. 6: Subthemes and categories within the maternal healthcare services theme

Theme	Subtheme	Categories
Maternal healthcare services	Major challenge in delivering maternal care services	Access and service delivery challenges Transport and referral system challenges Human resource and staffing challenges Infrastructure and equipment deficits Shortage of medical equipment and resources
	Perceptions of quality of maternal healthcare services	Mixed feelings Positive aspects of maternal healthcare
	Factors influencing the quality of maternal healthcare services	Availability of specialized maternal healthcare services Accessibility and outreach programs Adherence to guidelines and protocols Staff development and training Health promotion and patient empowerment Infrastructure and availability of equipment

Source: Self-generated by author

7.7.1 Subtheme: Major challenge in delivering maternal care services

Ensuring access to quality maternal healthcare remains a challenge, particularly in resource-constrained settings. The participants' responses highlight key systemic barriers that hinder the effective delivery of maternal care, notably delays in ambulance and emergency services, as well as overburdened healthcare facilities. These challenges contribute to increased maternal and neonatal morbidity and mortality.

(a) Access and Service Delivery Challenges

- Ambulance and emergency service delays

Timely access to emergency obstetric care is critical in preventing maternal deaths and birth-related complications. However, the participants reported significant delays in ambulance services, limiting access to urgent maternal healthcare interventions. These delays result from a combination of factors, including a shortage of ambulances, inadequate staffing, and poor coordination within the emergency referral system.

"The delaying of ambulances and shortage of staff." (Participant 13)

"Delay and lack of ambulance services." (Participant 27).

"The delaying of ambulances." (Participant 13)

"Delay and lack of ambulance services." (Participant 27)

The "Three Delays Model" (Thaddeus & Maine, 1994) identifies transport-related delays as a major contributor to maternal mortality. This second delay occurs when pregnant women are unable to reach health facilities on time, exacerbating complications such as obstructed labor, hemorrhage, and hypertensive disorders. A study in South Africa by Ngene and Moodley (2020) found that delays in emergency transport significantly increased maternal deaths due to postpartum hemorrhage and eclampsia. Research by Knight et al. (2020) emphasizes that maternal deaths can be prevented through efficient emergency response systems, particularly in rural and peri-urban areas where women face the greatest transportation barriers.

- Overburdened facilities

Participants also highlighted overcrowded healthcare facilities as a major barrier to quality maternal healthcare. High patient volumes, limited staff, and inadequate infrastructure negatively impact service delivery, leading to delays in care and increased maternal health risks. Overburdened facilities often coincide with shortages of skilled healthcare professionals, reducing the quality of maternal health services. Participant 10, for example, noted that staff shortages lead to service gaps, where patients "fall through the cracks" due to inadequate monitoring.

"Patients sometimes fall through the cracks due to overburdened facilities." (Participant 10).

WHO (2019) reports that a global shortage of midwives and obstetricians significantly affects maternal health outcomes, particularly in low- and middle-income countries (LMICs). A study by (Quan et al. 2024) found that

overworked healthcare providers were more likely to experience fatigue and decreased job performance, leading to suboptimal patient care. This is further supported by Participant 20, who states that:

"Overburdened facilities negatively affect most healthcare services." (Participant 20)

The above suggests that when maternal health facilities operate beyond capacity, healthcare workers struggle to provide adequate monitoring and timely interventions for pregnant women. This can result in preventable complications, including maternal sepsis, stillbirths, and neonatal asphyxia. Bohren et al. (2019) found that in overcrowded maternity wards, women often receive inadequate care, leading to higher rates of maternal and perinatal complications. Similarly, research by Sharma et al. (2018) highlights that high patient-to-provider ratios contribute to burnout among healthcare workers, negatively impacting the quality of maternal care, while Asim et al. (2021) argue that poor infrastructure and overburdened health facilities are major barriers to achieving universal health coverage for maternal and neonatal care.

(b) Transport and referral system challenges

Efficient transport and referral systems are critical components of maternal healthcare, ensuring that high-risk pregnancies and obstetric emergencies receive timely medical intervention. However, participants reported significant challenges, including a shortage of ambulances and mobile clinics, as well as inefficiencies in the referral system. These issues contribute to delayed treatment, increased maternal and neonatal complications, and preventable deaths.

- Shortage of ambulances and mobile clinics

A well-functioning emergency transport system is essential for reducing maternal mortality, particularly in cases requiring urgent obstetric care. However, participants noted a shortage of ambulances and mobile clinics, making it difficult for pregnant women—especially in rural or underserved areas—to access timely medical attention.

"Shortage of mobile clinics." (Participant 20)

"Lack of ambulances—mobile clinics." (Participant 12)

Mobile clinics serve as an essential strategy for bringing maternal healthcare services closer to communities, particularly in remote areas where permanent healthcare facilities are scarce. Participants acknowledged the shortage of mobile clinics as a barrier to improving maternal healthcare access. A systematic review by Knop et al. (2024) found that mobile health clinics improve antenatal care coverage, reduce delays in seeking care, and enhance maternal health outcomes. WHO (2020) advocates for mobile clinics as a cost-effective solution to maternal health service gaps in low-resource settings. Research from India and Kenya indicates that mobile clinics significantly reduce travel-related delays, leading to better pregnancy monitoring and timely interventions (Sharma et al., 2020).

- Referral system issues

The referral system plays a vital role in maternal healthcare by ensuring that high-risk pregnancies and obstetric emergencies are transferred from lower-level facilities to specialized centers. However, participants highlighted inefficiencies in the referral system, including poor coordination and inadequate training of CHWs.

"Referral challenges." (Participant 10)

Referral delays can occur due to multiple factors, including miscommunication between healthcare facilities, lack of transport, and inadequate tracking of referred patients. Inefficient referrals prolong the time taken for pregnant women to receive specialized care, increasing the likelihood of adverse maternal and neonatal outcomes. Studies by Assefa and Berhane (2020); Ofosu *et al.* (2021a) found that weak referral networks significantly contribute to maternal mortality, as women often experience delays in receiving emergency obstetric care. The study in Ethiopia by Assefa and Berhane (2020) revealed that maternal deaths were significantly lower in regions with well-organized referral systems compared to areas with fragmented referral pathways. According to Radovich *et al.* (2021), digital referral tracking systems can improve maternal health outcomes by reducing delays and enhancing coordination between healthcare providers.

Participant 30 noted that CHWs play an essential role in maternal health follow-ups but lack the necessary training to manage high-risk cases effectively. While CHWs provide crucial linkages between communities and healthcare systems, their effectiveness is often limited by inadequate training and resources.

*"Community health workers do the follow-up, but it's not enough as they lack proper training."
(Participant 30)*

A WHO (2019) report found that well-trained CHWs significantly improve maternal and neonatal health outcomes by enhancing early detection of complications and promoting facility-based deliveries. Research by Adams *et al.* (2020); Yankam *et al.* (2023) indicates that task-shifting—where CHWs are trained to take on additional responsibilities—can strengthen maternal healthcare systems, but only when accompanied by proper training and supervision. A study by Sharma *et al.* (2018) revealed that inadequate training among CHWs contributes to weak referral linkages and poor maternal health monitoring.

(c) Human Resource and Staffing Challenges

Human resource shortages, particularly the lack of skilled midwives and trained maternal healthcare professionals, remain a significant barrier to effective maternal and neonatal care. Participants repeatedly highlighted the critical shortage of healthcare providers, which leads to an overburdened workforce, compromised patient care, and poor maternal health outcomes. The challenges are twofold: a general shortage of healthcare personnel and the lack of adequate training opportunities for existing staff.

- Shortage of skilled staff

A critical shortage of midwives and maternal healthcare providers poses a significant challenge in ensuring quality antenatal, intrapartum, and postnatal care. Many healthcare facilities operate with insufficient skilled

staff, resulting in delayed maternal care, increased workload, and heightened risks for pregnant women and newborns.

"Shortage of staff is a critical point." (Participant 9)

"Poor or low production of skilled midwives; most facilities have one or two midwives, and other professional nurses do not have midwifery." (Participant 7)

"It's bad due to shortages of staff and equipment and overburdened facilities." (Participant 19)

"We are short-staffed, and we only have one ultrasound machine in the whole district." (Participant 30)

"Staffing is a serious challenge—no adequate numbers for provision of antenatal care." (Participant 2)

The most pressing challenge in maternal care services is the critical shortage of skilled healthcare practitioners, particularly midwives and nurses. Many facilities lack sufficient staff to manage patient loads, leading to poor service delivery and overburdened healthcare workers.

"Lack of skilled and experienced healthcare practitioners is a major challenge in delivering maternal care services." (Participant 1)

"Shortage of staff" (Participants 3, 4, 5, 6, 7, 11, 13, 14, 15, 16, 17, 18, 19, 20, 25, 26, 27, 28, 29)

"Midwife works alone due to shortage to conduct deliveries." (Participant 19)

"The ratio of midwives 1:10." (Participant 32)

The majority of participants reported a shortage of skilled staff, particularly trained midwives and advanced midwifery professionals, which impacts service delivery.

"Short skilled staff—each shift needs one; we have only one for the entire ward." (Participant 19)

"We need well-trained midwives and adequate equipment." (Participant 12)

"We don't have enough nurses with Advanced Midwifery." (Participant 22)

"A huge problem in a facility with one midwife at all times for ANC clients and all other streams." (Participant 9)

According to the State of the World's Midwifery Report (2021), there is a global shortage of 900,000 midwives, with sub-Saharan Africa facing the most severe gaps. This shortage undermines efforts to achieve sustainable development goal (SDG) 3.1, which aims to reduce the global maternal mortality ratio. A study by Blaauw et al. (2019) in South Africa found that midwife shortages lead to burnout and decreased quality of care, resulting in negative maternal outcomes such as prolonged labor and higher rates of stillbirth. Moyo et al. (2022) reported that nurse shortages in South African public healthcare facilities force midwives to take on additional

responsibilities, reducing their ability to provide focused maternal care. Adams *et al.* (2020) argue that increasing the number of skilled birth attendants could prevent 67% of maternal deaths, particularly in rural and resource-limited areas. The data from participants confirm these findings, with multiple reports of midwives working alone, facilities having only one trained midwife per shift, and healthcare professionals without midwifery training being required to provide maternal care.

- Lack of trained or competent staff

In addition to staff shortages, participants highlighted the lack of adequately trained healthcare providers in maternal health services. Many professional nurses do not have midwifery training, and limited training opportunities further exacerbate the issue. Training gaps prevent healthcare providers from effectively managing high-risk pregnancies, using diagnostic equipment, and following updated clinical guidelines.

"Professional nurses who do not have midwifery." (Participant 7)

"Lack of skilled labor, ambulances, mobile clinics, lack of equipment, and use of untrained CHWs." (Participant 12)

"Lack of skilled staff often leads to poor outcomes as well as resources." (Participant 23)

Some healthcare facilities conduct regular training on maternal health guidelines, while others report a complete lack of training opportunities. The lack of training affects the ability of staff to utilize diagnostic equipment effectively.

"Training is conducted regularly on ESMOE, BANC PLUS, VTP [Vertical Transmission Prevention] and new maternal health guidelines, TB and HIV." (Participant 2)

"Staff is unskilled, not being trained on the usage of the machine." (Participant 32)

"In-service training is done at the facility." (Participant 6)

"In-service training—very poor (none at some institutions)." (Participant 24)

The lack of midwives and nurses' training results in suboptimal maternal healthcare delivery. Midwives are often unable to attend professional development programs due to workforce shortages, creating a cycle in which untrained staff continue to provide care without updated knowledge or skills. Studies by Mwakawanga *et al.* (2023) and Filby *et al.* (2016) found that inadequate midwifery training contributes to maternal health disparities, as untrained personnel are unable to handle obstetric emergencies effectively. WHO (2019) recommends continuous professional development programs for midwives, yet many countries, including South Africa, struggle to implement these programs due to workforce shortages. Koblinsky *et al.* (2020) highlight that midwives trained in emergency obstetric care reduce the risk of maternal death by 50%, emphasizing the need for structured training programs. Maputle *et al.* (2022) found that healthcare facilities in rural South Africa lack access to competency-based midwifery training, leading to poor maternal health outcomes. Participants' responses confirm these findings, with reports of nurses lacking midwifery training, midwives being unable to attend training programs due to understaffing, and inadequate in-service training at some institutions.

"Training of advanced midwives [is] less." (Participant 29)

"Midwives [are] not managing to attend training because of shortage of staff." (Participant 7)

From the above narratives, one could draw the conclusion that the shortage of skilled midwives and inadequately trained healthcare providers presents a significant challenge in maternal healthcare services. Overburdened facilities, staff burnout, and inadequate service delivery contribute to poor maternal and neonatal health outcomes. Strengthening midwifery education, increasing workforce capacity, and implementing structured training programs are essential steps toward improving maternal healthcare in resource-limited settings.

(d) Infrastructure and equipment deficits

The availability of adequate infrastructure and essential medical equipment is critical for delivering quality maternal healthcare. However, numerous challenges related to infrastructure and equipment deficits were identified by participants, including poor facility conditions, lack of essential medical tools, and interruptions in basic utilities such as water and electricity. These deficiencies compromise healthcare services, delay timely interventions, and contribute to negative maternal and neonatal health outcomes.

- Poor facility infrastructure

Healthcare facilities with inadequate infrastructure hinder the effective delivery of maternal health services. Several participants highlighted that their facilities are in poor condition, with some structures deteriorating to a point where they pose safety risks to patients and healthcare workers. Poor infrastructure can lead to inefficiencies in service delivery and reduce the overall quality of care.

"Facility infrastructure is poor, with shortages of staff and equipment." (Participant 24)

"Infrastructure—some facilities are in a bad state." (Participant 8)

Studies indicate that infrastructural inadequacies, such as overcrowding, lack of well-equipped consultation rooms, and limited privacy, negatively affect maternal healthcare experiences (Chersich et al., 2020). The WHO emphasizes that well-maintained and properly designed healthcare facilities are essential for providing safe maternal and neonatal care (WHO, 2021). Additionally, inadequate infrastructure often forces healthcare workers to work under suboptimal conditions, leading to burnout and further diminishing the quality of care (Munjanja, Magure & Kandawasvika, 2021).

- Inadequate and deteriorating facilities

Several participants reported that some healthcare facilities operate in old buildings with weak structures, making them unsuitable for maternal healthcare services. Facilities in poor physical condition can discourage healthcare-seeking behavior among pregnant women and reduce accessibility to essential services.

"Infrastructure—not conducive for delivery of ANC patients." (Participant 5)

"Conditions of facilities are bad, and there are not enough equipment and staff." (Participant 20)

"Old infrastructure that can collapse at any time." (Participant 24)

According to Kruk et al. (2018), poor healthcare facility conditions are associated with lower patient satisfaction and higher risks of adverse maternal outcomes. A study in sub-Saharan Africa found that healthcare facilities with poor infrastructure often struggle with inadequate space, lack of essential supplies, and unsanitary conditions, all of which contribute to increased maternal and neonatal mortality rates (Afulani et al., 2019). Furthermore, the lack of proper ventilation, broken doors, and inadequate consultation rooms, as mentioned by Participant 21, affect both patient privacy and healthcare workers' ability to provide high-quality maternal care.

"Doors are not properly closing in consultation rooms." (Participant 21)

- Water and electricity issues

Reliable water and electricity supply are fundamental for maintaining hygiene, ensuring proper infection control, and performing medical procedures safely. Participants highlighted frequent water cuts and poor water quality as major concerns affecting their facilities. These issues not only disrupt daily healthcare services but also pose significant health risks for both patients and healthcare workers.

"Water cuts by municipality." (Participant 21)

"Poor water quality." (Participant 24)

Research by Benova et al. (2020) found that inadequate water, sanitation, and hygiene (WASH) services in healthcare facilities increase the risk of maternal and neonatal infections, leading to higher rates of morbidity and mortality. Furthermore, water shortages compromise basic obstetric practices such as sterilization of medical instruments and hand hygiene, further endangering patient safety.

(e) Shortage of medical equipment and resources

- Lack of essential equipment

Maternal healthcare facilities struggle with shortages of essential medical equipment, including ultrasound machines and other diagnostic tools, hampering early detection and intervention. Access to essential medical equipment, such as ultrasound machines, fetal monitors, and emergency obstetric care tools, is vital for comprehensive maternal healthcare. However, many participants reported shortages of critical medical devices, particularly ultrasound machines, which play a significant role in monitoring fetal development and identifying complications during pregnancy.

"No equipment." (Participants 13, 27)

"Shortages of equipment and staff, and most nurses are not motivated." (Participant 8)

"Lack of proper medical equipment." (Participant 24)

"Shortage of equipment like sonar." (Participant 29)

"We lack essential equipment like ultrasound." (Participant 30)

The above-mentioned challenge in medical equipment has consequences in maternal health care services. The WHO (2022) underscores that the availability of diagnostic tools, including ultrasound machines, significantly improves maternal health outcomes by allowing early detection of complications and timely interventions. In low-resource settings, a lack of such equipment leads to increased reliance on clinical judgment alone, which may not always be accurate (Goldenberg et al., 2019). Additionally, without proper equipment, healthcare providers struggle to implement evidence-based interventions, leading to suboptimal maternal and neonatal care (Hodgins et al., 2020).

The shortage of medical equipment and resources presents a significant barrier to the delivery of quality maternal healthcare services. Participants identified key challenges, including overcrowding due to limited space, a shortage of hospital beds, and inadequate consultation rooms, all of which negatively affect patient care. Additionally, the limited functionality of operating theaters in district hospitals impedes timely emergency obstetric care, leading to poor maternal and neonatal health outcomes.

- Lack of space and overcrowding

Overcrowding in healthcare facilities is a persistent challenge, particularly in areas with high patient loads. Participants reported that clinics are too small to accommodate the increasing number of patients, leading to prolonged waiting times and, in some cases, women leaving without receiving care.

"Our clinics are very small; clients wait for a long time, [and] others go back home without being helped." (Participant 22)

Studies have shown that overcrowding in maternal healthcare facilities is associated with delays in receiving care, reduced patient satisfaction, and increased stress among healthcare providers (Kruk et al., 2018). According to the World Health Organization (WHO, 2021), the availability of sufficient space and infrastructure is a crucial determinant of service efficiency and patient safety. When facilities lack adequate space, healthcare providers may rush through consultations, increasing the risk of misdiagnoses and inadequate prenatal care (Afulani et al., 2019). Furthermore, the growing population, including an influx of foreign nationals, has placed additional pressure on already strained healthcare facilities. Research in South Africa has highlighted that public health facilities, particularly in urban areas, are experiencing increased patient volumes that surpass their capacity, further exacerbating space and resource shortages (Benova et al., 2020). Overcrowding can also lead to compromised hygiene and infection control, increasing the risk of maternal and neonatal complications (Moxon et al., 2019).

The shortage of consultation rooms also affects the quality of services provided, as healthcare workers struggle to manage large patient volumes in inadequate spaces.

"Shortage of beds as the population is growing and women getting pregnant, including foreign nationals, and clinics are overcrowded." (Participant 32)

"Not adequate space." (Participant 11)

"No space (consulting rooms)." (Participant 17)

The WHO (2022) emphasizes that adequate hospital bed capacity is critical in ensuring timely and quality maternal healthcare, especially for high-risk pregnancies and emergency cases. A study by Munjanja et al. (2021) found that shortages of hospital beds in maternal healthcare units often result in patient congestion, reduced privacy, and increased patient discomfort, all of which contribute to poor birth outcomes. In many low-resource settings, women in labor are sometimes required to share beds or wait in hallways, increasing their risk of infections and other complications (Chersich et al., 2020).

- Limited functionality of theaters

The availability of functional operating theaters is crucial for managing obstetric emergencies such as cesarean sections and other life-saving procedures. However, participants reported that many district hospitals either lack functional theaters or have restricted operating hours, limiting access to emergency maternal care.

"Some theaters in district hospitals [are] not working." (Participant 2)

"Only two hospitals with functional theaters, one only doing eight hours but not fully functional, making it equal to zero." (Participant 2)

Research shows that restricted access to surgical facilities contributes to maternal morbidity and mortality, as delays in performing cesarean sections can lead to complications such as obstructed labor, postpartum hemorrhage, and fetal distress (Hodgins et al., 2020). According to the WHO (2021), timely access to emergency obstetric care is one of the most effective ways to reduce maternal and neonatal mortality, and ensuring the availability of well-equipped, fully functional operating theaters is a critical component of comprehensive maternal healthcare.

Additionally, staff shortages in labor wards and theaters further reduce the capacity to provide timely interventions.

"Nursing shortages in the labor ward plus theater doctor shortages." (Participant 10)

A study by Kruk et al. (2018) found that in many low-resource settings, the lack of surgical facilities and the shortage of specialized healthcare workers, such as obstetricians and anesthetists, result in preventable maternal deaths. In South Africa, the underfunding of district hospitals and inefficiencies in resource allocation contribute to the limited functionality of operating theaters (Afulani et al., 2019). Without reliable emergency surgical services, women experiencing complications during childbirth face a higher risk of adverse outcomes.

7.7.2 Subtheme: Perceptions of quality of maternal healthcare services

The quality of maternal healthcare services is a crucial determinant of maternal and neonatal health outcomes. Participants expressed mixed perceptions regarding the quality of maternal healthcare in their district, with some describing it as poor due to inadequate staffing and infrastructure, while others highlighted positive aspects, such as the presence of experienced healthcare professionals and accessible primary healthcare services.

These differing views reflect the complexities in assessing healthcare quality, which is influenced by multiple factors, including service availability, staff competence, infrastructure, and management efficiency.

- Mixed feelings

Participants had varying opinions on the quality of maternal healthcare services, ranging from poor to fair, with some acknowledging room for improvement through better management and resource allocation. The varied responses from participants suggest that while maternal healthcare services in the district may meet basic care standards, challenges such as staff shortages, inadequate management participation, and infrastructure deficits negatively impact service quality.

"The quality is poor... lack of staff." (Participant 3)

"Quality of service is fair." (Participant 8)

"Poor, but there is room to improve." (Participant 23)

"I will give 95% of quality." (Participant 28)

Some participants believed that the system has the potential for improvement if leadership and resource allocation are enhanced.

"The quality of maternal healthcare services provided in this district is not entirely bad; it can be improved if the management actively participates and assumes leadership roles." (Participant 1)

According to Donabedian's model of healthcare quality assessment, service quality depends on structure, process, and outcomes (Donabedian, 1988). Structural factors, such as infrastructure and workforce availability, directly influence service delivery processes, ultimately impacting maternal health outcomes. Studies show that well-managed healthcare facilities with sufficient resources and engaged leadership are more likely to provide high-quality maternal care (Kruk et al., 2018). A study by Afulani et al. (2019) found that perceptions of maternal healthcare quality are often influenced by interactions with healthcare providers, waiting times, and access to essential services. When healthcare workers are overburdened due to staff shortages, patient experiences tend to be negative, leading to perceptions of poor service quality. Similarly, infrastructure deficiencies, such as overcrowded facilities and lack of equipment, have been linked to dissatisfaction among both patients and healthcare workers (Benova et al., 2020).

- Positive aspects of maternal healthcare

Despite the challenges, some participants acknowledged strengths within the district's maternal healthcare system, such as the presence of qualified and experienced healthcare professionals and the accessibility of primary healthcare (PHC) services. These positive aspects suggest that while systemic barriers exist, certain components of the healthcare system function effectively to support maternal health.

"The quality of maternal health is being done by qualified, experienced professional nurses and doctors." (Participant 32)

“Primary healthcare is delivered as close to the community as possible, supported by strong enhancements in management and supervision.” (Participant 32)

Studies have emphasized that the competence of healthcare workers is one of the strongest predictors of maternal and neonatal survival (Munjanja et al., 2021). Skilled birth attendants, including midwives, professional nurses, and doctors, play a vital role in reducing maternal mortality and improving birth outcomes (Hodgins et al., 2020). The WHO (2022) advocates for continuous training and capacity-building programs to ensure that healthcare providers remain updated on best practices in maternal and newborn care.

Additionally, the availability of primary healthcare services close to communities is an important factor in improving maternal health outcomes. According to Gamberini, Angeli and Ambrosino (2022a), decentralized maternal healthcare services improve accessibility, reduce transportation barriers, and encourage timely antenatal care visits. The South African healthcare system has made efforts to strengthen PHC services, aligning with global recommendations for universal health coverage (Chersich et al., 2020).

7.7.3 Subtheme: Factors influencing the quality of maternal healthcare services

(a) Availability of specialized maternal healthcare services

The availability of specialized maternal healthcare services is a critical determinant of maternal and neonatal health outcomes. The observed data indicate that participants recognized high-risk clinics and referral systems as well as the availability of skilled midwives and healthcare professionals as key strengths in the provision of maternal healthcare services. These components play a significant role in ensuring timely intervention, reducing complications, and improving maternal and neonatal survival rates.

- **High-risk clinics and referral systems**

High-risk pregnancy clinics, particularly at district hospitals, play an essential role in screening, managing, and referring high-risk cases to higher levels of care. Many participants acknowledged the availability of high-risk clinics at district hospitals, which help identify complications early and ensure timely referrals to higher levels of care. This structured referral system enhances access to appropriate maternal healthcare services and reduces maternal and infant mortality.

“There is a high-risk clinic at each of the district hospitals to screen, manage, and refer high-risk conditions that can lead to poor maternal outcomes to a higher level of care.” (Participant 1)

“There are level 1 high-risk clinics in three district hospitals.” (Participant 2)

“Referral of clients from primary health care facilities to a higher level is helping a lot for the women to be fully accessed on time.” (Participant 9)

“Clinics also contact maternity ward or doctors directly if they have concerns about a certain case.” (Participant 10)

“ANC visits and referral of high-risk pregnancy.” (Participant 18)

A well-functioning referral system ensures that pregnant women with complications receive timely specialist care, which is crucial for preventing adverse outcomes (Mselle *et al.* 2021). The World Health Organization (WHO, 2021) emphasizes that integrated referral systems between primary healthcare (PHC) facilities and higher-level hospitals can significantly improve maternal health outcomes by ensuring that women receive specialized care when needed. Furthermore, the finding that primary healthcare (PHC) facilities directly communicate with maternity wards or doctors in hospitals aligns with best practices in maternal healthcare. According to a study by Ofori *et al.* (2021b), real-time communication between PHC providers and hospitals enhances decision-making and expedites necessary interventions, ultimately improving maternal and neonatal survival rates.

- Availability of skilled midwives and health professionals

Midwives are the backbone of maternal healthcare, particularly in LMICs where they provide the majority of antenatal, intrapartum, and postnatal care (Hodgins *et al.*, 2020). Research by Sriram, Almutairi and Albadrani (2024) found that midwifery-led care models improve maternal health outcomes, reduce unnecessary medical interventions, and enhance women's satisfaction with childbirth experiences. The presence of trained midwives, nurses, and doctors specializing in maternal health is a significant contributor to the quality of maternal healthcare services. Participants highlighted that those midwives, who are trained in BANC plus and advanced antenatal care programs play a crucial role in improving maternal health outcomes.

“Well-trained midwives, the Advanced Antenatal Care program, BANC plus, and referring institutions to higher levels of care.” (Participant 4)

“Skilled healthcare providers—midwives, nurses, and obstetricians.” (Participant 6)

“Good, trained doctors and advanced midwives at Nola Hospital.” (Participant 15)

“Having a registered midwife trained in advanced antenatal care.” (Participant 25)

The WHO (2022) recommends that countries invest in midwifery training and workforce development to achieve sustainable development goal (SDG) targets related to maternal health. The presence of advanced midwives and trained doctors in some facilities, as noted by the participants, aligns with global efforts to strengthen maternal healthcare systems through specialized training programs and capacity-building initiatives.

(b) Accessibility and outreach programs

Accessibility to maternal healthcare services is a key determinant of maternal and neonatal health outcomes. The findings highlight two critical aspects that enhance access: CHWs and home-based care and early booking for ANC services. These initiatives are essential for ensuring timely maternal healthcare interventions, particularly in underserved and rural areas where healthcare facilities may be distant or difficult to access.

- Community health workers and home-based care

CHWs play an essential role in bridging the gap between healthcare facilities and communities by ensuring that pregnant women, particularly those in remote or disadvantaged areas, receive timely care. Participants noted

that CHWs conduct home visits, identify high-risk pregnancies, and refer women to healthcare facilities, thereby improving access to maternal healthcare.

"Outreach teams (CHW) will find them at home and refer them to the clinics." (Participant 22)

"Community health workers make follow-ups at homes." (Participant 29)

"CHW will use a checklist in their household tool to engage the ANC clients." (Participant 22)

The role of CHWs in maternal and child health has been widely recognized in global health literature. Studies have shown that CHW-led interventions contribute significantly to increased antenatal care attendance, timely referrals, and improved pregnancy outcomes (Lassi et al., 2020). According to the World Health Organization (WHO, 2021), CHWs are instrumental in providing maternal health education, conducting home visits, and ensuring continuity of care for pregnant women, particularly in rural and low-resource settings. Additionally, South Africa's Ward-Based Outreach Teams (WBOTs), as referenced by Participant 2, play a crucial role in maternal healthcare. The WBOT model involves CHWs who work under the supervision of professional nurses, ensuring that pregnant women are monitored before and after delivery (Pillay & Barron, 2018). This approach reduces maternal and neonatal mortality by promoting early detection of complications and enhancing linkages between communities and health facilities (Chopra et al., 2019).

"WBOT linked to pregnant mothers during antenatal care and post-delivery." (Participant 2)

- Early Booking and Antenatal Care (ANC) Services

Early booking for ANC is a crucial factor in improving maternal and neonatal health. Participants emphasized that early registration allows healthcare providers to monitor pregnancies, provide essential interventions, and reduce the risk of complications.

"Early booking and health education." (Participant 11)

"We open [the] ANC book at any time they are here; we don't book the first visit." (Participant 16)

"Open ANC cases record early, less than 20 weeks." (Participant 28)

Early ANC registration is supported by international health guidelines, including the WHO's recommendation for pregnant women to attend their first ANC visit within the first 12 weeks of gestation (WHO, 2020). Studies have shown that ANC attendance early in pregnancy is associated with better monitoring of pregnancy-related complications, such as pre-eclampsia and gestational diabetes (McCauley et al., 2019), increased uptake of maternal health interventions, such as tetanus vaccination, iron supplementation, and HIV screening (Duku et al., 2021), and higher rates of skilled birth attendance, which leads to reduced maternal and neonatal mortality (Say & Raine, 2019). A study conducted in sub-Saharan Africa found that delayed ANC booking is linked to higher risks of maternal morbidity and mortality, often due to late detection of complications (Pell et al., 2018). In contrast, women who book early benefit from health education, nutritional support, and timely medical interventions, which contribute to better pregnancy outcomes (Owens et al., 2022).

(c) Adherence to guidelines and protocols

Adherence to standardized national guidelines and protocols is fundamental in ensuring quality, consistency, and effectiveness in maternal healthcare services. The findings highlight the use of national frameworks such as the BANC Plus model and the Ideal Clinic model, which guide healthcare providers in delivering structured, evidence-based ANC services. Participants emphasized the importance of following protocols in referrals, ANC visits, and follow-ups, ensuring that maternal health services are standardized and aligned with best practices.

- Use of national guidelines and protocols

The use of national maternal health guidelines plays a critical role in reducing maternal and neonatal mortality, enhancing healthcare efficiency, and ensuring that care is provided in a structured and standardized manner (WHO, 2021). South Africa has adopted evidence-based frameworks such as the BANC Plus model and the Ideal Clinic model to improve the quality of maternal healthcare services. The use of standardized guidelines, such as the BANC Plus model and Ideal Clinic model, ensures consistency in maternal healthcare delivery. Participants highlighted the importance of these guidelines in improving maternal health outcomes and ensuring quality services.

“Protocols and guidelines, referral, and ANC visits and follow-up.” (Participant 21)

*“The professional nurse will also use the guidelines provided when dealing with ANC clients.”
(Participant 22)*

“Follow the Ideal Clinic model on the first visit at ANC by the skilled midwife.” (Participant 7)

A study by Pattinson et al. (2019) found that implementation of the BANC Plus model in South Africa led to improved maternal health outcomes, including early detection of complications and better pregnancy monitoring. Similarly, WHO (2020) recommends structured ANC models to ensure continuity of care and evidence-based interventions that reduce maternal and neonatal risks.

(d) Staff development and training

Staff development and continuous training play a fundamental role in strengthening maternal healthcare services. The findings highlight the importance of ongoing professional training, capacity building, and knowledge enhancement for healthcare providers, particularly midwives and obstetricians. Regular training updates ensure that healthcare workers remain well-equipped with the latest clinical guidelines, best practices, and emerging trends in maternal and neonatal healthcare.

- Continuous training and capacity building

Continuous training of healthcare workers, especially midwives and obstetricians, strengthens maternal healthcare services. Regular training updates ensure that healthcare providers remain well-equipped with the latest knowledge and best practices.

“Training.” (Participant 13)

“Training in Advanced Midwifery.” (Participant 27)

A study by Pattinson et al. (2021) found that midwives and nurses who received structured training in emergency obstetric care had significantly improved maternal health outcomes, including reduced mortality and morbidity rates. Similarly, Goga et al. (2020) reported that continuous skills development among midwives led to better identification of pregnancy risks and improved patient-centered care. This is further supported by the claim that:

"The quality of maternal health is being done by qualified, experienced professional nurses and doctors." (Participant 32)

- Continuous professional development

Continuous professional development (CPD) is essential for sustaining healthcare quality and service improvement. Participants highlighted the need for regular review meetings and refresher courses, indicating that while training opportunities exist, more frequent skill enhancement programs are necessary.

"Staff knowledge and skills enhancement." (Participant 5)

"Fair, but we need more training." (Participant 11)

CPD involves ongoing learning through training workshops, review meetings, and practical skill assessments. Studies show that healthcare workers who participate in regular CPD programs demonstrate higher competency in managing maternal health complications and reducing perinatal mortality (Tshuma et al., 2021). A study by Ngwenya et al. (2021) found that healthcare facilities with structured CPD programs reported better ANC attendance, higher patient satisfaction, and improved pregnancy outcomes. However, gaps in training frequency and accessibility remain a challenge. Despite the benefits of CPD, some participants observed a lack of regular review meetings and training sessions. This aligns with research by Rispel et al. (2020), which found that many healthcare facilities in South Africa face challenges in sustaining CPD programs due to staff shortages, workload pressures, and limited funding.

"We are well trained and review meetings, though we are no longer doing them." (Participant 30)

(e) Health Promotion and Patient Empowerment

Health promotion and patient empowerment are critical components of improving maternal and infant health outcomes. The findings emphasize the importance of health education initiatives and patient involvement in decision-making, which collectively contribute to reducing maternal and infant mortality rates, preventing pregnancy-related complications, and fostering positive maternal healthcare experiences. Participants highlighted that health education empowers pregnant women with knowledge about prenatal care, safe delivery practices, and newborn care. Additionally, the active involvement of women in healthcare decisions enhances their adherence to medical advice, fosters trust in healthcare providers, and promotes better health outcomes.

- Health education and promotion

Health education initiatives play a crucial role in improving maternal healthcare by empowering women with knowledge about prenatal care, safe delivery practices, and newborn care. This contributes to better maternal and infant health outcomes. Based on the transcribed data, participants highlighted:

“Health education, health promotion, improving health outcomes for both mother and fetus.”
(Participant 5)

Participants recognized that maternal health promotion plays a vital role in reducing maternal and child mortality rates. This is evidenced in the statement below:

“Reducing maternal and child mortality and preventing long-term health complications.” (Participant 32)

Research has shown that mothers who receive adequate health education during pregnancy are more likely to attend ANC visits, follow medical recommendations, and practice safe childbirth methods (WHO, 2021). A study by Lincetto et al. (2020) found that maternal health education significantly improves pregnancy outcomes by promoting early ANC attendance, adherence to iron and folic acid supplementation, and better birth preparedness. Similarly, Moller et al. (2022) reported that health education programs contribute to reducing maternal and neonatal mortality rates, particularly in low-resource settings.

- Involving women in decision-making

The active involvement of women in their healthcare decisions fosters a patient-centered approach. This improves adherence to medical advice, enhances satisfaction with care, and promotes positive maternal health experiences. The following view sheds light on this:

“Women are included in decision-making.” (Participant 5)

The above narrative indicates that involving women in their healthcare decisions enhances adherence to medical advice, increases satisfaction with maternal healthcare services, and promotes positive maternal health experiences. Studies show that women who actively participate in decision-making regarding their pregnancy and delivery choices are more likely to follow recommended maternal healthcare guidelines (Tunçalp et al., 2021).

- Patient-centered care

According to Shah et al. (2022), patient-centered maternal care improves maternal health outcomes by fostering a collaborative approach between pregnant women and healthcare providers. The study highlighted that shared decision-making led to increased ANC attendance, better birth preparedness, and improved postnatal care adherence. From the observed data, it was uncovered that involving patients in decision-making, addressing their concerns, and ensuring satisfaction are seen as key indicators of quality care.

“This can be done through patient satisfaction; less stillbirths will see quality care.” (Participant 5)

“Involve patients in decision-making.” (Participant 5)

“CHW will use a checklist in their household tool to engage the ANC clients.” (Participant 22)

Research by Bohren et al. (2022) found that maternal health programs that integrate shared decision-making models significantly improve patient satisfaction, reduce unnecessary medical interventions, and enhance

overall pregnancy experiences. The data gathered supports the notion that patient satisfaction, including involvement in decision-making, is an essential metric for assessing healthcare quality.

"This can be done through patient satisfaction and involving patients in decision-making." (Participant 5)

Furthermore, monitoring maternal healthcare quality relies on statistical analysis, patient outcomes, and data collection during district meetings.

"By monitoring data with regards to stillbirth and identifying the gaps." (Participant 6)

"By statistics and referral." (Participant 16)

"By data and district meetings." (Participant 17)

(f) Infrastructure and Availability of Equipment

Infrastructure and availability of essential medical equipment are fundamental to ensuring quality maternal healthcare services. The findings highlight the importance of having modern medical technology, adequate maternity facilities, and efficient emergency transport services in reducing maternal and neonatal complications. Participants emphasized the role of portable ultrasound machines, neonatal care units, and ambulance services in enhancing maternal health outcomes.

- Availability of medical equipment and technology

The availability of essential medical equipment, such as portable ultrasound machines and neonatal care units, enhances maternal health services. These tools support early detection of complications and timely interventions.

"Portable ultrasound machines are currently piloted in certain PHC facilities to screen for abnormalities and prompt early interventions." (Participant 1)

According to WHO (2022), the use of basic obstetric ultrasound technology at the primary healthcare level improves ANC outcomes by enabling early identification of high-risk pregnancies, reducing delays in referrals, and improving decision-making regarding delivery methods. Portable ultrasound machines, for instance, allow for real-time fetal assessment, aiding in early identification of abnormalities, fetal distress, and placental issues (Pattinson et al., 2021). A study by Kawooya et al. (2021) found that portable ultrasound machines significantly improve maternal and fetal health outcomes in resource-limited settings by enhancing the accuracy of pregnancy risk assessments and reducing delays in seeking advanced care. Similarly, Villar et al. (2020) reported that the integration of modern obstetric technologies in maternal health services contributes to the early diagnosis of complications such as preeclampsia, fetal growth restriction, and placenta previa, thereby reducing adverse maternal outcomes.

Participants also acknowledged the significance of neonatal care units in managing newborn complications such as low birth weight, respiratory distress syndrome, and neonatal infections. Studies have shown that neonatal

intensive care units (NICUs) equipped with incubators, ventilators, and phototherapy units contribute to reducing neonatal morbidity and mortality (Moxon et al., 2021).

“Access to caesarean section and neonatal care services.” (Participant 6)

- Ambulance and emergency transport services

Emergency transport services are essential for pregnant women experiencing obstetric emergencies, including severe bleeding (postpartum hemorrhage), obstructed labor, eclampsia, and fetal distress. Participants highlighted the importance of ambulance availability in ensuring timely referrals to higher-level facilities, particularly for women in rural and remote areas.

“Availability of ambulance.” (Participant 26)

Studies indicate that delays in accessing emergency obstetric care are a leading cause of maternal mortality, particularly in low-resource settings (Thaddeus & Maine, 2020). According to Essendi et al. (2021), strengthening emergency obstetric transport systems significantly reduces the second delay, ensuring that pregnant women receive life-saving interventions on time. The study found that health systems with well-equipped ambulance services have lower maternal mortality rates compared to those relying on informal transport options. Research by Kebede et al. (2022) further confirms that ambulance availability reduces maternal mortality by 40% in rural settings where access to comprehensive emergency obstetric care is limited. The study suggests that investing in well-equipped ambulances with trained personnel improves maternal survival rates and enhances perinatal outcomes.

7.8 THEME 7: MODEL FOR STILLBIRTH PREVENTION

Table 7.7 shows the emerging subthemes and categories uncovered from the theme which explores a model for stillbirth prevention.

Table 7. 7: Model for stillbirth prevention

Theme	Subtheme	Categories
Model for stillbirth prevention	Intervention for the reduction of stillbirths	Access to maternal healthcare services Training and continuous professional development Early detection and prevention Community engagement and education Policy and infrastructure improvements Lifestyle and pregnancy health practices Danger signs in pregnancy
	Assessing the feasibility of model development to manage the risk factors for stillbirth	Feasibility of implementing the stillbirth prevention model Challenges and barriers to implementation Recommendations for stillbirth model Implementation

Source: Self-generated by author

7.8.1 Subtheme: Intervention for the reduction of stillbirths

This subtheme highlights the critical role of improving access to maternal healthcare services in reducing stillbirth rates. Participants emphasized the need for equitable access to maternal healthcare, particularly in rural areas, and the establishment of mobile clinics and designated obstetric ambulances to improve service delivery. Barriers such as geographical distance, lack of transport, and inadequate healthcare facilities contribute to delayed ANC bookings, inadequate pregnancy monitoring, and increased stillbirth risks. Enhancing maternal healthcare infrastructure, midwifery training, and emergency transport services is essential for reducing preventable stillbirths and improving maternal and neonatal health outcomes.

(a) Access to Maternal Healthcare Services

- Availability and accessibility of maternal health services

According to the WHO (2023), lack of access to quality maternal healthcare is a major contributing factor to stillbirths, particularly in LMICs where healthcare disparities persist. Regular ANC visits allow for early detection of pregnancy complications, timely interventions, and improved maternal and fetal health outcomes. Studies indicate that at least eight ANC visits, as recommended by WHO, significantly reduce stillbirth rates compared to fewer visits (Blencowe et al., 2021). Ensuring efficient and accessible maternal healthcare services is fundamental in preventing stillbirths and adverse pregnancy outcomes. Participants emphasized the need for efficient access to maternal healthcare services, especially in rural areas, with more PHC clinics offering obstetric services.

"There has to be efficient and effective access to maternal health services in all areas." (Participant 1)

"Every town in Lejweleputswa should have a PHC clinic offering obstetrics services to low-risk pregnant women." (Participant 1)

A study by McClure et al. (2022) found that expanding primary healthcare services with trained midwives and obstetricians reduces stillbirth rates by up to 30%. Furthermore, implementing community-based ANC outreach programs enhances awareness and accessibility, particularly in remote regions.

In addition, some of the participants emphasized the need for mobile clinics to improve maternal healthcare access for farm workers and rural women, who often struggle to attend ANC due to long travel distances, financial constraints, and lack of transport.

"We need more mobile clinics because we are surrounded by farms, and women from farms hardly come to book on time." (Participant 8)

"More midwives, mobile clinics for farm people." (Participant 15)

"More training for midwives and access to ANC in farm areas through mobile clinics." (Participant 20)

According to Kujawski et al. (2020), maternal health mobile units in South Africa, India, and Kenya have led to a 40% increase in ANC attendance and a 25% reduction in stillbirth rates by ensuring women receive timely pregnancy monitoring and essential prenatal interventions. Similarly, Kaiser et al. (2021) found that mobile maternal health services reduce the prevalence of preterm stillbirths by increasing maternal nutrition awareness and monitoring fetal growth abnormalities.

- Emergency transport and referral system

Delays in reaching healthcare facilities due to poor transport infrastructure and ambulance shortages contribute significantly to stillbirths and maternal deaths. Participants highlighted the urgent need for dedicated obstetric

ambulances in every local municipality to ensure timely transport of pregnant women experiencing labor complications or emergencies.

“Designated obstetric ambulance in every local municipality or local area to cater to the needs of pregnant women during labor or emergency.” (Participant 1)

A well-functioning emergency transport system plays a crucial role in reducing preventable stillbirths by ensuring that pregnant women with complications receive urgent medical attention. Studies show that delayed access to emergency obstetric care accounts for up to 50% of stillbirths in LMICs (Pattinson et al., 2022).

(b) Training and Continuous Professional Development

Training and continuous professional development focuses on enhancing midwifery skills, continuous professional development, and community health worker (CHW) training to improve maternal healthcare services and reduce adverse pregnancy outcomes, including stillbirths. Participants emphasized the need for structured midwifery education, refresher courses, and in-service training to ensure that healthcare providers remain competent in managing obstetric complications.

Adequate training in BANC, emergency obstetric and neonatal care (ESMOE), and advanced midwifery equips healthcare professionals with lifesaving skills needed to handle maternal emergencies effectively. Additionally, CHWs, who play a critical role in antenatal follow-ups and community-based maternal care, require enhanced training to improve their effectiveness.

- Midwifery and advanced training

Participants stressed the importance of structured midwifery training, including BANC and ESMOE, to ensure that midwives are well-equipped to handle pregnancy-related complications.

“Midwifery training or course has to include basic antenatal care and ESMOE training to ensure that newly qualified midwives are equipped with necessary skills to improve maternal health outcomes.” (Participant 1)

“Employment of more advanced midwives.” (Participant 5)

“Training midwives on following guidelines and proper referral procedures, more BANC training is needed.” (Participant 8)

Additionally, Participant 1 recommended refresher courses every 2–3 years to keep midwives updated on evolving maternal health guidelines.

“Refresher courses for the above-mentioned courses have to be compulsory and be conducted every 2–3 years to ensure continuous skills development.” (Participant 1)

Research has shown that well-trained midwives contribute significantly to reducing maternal and neonatal mortality (Renfrew et al., 2020). A study by Homer et al. (2019) found that comprehensive midwifery education leads to a 30% reduction in stillbirths and maternal deaths in resource-limited settings. The World Health

Organization (WHO, 2023) emphasizes that midwives trained in evidence-based antenatal and intrapartum care can prevent up to 83% of all maternal deaths, stillbirths, and newborn deaths.

Participant 22 emphasized the need for more advanced midwives to enhance maternal care quality.

“Train nurses in advanced midwifery.” (Participant 22)

A study by Bogren et al. (2022) found that healthcare facilities with an adequate number of advanced midwives have significantly lower rates of maternal complications and stillbirths. Midwifery-led continuity of care models, where highly trained midwives oversee the entire pregnancy, labor, and postpartum period, have been shown to reduce stillbirth rates by 23% (Sandall et al., 2020).

- Regular training and in-Service workshops

Several participants reiterated the importance of continuous in-service training and workshops to ensure that midwives and healthcare staff remain competent in managing obstetric emergencies.

“Monthly training of staff on obstetric emergencies.” (Participant 6)

“Regular in-service training of midwives in the facility.” (Participant 7)

“More training for midwives.” (Participant 18)

“Regular training/workshops.” (Participant 23)

“Going in-service training of staff (midwives).” (Participant 25)

According to the WHO (2023), healthcare providers must receive continuous education to keep up with evidence-based practices in maternal healthcare. A study by Vogel et al. (2021) in South Africa found that midwives who received monthly emergency obstetric training had a 40% reduction in maternal complications compared to those without ongoing training. Another study by Raymond et al. (2020) showed that facilities conducting quarterly training workshops had significantly lower stillbirth rates due to improved adherence to emergency response protocols.

- Training for Community Health Workers (CHWs)

Community health workers play a vital role in linking pregnant women to formal healthcare services. Studies show that CHW-led antenatal care initiatives have led to increased ANC attendance, earlier detection of pregnancy complications, and lower stillbirth rates (Bergström et al., 2021). However, many community health workers lack basic antenatal care knowledge, requiring additional training to improve their effectiveness in maternal healthcare. Based on the transcribed data, participants highlighted the need for CHWs to receive additional training, as they are responsible for maternal health follow-ups and community-based antenatal care. Currently, many CHWs lack basic ANC knowledge, which affects their ability to provide proper guidance to pregnant women.

“Most community health workers need training as they are the ones who do follow-up; at the moment, most of them lack basic knowledge of ANC.” (Participant 8)

A study by Kruk et al. (2020) found that training CHWs in basic ANC, danger signs in pregnancy, and maternal nutrition led to a 25% increase in early ANC bookings and a 17% reduction in stillbirths. Another study by Perry et al. (2021) highlighted that when CHWs are properly trained, they can increase facility-based births by 30% and reduce preventable maternal deaths.

Participants also mentioned increasing the number of CHWs to serve all underserved areas. For example, Participant 22 noted that:

“Increase the number of CHWs to cover the whole area which is not currently covered.” (Participant 22)

(c) Early Detection and Prevention

Early detection and prevention highlights the critical role of early screening, fetal growth monitoring, and infection prevention in improving maternal and neonatal health outcomes. Participants emphasized that early identification of high-risk pregnancies, rigorous fetal monitoring, and proactive management of maternal infections and fetal growth issues are essential to reducing maternal complications and stillbirths. The World Health Organization (WHO, 2023) and other maternal health studies confirm that timely detection and intervention for pregnancy complications significantly improve survival rates for both mothers and newborns. Implementing evidence-based screening protocols, referral systems, and fetal monitoring practices can help reduce the burden of maternal morbidity and neonatal mortality.

- Early detection of high-risk pregnancies

Participants emphasized the importance of identifying high-risk pregnancies early through advanced screening techniques such as Umbi flow studies (umbilical artery Doppler assessment), routine ultrasounds, and comprehensive obstetric screenings.

“Use of Umbi flow, a study was done by MRC and there was early detection.” (Participant 2)

“Early detection of high-risk pregnancies, continuous education to pregnant women, early referral to higher levels of care.” (Participant 4)

“Early referral for ultrasound.” (Participant 10)

“Rigorous screening for high-risk obstetric conditions.” (Participant 10)

Studies have shown that early identification of high-risk pregnancies enables timely interventions, reducing maternal and perinatal complications. A study by McCowan et al. (2020) found that Doppler ultrasound assessments of the umbilical artery (Umbi flow) significantly improve the detection of fetal growth restriction (FGR), reducing stillbirth rates by 20–30%. The WHO (2023) guidelines on antenatal care recommend that all pregnant women undergo regular risk assessments for hypertensive disorders, gestational diabetes, and fetal

growth abnormalities. High-risk pregnancies should be referred early to higher levels of care for specialized monitoring and management (Renfrew et al., 2020). A study by Vintzileos et al. (2019) showed that early referral and management of hypertensive disorders during pregnancy reduced the risk of stillbirth by 50%.

- Fetal growth monitoring

Participants stressed the importance of regular fetal monitoring, blood pressure checks, and ultrasound scans for fetal anomaly detection.

“Regular fetal movement monitoring.” (Participant 6)

“Blood pressure monitoring.” (Participant 6)

“Ultrasound for fetal anomaly detection.” (Participant 6)

- Prevention of morbidities and infections

Regular fetal growth monitoring is essential in identifying intrauterine growth restriction (IUGR), fetal distress, and placental dysfunction. According to Figueras and Gratacós (2021), fetal growth monitoring combined with Doppler velocimetry can reduce perinatal mortality by 30–40%. Participant 5 mostly highlighted the need for screening and management of fetal growth.

“Screening and management of fetal growth.” (Participant 5)

Continuous fetal monitoring through regular movement tracking, blood pressure monitoring, and ultrasound scans to detect anomalies early is essential. A study by Sovio et al. (2020) found that decreased fetal movements are associated with a 2.5-fold increased risk of stillbirth. The study suggests that regular ultrasound screening reduces the risk of undiagnosed fetal anomalies and birth complications. Participant 5 further recognized the need for early detection, prevention, and management of infections and pregnancy-related morbidities to ensure better maternal and fetal health outcomes.

“Prevention and management of infections.” (Participant 5)

“Prevention, detection, and management of morbidities.” (Participant 5)

Maternal infections such as syphilis, HIV, malaria, and bacterial infections are leading causes of preterm birth, low birth weight, and stillbirth (Goldenberg et al., 2020). Routine infection screening and timely antibiotic or antiviral treatment can prevent maternal and neonatal complications. The WHO (2023) Global Maternal Health Strategy recommends that pregnant women be screened and treated for infections such as syphilis, HIV, and bacterial vaginosis to reduce the risk of preterm labor and stillbirth. A study by Blencowe et al. (2021) found that treatment of maternal infections reduced neonatal sepsis cases by 50% and stillbirths by 30%.

(d) Community Engagement and Education

Community engagement and maternal health education are crucial for improving antenatal care (ANC) attendance, safe delivery practices, and overall maternal health outcomes. Participants emphasized the need for health education programs, awareness campaigns, and culturally sensitive approaches to maternal care.

According to the World Health Organization (WHO, 2023), community engagement through education and culturally sensitive approaches improves maternal and neonatal health outcomes by increasing early ANC visits, skilled birth attendance, and adherence to postnatal care guidelines. Studies have shown that health education empowers pregnant women and their families to make informed decisions about pregnancy, childbirth, and postpartum care, leading to reduced maternal and neonatal mortality rates (Dixon et al., 2020).

- Health education and awareness campaigns

Health education is a powerful tool for improving maternal health behaviors, increasing early ANC bookings, and reducing maternal complications. A study by McNabb et al. (2021) found that pregnant women who received structured health education were 2.5 times more likely to seek ANC services before 20 weeks of gestation compared to those without health education. Hence, community awareness programs and health education initiatives should be prioritized to improve maternal health outcomes. Consistent with this assertion, participants highlighted the importance of maternal health education programs and awareness campaigns to encourage early ANC visits, safe delivery, and postnatal care adherence.

“Having campaigns to give the community the knowledge needed and [the] importance of antenatal visits during pregnancy.” (Participant 3)

“Health education to the community and pregnant women.” (Participant 7)

“Regular antenatal visits, bookings before 20 weeks, [and] health education.” (Participant 13)

“Outreach community visits and community awareness and availability of information.” (Participant 19)

The WHO (2023) Antenatal Care Guidelines recommend that pregnant women receive structured health education on pregnancy-related risks, nutrition, danger signs, and the importance of skilled birth attendance. Health education should be integrated into community outreach programs, radio broadcasts, and mobile health (mHealth) interventions to reach a wider audience. A study by Lassi et al. (2020) found that community awareness campaigns increased ANC utilization by 35% and reduced maternal complications by 20%.

Furthermore, the need for family-centered maternal health education, where husbands, partners, and family members are included in the learning process, was also suggested by some of the participants. A study by Kwambai et al. (2021) found that male involvement in ANC education increases the likelihood of facility-based deliveries by 40%.

“Education on pregnant women and delivery should include family members, not pregnant women alone.” (Participant 9)

- Cultural sensitivity in maternal healthcare

According to Iswanti et al. (2024), maternity care providers must cultivate an attitude of respect and tolerance toward the cultural diversity of their patients and their families. Consistent with this, Participant 9 stressed the

importance of respecting cultural beliefs in maternal health education and service delivery. Cultural barriers often prevent pregnant women from seeking skilled healthcare services due to fear of judgment, discrimination, or conflict with traditional practices.

“Also, the community should be educated and know that cultural beliefs are not ridiculed.” (Participant 9)

Maternal healthcare services must be culturally sensitive and inclusive to promote trust and acceptance among diverse communities. A study by Mannava et al. (2019) found that disrespect for cultural beliefs in maternity care leads to lower ANC attendance and an increase in home deliveries with unskilled birth attendants. The WHO (2023) framework on respectful maternity care highlights that integrating cultural perspectives into maternal healthcare leads to improved patient satisfaction and better health outcomes. This includes respecting traditional beliefs while promoting evidence-based maternal health practices and training healthcare providers on cultural competence and sensitivity.

(e) Policy and Infrastructure Improvements

Strengthening maternal healthcare infrastructure and ensuring adequate policy support are critical to improving maternal and neonatal health outcomes. Participants emphasized the need for better healthcare infrastructure, reliable diagnostic equipment, and increased political commitment to budget allocation and service delivery.

According to the World Health Organization (WHO, 2023), well-equipped and adequately staffed healthcare facilities reduce maternal mortality by providing timely and quality obstetric care. The Lancet Maternal Health Series (2020) highlights that inadequate infrastructure, lack of medical equipment, and misallocation of resources contribute to preventable maternal deaths, especially in LMICs.

- Stronger healthcare infrastructure and reliable equipment

Participants emphasized the need for improved healthcare infrastructure, reliable diagnostic equipment, and functional sonar machines.

“Working equipment, e.g., sonar machines.” (Participant 15)

“Improve or build strong, reliable healthcare facilities.” (Participant 24)

“Having enough resources (e.g., BP machines that are serviced regularly).” (Participant 25)

Healthcare infrastructure, including well-equipped hospitals, functional primary health centers, and reliable transportation systems, plays a crucial role in ensuring that pregnant women receive timely and high-quality care. Namagembe *et al.* (2022) found that healthcare facilities with adequate infrastructure reduced maternal deaths by 30% compared to those with inadequate resources.

- Political will and budget allocation

The importance of political will and budget allocation emerged from the observed data. Participants emphasized that political commitment and proper budget allocation are necessary for improving maternal healthcare services.

“If feasible, if there is proper budget allocation.” (Participant 30)

Political will plays a fundamental role in driving policy reforms, increasing healthcare funding, and ensuring accountability in maternal health programs. A study by Shiffman and Smith (2019) found that maternal healthcare improvements are strongly linked to political commitment, with countries that prioritize maternal health policies experiencing a 50% reduction in maternal mortality rates.

Participants highlighted concerns regarding misuse of healthcare funds, corruption in healthcare tenders, and inadequate budget allocation for maternal health services. Participant 24 vehemently stated:

“Politicians [should] stop giving friends tenders to build shady structures.” (Participant 24)

The above agrees with literature that corruption in the South African healthcare system, including embezzlement, bribery, and kickbacks, has been a significant issue, leading to resource diversion, compromised service quality, and healthcare access inequalities (Hsiao, Vogt and Quentin 2019; Masenya and Mthombeni 2023).

(f) Lifestyle and Pregnancy Health Practices

Pregnancy is a critical period that requires proper nutrition, healthy lifestyle choices, and avoidance of harmful substances to ensure maternal and fetal well-being. Participants emphasized the importance of educating pregnant women about healthy eating habits, discouraging harmful traditional practices such as geophagy (eating soil), and avoiding smoking and alcohol consumption. According to the World Health Organization (WHO, 2022), inadequate maternal nutrition and unhealthy lifestyle choices significantly increase the risk of preterm birth, low birth weight, birth defects, and maternal complications. Research by Black et al. (2018) highlights that poor maternal nutrition is a major contributor to adverse pregnancy outcomes, including intrauterine growth restriction and gestational complications.

- Nutrition and lifestyle during pregnancy

Maternal nutrition and lifestyle choices play a crucial role in fetal development and pregnancy outcomes. Proper dietary intake, avoidance of harmful substances, and lifestyle modifications can significantly improve maternal and neonatal health. Participants advocate that pregnant women should be educated on proper nutrition, avoid harmful practices like geophagy, and understand the risks of smoking and alcohol consumption.

“Pregnant women should be advised to eat a healthy diet.” (Participant 32)

The above narrative aligns with the concept that a well-balanced diet rich in essential nutrients such as iron, folic acid, calcium, and protein is necessary for fetal growth, placental development, and maternal health. Research by Bhutta et al. (2019) indicates that maternal malnutrition is linked to increased risks of maternal anemia, gestational hypertension, and fetal neural tube defects.

Some participants raised concerns about geophagy, a common practice in certain cultures. While some believe it helps with nausea or provides minerals, studies indicate that geophagy can be harmful due to the risk of infections, parasites, and toxic metal exposure.

“Pregnant women should be discouraged [from eating] soil during pregnancy (geophagy).” (Participant 32)

A study by Young et al. (2021) found that pregnant women who engage in geophagy are at a higher risk of anemia, lead poisoning, and gastrointestinal infections. The Centers for Disease Control and Prevention (CDC, 2021) warns that soil may contain harmful bacteria, heavy metals, and pesticides, which can negatively affect both maternal and fetal health.

Participants emphasized the need to educate pregnant women on the dangers of smoking and alcohol consumption. Smoking during pregnancy is linked to low birth weight, preterm labor, and an increased risk of sudden infant death syndrome (SIDS) (Grewal et al., 2020). Similarly, alcohol consumption during pregnancy can lead to fetal alcohol spectrum disorders (FASD), which cause lifelong developmental disabilities (Lange et al., 2019).

“Inform mothers to stop smoking during pregnancy or drinking alcohol.” (Participant 29)

(g) Danger Signs in Pregnancy

Recognizing and responding to danger signs in pregnancy is critical for preventing maternal and fetal complications. Participant 32, for example, stresses the importance of educating pregnant women about danger signs and seeking immediate medical attention when symptoms arise.

“If she experiences any danger signs, she should consult the nearest clinic or hospital.” (Participant 32)

The World Health Organization (WHO, 2021) emphasizes that early recognition of pregnancy complications can significantly reduce maternal and perinatal mortality rates. Studies by Say et al. (2019) indicate that delayed healthcare-seeking behavior is a leading cause of maternal deaths, particularly in resource-limited settings.

7.8.2 Subtheme: Assessing the feasibility of model development to manage the risk factors for stillbirth

Stillbirth remains a global public health concern, with an estimated 2 million stillbirths occurring annually worldwide (WHO, 2021). Effective prevention models are critical to reducing stillbirth rates by addressing modifiable risk factors, enhancing healthcare delivery, and strengthening health policies. This theme explores the feasibility of implementing a stillbirth prevention model based on participants' perceptions regarding planning, financial investment, and policy commitment.

(a) Feasibility of Implementing the Stillbirth Prevention Model

The transcribed data revealed that participants identified three key factors influencing the feasibility of implementing a stillbirth prevention model.

- Feasibility with proper planning and resources

Several participants emphasized that successful implementation of a stillbirth prevention model depends on thorough planning, multi-stakeholder collaboration, and adequate healthcare resources. Proper planning ensures that healthcare professionals, infrastructure, and essential medical supplies are in place for effective service delivery.

“It is feasible to implement the model; this requires proper planning and engagement with the necessary stakeholders and service providers, for example, midwives.” (Participant 1)

“Very feasible to implement model, for example, availability of trained healthcare providers, access to resources.” (Participant 6)

“Very feasible.” (Participant 8)

“It is feasible.” (Participant 7)

“Feasible (training of nurses).” (Participant 26)

“Very feasible.” (Participant 25)

Research by Patterson *et al.* (2022) found that access to skilled birth attendants (midwives, obstetricians, and nurses) reduces the risk of stillbirth by up to 20%, particularly in low-resource settings. The presence of trained healthcare professionals allows for early detection of fetal distress, timely interventions, and improved intrapartum care. Furthermore, (Walker *et al.* 2020) highlight that enhanced training for nurses and midwives in fetal monitoring, emergency obstetric care, and neonatal resuscitation can significantly reduce stillbirth rates. Thus, participants' emphasis on midwife training aligns with global best practices for stillbirth prevention.

One participant noted that socio-economic factors must be addressed for the model to be feasible. Socio-economic disparities contribute to poor maternal health outcomes, including stillbirth, due to limited healthcare access, inadequate nutrition, and increased exposure to maternal infections (Blencowe *et al.*, 2021).

“Feasible if we can address socio-economic factors.” (Participant 28)

A study by Victora *et al.* (2020) in LMICs found that women from low-income backgrounds are twice as likely to experience stillbirth compared to women from higher-income households. Therefore, reducing economic barriers, such as transport costs to healthcare facilities, affordability of prenatal care, and access to nutritious food, is essential for implementing an effective stillbirth prevention model.

- Feasibility with financial investment

Several participants expressed concern about the financial viability of implementing a stillbirth prevention model. Funding constraints remain a major barrier in many healthcare systems, limiting access to essential maternal care services, equipment, and healthcare provider training.

“Access to financial resources.” (Participant 6)

“If the funds are there, it’s feasible.” (Participant 18)

“Increase the budget to attain all what I have mentioned.” (Participant 22)

According to WHO (2021), financial investments in maternal and newborn health programs lead to a high return on investment by reducing maternal and infant mortality and lowering long-term healthcare costs. This aligns with Participant 1’s suggestion that funds allocated for legal mitigation should be redirected to prevention strategies.

“The funds allocated for legal mitigation should be used for prevention strategies.” (Participant 1)

- Feasibility with Policy and Management Commitment

Some participants emphasized that successful implementation relies on strong policy frameworks, standard operating procedures (SOPs), and management commitment. The importance of maternal health policies is well documented in global public health research.

“Through maternal policies, standard operating procedures, protocols, and guidelines.” (Participant 5)

“Feasible ... commitment needed from management on top.” (Participant 15)

According to Heazell et al. (2022), policies that prioritize stillbirth prevention through structured interventions—such as enhanced prenatal screening, standardized care protocols, and improved facility-based delivery services—can significantly reduce stillbirth rates. Several studies suggest that countries with comprehensive maternal health policies have lower stillbirth rates. For example, Sweden implemented a national stillbirth reduction program, leading to a 50% decrease in stillbirths over 20 years (Flenady et al., 2019). The United Kingdom’s Saving Babies Lives Care Bundle focused on risk assessment, fetal movement monitoring, and early delivery of high-risk pregnancies, reducing stillbirth rates by 20% in two years (NHS, 2020). Thus, Participant 5’s mention of maternal policies, SOPs, and guidelines aligns with evidence-based approaches to stillbirth prevention.

(b) Challenges and Barriers to Implementation

Despite the potential feasibility of a stillbirth prevention model, participants identified several challenges and barriers that could hinder its successful implementation. These include the lack of resources and infrastructure, financial constraints, and skilled staff and training. These barriers align with global evidence indicating that structural, financial, and human resource limitations are significant obstacles to maternal healthcare improvements (Blencowe et al., 2021; Goldenberg et al., 2020).

- Lack of resources and infrastructure

Many participants believe that implementing a stillbirth prevention model is not feasible due to inadequate resources, inadequate healthcare facilities, and weak infrastructure.

“It’s not feasible because of lack of resources needed.” (Participant 3)

“Difficult: Implementation of such strategies requires more human resources, [and] more facilities.” (Participant 10)

“Not feasible under the current infrastructure.” (Participant 24)

“The department is not willing (not feasible).” (Participant 23)

“Current healthcare system is failing.” (Participant 24)

According to WHO (2021), a well-functioning healthcare system is essential for maternal and newborn survival. However, in many LMICs, the lack of medical equipment, essential drugs, and adequate healthcare facilities leads to poor maternal outcomes. A study by Lawn et al. (2016) found that healthcare infrastructure gaps, particularly in rural areas, limit access to ANC, emergency obstetric services, and neonatal care. McClure et al. (2018) reported that poor road networks, lack of referral hospitals, and inadequate maternity wards contribute to delays in seeking and receiving emergency care, increasing the risk of stillbirth.

This supports the concerns raised by Participants 3, 10, 23, and 24, who noted that the current healthcare system lacks the necessary infrastructure and government support to effectively implement a stillbirth prevention model. Furthermore, Flenady et al. (2019) emphasized that government commitment and resource allocation play a vital role in strengthening maternal health systems. Heazell et al. (2022) found that in countries where maternal health policies are weak or poorly enforced, implementation of evidence-based interventions is often inconsistent or ineffective. Therefore, Participant 23’s statement that the health department is unwilling to support the initiative reflects a broader issue of governance and accountability in healthcare management.

- Financial constraints

Financial limitations are a major barrier to maternal and newborn health interventions. Several participants highlighted that lack of budget allocation makes it difficult to implement new strategies, hire additional healthcare staff, and improve maternal care facilities. Some participants suggested that existing funds should be redirected toward prevention efforts.

According to Walker *et al.* (2020), shifting resources from legal mitigation (e.g., malpractice lawsuits) to maternal health programs would be a cost-effective strategy to reduce stillbirth rates and improve healthcare quality. Participants 2, 11, 12, and 14 concerns about limited financial resources highlight the need for better budget prioritization, increased maternal health funding, and financial transparency in healthcare systems.

“Cost/no budget available.” (Participant 2)

“Hard.” (Participant 12)

"It's hard and difficult." (Participant 11)

"It's hard." (Participant 14)

- Lack of skilled staff and training

Several participants emphasized the need for more trained healthcare providers, particularly midwives and obstetricians, to improve maternal care and reduce stillbirth rates.

"Enough educated/skilled staff [is] needed." (Participant 9)

"Advanced midwifery, continuous in-service training." (Participant 27)

"Holding meetings and in-service training." (Participant 29)

"We need more training for midwives, staffing improvement of infrastructure, and also mobile clinics and maternal education for ANC to empower community health workers." (Participant 30)

According to WHO (2021), there is a global shortage of 900,000 midwives, which severely impacts maternal and newborn health outcomes. According to Nove *et al.* (2021a), midwife-led interventions could prevent 82% of maternal and newborn deaths, but many countries face chronic shortages of skilled birth attendants. A study by Ojong *et al.* (2021) found that many hospitals in LMICs operate with inadequate staff-to-patient ratios, leading to high workloads, burnout, and poor quality of care. This finding supports the concerns raised by Participants 9, 27, 29, and 30, who emphasized the need for more trained midwives, continuous education, and staffing improvements.

(c) Recommendations for Stillbirth Model Implementation

The participants provided practical recommendations for the successful implementation of a stillbirth prevention model. Their suggestions align with global best practices in maternal and newborn healthcare. The key recommendations include community engagement and health education, strengthening the referral system and access to services. These recommendations are supported by research indicating that community-based interventions, enhanced ANC services, and strengthened healthcare systems are essential for reducing stillbirth rates (McClure *et al.*, 2018; Flenady *et al.*, 2019).

- Community engagement and health education

Community involvement is crucial for improving maternal health outcomes. Several participants suggested that educating traditional healers, enhancing ANC classes, and using multilingual pamphlets would raise awareness and encourage early antenatal care-seeking behavior.

Studies by Ngunyulu, Mulaudzi and Peu (2020); Musie *et al.* (2022) found that in many African and Asian communities, pregnant women seek care from traditional birth attendants and healers before accessing formal healthcare. A study by Mogawane *et al.* (2020) in South Africa reported that integrating traditional healers into maternal health programs improved community trust and early antenatal attendance. A study by Tamunu, Ponidjan and Nagara (2022) emphasized that training traditional healers on pregnancy complications and

referral pathways enhances early detection of high-risk pregnancies. This supports Participant 32's suggestion that training traditional healers would allow them to provide accurate health information and refer high-risk pregnancies to healthcare facilities.

"Traditional healers should also be trained about healthy pregnancies to educate their clients during their consultations." (Participant 32)

Goldenberg et al. (2020) found that comprehensive ANC education reduces maternal and neonatal complications by empowering women with knowledge about danger signs, nutrition, and safe delivery practices. McClure et al. (2018) demonstrated that structured ANC classes improve pregnant women's compliance with medical advice and increase skilled birth attendance. This aligns with Participant 32's recommendation that healthcare providers should be trained to deliver ANC education more effectively.

"Emphasizing antenatal care classes during their clinic visits, the staff should be trained on how to and topics to deal with during the visits." (Participant 32)

Research by Flenady et al. (2019) found that language barriers often prevent pregnant women from understanding maternal health messages, leading to delays in seeking care. According to Ojong et al. (2021), visual aids, such as illustrated pamphlets and posters, are effective in educating illiterate or low-literacy patients about pregnancy risks. This supports Participant 32's idea of using pamphlets, newspapers, and visual materials in multiple languages to enhance maternal health education.

"If there can be newspapers or pamphlets in different languages and photos for those who cannot read at maternal healthcare service providers, which will probably assist in enlightening the patient." (Participant 32)

- Strengthening the referral system and access to services

Improving referral pathways and access to ANC services was another key recommendation. Participants stressed the need for more midwife training, staffing improvements, and mobile clinics to increase accessibility. A well-functioning referral system ensures that high-risk pregnancies receive appropriate specialized care on time. Das and Twanabasu (2023) found that in low-resource settings, inadequate transportation, communication gaps, and poor coordination result in delays in receiving emergency obstetric care. A study by Mohamed et al. (2025) reported that implementing digital referral tracking systems improves patient transfers and reduces maternal and perinatal mortality rates. This aligns with Participant 30's recommendation that empowering community health workers and strengthening ANC referral pathways would enhance maternal healthcare services.

"We need more training for midwives, staffing improvement in infrastructure, and also mobile clinics and maternal education for ANC to empower community health workers." (Participant 30)

Overall, the responses indicate mixed perceptions about the feasibility of implementing a model to address stillbirth risk factors within the current healthcare system. While some participants believe it is feasible with proper planning, financial resources, and policy implementation, others highlight significant barriers such as

financial constraints, lack of infrastructure, and a shortage of skilled personnel. Recommendations include improving community education, increasing healthcare funding, and enhancing training for healthcare workers.

(d) Required Support to Implement a Stillbirth Prevention Model

The successful implementation of a stillbirth prevention model depends on multiple factors, including financial support, training and capacity building, adequate staffing, and infrastructure improvements. Participants emphasized that sustained investment in maternal healthcare services is necessary to reduce stillbirth rates. These recommendations align with international maternal health guidelines and research findings that highlight the importance of well-funded, well-staffed, and well-equipped healthcare systems in preventing stillbirths (Flenady et al., 2019; WHO, 2021).

- Financial support

Participants emphasized the need for dedicated funding for maternal health services, including financial support for training, infrastructure improvements, and advanced medical equipment such as fetal monitoring devices and sonar technology.

According to Flenady et al. (2019), investment in healthcare worker training leads to better clinical decision-making and improved maternal outcomes. Similarly, Frøen et al. (2018) highlighted that funding for data collection and research is crucial in identifying stillbirth risk factors and improving healthcare strategies. These findings support Participants 1, 6, and 12, who stressed the need for more funding for staff training, infrastructure upgrades, and research.

"Such a model requires more funding and staffing; current infrastructure can be converted to cater for obstetrics services for women with low-risk pregnancy." (Participant 1)

"Financial support: Funding for healthcare providers training and capacity building. Funding for research and evaluation, data analysis, and research." (Participant 6)

"Funding to improve facilities." (Participant 12)

WHO (2021) advocates for increased government and donor funding to support maternal and newborn health services, particularly in low-resource settings. This aligns with Participant 32's concern that maternal health funding should be separate from general healthcare budgets to ensure adequate resource allocation.

"Health departments should allow finances specifically for maternal health services, not to be generalized as 'Health Department', as there is a lot needed to cater for [the] maternal health department only." (Participant 32)

- Training and capacity building

Many participants stressed the importance of continuous education for healthcare professionals, including midwives, CHWs, enrolled nurses, and auxiliary nurses. Regular refresher courses and in-service training were suggested as essential strategies to improve maternal healthcare quality.

"Training centers are already available in the province and district that could upscale the skills needed to prevent further stillbirths in the district." (Participant 1)

Goldenberg et al. (2020) found that midwives who receive frequent refresher courses are more effective in detecting pregnancy complications early. Additionally, (Perlman et al. 2020) emphasized that hands-on, skill-based training is more effective than theoretical learning alone in preventing stillbirths. This supports Participant 23's recommendation for frequent refresher training to keep healthcare workers updated on the latest maternal health developments.

"Providing regular training (refresher courses) to keep abreast with the latest developments." (Participant 23)

A report by WHO (2021) recommends interdisciplinary training where multiple healthcare cadres (midwives, nurses, CHWs) work together to strengthen maternal care services. This aligns with Participant 32's suggestion that not only midwives but also enrolled and auxiliary nurses should be trained in maternal health education during antenatal and postnatal visits.

"More staff to be trained about maternal health. Not only can the midwives, but also the enrolled or auxiliary nurses be educated about how to give maternal lessons during antenatal visits and postnatal visits." (Participant 32)

- Staffing and human resource support

Participants highlighted a critical shortage of healthcare workers, particularly midwives and CHWs, in maternal health services. They recommended hiring more staff, deploying young midwives, and retaining experienced professionals beyond retirement age. Goldenberg et al. (2020) emphasized that hiring more midwives improves antenatal care coverage and reduces maternal and neonatal mortality. WHO (2021) recommends that countries increase the ratio of skilled birth attendants to pregnant women to meet global maternal health targets. These findings confirm the concerns raised by Participants 8 and 9 about the need for more midwives and healthcare workers to cater for growing communities.

"More midwives should be deployed in each facility and at least three to four mobile clinics in a sub-district." (Participant 8)

"Enough staff members, as communities are becoming larger at this moment." (Participant 9)

According (Perlman et al. 2020), delaying retirement for experienced midwives can provide valuable mentorship for younger healthcare workers and improve patient outcomes. Similarly, HakemZadeh et al. (2021) reported that flexible employment policies (e.g., part-time work for retired midwives) can help address staff shortages. This aligns with Participant 32's recommendation to allow retired nurses to continue working in maternal health services.

"The issue of retirement from work at a certain age should be dealt with, including employment age. There are many people/nurses who are at home with their skills, but due to age limitations, they cannot continue working." (Participant 32)

"Employ enough young midwives." (Participant 25)

- Infrastructure and system improvements

Participants suggested that infrastructure improvements such as additional mobile clinics, better-equipped hospitals, and stronger referral systems could significantly improve maternal healthcare services.

"Staffing can improve surveilling strategies and promote more thorough antenatal care by easing the burden felt currently." (Participant 10)

"Fixing of infrastructure." (Participant 25)

"More nursing staff is required as there is more shortage in clinics and hospitals." (Participant 32)

According to HakemZadeh *et al.* (2021), upgrading healthcare infrastructure reduces overcrowding in maternity wards and improves the quality of antenatal and delivery care. This aligns with Participant 19's suggestion to establish MOUs operating 24/7 and Participant 29's recommendation to build more clinics and mobile units.

"Create an MOU [memorandum of understanding] working 24/7 hours to give all people access to services." (Participant 19)

A study (Jeeana and Naidoo 2023) found that poor referral systems contribute to delays in emergency obstetric care, increasing the risk of stillbirths and maternal mortality. WHO (2021) recommends implementing digital referral tracking systems to improve communication between primary care clinics and hospitals. This supports Participant 24's recommendation that referral systems need to be restructured for better efficiency.

"Change the system (referral system)." (Participant 24)

The responses highlight that successful implementation of a stillbirth prevention model would require a multi-faceted approach. Adequate financial investment, enhanced training programs, increased staffing, and infrastructure development are crucial components for its feasibility. Addressing these key areas could significantly reduce stillbirth rates and improve maternal healthcare services.

7.9 SUMMARY AND CONCLUSION

The word cloud in the image visually represents frequently used terms in the dataset related to maternal healthcare and stillbirth prevention. Larger words indicate higher frequency in the text. The word cloud presents a comprehensive overview of the key themes surrounding maternal healthcare and stillbirth prevention. At the heart of the discussion is maternal healthcare services, with a particular emphasis on antenatal care and its role in reducing stillbirth rates. The prominence of terms such as "healthcare," "services," "antenatal," and "care" highlights the focus on improving access to and the quality of maternal health interventions. A major challenge

that emerges is the shortage of trained healthcare staff, as evidenced by the frequent appearance of words like "staffing," "staff," "training," and "skilled." This evidence suggests that healthcare providers, particularly midwives and obstetric specialists, play a crucial role in ensuring better maternal outcomes. However, limited resources and financial constraints remain significant barriers, with terms such as "economic," "financial," "funding," and "income" indicating that healthcare facilities require more support to implement effective stillbirth prevention strategies.

Additionally, infrastructure and equipment limitations are recurring concerns, as seen in the words "facilities," "resources," "equipment," and "availability." These suggest that many healthcare providers struggle with inadequate tools and poorly maintained facilities, which hinder the effective delivery of maternal healthcare services. Beyond the healthcare system itself, community involvement and education are also central themes. The inclusion of words like "community," "providers," "education," "knowledge," and "awareness" highlights the importance of empowering both healthcare professionals and pregnant women with the necessary information to improve maternal and fetal health outcomes. The focus on risk factors—as indicated by "risk," "factors," "high," and "rate"—suggests an ongoing effort to identify and address the key determinants that contribute to stillbirths.

Furthermore, systemic challenges and policy considerations are evident, with words such as "policy," "implementation," "challenges," and "strategies" pointing to the broader need for healthcare system reforms. Improving healthcare policies, workforce capacity, and financial investments appears crucial in making sustainable changes that would help reduce stillbirths and improve maternal health outcomes.

Overall, the word cloud underscores the multifaceted nature of stillbirth prevention, requiring a collaborative approach that integrates healthcare training, financial investments, infrastructure development, community education, and policy reforms. Addressing these challenges holistically will be key to ensuring better maternal and newborn health outcomes.



Figure 7. 11: Word cloud subsuming the key findings

Source: Self-generated by author

Overall, the findings of this study underscore the complex interplay of clinical, socio-economic, and systemic factors that contribute to stillbirths. Medical conditions such as maternal illnesses, infections, and placental complications, alongside lifestyle factors, significantly impact fetal survival. Additionally, inadequate antenatal care, poor health literacy, and socio-economic disparities further exacerbate the risk of stillbirth. The study highlights how limited access to healthcare services, cultural beliefs, financial constraints, and healthcare system inefficiencies create barriers to effective maternal and fetal care.

Antenatal care remains a crucial point of intervention in stillbirth prevention. Strategies such as early and consistent maternal health monitoring, comprehensive patient education, and timely referrals to specialized care have been identified as essential for reducing stillbirth rates. Furthermore, healthcare providers play a critical role in maternal care outcomes, with findings emphasizing the need for ongoing training, improved staffing, and enhanced resource availability.

Chapter Eight: Discussion

8.1 INTRODUCTION

The persistent challenge of stillbirth remains a major public health concern, particularly in developing nations where limited resources, socio-economic disparities, and infrastructure gaps often strain maternal healthcare systems. In South Africa, stillbirth continues to undermine maternal and child health goals, with the Lejweleputswa District Municipality in the Free State Province consistently reporting one of the highest stillbirth rates in the country. Despite ongoing policy commitments and healthcare reforms, the determinants of stillbirth remain underexplored at the district level, and the absence of tailored, evidence-based prevention models has hindered progress in reducing these tragic losses.

This study aimed to enhance South African maternal care within the public health system in the Lejweleputswa District Municipality by integrating both quantitative and qualitative approaches. By combining the statistical precision of Principal Component Analysis (PCA) and Structural Equation Modeling (SEM) with the practical experiences of healthcare providers, the study aimed to offer a well-rounded understanding of the complex factors driving stillbirth rates and the feasibility of implementing targeted prevention strategies.

The study was guided by six specific objectives. The first objective sought to investigate the underlying causes and determinants of stillbirths, focusing on why the Lejweleputswa District continues to report the highest rates in the Free State. The second objective aimed to examine the effect of socio-economic factors on the quality of antenatal care and their influence on antepartum stillbirth. The third objective focused on assessing the level of awareness and utilization of antenatal and obstetric services among pregnant women in the district. The fourth objective explored healthcare providers' knowledge, attitudes, and practices related to stillbirth prevention. The fifth objective examined maternal healthcare service delivery in the district, including infrastructure, staffing, and the overall quality of care. Finally, the sixth objective aimed to develop a model that addresses the key risk factors contributing to stillbirth within the local healthcare context.

This chapter presents a critical interpretation of the research findings in alignment with these objectives. Through the integration of quantitative data and qualitative insights, the discussion unpacks the multifaceted nature of stillbirth determinants, evaluates the gaps and strengths in current maternal healthcare practices, and proposes actionable recommendations for systemic improvements. The findings are further contextualized within the framework of health systems by proposing a validated model in efforts to reduce stillbirth rates and improve maternal and neonatal health outcomes in Lejweleputswa and similar settings.

8.2 OBJECTIVE ONE: INVESTIGATING UNDERLYING CAUSES AND DETERMINANTS OF STILLBIRTHS IN LEJWELEPUTSWA MUNICIPALITY EXPERIENCE THE HIGHEST STILLBIRTH RATE

Objective one sought to investigate the underlying causes and determinants of stillbirths, which positioned Lejweleputswa District Municipality as having the highest stillbirth burden in the Free State Province. The combination of both quantitative and qualitative findings reveals a complex interplay of medical, socio-economic, systemic, and cultural factors contributing to this persistent public health challenge.

8.2.1 Quantitative Findings

The quantitative analysis identified significant associations between stillbirth occurrences and several maternal health conditions, including hypertensive disorders, diabetes, HIV status, and anemia. Among these, hypertensive disorders—particularly preeclampsia and gestational hypertension—emerged as the strongest predictors of stillbirth, a finding consistent with global studies that recognize hypertension as a primary cause of placental insufficiency, intrauterine growth restriction, and fetal death (Goldenberg et al., 2011; Magee et al., 2022).

Additionally, chronic conditions such as HIV and diabetes mellitus were statistically linked to elevated stillbirth risk. This finding reinforces the established evidence that unmanaged blood glucose and high maternal viral loads pose substantial threats to fetal development, especially in resource-limited environments where consistent antenatal monitoring and medication access are often compromised (Cohan et al., 2023; McCance et al., 2019).

Socio-economic variables also showed strong predictive power in the quantitative model. Women from low-income households, those with limited educational attainment, and those experiencing food insecurity were disproportionately represented among stillbirth cases. These findings align with other studies in the literature, which show that poverty and low maternal education significantly reduce healthcare access and the timely uptake of antenatal care services, thus exacerbating pregnancy risks (Milton et al., 2022; Kotzee et al., 2024b).

8.2.2 Qualitative Findings

The qualitative interviews with healthcare providers and affected mothers reinforced the quantitative results and offered rich, contextual insights. Healthcare professionals consistently cited hypertensive disorders and unmanaged chronic diseases as recurring clinical drivers of stillbirths. Participants also stressed the systemic weaknesses that undermine maternal care delivery, including chronic staff shortages, inadequate medical equipment, poor infrastructure, and negative staff attitudes—challenges that were similarly flagged in health system audits.

Participants identified poverty, unemployment, and low health literacy as key barriers to early antenatal booking and regular follow-ups, echoing the socio-economic challenges highlighted in the quantitative data. In line with the findings of Malakoane et al. (2020) and Kruk et al. (2022), frontline staff emphasized that under-resourced health facilities, poorly functioning referral systems, and inconsistent policy implementation hinder efforts to prevent stillbirths effectively.

Moreover, cultural beliefs and practices surfaced as important behavioral determinants. Interviewees reported the use of traditional medicines, delayed recognition of pregnancy complications, and skepticism toward medical advice as common community behaviors. These patterns reflect the sociocultural context described by Mogawane et al. (2021) and Felisian et al. (2023), where traditional customs and community narratives often shape maternal health-seeking decisions in rural African settings.

8.2.3 Triangulation of Quantitative and Qualitative Results

The convergence of quantitative and qualitative data highlights that stillbirths in Lejweleputswa District are not merely the result of clinical complications but arise from a combination of interconnected medical, socio-economic, systemic, and cultural determinants. Both data sources affirm the central role of hypertensive disorders, chronic maternal illnesses, and poor antenatal care utilization while also pointing to the substantial impact of poverty, health system inefficiencies, and culturally driven health behaviors. These findings align with the theoretical perspective offered by the Andersen Behavioral Model of Health Service Use, which underscores the role of predisposing characteristics, enabling resources, and perceived need in shaping healthcare utilization patterns (Atkins et al., 2023a). The data suggest that reducing stillbirth rates will require a holistic and multi-sectoral approach—one that not only strengthens antenatal services and infrastructure but also prioritizes staff capacity-building, addresses social determinants of health, and fosters culturally sensitive community engagement.

In this light, targeted interventions should promote early antenatal booking, chronic disease management, and maternal education while simultaneously improving the working conditions and retention of healthcare professionals. Engaging community leaders and family decision-makers is equally critical to building trust in healthcare services and encouraging behavior change, as advocated by Aynalem et al. (2023).

8.3 OBJECTIVE TWO: THE EFFECT OF SOCIO-ECONOMIC FACTORS ON THE QUALITY OF ANTENATAL CARE AND ITS INFLUENCE ON ANTEPARTUM STILLBIRTH

Objective Two sought to examine the effect of socio-economic factors on the quality of antenatal care and its influence on antepartum stillbirth. The study's findings illuminate the significant role that socio-economic factors—including education, income, transportation access, and social inequalities—play in shaping ANC attendance and ultimately influencing antepartum stillbirth outcomes. Both the quantitative and qualitative strands of this research converged to emphasize the critical relationship between socio-economic status and maternal health behaviors, outcomes, and care-seeking patterns.

8.3.1 Quantitative Findings

The quantitative analysis revealed a strong and consistent relationship between socio-economic status and the quality and timing of antenatal care, as well as its influence on stillbirth outcomes. Women with higher educational qualifications were statistically more likely to attend ANC services early and regularly, with 72.3% (SF1) and 76.1% (SF6) of respondents affirming the link between education and awareness of stillbirth risk factors. This finding is in line with Singh et al. (2019) and Fagbamigbe and Idemudia (2016), who emphasize that maternal education enhances awareness of pregnancy danger signs, improves adherence to medical guidance, and fosters proactive health-seeking behaviors that reduce the risk of stillbirth.

Additionally, income level emerged as a significant determinant of ANC attendance and nutritional adequacy. Survey items SF2, SF4, and SF5 indicated that financial constraints limited access to quality care and essential

pregnancy-related nutrition, consistent with Gabrysch and Campbell's (2009) findings that economic barriers are a major determinant of maternal health outcomes in resource-limited settings.

The regression analysis further reinforced this association, demonstrating a statistically significant positive relationship ($\beta = 0.590$, $p < 0.001$) between socio-economic status and improved maternal and neonatal outcomes, including a lower risk of stillbirth. Transportation access also proved to be a significant factor, with 51% of respondents (SF3) agreeing that lack of reliable transport directly impacted timely ANC attendance, a barrier similarly highlighted by Moyer and Mustafa (2013) in low-income contexts.

8.3.2 Qualitative Findings

The qualitative interviews with healthcare providers and pregnant women provided deeper context to the survey results, confirming that socio-economic conditions shape not only access to antenatal care but also women's perceptions and engagement with health services. Participants frequently cited poverty, unemployment, and food insecurity as barriers to early ANC booking, regular attendance, and adequate nutrition during pregnancy.

Participants also shared real-world accounts of financial hardships, including the inability to afford transportation to clinics, diagnostic services, and supplements—factors that often resulted in delayed or missed ANC visits. These insights mirror global evidence by Lawn et al. (2016), which links socio-economic deprivation with decreased maternal healthcare utilization and elevated stillbirth risk.

Additionally, cultural beliefs and stigma were highlighted as barriers that disproportionately affect adolescent mothers and women from lower educational backgrounds. Some women reported avoiding ANC visits due to fear of mistreatment or judgment from healthcare providers, particularly younger or unmarried women—a pattern echoed by Bohren et al. (2019), who identified disrespect and discrimination as powerful deterrents to maternal health service utilization. The participants also emphasized the effect of transportation challenges, particularly for those in rural or remote farming areas where health facility closures and the discontinuation of mobile clinics left many women without feasible access to ANC services. This aligns with the transportation-related findings highlighted by Moyer and Mustafa (2013).

8.3.3 Triangulation of Quantitative and Qualitative Results

Both the quantitative and qualitative strands of this study converge to demonstrate the central role of socio-economic status in determining the quality of antenatal care and its direct impact on stillbirth outcomes. Higher education, stable income, reliable transport access, and reduced social inequality were consistently associated with improved ANC attendance, enhanced health literacy, and lower stillbirth risks.

The data underscore that socio-economic disadvantage not only limits material access to healthcare services but also influences women's knowledge, decision-making power, and confidence in engaging with the healthcare system. This evidence supports the assertions of Say and Raine (2007) and Rosenberg et al. (2020), who emphasize the role of structural inequalities in shaping maternal health behaviors and outcomes in low-resource settings.

Moreover, the study highlights that interventions aimed at reducing stillbirth rates in Lejweleputswa must extend beyond clinical care to address the broader social and economic landscape. Targeted policy responses should include poverty alleviation, improved maternal health education, transport subsidies, and culturally competent healthcare services designed to dismantle stigma and foster equitable access to antenatal care.

In summary, the findings reinforce the conclusion that socio-economic conditions are not peripheral but central determinants of maternal health outcomes and that addressing these inequalities is essential to reducing antepartum stillbirth in the Lejweleputswa District.

8.4 OBJECTIVE THREE: AWARENESS AND UTILIZATION OF ANTENATAL AND OBSTETRIC SERVICES AMONG PREGNANT WOMEN IN THE DISTRICT.

Objective three sought to assess the awareness and utilization of antenatal and obstetric services among pregnant women in the district. The objective only covers the qualitative results gathered from the experts interviewed. The findings on the awareness and utilization of antenatal and obstetric services highlight the multifaceted barriers and facilitators influencing pregnant women's engagement with maternal healthcare. This study uncovers a complex interaction of awareness, systemic challenges, and behavioral factors that impact maternal healthcare outcomes in the district.

A key finding of the study is that many pregnant women are aware of the available antenatal and obstetric services. The heightened awareness is largely attributed to ongoing health education efforts, including household visits by community health workers (CHWs) and national campaigns such as Pregnancy Awareness Week. Previous studies have corroborated the positive influence of such awareness campaigns on the utilization of maternal health services. For instance, Kyei-Nimakoh et al. (2017) emphasized that knowledge of available services significantly contributes to the timely booking of ANC, which is associated with better pregnancy outcomes. Participants support the assertion that pregnant women in the community are highly aware of ANC services and where to access them.

However, despite high awareness levels, the study also revealed that awareness does not always translate into full utilization of the services. This finding is consistent with the work of Thaddeus and Maine (1994) on the "Three Delays Model," which emphasizes that the decision to seek care is influenced by awareness, but also by cultural beliefs, perceived need for care, and behavioral motivations. As some participants observed, a lack of motivation or ignorance regarding the necessity of ANC, especially among women who have had previous uncomplicated pregnancies, can delay the decision to seek care. This points to the need for behavioral change interventions to complement awareness campaigns.

While awareness is an essential factor, several systemic and logistical challenges restrict the full utilization of antenatal services. Participants reported challenges such as long waiting times, staff shortages, and inadequate referral systems, which deter pregnant women from seeking ANC. Research by Pell et al. (2013) and WHO (2016) highlights how systemic inefficiencies, including understaffing and poorly coordinated referral systems, create barriers to accessing maternal healthcare services. The extended waiting times experienced by pregnant women in the district are particularly problematic, as they can contribute to delays in receiving timely care,

potentially leading to adverse maternal and fetal outcomes. Furthermore, the study also revealed the significant impact of geographic and financial barriers, particularly for women living in rural areas who have to travel long distances to reach healthcare facilities. Studies by Dahab and Sakellariou (2020) and Ezeanochie and Jahonga (2024) show that transportation challenges are a critical factor contributing to maternal morbidity and mortality. The lack of dedicated obstetric ambulances further exacerbates this problem, leading to delays in accessing emergency care when complications arise.

In addition to logistical challenges, participants consistently highlighted resource shortages in healthcare facilities, including the lack of skilled staff and necessary medical equipment. Nove et al. (2021) and Mlotshwa and Sibiya (2023) emphasized that these shortages, particularly prevalent in rural areas, contribute to the underutilization of ANC services and can negatively affect maternal health outcomes.

The study also uncovered healthcare system failures that hinder the effective utilization of ANC services. The negative attitudes of healthcare workers, including instances of mistreatment and disrespect, were reported as significant deterrents for women seeking care. These findings align with studies by Mapumulo et al. (2021), who identified poor treatment by healthcare providers as a key factor contributing to maternal healthcare hesitancy. Inadequate emotional and psychological support during pregnancy further exacerbates the issue, as women feel unsupported during a crucial time in their lives. Wittkowski et al. (2020) emphasize the importance of integrated psychological care in ANC to improve maternal mental health, highlighting the need for a more holistic approach to maternal care. Sociocultural factors, such as stigma surrounding pregnancy—particularly among unmarried women and adolescents—also influence the utilization of ANC services. Participants highlighted that societal norms and cultural beliefs sometimes discourage women from seeking care. The stigma surrounding pregnancy outside of marriage, as well as misconceptions about ANC, can prevent women from seeking help from health facilities. Research by Michael et al. (2023) and Erasmus et al. (2020) supports these findings, noting that cultural barriers remain a significant challenge in improving maternal health outcomes. These cultural perceptions underscore the need for targeted health education interventions that address misconceptions and reduce stigma.

Nevertheless, research revealed that CHWs play a pivotal role in increasing awareness and promoting the utilization of ANC services. The participants acknowledged that CHWs are instrumental in reaching pregnant women through household visits, health talks, and education during ANC visits. Studies have demonstrated that their efforts significantly improve ANC attendance rates, particularly in underserved areas. Studies by Le Roux et al. (2020) and Lassi et al. (2016) confirm that CHWs are key in bridging the gap between the healthcare system and communities, particularly in rural settings.

The findings of this study highlight the importance of addressing both awareness and access-related barriers to improve the utilization of antenatal and obstetric services in the district. While awareness of maternal health services is generally high, systemic challenges such as healthcare resource shortages, poor service delivery, geographical barriers, and negative attitudes toward healthcare workers hinder the full utilization of these services. Efforts to strengthen the healthcare system, including improving staffing, addressing infrastructural deficits, and reducing transportation and financial barriers, are essential to ensure that awareness translates into increased attendance at ANC clinics.

8.5 OBJECTIVE FOUR: ANALYZING HEALTHCARE PROVIDERS' KNOWLEDGE, ATTITUDES, AND PRACTICES REGARDING STILLBIRTH PREVENTION

Objective four sought to analyse healthcare providers' knowledge, attitudes, and practices regarding stillbirth prevention. The combination of quantitative and qualitative findings provides a comprehensive view of healthcare workers' knowledge, attitudes, and practices regarding stillbirth prevention, highlighting both strengths and areas for improvement.

8.5.1 Knowledge of Stillbirth

Quantitative findings

The quantitative results revealed a generally high level of awareness among healthcare providers regarding key risk factors for stillbirth. A significant proportion of respondents (68.4%) identified maternal age as a contributing factor, while more than 80% correctly acknowledged the roles of smoking and hypertension in increasing stillbirth risk. Furthermore, healthcare providers demonstrated strong knowledge of conditions requiring early detection, with 91.6% of respondents reporting awareness of pre-eclampsia symptoms and 88.2% recognizing the importance of identifying placental abruption early. An equally high proportion (88.6%) agreed that the timely detection of pre-eclampsia substantially reduces the risk of stillbirth. These patterns suggest that healthcare providers generally possess strong baseline knowledge about stillbirth prevention, particularly for conditions commonly emphasized in clinical training. However, some uncertainty emerged regarding obesity and diabetes, as a notable portion of respondents expressed neutral positions, indicating possible gaps in knowledge or confidence when addressing these more complex or evolving risk factors. Statistical analysis reinforced the critical role of knowledge in practice, with a significant positive correlation ($R = 0.571$, $p < .001$) observed between knowledge of stillbirth and the application of antenatal care practices. This finding highlights the link between informed healthcare providers and proactive clinical care.

Qualitative findings

The qualitative findings echoed the quantitative trends, with many healthcare providers expressing confidence in their knowledge of stillbirth risk factors, particularly those who had undergone specialized training or possessed years of experience in maternal and neonatal care. Several participants emphasized their ability to recognize conditions such as pre-eclampsia and placental abruption, noting that both clinical experience and regular training enhanced their diagnostic capabilities. However, some providers admitted to limitations in their knowledge, particularly regarding the evolving understanding of diabetes and obesity as stillbirth risks. These gaps were often attributed to outdated training, infrequent guideline updates, or limited access to continued professional development opportunities. Participants stressed the value of ongoing education, regular workshops, and peer-to-peer knowledge sharing as essential strategies for keeping healthcare staff informed and prepared to manage stillbirth risks. Additionally, the importance of mentorship and collective learning environments was highlighted as a way to strengthen both knowledge and clinical decision-making, especially for handling high-risk pregnancies.

Triangulation of Quantitative and Qualitative Findings: Knowledge of Stillbirth

When triangulating the quantitative and qualitative findings, a comprehensive picture of healthcare providers' knowledge regarding stillbirth emerges. Both strands of data consistently show that healthcare providers are well-informed about traditional risk factors such as maternal age, hypertension, smoking, pre-eclampsia, and placental abruption, which are widely covered in clinical guidelines and training programs. This finding is aligned with the literature, where formal education and adherence to evidence-based clinical protocols have been shown to significantly improve stillbirth prevention efforts (Goldenberg et al., 2020; Ota et al., 2020). However, the mixed responses related to obesity and diabetes in both datasets reveal important knowledge gaps, which suggest that some healthcare workers may struggle with newer or less straightforward risk factors. These gaps underscore the need for structured professional development, ongoing training, and up-to-date clinical guidelines to ensure healthcare providers are fully equipped to identify and manage the diverse causes of stillbirth (Flenady et al., 2019; Atkins et al., 2023).

Moreover, both the quantitative correlation analysis and qualitative narratives pointed to the critical role of knowledge in shaping clinical practice. Providers who reported higher levels of knowledge were more likely to engage in proactive preventive measures such as monitoring fetal movements, screening for infections, and promoting antenatal care attendance. This study reinforces the argument made by Christou et al. (2021) that healthcare workers' knowledge directly influences their capacity for early intervention, which is key to preventing stillbirths. The need for continuous training and professional support systems—including workshops, mentorship, and peer collaboration—was repeatedly emphasized by participants, mirroring the conclusions of Blencowe et al. (2022) and Kirkpatrick et al. (2020), who highlight the role of workplace learning and support in improving clinical outcomes. Ultimately, the integration of both quantitative and qualitative findings underscores the importance of knowledge as a cornerstone for stillbirth prevention and highlights the ongoing need for systematic efforts to close knowledge gaps and strengthen healthcare provider competencies through lifelong learning and professional support (WHO, 2023).

8.5.2 Attitudes towards maternal care

Quantitative Findings

The quantitative results of this study underscored the significant influence of healthcare providers' attitudes on maternal healthcare engagement, particularly in stillbirth prevention and antenatal care (ANC) utilization. An overwhelming majority of healthcare workers (92%) agreed that regular ANC attendance reduces the risk of stillbirth, reinforcing the critical role of routine care in improving pregnancy outcomes. In addition, 94.6% of respondents acknowledged that compassionate and respectful care directly encourages pregnant women to engage with ANC services, highlighting a widespread understanding of the importance of provider attitudes in promoting maternal well-being. Similarly, 86.7% of participants agreed that positive healthcare worker attitudes improve the likelihood of continued maternal care engagement. These findings reflect the established evidence in global maternal health research, which emphasizes that the quality of interpersonal interactions between healthcare providers and patients can either encourage or hinder timely and consistent use of healthcare services (Renfrew et al., 2014; Kruk et al., 2018).

Qualitative Findings

The qualitative insights reinforced and deepened the understanding of how healthcare providers' attitudes shape maternal healthcare experiences and stillbirth prevention. Participants consistently highlighted the transformative role of compassion, empathy, and kindness in their interactions with pregnant women. Many healthcare workers reported that positive, non-judgmental attitudes foster trust, encourage open communication, and promote early help-seeking behaviors, all of which are vital for reducing the risk of stillbirth. These findings align with World Health Organization guidelines (WHO, 2023) and research by Mills et al. (2022), both of which underline the link between respectful provider-patient relationships and improved maternal health outcomes.

Conversely, the qualitative data illustrated that the detrimental effects of negative attitudes, including disrespect, indifference, and dismissiveness were significant barriers that discourage women from attending ANC or seeking timely medical intervention. Participants acknowledged that such negative behaviors sometimes result from work-related stress, staff shortages, and emotional burnout. These admissions mirror the findings of Mengesha et al. (2020) and Sewpaul et al. (2021), who identified disrespectful or abusive care as a key deterrent to maternal health service utilization, which can potentially increase the likelihood of adverse outcomes, including stillbirth.

Additionally, several participants linked negative attitudes to systemic challenges within the healthcare environment. Staff burnout, resource shortages, and high workloads were highlighted as underlying factors contributing to reduced empathy and professional detachment. This observation is consistent with the research of Shah et al. (2021) and Wright et al. (2020), who found that healthcare provider burnout leads to emotional exhaustion and diminished patient-centered care, ultimately undermining maternal health outcomes.

Triangulation of Quantitative and Qualitative Findings

The integration of both quantitative and qualitative findings presents a cohesive narrative about the crucial role of healthcare providers' attitudes in shaping maternal care engagement and preventing stillbirth. Quantitative results clearly demonstrated that positive provider attitudes are statistically associated with improved antenatal care practices, as evidenced by a strong and significant positive correlation ($R = 0.600$, $\beta = 0.600$). This finding complements the qualitative data, where healthcare workers described how compassionate, respectful, and empathetic care-built trust, encouraged ANC adherence, and fostered early detection of pregnancy complications.

Both data strands highlighted that positive attitudes serve as powerful enablers of maternal healthcare engagement, while negative attitudes act as barriers that limit care-seeking behavior. Furthermore, both datasets pointed to the systemic pressures—such as staff burnout and resource shortages—that shape these attitudes. These findings support the argument advanced by Renfrew et al. (2014) and Kruk et al. (2018), who assert that the relational quality of care, as much as technical competence, is central to improving maternal and perinatal health outcomes.

The combined findings underscore the dual need for individual-level interventions aimed at fostering compassionate care and system-level reforms designed to alleviate the working conditions that contribute to negative attitudes. As highlighted in the literature, addressing emotional exhaustion through staff support, fair workload distribution, and adequate resources can help mitigate the attitudinal barriers identified in this study (Shah et al., 2021; Wright et al., 2020).

In conclusion, the triangulated results affirm that improving healthcare workers' attitudes through targeted training, emotional support, and systemic improvements is essential for enhancing antenatal care engagement and reducing stillbirth risks. Both datasets suggest that cultivating empathy, respect, and kindness, alongside addressing structural challenges, will create a more supportive maternal healthcare environment—one that fosters trust, improves outcomes, and aligns with global calls for respectful maternity care (WHO, 2023).

8.5.3 Practices of Antenatal Care

Quantitative Findings

The quantitative analysis of this study revealed a strong consensus among healthcare professionals regarding the critical role of ANC in preventing stillbirths. An overwhelming majority of respondents (89.3%) agreed that ANC attendance plays a vital role in reducing stillbirth risks. Furthermore, 93.6% of participants emphasized the importance of early detection of pregnancy-related complications, and 87.9% acknowledged that regular fetal growth monitoring is essential throughout pregnancy. These responses indicate that healthcare practitioners are highly aware of the need for structured, routine ANC visits to monitor maternal and fetal well-being.

Additionally, the data revealed that 95.4% of respondents affirmed their health facilities actively promote ANC attendance, showcasing institutional commitment to improving early engagement in maternal health services. However, despite these encouraging responses, a smaller proportion of participants expressed uncertainty or disagreement about the minimum number of ANC visits recommended for low-risk pregnancies, suggesting inconsistencies in practice or differing interpretations of maternal health guidelines.

The quantitative results also highlighted the existence of structured referral systems for managing high-risk pregnancies, as reported by 85.5% of participants. However, these figures do not necessarily reflect the timeliness or efficiency of such systems, which qualitative data later illuminated. Overall, the quantitative findings reflect a broad alignment with global evidence, which underscores the protective role of ANC in identifying complications and improving pregnancy outcomes (McCowan et al., 2020; Blencowe et al., 2021).

Qualitative Findings

The qualitative interviews provided depth and context to the quantitative trends, offering real-world insights into the experiences and perceptions of healthcare providers and community health workers regarding ANC practices. Participants consistently emphasized the significance of early detection and regular monitoring of fetal development during ANC visits. Many shared personal accounts highlighting how the identification of high-risk conditions—such as hypertensive disorders, gestational diabetes, and fetal growth restriction—during ANC facilitated timely interventions that could prevent stillbirths.

However, a recurring concern among participants was the challenge of access to ANC services, particularly for women in rural and underserved communities. Long travel distances, limited transportation options, and financial barriers were commonly cited as significant obstacles that hinder women's ability to attend ANC appointments, often leading to delayed detection of complications. Participants also underscored the vital role of community health workers (CHWs) in improving ANC attendance through home visits, health education, and follow-up services, particularly in marginalized communities.

Another prominent theme was the inadequacy of emergency transport systems for pregnant women requiring urgent referrals. While referral systems existed on paper, participants described delays in ambulance availability and a shortage of dedicated obstetric ambulances, which often resulted in critical time lapses when complications arose. This finding resonates with global research, which identifies delays in emergency obstetric transport as a significant contributor to maternal and perinatal mortality, particularly in low- and middle-income countries (Pattinson et al., 2022).

Participants also highlighted the need for continuous professional development for healthcare providers, especially midwives, to ensure clinical competence and preparedness for managing obstetric complications. They advocated for structured refresher training every two to three years, as well as advanced midwifery education, echoing global best practices that emphasize skilled and up-to-date healthcare professionals as a cornerstone of improved maternal and neonatal outcomes (Homer et al., 2019; WHO, 2023).

Triangulation of Quantitative and Qualitative Findings

The integration of quantitative and qualitative findings offers a comprehensive understanding of antenatal care practices and their role in preventing stillbirths. Both strands of data strongly converge on the consensus that regular ANC attendance, early complication detection, and proactive clinical management are key strategies in reducing stillbirth risks. The high percentage of agreement (93.6%) regarding the importance of early detection was reflected in the qualitative accounts of healthcare workers, who provided lived examples of how timely diagnosis and management of conditions like hypertension and gestational diabetes directly improved maternal and fetal health outcomes.

Likewise, both data sources highlighted the importance of promoting ANC attendance. Quantitatively, 95.4% of healthcare workers reported active promotion of ANC visits at their facilities, while qualitative narratives stressed the complementary role of health education programs and the involvement of CHWs in encouraging early ANC booking and sustained engagement. These findings are supported by global research, including McNabb et al. (2021), which found that culturally tailored community education programs significantly increase ANC attendance, especially in low-resource settings.

However, discrepancies emerged in the area of emergency transport and referral systems. While the quantitative data suggested that referral systems were largely in place (85.5%), the qualitative findings revealed serious concerns about the efficiency and timeliness of these systems, especially in rural areas where the absence of dedicated obstetric ambulances and prolonged emergency response times were described as critical

barriers to care. This concern echoes Pattinson et al.'s (2022) findings, which underscore the fact that delays in emergency obstetric care contribute to nearly half of stillbirths in low- and middle-income countries.

The data also revealed shared concerns about healthcare provider training. While quantitative responses suggested generally good adherence to maternal health guidelines, qualitative narratives emphasized gaps in continuing professional development and advocated for enhanced midwifery training. These insights are reinforced by Homer et al. (2019) and WHO (2023), both of which highlight the pivotal role of skilled healthcare providers in reducing maternal and perinatal mortality.

In summary, the triangulated findings affirm that while healthcare providers recognize the importance of ANC in stillbirth prevention, structural barriers such as transport shortages, inconsistent training, and limited healthcare access in rural areas continue to undermine optimal outcomes. Addressing these gaps through improved health system infrastructure, community engagement, and professional development is essential for reducing stillbirth rates. These findings align with global evidence underscoring the transformative potential of accessible, comprehensive, and consistently high-quality antenatal care (Blencowe et al., 2021; McCowan et al., 2020; WHO, 2023).

8.6 OBJECTIVE FIVE: MATERNAL HEALTHCARE SERVICE QUALITY

Objective five sought to examine maternal healthcare services in the Lejweleputswa District Municipality, including infrastructure, staffing, and quality service delivery. The findings from both the quantitative and qualitative data suggest a generally positive perception of maternal healthcare services, although areas for improvement remain evident.

8.6.1 Quantitative Findings

The quantitative results of the study provided a strong statistical endorsement of maternal healthcare service quality in the Lejweleputswa District Municipality. The mean satisfaction score was notably high ($M = 3.90$, $SD = 0.54$) with a medium effect size ($d = 0.58$), indicating that the majority of respondents positively rated the quality of maternal healthcare services. Additionally, 76.4% of participants agreed that these services met the necessary standards for reducing stillbirths, underscoring a generally favorable perception of service quality.

Further, 84.7% of respondents acknowledged the importance of quality maternal care in preventing stillbirths, and 85.2% confirmed that comprehensive screening for risk factors was routinely conducted. A significant 91.3% reported clear communication about follow-up care, illustrating strong patient-provider interactions. However, gaps were noted, particularly in staffing and infrastructure. About 45.6% disagreed that there were enough staff to handle patient loads, and 18.6% expressed concerns over the adequacy of infrastructure. A significant portion (77.6%) confirmed timely interventions during complications, though nearly 23% indicated either neutrality or disagreement, highlighting room for improvement.

Despite positive ratings for service quality (see Figure 4.7), a significant number of participants expressed concerns about access to maternal healthcare services. The importance of timely access to care was overwhelmingly supported, with 84.7% of participants affirming the critical role of quality maternal healthcare in

preventing stillbirths. The regression analysis revealed that maternal healthcare services accounted for 25.3% of the variance in infant outcomes ($\beta = 0.503$, $p < 0.001$), affirming the direct link between quality care and positive neonatal outcomes.

8.6.2 Qualitative Findings

The qualitative data enriched these quantitative insights by providing depth and context to the statistics. Participants frequently praised healthcare providers for offering comprehensive antenatal services, early complication detection, and clear follow-up instructions. Participant 6 remarked, “The clinic provides good care, but we still worry about delays in diagnosis,” emphasizing satisfaction mixed with apprehension over systemic delays.

Staffing was a recurring concern. Participant 2 noted, “Sometimes the nurses are overwhelmed, and we have to wait longer for help.” The shortage of midwives and the excessive workload on available staff were identified as key contributors to delays, impacting both the timeliness and quality of care. Infrastructure also emerged as a challenge. Participants identified inadequate medical equipment, unreliable utilities, and poorly maintained facilities as barriers to effective service delivery.

The gap between the perceived quality of services and the systemic challenges identified in the qualitative data indicates a disparity between patient expectations and the realities faced by healthcare providers. While patients may rate the services highly in terms of the perceived availability of care and its role in preventing stillbirths, the structural and logistical challenges in the system (e.g., ambulance delays, overcrowded facilities) mitigate the overall effectiveness of these services. Qualitative responses also emphasized the need for better equipment, particularly in emergency situations. Participant 1 noted, “The facility needs better equipment, especially for emergency situations. Sometimes, we have to wait for hours before we get the equipment we need.” Adequate infrastructure is crucial for the effective delivery of maternal healthcare services. The WHO (2020) underscores that maternal healthcare facilities must be equipped with essential medical technologies, such as ultrasound machines and emergency transport, to ensure timely interventions. Similarly, a study by Kawooya et al. (2021) found that portable ultrasound machines can significantly improve maternal and fetal health outcomes by enhancing early detection of high-risk pregnancies in resource-limited settings.

Despite these shortcomings, communication about follow-up care was highlighted as a strength. Participant 5 shared, “I always know when to return for my next visit, and the nurses remind me if I forget.” The qualitative responses also reiterated the significance of comprehensive screenings for conditions like hypertension and diabetes, as expressed by Participant 8: “The tests and screenings helped me understand what could go wrong and what to do to avoid it.” Participants also raised concerns about emergency response systems, especially ambulance delays. The discussion highlighted the critical gap between service availability and accessibility during emergencies, further emphasized by comments on the shortage of mobile clinics and transport.

8.6.3 Triangulation of Quantitative and Qualitative Findings

The integration of both quantitative and qualitative data underscores a central conclusion: while maternal healthcare services in Lejweleputswa are generally perceived as satisfactory, significant operational barriers

affect their reliability and reach. The high satisfaction rates and positive patient narratives align with global literature, suggesting that comprehensive antenatal care—including regular screenings, early detection of complications, and timely interventions—is critical in preventing stillbirths and improving maternal outcomes (Geller et al., 2021; WHO, 2021).

The quantitative data indicated that 76.4% of participants felt that maternal healthcare services met the required standards for reducing stillbirths. This conclusion was further supported by qualitative data, where participants emphasized the importance of comprehensive antenatal care, regular check-ups, and early detection of complications in pregnancy. As Participant 6 noted, “The clinic provides good care, but we still worry about delays in diagnosis.” These findings reflect the critical role of regular screenings and early detection in improving maternal and infant health outcomes. Literature also supports these findings, as studies have shown that timely prenatal care and early intervention are key to reducing the risk of stillbirths (Geller et al., 2021). The WHO (2021) emphasizes that comprehensive antenatal care, which includes the early identification of complications such as pre-eclampsia or gestational diabetes, can significantly reduce stillbirth risks.

A substantial proportion of participants (45.6%) disagreed that there were sufficient staff to manage the volume of cases at the healthcare facility. Qualitative responses echoed this concern, with participants citing long waiting times and overwhelmed staff as significant issues. The qualitative responses further elaborate on the staffing challenges, with participants highlighting the shortage of skilled midwives and the overburdening of existing staff. Inadequate training exacerbates these shortages, as many healthcare workers lack the necessary specialized skills to handle high-risk pregnancies and emergency situations. WHO (2019) and studies by Moyo et al. (2022) confirm that staffing shortages are a global issue, with significant consequences for maternal care quality. Participants’ concerns about understaffing and its effects on the quality of care resonate with findings from Blaauw et al. (2019), who argue that staff burnout, caused by overwork and understaffing, leads to poorer maternal health outcomes, including increased rates of stillbirths.

Participant 2 stated, “Sometimes the nurses are overwhelmed, and we have to wait longer for help.” This finding aligns with literature on the impact of inadequate staffing in healthcare systems. Studies indicate that staffing shortages contribute to delays in timely interventions, which can affect maternal health outcomes, including stillbirth rates (Alkema et al., 2021). Adequate staffing is essential to ensure that healthcare facilities can respond promptly to emergencies and provide consistent care, thus improving both maternal and neonatal outcomes.

The majority of respondents (84.7%) affirmed the critical role that quality maternal healthcare plays in preventing stillbirths—a sentiment supported by qualitative data. Participants emphasized the need for regular screenings, early prenatal visits, and prompt medical interventions. Participant 3 explained, “Good healthcare means fewer risks during pregnancy, which leads to fewer stillbirths.” Research confirms that access to quality maternal care, including early prenatal screenings and comprehensive antenatal services, is closely linked to improved pregnancy outcomes (McClure et al., 2020). The WHO also highlights that timely interventions and access to skilled maternal healthcare providers can prevent stillbirths and other adverse pregnancy outcomes (WHO, 2021).

While the majority of participants (61.2%) agreed that the healthcare facility's infrastructure supported maternal care, a significant portion (18.6%) expressed concerns regarding the adequacy of facilities. Qualitative data provide further context to these quantitative findings, highlighting challenges in the system. Participants in the qualitative interviews underscored the significant infrastructure deficits that affect the quality of care, such as poor facility conditions, unreliable water and electricity supplies, and the absence of essential medical equipment. These infrastructure challenges compromise the safety and efficiency of maternal healthcare, aligning with findings from Kruk et al. (2018) and Chersich et al. (2020), who stress the importance of well-maintained healthcare facilities for safe maternal and neonatal care. Poor infrastructure not only impacts the quality of care but also discourages pregnant women from seeking care at health facilities, which can lead to increased risks during pregnancy.

However, service delays, particularly in ambulance responses, were flagged as significant concerns. The qualitative data reinforce the quantitative findings, revealing systemic barriers such as delays in ambulance services and overcrowded healthcare facilities. The shortage of ambulances and mobile clinics, as well as inefficiencies in the referral system, exacerbate delays in care and increase the likelihood of adverse maternal and neonatal outcomes. Knop et al. (2024) and Sharma et al. (2020) emphasize the role of mobile clinics in reducing delays and improving maternal healthcare access, particularly in rural settings. The shortage of ambulances and mobile clinics, as noted by participants, undermines efforts to ensure timely access to care for pregnant women in remote or underserved areas. Studies by Ngene and Moodley (2020) and Knight et al. (2020) reinforce the importance of timely access to care, which is echoed in the participants' feedback about delays in ambulance services.

An overwhelming 91.3% of participants reported that they received clear instructions for follow-up care after each antenatal consultation. This finding was corroborated by qualitative data, where participants expressed satisfaction with the clarity and consistency of communication regarding follow-up visits. Participant 5 stated, "I always know when to return for my next visit, and the nurses remind me if I forget." Effective communication is essential for improving patient satisfaction and ensuring continuity of care. Studies have shown that clear communication regarding follow-up care significantly improves adherence to prenatal visits, which in turn contributes to better pregnancy outcomes (Pattinson et al., 2019).

The majority of respondents (85.2%) confirmed that the healthcare facility included comprehensive screening for risk factors associated with stillbirth. In qualitative responses echoed, this statement emphasizing the crucial role of screenings in identifying complications such as hypertension and diabetes. Participant 8 noted, "The tests and screenings helped me understand what could go wrong and what to do to avoid it". Comprehensive screening is a critical component of quality maternal healthcare. A study by O'Rourke et al. (2021) found that regular screenings during pregnancy lead to early detection of risk factors, which allows for timely interventions that can prevent stillbirths and other complications.

A significant portion of respondents (77.6%) affirmed that timely interventions were always carried out in the case of maternal complications. However, 19.8% of participants were neutral, and 2.7% disagreed, indicating that delays may occur. Qualitative data supported this, with some participants indicating that delays were due to understaffing or lack of emergency resources. The importance of timely interventions is widely acknowledged

in the literature. Studies show that delays in receiving medical care during pregnancy can lead to adverse outcomes, including stillbirths and maternal morbidity (Adegoke et al., 2020). This phenomenon emphasizes the need for better resource allocation and staff support to ensure that timely interventions are consistently provided.

Another area of strong convergence was the communication of follow-up care. Both the high quantitative affirmation (91.3%) and positive qualitative reflections reinforce the link between effective communication and patient adherence to prenatal care schedules—a connection corroborated by Pattinson et al. (2019). The quantitative results revealed a strong positive correlation ($r = 0.503$) between the quality of maternal health services and infant outcomes, highlighting the importance of quality care in improving infant health. The regression model ($\beta = 0.503$; $p < 0.001$) confirmed that maternal healthcare services accounted for 25.3% of the variance in infant outcomes. This relationship is consistent with the qualitative findings, where participants emphasized that quality maternal care directly contributed to better infant health outcomes. Participant 9 explained, “When the clinic provides good care, I know that my baby will be healthier.” Research supports this correlation, with studies showing that high-quality maternal healthcare services led to better birth outcomes, including reduced infant mortality and morbidity (Baker et al., 2021). The WHO (2020) also emphasizes the importance of ensuring that maternal care is of the highest quality, as it directly influences infant health and survival.

8.7 OBJECTIVE SIX: MODEL THAT ADDRESSES THE RISK FACTORS CONTRIBUTING TO STILLBIRTH

This study aimed to develop a conceptual model for addressing the risk factors that contribute to stillbirth using both quantitative and qualitative approaches. Using a mixed-methods design, the study combined the statistical rigor of Principal Component Analysis (PCA) and Structural Equation Modeling (SEM) with the real-world insights of healthcare providers, revealing a comprehensive view of the underlying risk factors and the feasibility of implementing a prevention model in the South African healthcare context. Drawing from the health belief model, the study proposed a model applicable to Lejweleputswa District Municipality, South Africa to address the risk factors contributing to stillbirth. The model was validated through factor analysis.

8.7.1 Quantitative findings

The Principal Component Analysis (PCA) identified six key components that explained 68.073% of the variance in the dataset, highlighting the complex, multifactorial nature of stillbirth determinants. Following PCA, confirmatory factor analysis (CFA) refined the model, establishing constructs such as attitudes towards maternal healthcare, practice related to antenatal care, and quality of maternal health services were statistically valid and reliable. These findings provided a strong empirical foundation for model development. Figure 7.1 illustrates the refined and validated model.

The SEM analysis revealed significant pathways that underscore the centrality of maternal healthcare practices and service quality in influencing infant outcomes. Specifically, attitudes toward maternal healthcare (ATT) were found to significantly influence antenatal care practices ($\beta = 0.551$, $p < 0.001$). These practices, in turn, significantly predicted both the perceived quality of maternal health services ($\beta = 0.587$, $p < 0.001$) and the

ultimate infant outcomes ($\beta = 0.240$, $p = 0.001$). Furthermore, the quality of maternal services was itself a strong predictor of infant outcomes ($\beta = 0.386$, $p < 0.001$). These relationships echo previous findings by Lawn et al. (2016) and Blencowe et al. (2021), who identified antenatal care and service quality as essential determinants of maternal and neonatal outcomes.

Interestingly, the direct path between attitudes towards maternal healthcare and quality of maternal health services was not statistically significant, suggesting that improved maternal attitudes alone, without corresponding practices, may not directly translate into better service quality. This finding emphasizes the importance of behavior change beyond mere knowledge or beliefs—a pattern observed in previous maternal health studies (Goldenberg et al., 2020).

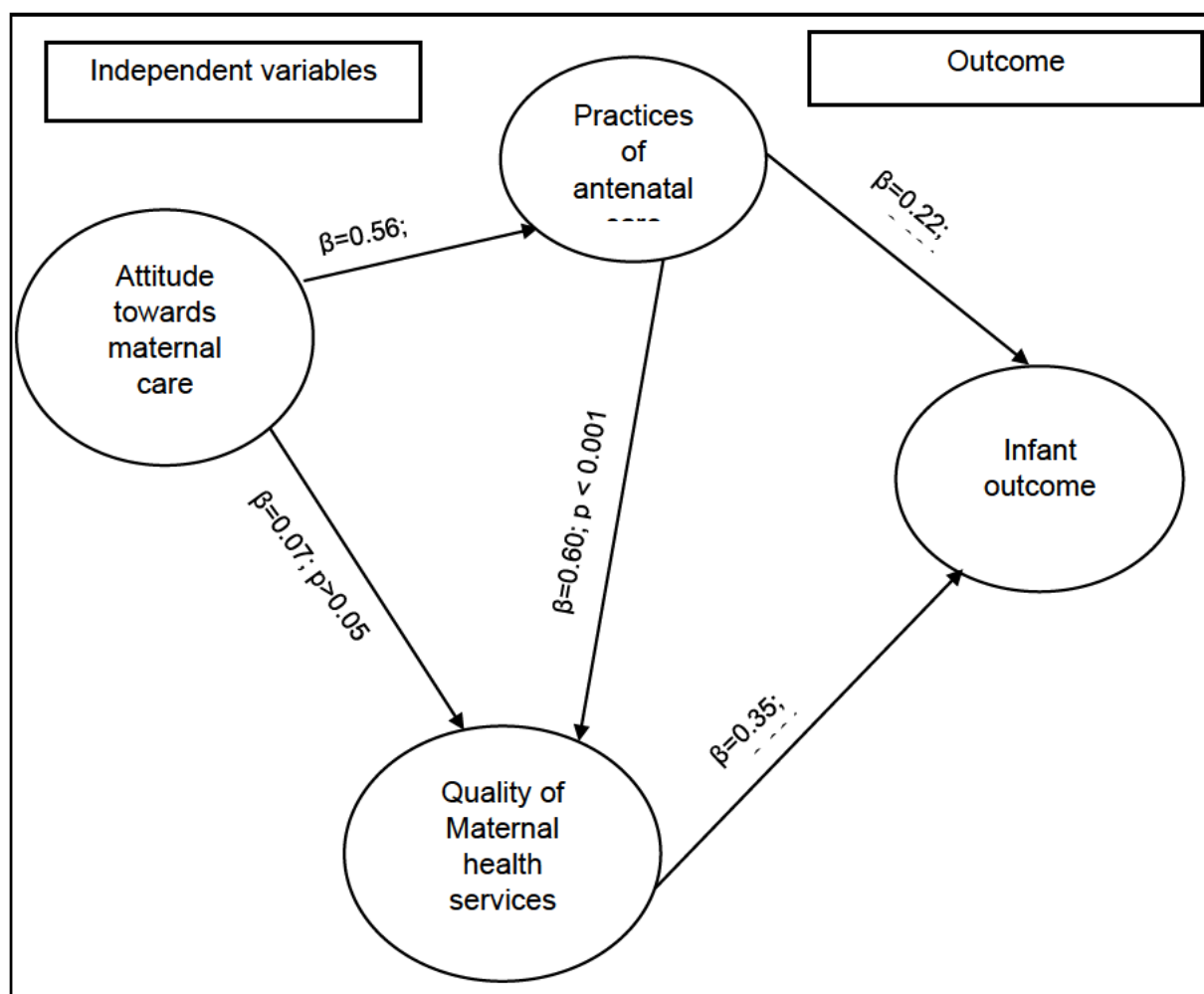


Figure 8. 1 Refined conceptual framework

Source: Self-generated by author

8.7.2 Qualitative findings

The findings from the qualitative interviews reinforced and enriched the quantitative findings by offering frontline perspectives on the feasibility of implementing a stillbirth prevention model. Healthcare workers emphasized that successful implementation requires three core enablers: proper planning and resources, financial investment, and policy and management commitment.

Participants stressed that trained healthcare personnel, especially midwives, and accessible maternal services are foundational to preventing stillbirths—aligning with Patterson et al. (2022), who emphasized the lifesaving potential of skilled birth attendance, particularly in lowly resourced environments. Furthermore, participants like Participant 28 highlighted the influence of socio-economic disparities, echoing global studies such as Victora et al. (2020) that found income inequality significantly correlates with poor pregnancy outcomes, including stillbirth.

Financial constraints and lack of infrastructure were repeatedly cited as key barriers to implementation. This reasoning matches the WHO's (2021) position that sustained investments in maternal health services produce long-term cost savings by reducing the need for crisis interventions. Similarly, concerns over human resource shortages parallel global findings by Nove et al. (2021a) and Ojong et al. (2021), which documented the severe shortage of midwives and its effect on maternal and newborn health outcomes.

8.7.3 Triangulation of results

Furthermore, the integration of quantitative and qualitative results illustrates a clear convergence around the crucial roles of maternal care practices, service quality, and health system support. The quantitative modeling established the pathways through which attitudes, practices, and service quality shape infant outcomes, while qualitative feedback added depth, illustrating the real-world conditions—such as funding gaps, policy enforcement, staff shortages, and infrastructure weaknesses—that mediate these relationships. For instance, the significant quantitative link between antenatal care practices and improved infant outcomes ($\beta = 0.240$) is strongly echoed in participant narratives emphasizing the need for trained midwives and continuous in-service education. Walker et al. (2020) and Heazell et al. (2022) similarly argue that frontline training and structured maternal care protocols are critical to reducing stillbirths.

Moreover, the qualitative data highlighted the importance of policy commitment and resource planning for sustainable model implementation. This aligns conclusion with international evidence from Sweden (Flenady et al., 2019) and the UK (NHS, 2020), where structured policies led to significant stillbirth reductions.

The finding that attitudes alone do not directly impact service quality (H3) was echoed in qualitative responses where participants stressed the need for comprehensive support systems, not just awareness or good intentions, to prevent stillbirth. This result supports the argument by Goldenberg et al. (2020) that reducing stillbirths is not merely about education or attitude change but about ensuring systemic health service improvements.

This study demonstrates that stillbirth prevention is a multifaceted challenge requiring systemic improvements in maternal healthcare practice, service quality, and health system governance. The integrated quantitative and qualitative results offer compelling evidence for developing a comprehensive stillbirth prevention model that is contextually grounded, and evidence based. The model's success, however, will depend on translating these insights into actionable policies, adequate resource allocation, and sustained health workforce investments.

8.8 THEORETICAL CONTRIBUTIONS AND IMPLICATIONS

This study developed an integrated model to address the multifaceted risk factors contributing to stillbirth in the South African healthcare context (Figure 8.2). The model emerged from a convergence of quantitative findings—derived from Principal Component Analysis (PCA) and Structural Equation Modeling (SEM)—and qualitative insights obtained from frontline healthcare workers. Together, these strands of evidence present a comprehensive, context-sensitive approach to stillbirth prevention.

The model created offers an integrated framework that captures the multifactorial nature of stillbirth risk, focusing on the interaction between maternal attitudes, antenatal care practices, service quality, and systemic enablers such as policy commitment, health workforce capacity, and socio-economic conditions. The mixed-methods design combined statistical evidence with real-world insights from frontline healthcare providers, leading to a comprehensive understanding of the pathways contributing to stillbirths in the South African healthcare context.

8.8.1 Maternal Attitudes and Antenatal Care Practices

The model confirms that maternal attitudes toward healthcare significantly influence antenatal care practices ($\beta = 0.551$, $p < 0.001$). This finding echoes previous studies that emphasize the role of health-seeking behavior and belief systems in shaping maternal health outcomes. Lawn et al. (2016) and Goldenberg et al. (2020) both highlight how positive maternal attitudes and early engagement with antenatal services lower stillbirth risks through early detection and timely intervention. However, the model also reveals that attitudes alone are not sufficient to directly improve health service quality (non-significant pathway), underscoring that knowledge or willingness must be supported by structural access and competent service provision. This finding supports the behavior change theories advanced by Michie et al. (2011), which assert that behavior change is driven not only by motivation but also by opportunity and capability.

8.8.2 Antenatal Care Practices and Service Quality

Antenatal care practices emerged as a pivotal mediator, linking maternal attitudes to both service quality ($\beta = 0.587$, $p < 0.001$) and infant outcomes ($\beta = 0.240$, $p = 0.001$). This result aligns with global health recommendations that advocate for regular, structured antenatal visits to monitor fetal development, identify complications, and ensure timely referrals (WHO, 2021). Consistent with Blencowe et al. (2021), the model positions antenatal care as a cornerstone of stillbirth prevention, especially when integrated with the delivery of quality health service. The pathway from antenatal care to perceived service quality reinforces the view that service users' expectations and outcomes are shaped as much by their own practices as by the systems they interact with.

8.8.3 Quality of Maternal Health Services and Infant Outcomes

The quality of maternal health services is identified as a strong predictor of infant outcomes ($\beta = 0.386$, $p < 0.001$). This result corroborates the evidence by Heazell et al. (2022), who stress that structured maternal health interventions, including timely intrapartum care, fetal monitoring, and emergency obstetric support, significantly reduce stillbirth rates. Furthermore, the qualitative narratives underscore that even when attitudes and practices are adequate, stillbirth risks remain high in environments where service quality is undermined by staff shortages, poor infrastructure, and lack of equipment—a point emphasized by Ojong et al. (2021) and Nove et al. (2021a).

8.8.4 Health System Governance and Socio-economic Context

The model illustrates that cross-cutting enablers—including health system capacity, governance, policy commitment, and socio-economic context—serve as the foundational pillars that shape the effectiveness and

sustainability of maternal healthcare interventions. These factors are deeply interdependent rather than isolated components; the success or failure of efforts to reduce stillbirth hinges on their coordinated implementation.

Qualitative insights from healthcare providers consistently underscored the importance of a reliable supply of trained staff, adequate medical equipment, and sufficient health system financing. Participants emphasized that even the presence of a highly skilled workforce cannot compensate for shortages in essential resources or the absence of strong policy support. Fragmented and inconsistent care is the inevitable outcome when sound policies are not backed by adequate funding or when well-trained professionals lack the tools and infrastructure required to deliver quality maternal healthcare. This finding aligns with the conclusions drawn by Flenady et al. (2019) and the NHS (2020), both of whom demonstrated that comprehensive policy frameworks, institutional accountability, and adherence to consistent care standards significantly contribute to the reduction of stillbirth rates.

The model also highlights the critical role of socio-economic disparities, which were repeatedly emphasized by both participants and existing literature. Income inequality, geographic inaccessibility, and limited educational opportunities emerged as indirect yet powerful drivers of stillbirth risk. As noted by Victora et al. (2020), stillbirth rates are disproportionately concentrated among socio-economically disadvantaged and marginalized populations, a trend observed both globally and within South Africa. These insights underscore the need for integrated policies that address both social and healthcare inequalities in tandem. Further supporting this perspective, Heazell et al. (2022) emphasized that system-wide coordination and strategic resource alignment are essential for translating policy intentions into meaningful clinical practice, particularly in contexts where stillbirth rates remain high.

Moreover, the qualitative findings enriched and reinforced the quantitative model, particularly in relation to systemic barriers such as under-resourced healthcare facilities, staff shortages, and inconsistent policy enforcement. Healthcare providers repeatedly highlighted the non-negotiable need for accessible infrastructure, trained healthcare personnel—especially midwives—and a stable supply of essential medical equipment to effectively prevent stillbirths. This sentiment echoes the position of the World Health Organization (2021), which emphasizes that sustained investments in health system capacity are vital for improving maternal health outcomes and reducing perinatal mortality. Similarly, Nove et al. (2021a) demonstrated that the global shortage of skilled birth attendants, particularly in resource-constrained settings, is a significant contributor to persistently high stillbirth rates.

In addition, the model draws attention to the influence of broader socio-economic determinants—including household income, maternal education, and geographic accessibility—on shaping both healthcare-seeking behaviors and maternal health outcomes. Participants identified transportation costs, unemployment, and social vulnerability as persistent barriers to timely antenatal care. These observations mirror global findings that poverty, inequality, and limited access to education are among the strongest predictors of adverse pregnancy outcomes, including stillbirth, as reinforced by the work of Victora et al. (2020).

In sum, the model highlights that reducing stillbirth is a complex, multi-layered challenge. Sustainable prevention requires not only individual behavior change but also the strengthening of healthcare systems, the alignment of policy and resources, and the reduction of structural socio-economic barriers.

Conceptual Framework: Addressing Stillbirth Risk Factors in South Africa

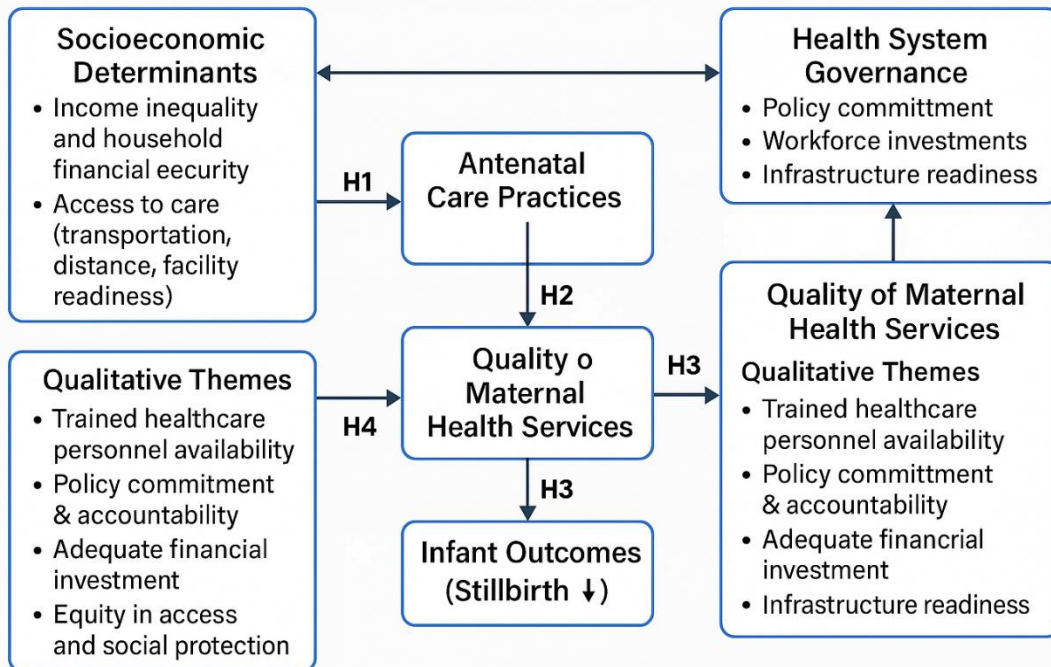


Figure 8. 2 Conceptual Framework: Addressing Stillbirth and Risk Factors in South Africa

Source: Self-generated by author

8.9 CONCLUSION

In conclusion, the integrated model emphasizes that reducing stillbirths is not merely a matter of enhancing maternal knowledge or antenatal care behavior. Instead, it necessitates a systemic, multi-dimensional approach that improves health service quality, guarantees equitable access, and fosters sustained policy and resource commitment. As the findings indicate, effective stillbirth prevention depends on translating positive maternal health attitudes into concrete practices—backed by capable, well-governed, and adequately resourced healthcare systems. This model provides a pathway for both researchers and policymakers to create targeted, evidence-based interventions that tackle stillbirth risk at various levels—individual, community, and system-wide—thereby improving maternal and neonatal survival outcomes in South Africa and similar contexts.

Chapter Nine: Conclusion and Recommendations

9.1 INTRODUCTION

This chapter presents the key conclusions and recommendations derived from the study, which aim to enhance South African maternal care within the public health system in the Lejweleputswa District Municipality. This study investigates the factors influencing the quality of antenatal care and their subsequent impact on stillbirth rates in rural South African settings, with a specific focus on the Lejweleputswa District. Stillbirth and maternal mortality remain significant public health concerns in low- and middle-income countries, with rural areas disproportionately affected due to inadequate healthcare access and poor infrastructure. Maternal healthcare quality, infrastructure, and knowledge play a fundamental role in reducing maternal mortality and stillbirth rates, particularly in rural areas where healthcare access remains a challenge (Vallely et al. 2023). Despite national policy commitments, rural communities continue to experience disproportionately high rates of stillbirth. This study's primary aim is to enhance South African maternal care within the public health system, emphasizing stillbirths in the Lejweleputswa District Municipality. To achieve this aim, the study set out the following objectives:

- To investigate underlying causes and determinants of stillbirths, making Lejweleputswa Municipality experience the highest stillbirth rate.
- Examine the effect of socio-economic factors on the quality of antenatal care and its influence on antepartum stillbirth.
- To assess the awareness and utilization of antenatal and obstetric services among pregnant women in the district.
- To analyze healthcare providers' knowledge, attitudes, and practices regarding stillbirth prevention.
- To examine maternal healthcare services in the Lejweleputswa District Municipality, including infrastructure, staffing, and quality service delivery.
- To develop a model that addresses the risk factors contributing to stillbirth

The study proposes and validates a behavioral model for stillbirth prevention that is grounded on the Andersen model of health care utilization. To strengthen the proposed framework, a mixed-method approach was adopted. Data for the quantitative phase was collected through structured surveys administered to health workers in the Lejweleputswa District Municipality. The quantitative data was collected from 263 respondents with a response rate of 73.5%. The sample included respondents from public healthcare facilities across the district. The study employed confirmatory factor analysis (CFA) and structural equation modeling (SEM) to validate the proposed model. Additionally, ANOVA and t-tests and regression analysis were conducted to determine how variables such as maternal education, household income, access to healthcare services, and employment status affect antenatal care quality and stillbirth outcomes. To complement the quantitative data, in-depth qualitative interviews were conducted with midwives, professional nurses, and medical officers working in antenatal and obstetric care units. This study was carried to further explore and contextualize the key determinants and risk factors contributing to stillbirth, as perceived by maternal healthcare providers in the Lejweleputswa District.

This chapter summarizes the main findings, discusses their implications, and provides actionable recommendations for the improvement of maternal care services and stillbirth prevention providers in the Lejweleputswa District.

9.2 SUMMARY OF PRIMARY RESEARCH FINDINGS

Objective One aimed to investigate the root causes of stillbirths in the Lejweleputswa District Municipality, which bears the highest stillbirth rate in the Free State Province. The integrated findings revealed that stillbirths result from a complex interplay of medical, socio-economic, systemic, and cultural factors. The study quantitatively identified hypertensive disorders, particularly preeclampsia and gestational hypertension, as the strongest clinical predictors, alongside HIV, diabetes, and other chronic maternal conditions. Socio-economic hardships such as poverty, limited education, and food insecurity further compounded the risk, restricting access to timely and quality antenatal care. Qualitative interviews deepened these insights by highlighting systemic healthcare barriers, including staff shortages, poor infrastructure, and negative provider attitudes, as well as the influence of cultural beliefs, traditional medicine use, and financial constraints on delayed care-seeking. Both data strands converged to confirm that stillbirth in Lejweleputswa is rarely caused by a single factor but rather emerges from the combined effects of health conditions, social inequalities, under-resourced systems, and entrenched cultural practices.

Objective Two explored how socio-economic factors shape antenatal care quality and influence antepartum stillbirth risk in the Lejweleputswa District Municipality. The integrated findings revealed that education, income, transport access, and social inequalities are key determinants of ANC engagement and stillbirth outcomes. The quantitative analysis indicated that women with higher education and stable income were more likely to initiate early ANC, maintain consistent follow-up, and adopt healthier behaviors, while poverty, food insecurity, and unreliable transport increased stillbirth risk. Qualitative interviews reinforced these patterns, highlighting how financial hardship, geographic isolation, and social stigma—especially for adolescents and marginalized women—delayed care-seeking and compromised maternal and fetal health. The findings confirm that socio-economic disparities are central to stillbirth risk and call for integrated policies addressing poverty, education, transport, and culturally respectful care to reduce preventable stillbirths in the district.

The third objective explored the awareness and utilization of antenatal and obstetric services among pregnant women in Lejweleputswa District, based on qualitative insights from healthcare professionals. The findings revealed that while most women exhibited high awareness of available maternal health services—driven by sustained health education campaigns and outreach by community health workers (CHWs)—this knowledge did not consistently translate into service utilization. Behavioral factors, cultural beliefs, prior pregnancy experiences, and perceived low risk often led to delayed or missed antenatal visits.

Additionally, systemic challenges such as long waiting times, staff shortages, inefficient referrals, and limited transport access, especially in rural areas, hindered care-seeking behavior. Negative healthcare provider attitudes and social stigma, particularly toward adolescents and unmarried women, also discouraged consistent engagement with services. Despite these barriers, CHWs emerged as vital facilitators, helping bridge the gap between communities and health facilities by fostering trust and encouraging early antenatal care attendance.

These findings highlight the need for integrated strategies that address both systemic inefficiencies and social determinants to improve maternal healthcare utilization in the district.

This objective four explored healthcare providers' knowledge, attitudes, and practices regarding stillbirth prevention using both quantitative and qualitative approaches. The key finding suggests that healthcare providers demonstrated solid awareness of traditional stillbirth risk factors, including maternal age, smoking, hypertension, pre-eclampsia, and placental abruption. However, both data strands identified knowledge gaps around emerging risk factors like obesity and diabetes, pointing to the need for continuous education and guideline updates. Knowledge was positively linked to improved clinical practices, underlining its role in proactive stillbirth prevention. The key finding showed that healthcare providers largely recognize the importance of positive, compassionate, and respectful attitudes in ANC attendance and reducing stillbirth risk. Negative attitudes, often driven by burnout and systemic pressures, were identified as barriers to care-seeking. Both quantitative and qualitative results emphasized that fostering empathetic provider-patient relationships is essential for improving maternal health outcomes.

Healthcare providers widely agreed on the importance of regular ANC visits, early detection of complications, and structured referral systems. Qualitative insights, however, revealed challenges like transport delays, inconsistent emergency responses, and limited access in rural areas, which often undermine timely interventions. The need for ongoing professional development, especially for midwives, was highlighted as critical to sustaining effective stillbirth prevention practices.

The integrated findings affirm that while healthcare providers possess strong foundational knowledge and positive attitudes, systemic barriers and training gaps continue to limit the full implementation of best practices for stillbirth prevention. Strengthening continuous education, improving healthcare infrastructure, and supporting staff welfare are essential to enhance maternal and perinatal outcomes.

Objective Five aimed to assess the quality of maternal healthcare services in the Lejweleputswa District Municipality, focusing on infrastructure, staffing, and service delivery. Both quantitative and qualitative findings highlighted generally positive perceptions of care, though operational shortcomings remain. The key findings from the quantitative data findings revealed high levels of satisfaction among respondents ($M = 3.90$, $SD = 0.54$), with 76.4% agreeing that services met the standards required to reduce stillbirths. Strong communication was noted, with 91.3% reporting clear follow-up instructions and 85.2% confirming routine risk-factor screenings. However, 45.6% of participants expressed concern over inadequate staffing, and 18.6% flagged infrastructure shortcomings. A regression analysis confirmed that maternal healthcare services significantly influenced infant outcomes, explaining 25.3% of the variance ($\beta = 0.503$, $p < 0.001$).

Similarly, the qualitative findings supported these insights, with participants praising healthcare providers for comprehensive care and effective communication. However, participants consistently voiced concerns about staff shortages, emergency response delays, and inadequate infrastructure, including outdated equipment and unreliable utilities. These barriers were perceived as undermining the quality and timeliness of care, despite overall positive ratings. The triangulation of data confirmed that while maternal healthcare services were generally viewed as satisfactory, persistent issues in staffing, infrastructure, and emergency logistics limit their

effectiveness. Both data strands stressed the crucial role of comprehensive screenings, skilled staffing, timely interventions, and effective communication in improving maternal and infant outcomes.

Objective Five explored the quality of maternal healthcare services in the Lejweleputswa District Municipality, focusing on infrastructure, staffing, and service delivery. Both quantitative and qualitative findings revealed that maternal healthcare services were generally perceived as satisfactory, particularly in aspects like patient-provider communication, follow-up care, and comprehensive screenings for risk factors. The key findings from the qualitative results showed high satisfaction levels ($M = 3.90$, $SD = 0.54$), with 76.4% of respondents affirming that services met stillbirth prevention standards and 85.2% confirming routine risk screenings. Clear communication was another strength, with 91.3% of respondents reporting consistent follow-up instructions. However, concerns emerged over staffing (45.6% disagreed that staffing was sufficient) and infrastructure (18.6% raised concerns). Regression analysis confirmed that maternal healthcare quality significantly influenced infant outcomes ($\beta = 0.503$, $p < 0.001$).

The quantitative findings are further complemented by the qualitative results, which highlight strong patient appreciation for comprehensive care and clear communication, but also recurrent frustrations over understaffing, equipment shortages, and delays in emergency response (especially ambulance services). Participants stressed that while the care received was often good, systemic gaps, including insufficient staff and outdated or inadequate infrastructure, limited the reliability and accessibility of services. The triangulation of both data sets confirmed that despite high satisfaction with the quality of care, operational barriers like staffing shortages, infrastructure limitations, and emergency response delays remain critical challenges. The findings echo global literature, affirming that quality maternal care, including regular screenings, early complication detection, and timely interventions is central to improving maternal and infant outcomes.

Objective Six focused on developing and validating a conceptual model to address risk factors contributing to stillbirth in the Lejweleputswa District Municipality, South Africa. Using a mixed-methods approach grounded in the health belief model, the study combined both quantitative and qualitative data to identify and structure key determinants influencing stillbirth risk. The key findings from the quantitative results, particularly from PCA, extracted six core components that accounted for 68.073% of the variance. This affirmed the complex, multifactorial nature of stillbirth causes. CFA validated constructs like attitudes toward maternal healthcare, antenatal care practices, and quality of maternal health services as statistically sound. Attitudes toward maternal healthcare positively influenced antenatal care practices ($\beta = 0.551$, $p < 0.001$). Antenatal care practices predicted both quality of maternal health services ($\beta = 0.587$, $p < 0.001$) and infant outcomes ($\beta = 0.240$, $p = 0.001$). Quality of maternal health services was the strongest predictor of infant outcomes ($\beta = 0.386$, $p < 0.001$).

Notably, attitudes alone did not directly impact service quality, underscoring the need to translate knowledge and beliefs must into actionable health practices for real improvements. This finding aligned with earlier maternal health research. This model offers a structured framework for healthcare providers and policymakers, emphasizing the critical role of promoting antenatal care practices and enhancing service quality to reduce stillbirth risks. The qualitative interviews deepened the understanding of stillbirth risk factors by highlighting real-world barriers and enablers to implementing a prevention model. Healthcare providers emphasized three critical requirements for success: strategic planning and resources, financial investment, and strong policy and

management commitment. Participants stressed that skilled healthcare professionals, especially midwives, and accessible maternal health services are essential to reducing stillbirths reinforcing global evidence (Patterson et al., 2022; Victora et al., 2020). Socio-economic disparities, infrastructure shortages, and staff deficits were identified as significant barriers, which underline the impact of underfunded health systems on maternal and newborn outcomes.

The integration of quantitative and qualitative data showed strong alignment. While quantitative analysis confirmed the pathways between maternal attitudes, care practices, service quality, and infant outcomes, qualitative insights illuminated the operational realities—such as financial shortfalls, policy gaps, and workforce challenges—that directly influence these factors. Participants confirmed that improving attitudes alone is insufficient without systemic support. The results underscore that stillbirth prevention demands a holistic approach combining healthcare practice, service quality enhancement, and robust health system governance. The study concludes that the proposed stillbirth prevention model is both evidence-based and context-specific, but its success will depend on policy translation, sustainable funding, and ongoing investment in human resources.

9.3 CONCLUSIONS FOR EACH OBJECTIVE

9.3.1 Conclusions on investigating the underlying causes and determinants of stillbirths in Lejweleputswa Municipality

The study achieved objective one, which sought to investigate underlying causes and determinants of stillbirths, making Lejweleputswa Municipality experience the highest stillbirth rate. In conclusion, the findings from objective one revealed that stillbirth is a multifactorial outcome shaped by the intersection of medical, socio-economic, systemic, and cultural influences. Hypertensive disorders, HIV, and diabetes emerged as the most significant clinical predictors, while poverty, limited education, and food insecurity further heightened the risk by limiting access to quality antenatal care. Qualitative insights confirmed that systemic healthcare shortcomings and culturally shaped health-seeking behaviors also contribute to the persistence of stillbirths. Together, these findings underscore the need for a comprehensive, integrated approach that addresses both the clinical and social determinants of maternal and fetal health to reduce stillbirth rates in the district.

9.3.2 Conclusion on the effect of socio-economic factors on the quality of antenatal care and its influence on antepartum stillbirth

The study achieved objective two, which sought to examine the effect of socio-economic factors on the quality of antenatal care and its influence on antepartum stillbirth. The study affirms that improving the quality of antenatal care and reducing antepartum stillbirth in the district is contingent on addressing the socio-economic conditions that shape women's health choices and opportunities. Sustainable progress will depend on a coordinated response from health systems, social policy frameworks, and community-based initiatives aimed at creating an equitable environment where every woman can access safe and respectful maternity care.

9.3.3 Conclusion on the awareness and utilization of antenatal and obstetric services among pregnant women in the district

The study achieved research objective three, which sought to assess the awareness and utilization of antenatal and obstetric services among pregnant women in the district. The study reveals that while awareness of antenatal and obstetric services in the district is relatively high, significant barriers, including health system inefficiencies, geographic isolation, financial hardship, healthcare worker attitudes, and sociocultural stigma, continue to limit the full and timely utilization of these services. The study underscores the urgent need for multi-layered interventions that not only enhance health education but also strengthen health system capacity, reduce access barriers, and promote culturally sensitive and respectful maternal care.

9.3.4 Conclusion on healthcare providers' knowledge, attitudes, and practices regarding stillbirth prevention

The study achieved research objective four, which sought to analyze healthcare providers' knowledge, attitudes, and practices regarding stillbirth prevention. The findings revealed that healthcare providers possess strong foundational knowledge of established stillbirth risk factors and display positive attitudes toward compassionate, respectful maternity care. However, knowledge gaps around emerging risks such as obesity and diabetes, along with burnout-induced negative attitudes, highlight the need for continuous training and staff support to sustain best practices. In terms of service quality, both quantitative and qualitative data indicated general satisfaction with maternal healthcare services, particularly regarding communication and risk screening. Nonetheless, persistent barriers, including staff shortages, outdated infrastructure, and delays in emergency responses, continue to undermine the effectiveness of care.

9.3.5 Conclusion on maternal healthcare services in the Lejweleputswa District Municipality

The study achieved research objective five, which sought to examine maternal healthcare services in the Lejweleputswa District Municipality, including infrastructure, staffing, and quality service delivery. The findings reveal that while maternal healthcare services in the Lejweleputswa District Municipality are generally perceived as satisfactory, critical gaps remain in staffing, infrastructure, and emergency response systems. High levels of patient satisfaction were reported, particularly regarding comprehensive antenatal screenings, clear follow-up communication, and the perceived role of quality care in preventing stillbirths. However, qualitative insights and quantitative data both highlighted persistent concerns over staff shortages, inadequate medical equipment, and delays in emergency interventions. The strong correlation between service quality and improved infant outcomes confirms the essential role of accessible, well-resourced, and timely maternal healthcare.

9.3.6 Conclusion on developing a model that addresses the risk factors contributing to stillbirth

The study achieved research objective five, which sought to develop a model that addresses the risk factors contributing to stillbirth. The quantitative analysis through PCA and CFA confirmed the multifaceted nature of stillbirth determinants, which thus highlights the critical pathways between maternal attitudes, antenatal care

practices, service quality, and infant outcomes. The strongest predictor of improved infant outcomes was the quality of maternal health services, while attitudes alone were insufficient without practical action. The qualitative findings enriched this framework by identifying systemic barriers such as resource constraints, policy gaps, and workforce shortages, underscoring the need for strategic investment and governance reform. Together, these results emphasize that stillbirth prevention requires not only improving maternal health behaviors but also strengthening healthcare systems to support sustainable, high-quality care. The proposed model offers a practical, evidence-based roadmap for policymakers and practitioners aiming to reduce stillbirth risks in similar resource-limited settings.

9.4 THEORETICAL AND PRACTICAL CONTRIBUTIONS

The study makes significant theoretical and practical contributions to the field of maternal and child health, specifically in understanding stillbirth determinants within the South African healthcare context.

9.4.1 Theoretical contributions of the study

This study makes significant theoretical contributions to the field of maternal health and reproductive epidemiology, particularly within under-resourced settings in South Africa. Grounded on both the Andersen model of health care utilization and the Precede-Proceed Model, the study enhances theoretical understanding of the multifaceted factors contributing to stillbirths. The research underscores the interaction between structural, health system, socio-cultural, and individual-level determinants, offering an expanded view of the pathways through which stillbirths occur beyond clinical risk factors. By demonstrating how delays in seeking, reaching, and receiving adequate care intertwine with socio-economic deprivation, cultural beliefs, and healthcare infrastructure deficiencies, the study deepens the theoretical discourse on preventable perinatal mortality in developing countries.

Furthermore, the study extends the Andersen model of health care utilization and the Precede-Proceed Model by providing empirical evidence on how maternal education, household income, health facility accessibility, and systemic inefficiencies collectively influence pregnancy outcomes. The incorporation of qualitative data enriches theoretical models by embedding lived experiences and contextual realities, offering a more human-centered interpretation of existing theories.

9.4.2 Practical Contributions of the Study

The study also offers practical implications for healthcare practitioners, policymakers, and community stakeholders working to reduce stillbirth rates in South Africa. The findings provide actionable insights into the design and implementation of maternal health interventions at both the health system and community levels.

The research highlights the urgent need for strengthening antenatal care accessibility, improving referral systems, and addressing staff shortages and equipment deficiencies at district hospitals and clinics. Based on participant experiences, the study recommends targeted community outreach programs to raise awareness about stillbirth risks, especially among women in socio-economically disadvantaged and rural areas.

Additionally, the study underscores the importance of culturally sensitive health education that addresses harmful beliefs and stigma surrounding stillbirths, thereby fostering open communication between expectant mothers and healthcare providers. The identification of system-level inefficiencies, such as delayed responses during obstetric emergencies and inconsistent monitoring during labor, emphasizes the need for healthcare quality assurance, ongoing staff training, and improved accountability mechanisms.

These practical insights can guide district health planners and national policymakers in refining maternal health policies while also informing future programmatic interventions designed to reduce stillbirth incidence, enhance maternal trust in healthcare services, and improve neonatal outcomes in South Africa and comparable contexts.

9.5 RECOMMENDATIONS

The study's findings supported by relevant literature, propose the following eight recommendations are proposed to enhance maternal care services in Lejweleputswa. The recommendations are rooted in both the primary findings and best international best practices that are designed to address the systemic, social, medical, and cultural determinants of stillbirths holistically.

9.5.1. Strengthen Hypertensive Disorder Screening and Management During Antenatal Care

The primary research findings, clearly indicate that hypertensive disorders, especially preeclampsia and gestational hypertension, were the strongest predictors of stillbirth, highlighting critical deficiencies in early detection and management. The study, therefore, recommends the implementation of routine blood pressure monitoring and urine protein testing at every antenatal visit. In addition, it is critical that hospital management fast-track referrals for high-risk cases and supply antihypertensives at community clinics to improve maternal-fetal outcomes. This recommendation is supported by the literature. For example, Goldenberg et al. (2011) and Magee et al. (2022) emphasize that hypertensive disorders are globally recognized as leading causes of placental insufficiency, intrauterine growth restriction, and stillbirth.

9.5.2 Expand Integrated Chronic Disease Management for Pregnant Women

The study findings uncovered that chronic conditions like HIV and diabetes were statistically linked to increased risks of stillbirth, a situation compounded by poor access to treatment in resource-limited settings. Hence, it is highly recommended that hospital management integrate HIV, diabetes, and hypertension management into routine ANC services at the primary healthcare level, along with case management protocols and decentralized drug delivery to ensure treatment continuity. The recommendation supports other scholars such as Cohan et al. (2023) and McCance et al. (2019), who stress the importance of consistent antenatal monitoring for chronic conditions to prevent maternal and fetal complications.

9.5.3 Implement Socio-economic Support Programs for Vulnerable Mothers

The study findings disclosed that low-income households, minimal education, and food insecurity were directly associated with higher stillbirth rates. Milton et al. (2022) and Kotzee et al. (2024b) confirm that poverty and educational barriers restrict healthcare access and raise the risk of pregnancy complications. As such, the study

recommends that maternal care services in Lejweleputswa establish maternal health vouchers or cash-transfer schemes tied to antenatal attendance, along with food supplementation programs for at-risk pregnant women in low-income settings.

9.5.4 Improve Healthcare Facility Infrastructure and Resource Availability

One of the critical concerns found in the study was attributable to staff shortages, unreliable equipment, and deteriorating infrastructure undermining quality care and timely interventions. In light of this, the study highly recommends that maternal care services in Lejweleputswa prioritize infrastructure upgrades, reliable electricity and water supply, and equipment maintenance in maternity wards while investing in telemedicine and mobile outreach for rural clinics. This recommendation is particularly important given that other scholars, such as Malakoane et al. (2020) and Kruk et al. (2022), found that health system deficiencies directly contribute to poor maternal and neonatal outcomes.

9.5.5 Launch Community-Engaged, Culturally Sensitive Health Education Campaigns

The primary results reveal that cultural reliance on traditional medicine and skepticism toward medical advice led to delayed healthcare seeking and increased stillbirth risk. This conclusion is strongly confirmed by other scholars, such as Mogawane et al. (2021) and Felisian et al. (2023), who found that cultural beliefs strongly shape maternal health decisions in rural African communities. Hence, it is reasonable to recommend that maternal care services in Lejweleputswa develop community-centered health dialogues involving traditional healers, elders, and local leaders to address myths, encourage early ANC booking, and promote biomedical care while respecting cultural norms.

9.5.6 Expand Community Health Worker (CHW) Outreach and Support

The study findings identified CHWs as pivotal in bridging the gap between healthcare systems and pregnant women, especially in marginalized communities. This study therefore recommends the strengthening of CHW recruitment, training, and support, with clear guidelines for early pregnancy identification, stillbirth risk education, and home-based follow-up for high-risk mothers. This recommendation is in line with Le Roux et al. (2020) and Lassi et al. (2016) who found that CHWs improve ANC utilization and maternal outcomes, especially in under-resourced rural settings.

9.5.7 Address Health Worker Attitudes and Burnout to Improve Patient Trust

Data collected frequently cited negative staff attitudes and burnout as barriers to care-seeking, particularly among young or marginalized women. Given this concern, the study highly recommends that management of the maternity clinic implement respectful maternity care (RMC) training and psychosocial support programs for health workers, along with fair workloads and debriefing practices to reduce burnout and patient mistreatment. The recommendation has strong support from Mapumulo et al. (2021), who highlight the strong link between respectful maternity care and improved maternal service uptake.

9.5.8 Enhance Emergency Transport and Referral Systems

The data gathered from the primary finding suggests that unreliable transport, especially in rural areas, delays access to emergency obstetric care and increases stillbirth risk. Scholars such as Moyer and Mustafa (2013) and Dahab and Sakellariou (2020) confirm transport limitations as a major factor in maternal and perinatal deaths. Given the persistent challenges of transport in the district, it is recommended that maternal care services in Lejweleputswa invest in district-level obstetric ambulances and subsidized transport vouchers for pregnant women and establish rapid referral pathways for high-risk pregnancies across healthcare facilities.

9.6 LIMITATIONS AND DIRECTIONS FOR FUTURE STUDIES

The limitations identified in the study, as well as proposed directions for future studies, are detailed in this section.

9.6.1 Study limitations

Although the study followed robust methodological research drawing from the strengths of both quantitative and qualitative research designs to gain valuable insights on how to enhance South African maternal care within the public health system within the Lejweleputswa District Municipality, it is also ethical to acknowledge certain limitations. Firstly, the study was conducted exclusively within the Lejweleputswa District Municipality, a region characterized by its unique socio-economic, healthcare, and cultural landscape. While the findings offer critical insights into the underlying causes of stillbirths in this district, the localized scope limits the generalizability of the results to other regions of South Africa or other low- and middle-income countries. The determinants identified may manifest differently in areas with alternative healthcare systems, economic conditions, or cultural beliefs. Another limitation is that the qualitative component included a limited number of healthcare professionals, primarily midwives and nurses, from public healthcare facilities. While their insights were invaluable, the perspectives of private practitioners, community leaders, and traditional birth attendants were not incorporated, limiting the diversity of professional viewpoints on stillbirth determinants.

9.6.2 Directions for future studies

To build upon the findings of this research, future studies should adopt longitudinal designs to monitor pregnant women across the full continuum of care, that is, from early pregnancy through delivery, to establish causal relationships between maternal health conditions, socio-economic status, healthcare utilization, and stillbirth outcomes. Such designs would also allow for the identification of critical intervention points.

While it is acknowledged that the study was conducted exclusively in the Lejweleputswa District Municipality, given the maternal and infant mortality in sub-Saharan Africa, expanding the research to include multiple districts or provinces would enable comparative analysis to determine whether the patterns observed in Lejweleputswa are consistent across South Africa or specific to its socio-economic and healthcare profile. Such comparisons would strengthen the policy relevance and scalability of intervention recommendations.

Additionally, future qualitative research should integrate the voices of community leaders, traditional birth attendants, and family decision-makers. Given the cultural factors influencing maternal healthcare-seeking behavior, these stakeholders can offer insights into belief systems and practices that formal healthcare workers may not fully capture. There is a pressing need for studies that go beyond the identification of determinants and test the effectiveness of specific interventions. Community health education programs, culturally sensitive outreach models, and health system strengthening initiatives should be piloted and evaluated for their impact on reducing stillbirth rates.

9.7 CONTRIBUTION OF THE STUDY

The insights generated from this study are expected to significantly contribute to the body of knowledge on the determinants of stillbirths in South Africa, with a particular focus on the Lejweleputswa District Municipality in the Free State province. This study will enhance existing research on maternal and child health by offering a contextualized understanding of the complex interplay between socio-economic barriers, healthcare system inefficiencies, cultural practices, and medical factors that contribute to stillbirths in under-resourced settings.

This research will complement recent studies on maternal health inequalities in low- and middle-income countries, providing a localized perspective on how structural, individual, and community-level determinants shape pregnancy outcomes. The study is poised to add to the growing literature on reproductive health challenges in South African rural districts, offering valuable insights into the lived experiences of affected women and the perspectives of healthcare professionals involved in maternal care.

Moreover, this study will make a distinct contribution by adopting a multi-stakeholder approach, capturing both patients and healthcare providers' voices to present a holistic and nuanced understanding of the factors influencing stillbirths. By addressing both health system and socio-cultural dimensions, the research aims to bridge gaps between epidemiological data and qualitative human experiences, thus informing both policy and practice.

Therefore, the findings of this study are intended to represent an important first step in strengthening maternal health policy formulation, community engagement strategies, and healthcare service delivery aimed at reducing stillbirth rates in South Africa. It further intends to contribute to the global literature on preventable perinatal mortality in developing regions and offers foundational insights for designing targeted interventions and future research aimed at improving maternal and neonatal outcomes.

9.8 CONCLUSIONS

In conclusion, this study sheds light on the complex and multifaceted nature of stillbirths in the Lejweleputswa District Municipality, which holds the highest stillbirth rate in the Free State Province. The integrated findings confirm that stillbirths arise from an intricate interplay of medical, socio-economic, systemic, and cultural factors rather than a single, isolated cause. The quantitative results identified hypertensive disorders, particularly preeclampsia and gestational hypertension, along with HIV, diabetes, and other chronic maternal conditions as

key clinical predictors, while socio-economic hardships such as poverty, low educational attainment, and food insecurity significantly restricted access to timely and quality antenatal care.

The qualitative insights further revealed that systemic healthcare barriers, including staff shortages, poor infrastructure, negative healthcare provider attitudes, and inefficient referral systems, compounded the risks associated with stillbirth. Cultural beliefs, the use of traditional medicine, and financial limitations also shaped women's care-seeking behaviors, often leading to delays in accessing antenatal and obstetric services.

The study also demonstrated that, despite although awareness of antenatal and obstetric services was relatively high due to community outreach efforts and health education campaigns, knowledge alone did not guarantee utilization. Social stigma, perceived low risk, logistical obstacles, and institutional inefficiencies remained significant barriers that hindered women from fully engaging with maternal healthcare services. Ultimately, the findings highlight the urgent need for comprehensive, integrated interventions that go beyond clinical care to address the underlying social determinants of stillbirth. Policies aimed at poverty reduction, health education, improved transport, culturally sensitive care, and strengthening community health systems are essential for reducing stillbirth rates in the district. The study provides a strong foundation for future research and policy planning, offering evidence-based insights to guide healthcare providers, policymakers, and community leaders in designing more equitable and responsive maternal health strategies for resource-constrained settings like Lejweleputswa.

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APPENDICES

Appendix 1: Questionnaire



Enhancing South African maternal care within the public health system: A case of stillbirths in the Lejweleputswa District Municipality

Greetings,

My name is Simbarashe Magaisa, a PhD student in Management Sciences at the Durban University of Technology, South Africa. I am conducting research on the topic *"Enhancing South African Maternal Care within the Public Health System: A Case of Stillbirths in the Lejweleputswa District Municipality."* The aim of this study is to improve maternal healthcare delivery and contribute to the reduction of stillbirths in the district.

You have been carefully selected as a key participant in this study due to your valuable knowledge and experience. Your participation is entirely voluntary and will take place at your convenience. Please be assured that all information you provide will be treated with strict confidentiality and will not be used against you in any way.

Would you be willing to participate in this study?

1. Yes
2. No

Questionnaires

Questionnaires Number

Job Title:

Healthcare Facility:

Demographic factors

1. What is your age?

Under 24 years	25- 34 years	35-44 years	55-64 years	Above 65 years
1	2	3	4	5

2. What is your gender?

Male	Female	Other (please specify)	Prefer not to say	
1	2	3	4	

3. What is the highest level of education you have completed?

Diploma	Bachelors	Honors	Masters	PhD
1	2	3	4	5

Others, please specify.....

4. What is your marital status?

Single	Married	Separated	Divorced	Widowed
1	2	3	4	5

5. What is your specialty?

Nurse	Midwife	Gynaecologist	General Doctor	Other
1	2	3	4	5

Other, please specify.....

6. What is your ethnicity?

Black	Colored	White	Indian	Others
1	2	3	4	5

Other, please specify.....

7. How many children do you have?

None	1	2	3	More than 3
1	2	3	4	5

General Knowledge

1. How many years have you been serving in maternal healthcare

0 to 2 years	2 to 5 years	5- 8 Years	8 -10 yes	10 years and above
1	2	3	4	5

2. This facility provides adequate information, education, and communication materials to educate clients about stillbirth prevention.

Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
1	2	3	4	5

3. I regularly provide information to pregnant women about stillbirth prevention during antenatal check-ups.

Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
1	2	3	4	5

4. I feel confident in screening pregnant women for stillbirth risk factors during ANC visits.

Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
1	2	3	4	5

5. Training programs for healthcare providers are essential for improving stillbirth outcomes.

Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
1	2	3	4	5

6. I believe educating men about antenatal care and stillbirth risks is essential for reducing maternal and infant mortality.

Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
1	2	3	4	5

7. I know the guidelines regarding the prevention and management of stillbirth at this health facility.

Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
1	2	3	4	5

8. I regularly update my knowledge of stillbirth prevention through training and workshops.

Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
1	2	3	4	5

9. I know the specific steps to take if a pregnant woman is at high risk for stillbirth.

Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
1	2	3	4	5

10. The training provided to healthcare workers on stillbirth prevention is adequate at this facility.

Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
1	2	3	4	5

Knowledge of Stillbirth

This category assesses healthcare providers' understanding of stillbirth causes, prevention strategies, and their role in reducing stillbirth rates.

11. Does maternal age play a role in the causes of stillbirth?

Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
1	2	3	4	5

12. Does obesity cause stillbirth?

Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
1	2	3	4	5

13. Does diabetes cause stillbirth?

Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
1	2	3	4	5

14. Does smoking during pregnancy lead to stillbirth?

Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
1	2	3	4	5

15. Hypertension causes stillbirth.

Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
1	2	3	4	5

16. I am aware of the signs and symptoms of pre-eclampsia (e.g., high blood pressure, swelling, and protein in urine).

Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
1	2	3	4	5

17. I feel confident in identifying early warning signs of pre-eclampsia in pregnant women.

Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
1	2	3	4	5

18. I believe that timely detection of pre-eclampsia can significantly reduce the risk of stillbirth.

Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
1	2	3	4	5

19. I am aware of the signs and symptoms of placental abruption (e.g., vaginal bleeding, abdominal pain, and contractions).

Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
1	2	3	4	5

20. I believe that early detection of placental abruption can significantly reduce maternal and fetal risks.

Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
1	2	3	4	5

Attitude Towards Maternal Healthcare

This category evaluates the attitudes of healthcare workers towards maternal healthcare services and their impact on stillbirth prevention.

21. I believe that regular antenatal check-ups can significantly reduce the risk of stillbirth.

Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
1	2	3	4	5

22. Providing compassionate care to pregnant women improves their engagement with antenatal care services.

Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
1	2	3	4	5

23. I feel that cultural beliefs influence health-seeking behavior among pregnant women in this community.

Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
1	2	3	4	5

24. It is important to address women's concerns about stillbirth during every ANC visit.

Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
1	2	3	4	5

25. The attitudes of healthcare workers towards pregnant women can either encourage or discourage continued care.

Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
1	2	3	4	5

26. Improving maternal healthcare attitudes can lead to better pregnancy outcomes.

Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
1	2	3	4	5

27. More efforts should be made to change negative attitudes towards antenatal care in this community.

Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
1	2	3	4	5

28. Pregnant women in this community are motivated to seek antenatal care regularly.

Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
1	2	3	4	5

29. Pregnant women understand the importance of attending all recommended ANC visits.

Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
1	2	3	4	5

30. Attitudes toward antenatal care in this community influence the overall quality of maternal health services.

Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
1	2	3	4	5

Socio-economic Factors

These questions assess the impact of socio-economic conditions (income, education, etc.) on the ability to access maternal care services and reduce stillbirth.

31. Women with higher education levels are more likely to attend regular antenatal care visits.

Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
1	2	3	4	5

32. Low-income women face more barriers to accessing quality antenatal care services.

Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
1	2	3	4	5

33. Lack of transportation is a major factor preventing women from attending antenatal check-ups in this area.

Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
1	2	3	4	5

34. Women from poorer households are less likely to seek maternal health care compared to women from higher-income households.

Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
1	2	3	4	5

35. Income level significantly impacts whether women can afford adequate nutrition during pregnancy.

Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
1	2	3	4	5

36. Higher educational attainment among women leads to better awareness of stillbirth risk factors.

Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
1	2	3	4	5

37. Increased financial support for pregnant women would significantly improve antenatal care attendance.

Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
1	2	3	4	5

38. Educational programs in this community have successfully improved knowledge of maternal care and stillbirth prevention.

Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
1	2	3	4	5

39. Socio-economic inequality contributes to disparities in antenatal care service utilization.

Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
1	2	3	4	5

40. Income and employment status influence maternal health outcomes in this community.

Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
1	2	3	4	5

Practices Related to Antenatal Care

These questions evaluate healthcare workers' practices during antenatal care visits and how they affect stillbirth outcomes.

41. Antenatal care visits play a critical role in preventing stillbirths.

Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
1	2	3	4	5

42. I always inform pregnant women about the importance of attending all their scheduled ANC visits.

Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
1	2	3	4	5

43. Early detection of warning signs during antenatal care helps prevent stillbirths.

Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
1	2	3	4	5

44. Regular ANC visits are promoted and encouraged at this health facility.

Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
1	2	3	4	5

45. I provide information on the symptoms and warning signs that require urgent medical attention.

Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
1	2	3	4	5

46. There is a structured system in place for referring high-risk pregnancies to specialized care.

Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
1	2	3	4	5

47. A minimum of four ANC visits is required for normal pregnancies without complications.

Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
1	2	3	4	5

48. I feel that antenatal care practices in this facility meet the standard guidelines for reducing maternal and infant mortality.

Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
1	2	3	4	5

49. I always advise pregnant women to follow a proper nutrition and exercise plan during pregnancy.

Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
1	2	3	4	5

50. Regular monitoring of fetal growth during ANC visits is critical for detecting potential stillbirth risks.

Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
1	2	3	4	5

Quality of Maternal Health Services

This section assesses the quality of maternal healthcare services available, focusing on service provision, staff competence, and overall healthcare infrastructure.

51. The maternal healthcare services in this facility meet the standard required for reducing stillbirths.

Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
1	2	3	4	5

52. We have sufficient staff to handle the volume of maternal care cases at this facility.

Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
1	2	3	4	5

53. Access to quality maternal healthcare services is critical in preventing stillbirths.

Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
1	2	3	4	5

54. I believe that poor-quality maternal services are responsible for adverse pregnancy outcomes like stillbirths.

Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
1	2	3	4	5

55. The healthcare infrastructure at this facility is adequate to support safe and effective maternal care.

Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
1	2	3	4	5

56. After each antenatal consultation, women are provided with clear information on when to return for follow-up visits.

Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
1	2	3	4	5

57. The antenatal care provided at this facility includes comprehensive screening for risk factors associated with stillbirth.

Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
1	2	3	4	5

58. In case of maternal complications, timely interventions are always carried out to prevent adverse outcomes, including stillbirths.

Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
1	2	3	4	5

59. Communication between healthcare providers (doctors, nurses, midwives) in this facility ensures that maternal cases are handled effectively and on time.

Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
1	2	3	4	5

60. Women who experience high-risk pregnancies receive adequate support and counseling from healthcare professionals at this facility to minimize risks to maternal and fetal health.

Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
1	2	3	4	5

Infant Outcome

61. Current maternal health practices help reduce maternal mortalities.

Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
1	2	3	4	5

62. Is there a need to improve current maternal practices to improve maternal outcomes?

Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
1	2	3	4	5

63. The existing Guidelines for Maternity Care in South Africa help improve maternal outcomes.

Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
1	2	3	4	5

64. The current Guidelines for Maternity Care in South Africa need improvement to increase positive maternal outcomes.

Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
1	2	3	4	5

65. Do you think the current healthcare infrastructure supports safe and effective delivery and maternal

care?

Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
1	2	3	4	5

66. Current healthcare infrastructure needs improvements to support safe and effective delivery and maternal care.

Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
1	2	3	4	5

67. Are you confident in handling complicated pregnancies and reducing adverse outcomes such as stillbirths?

Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
1	2	3	4	5

68. Healthcare providers need more confidence in handling complicated pregnancies and reducing adverse outcomes such as stillbirths.

Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
1	2	3	4	5

69. The current interventions reduce the occurrence of stillbirths.

Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
1	2	3	4	5

70. Current interventions need improvements to reduce the occurrence of stillbirth.

Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
1	2	3	4	5

Any other contributions or comments

.....

.....

.....

.....

.....

Thank you for participating

Contacts: Tel No +27 60 7258333 e-mail: simbamagaaisa18@gmail.com/ 22384490@dut4life.ac.za

Appendix 2: Interview Questions



Enhancing South African maternal care within the public health system: A case of stillbirths in the Lejweleputswa District Municipality

Dear Participant,

My name is Simbarashe Magaisa. I am a PhD student in Management Sciences at the Durban University of Technology, South Africa. I am conducting research on the topic: *"Enhancing South African Maternal Care within the Public Health System: A Case of Stillbirths in the Lejweleputswa District Municipality."*

The purpose of this study is to gain deeper insights into the factors contributing to stillbirths and to explore ways of improving maternal healthcare services in the public health sector. You have been carefully selected to share your experiences and perspectives on maternal health service delivery within your facility or community.

Your participation in this interview is entirely voluntary and will be arranged at your convenience. Please note that any information you provide will be treated with the strictest confidentiality and will not be used against you in any way.

Job Title:

Healthcare Facility:

Interview Questions

For Healthcare Providers:

Investigating Causes and Determinants of Stillbirths

1. What are the primary factors contributing to the high stillbirth rate in Lejweleputswa Municipality?
2. Can you describe common clinical or health-related conditions that you encounter that may lead to stillbirths?
3. How do you address the risks of stillbirth during antenatal care?

Socio-economic Factors and Antenatal Care

4. In your experience, how do socio-economic factors such as maternal age, education, and income levels impact the quality of antenatal care provided in this district?
5. Can you provide examples of where socio-economic challenges have affected the maternal healthcare outcomes of your patients?

Awareness and Utilization of Antenatal and Obstetric Services

6. How aware do you think pregnant women in this community are of the available antenatal and obstetric services?
7. What challenges do pregnant women face when accessing antenatal and obstetric services in this district?

Healthcare Providers' Knowledge, Attitudes, and Practices

8. How would you rate your knowledge and understanding of stillbirth prevention strategies?
9. What is your opinion on the importance of attitudes and behaviors of healthcare providers in reducing stillbirths?
10. Can you describe the key practices you follow to prevent stillbirth during antenatal care?

Maternal Healthcare Services: Infrastructure, Staffing, and Quality

11. How do you assess the quality of maternal healthcare services provided in this district?
12. In your opinion, what are the main strengths of the maternal healthcare services here?
13. What challenges do you face in terms of infrastructure and staffing when delivering maternal care services?
14. How often are resources, such as diagnostic equipment and skilled staff, available for maternal healthcare?

Developing a Model for Stillbirth Prevention

15. What interventions do you think could effectively reduce the stillbirth rate in this district?
16. How feasible would it be to implement a model that addresses the risk factors for stillbirth within the current healthcare system?
17. What support (financial, training, staffing) would be required to successfully implement such a model?
- 18.

Thank you for participating

Contacts: Tel No +27 60 7258333 e-mail: [simbamagaisa18@gmail.com/](mailto:simbamagaisa18@gmail.com) 22384490@dut4life.ac.za

Appendix 3: Letter of Information



LETTER OF INFORMATION

Title of the Research Study: Enhancing South African maternal care within the public health system: A case of stillbirths in the Lejweleputswa District Municipality.

Principal Investigator/s/researcher: Simbarashe Magaisa, Doctor of Philosophy in Management Sciences: Public Administration

Co-Investigator/s/supervisor/s: Prof Nirmala Dorasamy, PhD Administration

I am a 2nd-year student at DUT doing research for my Doctor of Philosophy in Management Sciences: Public Administration. I would like to invite you to participate in the research

Research Outline:

Like many other countries, South Africa has made significant efforts to achieve the Sustainable Development Goals (SDGs), particularly Goal 3, which aims to ensure healthy lives and promote well-being people for all ages. South Africa has also taken steps to address stillbirths through Every Newborn Action Plan (ENAP), which aims to reach less than 12 per 1000 births by 2025, aligned with global efforts to reduce neonatal and stillbirth mortality. While South Africa has made progress in its efforts to achieve SDG Goal 3 and the objectives outlined in the ENAP, challenges remain, especially in addressing the persistently high stillbirth rates which is 21 per 1000 nationally and Lejweleputswa has experienced alarmingly high stillbirth rates, contributing to the burden of perinatal mortality in the region of 29.3 per 1000.

The aim of the study is to investigate and propose strategies for enhancing maternal healthcare within the public health system, specifically focusing on reducing stillbirths in the Lejweleputswa Municipality District.

A mixed-method design, combining both quantitative and qualitative data collection methods and primary data collection methods will include questionnaires and interviews with doctors, nurses, and midwives that work in maternal wards and hospital and clinic management personnel in the district. This will provide valuable insights into the management of South African maternal care within the public health system, specifically focusing on stillbirths, and contribute to the development of effective interventions that address the unique challenges faced

in the Lejweleputswa Municipality District. The results of the study will be shared with health authorities, publications and presenting on conferences.

This study aims to Enhancing South African maternal care within the public health system: A case of stillbirths in the Lejweleputswa District Municipality

1.4.1 Objectives

- g. To investigate underlying causes and determinants of stillbirths making Lejweleputswa Municipality experience the highest stillbirth rate.
- h. Examine the effect of socio-economic factors on the quality of antenatal care and its influence on antepartum stillbirth.
- i. To assess the awareness and utilization of antenatal and obstetric services among pregnant women in the district.
- j. To analyze healthcare providers' knowledge, attitudes, and practices regarding stillbirth prevention.
- k. To examine maternal healthcare services in the Lejweleputswa District Municipality, including infrastructure, staffing, and quality service delivery.
- l. To develop a model that address the risk factors contributing to stillbirth

1.4.2 Research Questions

- g) What are the primary underlying causes and determinants contributing to the high stillbirth rate in Lejweleputswa Municipality?
- h) How do socio-economic factors affect the quality of antenatal care received by pregnant women in Lejweleputswa Municipality?
- i) What is the level of awareness among pregnant women in Lejweleputswa Municipality regarding available antenatal and obstetric services?
- j) How do healthcare providers' attitudes and practices impact the effectiveness of stillbirth prevention strategies?
- k) What are the strengths and weaknesses of maternal healthcare services, including infrastructure, staffing, and service delivery, in Lejweleputswa District Municipality?
- l) How can a model addressing the risk factors of stillbirth be effectively implemented in the healthcare system of Lejweleputswa Municipality?

Participant reasons to withdraw from the Study:

Participants in the study may be withdrawn under specific circumstances, such as non-compliance with study protocols, the development of health conditions (illness), or adverse reactions that may pose a risk to their well-being. If the research team deems it necessary to end a participant's involvement for these reasons, this will be communicated clearly, and all safety protocols will be followed to ensure the participant's health is not compromised.

Additionally, participants have the right to voluntarily withdraw from the study at any point, without needing to provide a reason. This decision will not affect their access to the standard level of care they

are entitled to. Whether the withdrawal is initiated by the participant or the researcher, an orderly process will be in place to manage the termination of participation smoothly. This will include any necessary follow-up care and clear instructions regarding the discontinuation of study-related activities.

Remuneration:

Participants will not receive any monetary or other types of remuneration, or no compensation will be paid to the participant.

Costs of the Study:

Participants will not be expected to cover any costs towards the study.

Confidentiality:

Confidentiality of participant information will be strictly maintained throughout the study. All data collected will be anonymized, and identifying information such as names or personal details will not be linked to the research findings or reports. Only authorized research team members will have access to the data, and participants' privacy will be protected to ensure that they cannot be identified by individuals not involved in the study.

Data will be securely stored in password-protected databases or locked cabinets, accessible only to the research team. If data is shared with other parties, such as for audit purposes, this will be done in a manner that ensures no personal information is revealed. However, there are certain limits to confidentiality, such as legal requirements to disclose information in the case of serious health risks or threats to safety, which will be explained to participants beforehand.

In all cases, the privacy and rights of participants will be respected, and any necessary access to the data will follow strict ethical guidelines to prevent unauthorized exposure of sensitive information.

Results:

The researcher plans to disseminate the results of the study through academic channels, including peer-reviewed journals, conferences, and presentations to relevant stakeholders such as healthcare institutions, policymakers, and local health authorities. Participants will not be personally identified in any published material, ensuring confidentiality is upheld.

If any significant new findings emerge during the research, particularly those that may impact participant health or care practices, these will be communicated directly to the participants in a timely manner. The researcher will ensure that this information is conveyed through appropriate channels, such as personal contact, follow-

up meetings, or written correspondence, and clearly and understandable for the participant. Participants will also be informed of any recommendations or changes in healthcare practices resulting from these findings, as well as any resources or support available to them.

Storage of all electronic and hard copies including tape recordings

All electronic data, including any digital recordings or documentation, will be securely stored on password-protected computers or encrypted drives, accessible only to authorized members of the research team. Hard copies, such as consent forms or printed questionnaires, will be kept in locked filing cabinets within a secured office or facility, also accessible only to the research team.

Audio recordings (if applicable) will be stored in encrypted files and treated with the same level of security as other electronic data. Access to both electronic and physical data will be limited to the principal investigator and designated members of the research team, who are bound by confidentiality agreements.

The data will be stored for a predetermined period, typically five years, following the conclusion of the study to allow for audits, follow-up research, or verification. After this period, all data will be securely destroyed; electronic data will be deleted using professional data-erasure software, while hard copies will be shredded.

Persons to contact in the Event of Any Problems or Queries:(Professor Nirmala Dorasamy) Please contact the researcher (tel no 0724580015/0607258333.), my supervisor (tel no. 0722678704) or the DUT-Institutional Research Ethics Administrator on 031 373 2375. Complaints can be reported to the Acting Director: Research and Postgraduate Support on researchdirector@dut.ac.za

Appendix 4: Consent



Full Title of the Study: Enhancing South African maternal care within the public health system: A case of stillbirths in the Lejweleputswa District Municipality

Names of Researcher/s: Simbarashe Magaisa

Statement of Agreement to Participate in the Research Study:

- I hereby confirm that I have been informed by the researcher Simbarashe Magaisa , about the nature, conduct, benefits and risks of this study - Research Ethics Clearance

Number: IREC 056/24,

- I have also received, read and understood the above written information (Participant Letter of Information) regarding the study.
- I am aware that the results of the study, including personal details regarding my sex, age, date of birth, initials and diagnosis will be anonymously processed into a study report.
- In view of the requirements of research, I agree that the data collected during this study can be processed in a computerised system by the researcher.
- I may, at any stage, without prejudice, withdraw my consent and participation in the study.
- I have had sufficient opportunity to ask questions and (of my own free will) declare myself prepared to participate in the study.
- I understand that significant new findings developed during the course of this research which may relating to my participation will be made available to me.

_____	_____	_____	_____
Full Name of Participant	Date	Time	Signature / Right

Thumbprint

herewith confirm that the above participant has been fully
I, Simbarashe Magaisa

informed about the nature, conduct and risks of the above study.

_____	_____	_____
Full Name of Researcher	Date	Signature

_____	_____	_____
Full Name of Witness (If applicable)	Date	Signature

_____	_____	_____
Full Name of Legal Guardian (If applicable)	Date	Signature

Please note the following:

Research details must be provided in a clear, simple and culturally appropriate manner and prospective participants should be helped to arrive at an informed decision by use of appropriate language (grade 10 level- use Flesch Reading Ease Scores on Microsoft Word), selecting of a non-threatening environment for interaction and the availability of peer counselling (Department of Health, 2004).

If the potential participant is unable to read/illiterate, then a right thumb print is required and an impartial witness, who is literate and knows the participant e.g. parent, sibling, friend, pastor, etc. should verify in writing, duly signed that informed verbal consent was obtained (Department of Health, 2004).

If anyone makes a mistake completing this document e.g. a wrong date or spelling mistake, a new document has to be completed. The incomplete original document has to be kept in the participant's file and not thrown away, and copies thereof must be issued to the participant.

References:

Department of Health: 2004. *Ethics in Health Research: Principles, Structures and Processes* <http://www.doh.gov.za/docs/factsheets/guidelines/ethnics/>

Department of Health. 2006. *South African Good Clinical Practice Guidelines*. 2nd Ed. Available at: http://www.nhrec.org.za/?page_id=14



04 September 2024

Mr S Magaisa
External Association
Durban University of Technology

Dear Mr Magaisa

Subject: Enhancing South African maternal care within the public health system: A case of stillbirths in the Lejweleputswa District Municipality.

- Please ensure that you read the whole document, Permission is hereby granted for the above – mentioned research on the following conditions:
- Participation in the study must be voluntary and written consent by each participant must be obtained.
- Serious adverse events to be reported to the Free State department of health and/ or termination of the study
- Ascertain that your data collection exercise neither interferes with the day to day running of **selected facilities (see page 2)** nor the performance of duties by the respondents or health care workers.
- The DOH expects that the researcher will be the responsible data manager according to the POPI Act. The responsibility thus lies with the researcher to ensure that the processing of all participant's personal information and research data is lawful according to the stipulations of the POPI Act (Protection of Personal Information Act 4 of 2013).
- Confidentiality of information will be ensured and please do not obtain information regarding the identity of the participants.
- Department of Health to be fully indemnified from any contravention of the POPIA Act as you conduct this study.
- **Research results and a complete report should be made available to the Free State Department of Health on completion of the study (a hard copy plus a soft copy).**
- Progress report must be presented not later than one year after approval of the project to the Ethics Committee of the University of the Free State and to Free State Department of Health.
- Any amendments, extension or other modifications to the protocol or investigators must be submitted to the Ethics Committee of the University of the Free State and to Free State Department of Health.
- **Conditions stated in your Ethical Approval letter should be adhered to and a final copy of the Ethics Clearance Certificate should be submitted to sebeelats@fshealth.gov.za/lithekom@fshealth.gov.za before you commence with the study**
- No financial liability will be placed on the Free State Department of Health
- **Please discuss your study with Institution Manager on commencement for logistical arrangements.**
- Department of Health to be fully indemnified from any harm that participants and staff experiences in the study
- As part of the feedback, you will be required to present your study findings/results at the Free State Provincial Health Research Day.

Trust you find the above in order.

Mr. MNG Mahlatsi
HEAD: FREE STATE HEALTH

Date: 5/09/2024



health

Department of
Health
FREE STATE PROVINCE

07 October
2024

Mr S
Magai
sa
Extern
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Associ
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Durban University of
Technology Dear Mr
Magaisa

Subject: Study sites as amended for research protocol with Title "Enhancing South African maternal care with the public health system: A case of stillbirths in the Lejweleputswa District Municipality"

Lejweleputswa District Municipality Office
Albert Luthuli Memorial Clinic

Allanridge Clinic
AM Kruger Clinic
Boithusong Clinic
Bongani Hospital

Bophelong (Allanridge) Clinic
Bophelong (Odendaalsrus) Clinic
Bophelong (Welkom) Clinic
Boshof Clinic

Bothaville Clinic
Bronville Clinic
Dealesville Clinic
Geneva Clinic
Hani Park Clinic
Hennenman Clinic
Hoopstad Clinic
Hope CHC
Ikgomotseng Clinic
Kamohelo Clinic
Katleho Hospital

Kgotsong (Bothaville) Clinic
Kgotsong (Welkom) Clinic
Khotalong Clinic

K-Maile Clinic

Leratong Clinic
Lusaka Clinic

Marantha Clinic**Masilo Clinic**
Matjhabeng Clinic

Meloding Clinic
Mmamahabane Clinic
Mohau Hospital

Nala Hospital
OR Tambo Clinic

Phahameng (Bultfontein) Clinic
Phedisanang Clinic

Phomolong (Hennenman) Clinic
Rearabetsoe (Virginia) Clinic
Rheederspark Clinic
Riebeeckstad Clinic

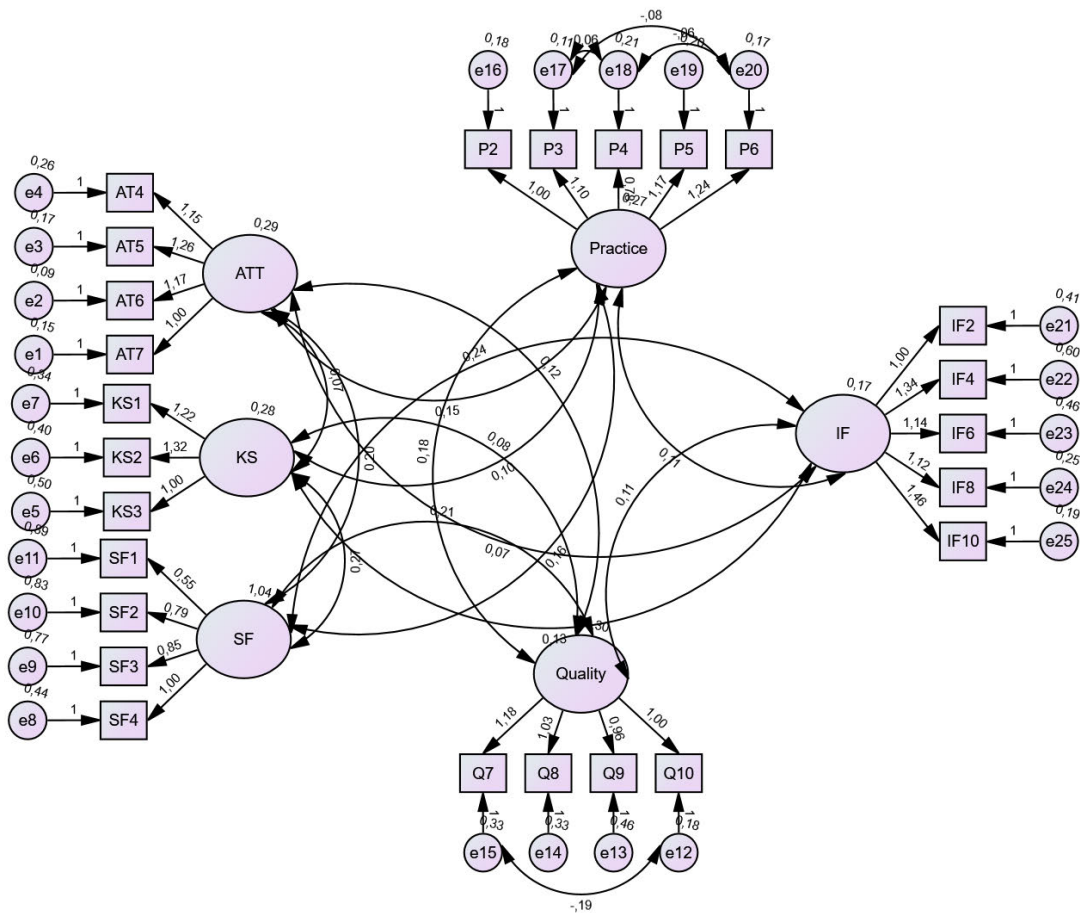
Thabong Clinic
Thusanong Hospital

Tshepong (Verkeerdevlei) Clinic
Tshepong (Welkom) Clinic
Tshwaraganang (Hertzogville) Clinic
Vaal Rock Clinic

Virginia Clinic
Welkom Clinic
Winburg Clinic

Winburg Hospital

Appendix 4: Initial CFA model



Fit indices	Fit values	Criteria
χ^2 / df (p-value)	4.048(<.001)	<5
IFI	0.788	>.9
CFI	0.785	>.9
TLI	0.748	>.9
RMSEA	0.108	<0.08

	CR	AVE	MSV	MaxR(H)	SF	ATT	KS	Quality	Practice	IF
SF	0,778	0,473	0,317	0,816	0,688					
ATT	0,903	0,701	0,286	0,914	0,357	0,837				
KS	0,738	0,486	0,328	0,750	0,496	0,232	0,697			
Quality	0,807	0,513	0,397	0,818	0,378	0,393	0,271	0,716		
Practice	0,893	0,627	0,397	0,904	0,299	0,535	0,349	0,630	0,792	
IF	0,777	0,417	0,328	0,809	0,563	0,295	0,573	0,478	0,502	0,646

Appendix 5: Statistician's Certificate

Dr. SC Onwubu

46 Thomon Avenue, Seaview, Durban, 4091
0717930852
Profstan4christ@yahoo.com

STATISTICIAN CERTIFICATE

Date: 20 April 2025

Re: Simbarashe Magaisa

Faculty of Management Sciences, Durban University of Technology

PhD Thesis: **Enhancing South African maternal care within the public health system:
A case of stillbirth in the Lejweleputswa District Municipality**

I confirm that Mr Simbarashe Magaisa consulted me regarding his data analysis. I did his statistical work using both descriptive and inferential statistics. I attest that the statistical analysis conducted meets the post-graduate guidelines and addresses the research objectives.

Dr. SC Onwubu

20 April 2025

Per email

Appendix 6: Turnitin Report

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feedback studio

Simbarashe Magaisa | Magaisa Final 2025.docx

Chapter One

Overview of the Research

237

1.1 Introduction

Maternal healthcare remains a critical component of public health systems worldwide, as it directly influences maternal and child mortality rates, two key indicators of a nation's health status (Souza *et al.* 2024a). South Africa, a nation renowned for its rich history and natural beauty, continues to grapple with significant challenges in its healthcare system, particularly in maternal and child health (Yuningsih, Yohandoko and Pirdaus 2024). Maternal and infant mortality rates remain elevated, exacerbated by inequitable access to healthcare services, low levels of education and awareness regarding reproductive health, as well as the ongoing issues of malnutrition and HIV/AIDS (Maswime *et al.* 2021; Adam and Daba 2024). According to Maswime *et al.* (2021), these factors collectively contribute to the country's struggle to improve health outcomes for mothers and children. In South Africa, maternal health has been a focal point of public health policy, yet challenges persist, particularly in under-resourced regions (Yuningsih, Yohandoko and Pirdaus 2024). In sub-Saharan Africa, stillbirth rates are high, with

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Chapter One

Overview of the Research

1.1 Introduction

Maternal healthcare remains a critical component of public health systems worldwide, as it directly influences maternal and child mortality rates, two key indicators of a nation's health status (Souza et al. 2018). South Africa, a nation renowned for its rich history and cultural diversity, continues to grapple with significant challenges in its healthcare system, particularly in maternal and child health (Yunzhang, Yuhendoko and Pridoux 2024). Maternal and infant mortality rates remain elevated, exacerbated by inequitable access to healthcare services, low levels of education and awareness regarding reproductive health, as well as the ongoing issues of malnutrition and HIV/AIDS (Maswime et al. 2021; Adam and Diba 2024). According to Maswime et al. (2021), these factors collectively contribute to the country's struggle to improve health outcomes for mothers and children. In South Africa, maternal health has been a focal point of public health policy, yet challenges persist, particularly in under-resourced regions (Yunzhang, Yuhendoko and Pridoux 2024). In sub-Saharan Africa, stillbirth rates are high, with over 50% occurring in rural areas (Diale et al. 2022). South Africa has experienced persistent stillbirth rates, with some reports indicating over 20 per 1,000 live births (Hogeweg et al. 2020). According to Hogeweg et al. (2020: 1), in South Africa (SA), approximately 18 000 stillbirths occur annually.

Stillbirth remains a persistent and heart-wrenching challenge within the global public health landscape, particularly in low- and middle-income countries like South Africa. Defined as the death of a fetus at or after 28 weeks of gestation (World Health Organization 2014). According to World Health Organization (2014), there are nearly 2 million stillbirths every year that is one every 16 seconds. Over 40% of stillbirths occur during labor (Khail et al. 2024). World Health Organization (2014). A loss that could be averted with improved quality and respectful care during childbirth including routine monitoring and timely access to emergency obstetric care when required. Stillbirth is not only a personal tragedy for families but also an indicator of broader systemic issues within maternal healthcare (Khail et al. 2024). Others define stillbirth as the death of a fetus after 20 weeks of gestation but before delivery, remains a significant public health issue worldwide (Murphy et al. 2022a). WHO recommends standardizing the international stillbirth definition for epidemiologic studies, utilizing a birthweight of ≥ 1000 g and ≥ 28 weeks gestation (Kelly et al. 2021).

Every Newborn Action Plan (ENAP), launched in 2014 by WHO and UNICEF, aims to reduce preventable newborn deaths and sickle-cell mortality (Yu 2021; Datta, Ginn and Aquino 2022). According to Quigley (2020), ENAP sets targets of fewer than 10 newborn deaths and stillbirths per 1000 births by 2030. Many low- and middle-income countries including South Africa have adopted newborn health policies aligned with ENAP, but implementation varies (May et al. 2022). Key strategies include improving the quality of care during pregnancy, childbirth, and the postnatal period (Organisation 2014). According to Mthembu-Mathem et al. (2021a), challenges in scaling up newborn

Appendix 7: Proof of language editing

Sury Bisetty Academic Editing Services

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To whom it may concern

I edited the thesis titled: Enhancing South African maternal care within the public health system: A case of stillbirths in the Lejweleputswa District Municipality, Simbarashe Magaisa, submitted in fulfilment of the requirements for the degree of Doctor of Philosophy in Management Sciences, specializing in Public Administration in the Faculty of Management Sciences at the Durban University of Technology

Signed: S. Bisetty

Date: 22 April 2025

Professional Language and Technical Editor



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