

**LEVELS, TRENDS AND DETERMINANTS OF MATERNAL HEALTH SERVICE  
UTILISATION IN ZAMBIA.EVIDENCE FROM ZDHS: 1992-2014.**

**BY**

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## **DEDICATION**

To my wife (Natasha) and Children (Tevin, Jada and Shammai).

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## **CERTIFICATE OF APPROVAL**

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## ABSTRACT

This study assessed the utilisation of Maternal Health Services from skilled personnel, as a 'Continuum of Care' in Zambia between 1992 and 2014. The Continuum of Care for Maternal New-born and Child Health advocates for the continuous uptake of antenatal, birth and postnatal care services from medically trained health professionals. This Continuity of Care has been widely recognised as a key strategy for improving health outcomes of both mothers and new-borns in reproductive health. Over the years, Antenatal care use in Zambia has been well above World Health Organisation target of 90 per cent coverage by 2015, unlike Delivery and Postnatal care service utilisation which range between 51 to 64 per cent and 12 to 60 per cent respectively during the period. Women reception of Antenatal care alone is not enough however, as the majority of fatal complications in reproductive health arise during or shortly after delivery. This was quantitative study that employed a time series design of cross-sectional data extracted from the 1992 to 2014 ZDHS surveys. The woman aged 15 to 49 years who had at least one live birth in the 5 years preceding the surveys was the unit of analysis of the study. Determination of factors associated with the use of skilled maternal health services along a continuum of care was achieved using a multi-variable logistic regression model in Stata. The study revealed that women in Zambia do overwhelmingly undertake antenatal care visits although delivery and postnatal care service utilisation are still low. Findings regarding maternal health service utilisation as a continuum of care show that, despite a gradual improvement over the years, the general pattern of utilisation across time still indicates a low proportion of women completing the same. This could be attributed to various cultural factors. Regression results indicate that maternal health care-seeking behaviours in Zambia are shaped by various factors including, mother's education, residence type, exposure to media, number of children ever born and the birth rank for one period or the other and husband/partner's approval of health service use. Moreover, maternal age at birth of the child, the household wealth status and husband/partner's level of education were not significant predictor variables for the use of maternal health services, largely resulting from probable government policy that reduced inequalities in accessing health care. A large proportion of women in Zambia, do not complete the continuum of care and therefore, future measures including stressing the importance of skilled birth attendance and postnatal care should be emphasised during antenatal visits. Both, women and men's education and exposure to media are therefore major policy variables that can be used to change health beliefs and

personal characteristics of the users. The findings clearly point to the need for a further qualitative study to enrich the current study on why many women from the same socio-economic standing attend antenatal care and yet fewer continue to attend skilled delivery and postnatal care services despite most deaths occurring during and after delivery. Thus, the findings of the study therefore provide evidence on the current levels, trends and determinants of maternal health service utilisation between 1992 and 2014 in Zambia, and the knowledge obtained serves as a basis for addressing MHC utilisation challenges.

**Keywords: Maternal Health, Continuum of Care, Determinants, Skilled.**

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## **LIST OF ACRONYMS/ABBREVIATIONS**

ANC	Antenatal
CI	Confidence Interval
CEB	Children Ever Born
CSO	Central Statistics Office.
EOC	Emergency Obstetric Care.
MDGs	Millennium Development Goals.
MHC	Maternal Health Care
MMR	Maternal Mortality Rate.
MoE	Ministry of Education
MoH	Ministry of Health
MNCH	Maternal New-born and Child Health
NHSP	National Health Strategic Plan
PMTCT	Prevention of Mother to Child Transmission.
PNC	Postnatal care
SBA	Skilled Birth Attendance
SDGs	Sustainable Development Goals
TBAs	Traditional Birth Attendants
UNICEF	United Nations Children's Fund.
WHO	World Health Organisation.
ZDHS	Zambia Demographic Health Survey







## CHAPTER ONE: INTRODUCTION

This chapter contextualises the problem and provides a brief insight of maternal health utilisation related challenges along the continuum of care. The chapter also discusses the statement of the problem, purpose of the study, study objectives, research questions, and hypotheses, significance of the study, the conceptual framework and operational definitions related to the study.

### 1.1 Background.

The subject of maternal health service (MHS) utilisation in developing countries arguably poses a more serious health challenge than any other in the 21st century. According to Barros *et al.* (2010) the world is well past the achievement of the Millennium Development Goals (MDGs), aspirations meant to be achieved by 2015 of which Maternal, New-born and Child Health (MNCH) had been an integral part, yet global progress toward MDG 5 (improving maternal health) exhibited the least progress of all health MDGs worldwide. In developing countries health seeking behaviour towards conventional services has for a long time been envisaged as a complex behavioural phenomenon. Chakraborty *et al.* (2003), note that empirical studies of preventive and curative services have often found complexities in utilisation of health services in developing countries, as it is related to the availability, quality and cost of services, the socio-economic structure, health beliefs and personal characteristics among other characteristics of the users. Utilisation of key maternal health services in Zambia which include Antenatal care (ANC), Skilled Birth Attendance (SBA) and Postnatal Care Services (PNC) from skilled health professionals is not exceptional, as they are faced with numerous challenges. ANC, SBA and PNC from medically trained personnel are internationally recognised maternal health interventions, and provision of a full range of these services along a 'continuum of care' has been widely argued to enhance the survival and well-being of both the mother and the child. The continuum or continuity of care for Maternal New-born and Child Health (MNCH) refers to the continuous uptake of ANC, delivery care and PNC services from skilled health professionals.

In Africa however, although pregnancy and delivery are acknowledged as potential risks, Thaddeus and Maine (1994) are of the opinion that they are commonly considered natural, normal work for women and as such, they are often not regarded as illnesses for which

medical expenses can be justified and therefore a hospital room booked. Non utilisation of maternal health care services has been an impediment to Zambia's development efforts, particularly in its effort to achieve the Sustainable Development Goal (SDG) three, which is set to ensure health lives and promotion of well-being for all at all ages .A study by Wang *et al.* (2011, p 1) has shown evidence that “high maternal, neonatal and child mortality rates are associated with inadequate and poor quality maternal healthcare services which include antenatal care, skilled birth attendance and postnatal care. “Maternal health therefore, goes beyond the survival of pregnant women and mothers as it is also intricately linked to the survival of the child. Thaddeus and Maine (1994, p 2) argue that “maternal aspects of maternal-child health have all too often been relegated to secondary priority within the child survival revolution.”

Since legislation on healthcare and health services is almost non-existent, Zambia has relied on national health policies and strategies as mechanisms of supporting healthcare since 1992 (Nsemukila,2014).As party, to a number of international and regional instruments influencing policy direction, with particular focus on Maternal, New-born and Child Health, Zambia adopted a robust policy framework around the subject as a way of government commitment to foster behavioural change and provide equitable access to quality health services as close to the family as possible in order to address health seeking behaviour among women. The Government of the Republic of Zambia has since, placed health in general and maternal health in particular high on its agenda of reform and as a result, remarkable effort is being made to enhance utilisation of the full range of maternal and child health services in the last few decades as evidenced by the adoption of a robust policy framework. To foster access and women's utilisation of health services from trained personnel, and to support the equitable provision of these services a wide range of interventions have been implemented in the country, including; the removal of user fees for all maternal/child health services, the launch of the Safe Motherhood Initiative (SMI) and the Prevention of Maternal Mortality Program (PMM) of 1987 and the adoption of the MDGs in the 1990s.These and many other programmes including, the2010 Campaign on Accelerated Reduction of Maternal Mortality in Africa (CARMMA),the Road Map for Accelerating Reduction of Maternal New-Born and Child Mortality 2013-2016, and the National Health Strategic Plan 2011-2015 specifically implemented to underscore provision of skilled attendance across the continuum of care, were launched. Most importantly, the Ministry of Health (MoH) also redirected its attention towards maternal health by the creation of the Ministry of Community Development Mother

and Child Health (MCDMCH) in 2011 to offer a holistic and synergised approach and to help guide implementation of programmes and direct service delivery closer to communities as was before(Pratt,2013).In light of this background, the past two decades have raised many expectations as regards to improving a continuous utilisation of key maternal health services in Zambia. Nevertheless, for the third world and Zambia in particular, both maternal healthcare utilisation and the maternal health care (MHC) responsiveness along the continuum of care seem to constitute a vision rather than a reality. Service utilisation has for a long time been faced with a lot of inequalities within the social-economic structure.

In Zambia, ANC use has been consistently high unlike SBA and PNC which are faced with numerous utilisation challenges. Ayele *et al.* (2016) have argued though, that women reception of ANC alone is not enough as the majority of fatal complications in reproductive health arise during or shortly after delivery. In the past decades much research has focused on the use of the components of MHC namely ANC, SBA and PNC. This scenario has undoubtedly led to poor representation of the subject. Moreover, even when a number of studies have been carried out on the subject; (UNICEF, 2015a; Stekelenburg, 2004; Wang *et al.*, 2011 and Nsemukila *et al.*, 1998), there was yet no specific academic study carried out on the levels, trends and determinants of maternal health service utilisation along the continuum of care in Zambia. In light of foregoing it remains unclear why many women from the same economic standing manage ANC visits but fewer go on to complete the continuum of care by attending SBA and PNC. It is this huge knowledge gap that this study is designed to fill.

## **1.2 Statement of the problem.**

ANC is indeed a vital service as it presents an avenue to provide pregnant women with information, to treat existing social and medical conditions and screen for risk factors (Ayele *et al.*, 2014).In Zambia ANC use has been well above the World Health Organisation (WHO) target of 90 % coverage by 2015 as evidenced by the recent statistics in which the country recorded 96 per cent of women attending skilled ANC check-ups, 64 per cent receiving skilled delivery care and 63 per cent undertaking PNC check-ups (ZDHS, 2013-14).Overall, the statistics show an improvement on previous ZDHS records, yet it clearly still reflects a lack of continuity in the use of MHC. Ironically, the use of the continuum of MHC has been under explored in Zambia and to some extent inadequate information is available on why women within certain communities and from the same social economic standing attend ANC and yet fewer continue to attend skilled delivery and PNC, despite most deaths occurring

during and after delivery. While it is true that the subject has been understudied, it is vital to acknowledge the ground breaking contributions by Stekelenburg (2004) Wang *et al* (2011) and Nsemukila (2014). Not only have these writings been few, but most of them have exclusively focused on the use of individual components of MHC and have not provided adequate answers to the changes and determinants of MHC use along the continuum of care. The writings in question have also largely depended on qualitative approaches with little appreciation of the quantitative aspect. Furthermore, those that performed the quantitative analyses were based on single cross-section data. In light of the background posited above the present study goes beyond what currently exists in the country by addressing and applying the quantitative analyses to articulate the levels, trends and determinants of MHC use along the continuum of care between 1992 and 2014.

### **1.3 Main objective**

The study aims to evaluate the levels, trends and determinants of maternal health service use along the continuum of care in Zambia between 1992 and 2014.

### **1.4 Specific objectives.**

The study sought to achieve the following objectives:

1. To establish if there are significant changes in the use of the components of maternal health care from skilled personnel among women in Zambia, overtime.
2. To examine trends in women completing the continuum of skilled maternal health care overtime.
3. To determine factors that influences the utilisation of skilled maternal health care along the continuum of care during the period.

### **1.5 Research questions**

Arising from the background to the research study, the literature reviewed and the statement of the problem, the following questions evolved:

1. Are there significant changes in the use of the components of maternal health services from skilled personnel among women in Zambia, overtime?

2. What are the trends of women in Zambia completing the continuum of skilled maternal health care across time?
3. What factors influence women's trends in utilisation of skilled maternal health care as a continuum of care during the period?

### **1.6 Rationale/Justification of the study**

The subject of maternal health care service utilisation from the continuum of care perspective has not been adequately investigated in Zambia. Many researches undertaken have concentrated on MHC use in terms of ANC, SBA and PNC as individual components. For instance the study by Stekelenburg et al.(2004) in Kalabo, Zambia focused on the use of SBA ignoring the value of continuity in health seeking behaviour among women and the other by Nsemukila (1998) whose focus was on PNC with little detail on the continuum of care for maternal health. This study is therefore a significant departure from most studies as it looks at the concept of MHC as a single and continuous process from antenatal to postnatal. The study is worth undertaking as it contributes to the scholarly literature on MHC use and endeavoured to bridge the knowledge gap on maternal health as a continuum of care. The study therefore proposed recommendations to redress the MHC in the operational context to ensure continuity of maternal care among women in Zambia. As such an exploration of the levels, trends and determinants of maternal health service use between 1992 and 2014 was worth undertaking.

### **1.7 Significance of the study**

This study brings into perspective two significant additions to population studies and demography in Zambia. Firstly, it is a valuable addition to the existing literature as it expands the national population and health database. Observed results in this study will provide invaluable information for needs assessment, program planning, monitoring and evaluation, program evaluation and policy development and analysis strategies. Secondly, examination of data overtime permits to make predictions about future frequencies and rates of occurrence.

## 1.8 Conceptual framework

The study is guided by Andersen and Newman (1973)'s health seeking behaviour model (BM) that incorporates both individual and contextual determinants of health service utilisation. The BM hypothesizes that the use of health care services is a function of three constructs namely; predisposing, enabling and need factors.

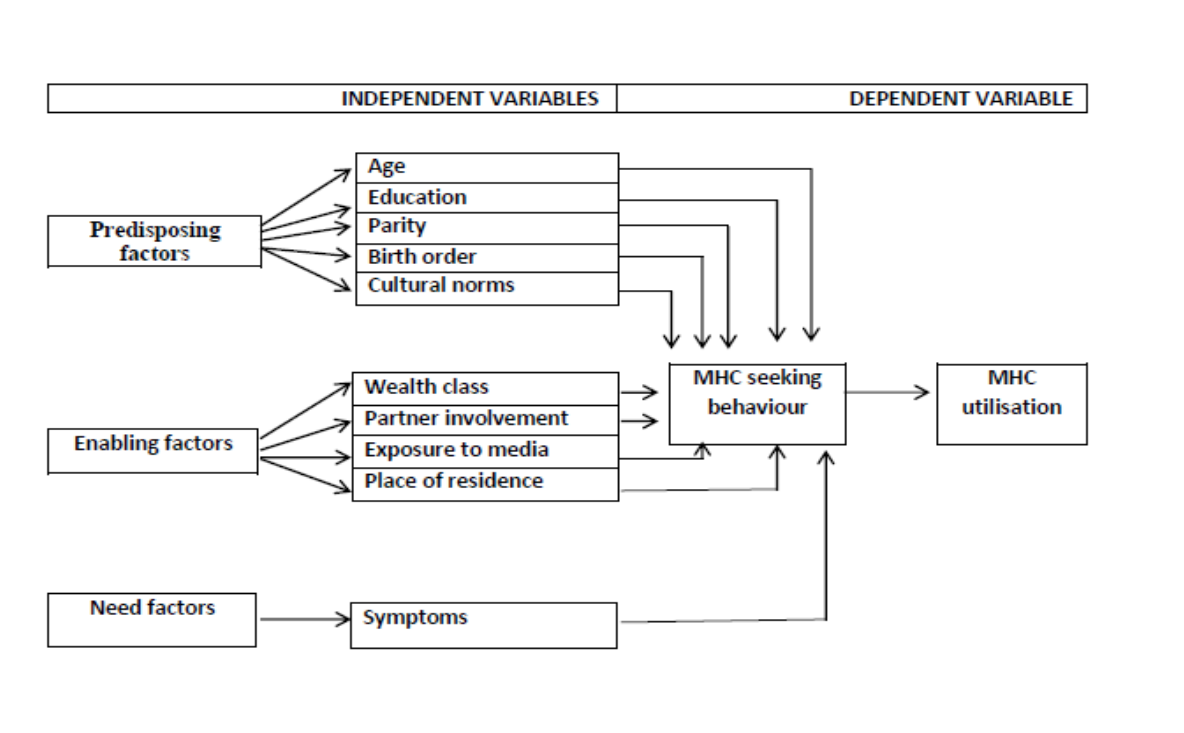
**Predisposing factors**-According to Andersen and Newman (1973) some individuals have a propensity to use services more than others where propensity toward use can be predicted by individual characteristics which exist prior to onset of specific episodes of illness. Fosu (1994) relates that the predisposing factors entail that families with different characteristics have different propensity to use health services. Heath (1976) argues that there is always an assumption that individuals will act rationally every time they consider the most effective way of achieving their medical goals. People with certain characteristics are more likely to use health services even though the characteristics may not be directly responsible for health service use. Predisposing factors include socio-cultural and biological factors including age, education, birth order, parity, social status and cultural norms. Even though age and sex for instance are among demographic variables intimately related to health and illness, they are still considered to be predisposing conditions. Andersen and Newman(1973,p 15) further argue that “in as much as age per se is not considered a reason for seeking health care, rather people in different age groups have different types and amounts of illness and consequently different patterns of medical care.” Utilisation of maternal health services can therefore be affected by the predisposing variables outlined above.

**Enabling factors**-Even though individuals may be pre-disposed to use health services, some means must be available for them to do so. Enabling conditions make health service resources available or accessible to the individual. Studies have shown that accessibility is key, to the use of health facilities as well as improvement in various health conditions (Chakraborty et al, 2003, Mekonnen and Mekonnen, 2003, Abor and Abekah-Nkrumah, 2013).Enabling factors refer to accessibility factors both physical and economical such as, wealth status, distance, exposure to media, residence/availability of health services and health policies. This therefore points to the fact that access to both health care services and personnel is in fact a vital determinant of maternal health service utilisation.

**Need factors (Illness level)** - Assuming the presence of predisposing and enabling conditions, the individual or his family must perceive illness or the probability of its

occurrence for the use of health services to take place. The model considers illness levels as the most immediate cause of health service use. Need factors are perceived needs for health services or people's views on their own general health and whether or not their problems are of sufficient importance and magnitude to seek professional medical attention. The illness level includes variables such as symptoms and diagnosis of disease. According to Abor and Abekah-Nkrumah (2013) the mother's perception of modern maternal health care has the potential to influence the use of maternal health services. The need factors suggest that medical need is not only a function of the mere presence of physical disease but also the cultural perception of illness. Azevedo *et al.*, (1991) point out that, the assumption underlying this position is that individuals may accord certain health conditions little seriousness because they may regard such conditions normal based on their cultural understanding and experience of that particular condition. The need factors are also equally important determinants of MHC use. The conceptual framework of the study is summarised in figure 1.1 below;

**Figure 1.1: A framework of the determinants of maternal health care use.**



Adapted from Andersen and Newman (1973).



## 1.9 Operational definitions

The following are the key indicators for the study and are defined based on the WHO definitions in exception of first one developed for the sole purpose of this research.

**Maternal Health Care:** In this study maternal health care refers to an integrated or combined reception of three interventions (ANC, SBA and PNC) from skilled personnel that constitute the continuum of care.

**Antenatal care (ANC):** Refers to pregnancy care provided by skilled health professionals (doctors, clinical officers, nurses and midwives) to a woman during pregnancy.

**Maternal health:** Refers to the health of a woman during pregnancy, at delivery of the child and the period following birth (up to six weeks).

**Skilled Birth Attendance (SBA):** Delivery care provided by skilled health professionals including doctors, clinical officers, nurses and midwives to the respondent at the time of giving birth.

**Skilled attendants:** A skilled health worker is “an accredited health professional such as a midwife, doctor, or nurse, who has been educated and trained to proficiency in the skills needed to manage normal (uncomplicated) pregnancies, childbirth and the immediate postpartum period, and in the identification, management, and referral of complications in women and new-borns.”(WHO, 2005).

**Postnatal care (PNC):** These are check-ups provided by skilled health personnel including doctors, clinical officers, nurses and midwives within 48 hours of child birth.

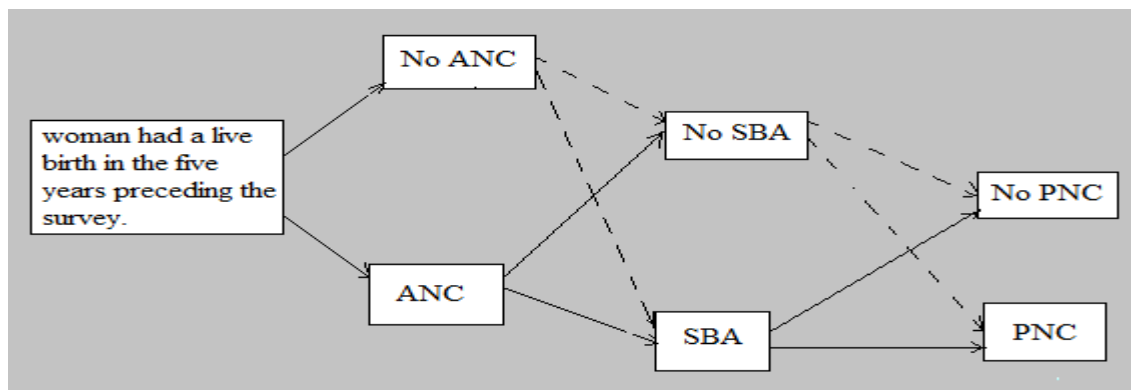
**Traditional Birth Attendant (TBA):** Refers to traditional, independent (of the health system), non-formally trained and community-based providers of care during pregnancy, childbirth, and the postnatal period, but who have often acquired skills through apprenticeship and are known by the people in the community. (ZDHS, 2013-14).

## 1.10 Scope of maternal health services as a continuum of care

According to UNICEF (2008) the continuum of Maternal, New-born and Child Health care focuses on two dimensions in its provision. The time factor or sequential time recognises the

need to ensure essential services for mothers during pregnancy, childbirth, the postpartum period, infancy and early childhood driven from the fact during and after birth, are the critical times when mortality and morbidity risks are highest for both mother and child. Secondly, the place or space dimension which links the delivery of essential services in a primary health care system that integrates home, community, outreach and facility based care. Data regarding women's probable service utilisation of the selected maternal health services are summarised in figure 1.2 below.

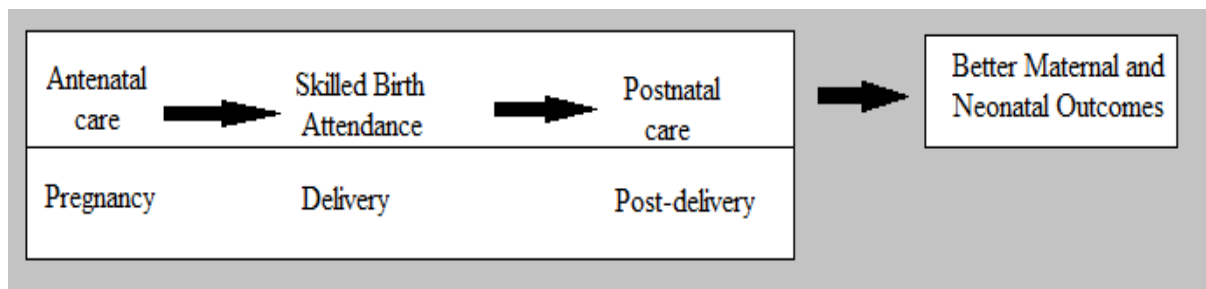
**Figure 1.1: Women's probable pathways of maternal health service utilisation.**



Source: Wenjuan and Hong, 2013.

The continuum of care has increasingly become a key strategy of interventions that improves health and the wellbeing of the mother and new-borns. The strategy calls for a service delivery system connecting the three components of maternal care namely ANC, SBA and PNC.(Wenjuan and Hong, 2013).According to Kerber *et al* .(2007),the concept of the Maternal New-born and Child Health (MNCH) continuum of care refers to universal coverage of effective interventions, integrating care throughout the life cycle and building a comprehensive and responsive health system. This study however limits the scope of continuum of care to a combined and universal coverage of ANC, SBA and PNC from skilled health providers. These three indicators are expected to be provided as an integrated service delivery in order to provide optimum benefits. Their provision in a comprehensive and continuum pattern of care from pregnancy, to child birth and after delivery contributes to a significant reduction of maternal and child deaths (Dahiru and Oche,2015).Figure 1.3 below illustrates the scope of maternal health services which shows the pathway for continuity in receiving maternal health services.

**Figure 1.2: Pathway for Continuum of Care.**



Source: Wenjuan and Hong, 2013.

### **1.11 Limitations**

The study was confined to available data collected during the ZDHS surveys. The data collected was skewed towards quantitative and as a result it did not collect more detail on women's views and opinions.

### **1.12 Summary**

The chapter introduced the subject of the levels, trends and determinants of maternal service utilisation in Zambia. It also presented the background to the problem, the problem statement, research objective and hypotheses, the significance of the study the conceptual framework applied to the study, limitations and ethical aspects. The next chapter provides a review of literature relevant to the study.

## **CHAPTER TWO: LITERATURE REVIEW**

This chapter gathered information through the review of literature on what other studies have highlighted. The literature is purposely searched and selected on the basis of relevance to the topic of levels, trends and determinants of maternal health service utilisation in Zambia. The literature review is presented according to the following themes: Maternal Health Care: A general overview, Changes in the use of the components of maternal health care, Trends in women completing the use of maternal health as a continuum of care and Factors influencing the use of MHC along the continuum of care. The chapter also includes the concept of male involvement in MHC which is vital in women accessing these services. A main thrust of this chapter is the discussion of salient aspects pertaining to the proper management of maternal health. The chapter also helps to show the existing gap in literature on Maternal Health Care utilisation.

### **2.1 Maternal Health Care: A General Overview.**

MHC provision includes such essential measures as, ANC, SBA, access to emergency obstetric care (EOC) when necessary, adequate nutrition, post-partum and PNC, new-born care and education to improve health, infant feeding and hygiene behaviours. Maternal Health Care encompasses an integrated health care system which places emphasis on reception of three interventions (ANC, SBA and PNC) from skilled personnel that constitute the continuum of care. According to the United Nations Children 's Fund (UNICEF,2009), the enabling environment for safe motherhood and childbirth depends on the care and attention provided to pregnant women and new-borns by communities and families; the acumen of skilled health personnel, coupled with the availability of adequate health-care facilities; equipment; medicines and emergency care when needed. The current emphasis on maternal health coverage is on the utilisation of skilled health personnel such as midwives, doctors, clinical officers or nurses, who have the know how to manage normal pregnancies, childbirth and the immediate postpartum period; and competent in the identification, management, and referral of complications in women and new-borns .Studies of maternal mortality in low income countries have shown that making pregnancy and childbirth safe, means to ensure that women have access to a continuum of care, including appropriate management of pregnancy, delivery and the post-partum period together with access to life-saving emergency obstetric care (EOC) when complications arise (Stekelenburg *et al.* ,2004).

Many developing countries have made limited progress in achieving maternal health utilisation related targets by 2015 as prescribed by the World Health Organisation (WHO). According to Ssengooba *et al.*, (2003) the process indicator for maternal health service utilisation was targeted at 90 per cent utilisation by 2015. MHC utilisation in developing countries is far lower than the global target of 90 per cent coverage by 2015 and women still suffer from pregnancy related complications that eventually lead to deaths which can otherwise be easily avoided. According to AbourZahr (2003) about 80 per cent of all maternal deaths are direct obstetric deaths resulting from post-partum haemorrhage (24%), unsafe abortion (13%), infection (15%), pre-eclampsia and eclampsia (12%) and obstructed labour (8%). On the other hand, WHO (2005), found that between 11 per cent and 17 per cent of the deaths occur at time of delivery while between 50 per cent and 71 per cent during the postpartum period. WHO (2005), further points out that close to 45 per cent of postpartum deaths occur during the first 24 hours, and more than two thirds during the first week. Post-partum haemorrhage is therefore the largest contributor to maternal mortality. Low demand for MHC in least developing countries has been attributed to an enduring preference for traditional medicine (World Bank, 1999), a lack of awareness of the need for routine care visits in the absence of danger signs, lack of insurance coverage, transportation difficulties (Stekelenburg *et al.*, 2004) and a preference for traditional childbirth practices (Van den Broek *et al.*, 2003).

In Zambia, a study by Nsemukila *et al.*, (1998) showed that the knowledge and benefits of attending ANC was almost universal and well perceived by all age groups among women in Zambia. Furthermore, the study found predominant home deliveries necessitated by perceived inefficiency of health facilities in providing adequate delivery care. The study also found low levels of knowledge on PNC as the women did not recognise the need to seek PNC. The women were not motivated partly due to the fact that they did not encounter any problems after delivery and partly due to various cultural beliefs.

## **2.2 Changes in the use of the components of MHC.**

The use of the components of MHC provides a vital opportunity for various medical interventions that may prove useful to the preservation of life of both the mother and the

baby. The components of MHC include ANC, SBA and PNC and observing the changes in relation to utilisation of these services throughout the period is necessary.

### **2.2.1 Antenatal care utilisation.**

Receiving an antenatal consultation from skilled health personnel is widely recognised as an opportunity to deliver interventions for improving maternal nutrition, provision of health education, encouragement of skilled attendance at birth and use of facilities for emergency obstetric care (EOC). All of these interventions have been linked to significantly contribute to the reduction of maternal mortality and improving the chances of infant survival. A study by Wang *et al.* (2011) conducted in 38 developing countries worldwide including Zambia revealed great success in extending the reach of ANC, as close to between 80 and 90 per cent of women in the majority of countries studied had at least one ANC visit during pregnancy. The study by Wang *et al.* (2011) provided some insights into this study nevertheless, the study was a comparative report primarily based on a descriptive approach with minimal analytical skills employed. However, it is vital to stress here that reception of ANC alone should not be an end in itself as most complications that women face are experienced at the time of delivery and the period immediately after. (Kerber *et al.* 2007, Arthur, 2012, Ayele *et al.* 2014). WHO recommends a minimum of four ANC visits, based on reviewing the effectiveness of different models of service delivery (ZDHS:2013-14). However, global estimates indicate that only about half of pregnant women receive this recommended amount of care from skilled health personnel. Furthermore, Wang *et al.* (2011) found that despite the progress in extending ANC coverage, many developing countries, particularly in sub-Saharan Africa and South/Southeast Asia, still experience unsatisfactory levels of the WHO recommendation of four or more ANC visits. While the main components of ANC are vital in enhancing the provision of care, AbouZahr and Wardlaw (2001), observe that in least developing countries, most ANC programmes are established along the lines used in developed countries, with little adjustment for local conditions and as result, in recent years the underlying premise of much that is carried out under what is known as ANC has been called into question.

#### **2.2.1.1 Trends in women antenatal care use in Zambia.**

The ZDHS subsequent reports (1992-2014) reveal an increase in percentages of ANC service use during the period. ANC use increased from 92.4 per cent in 1992 to 95.7 per cent in

2013-14. There was a 3.2 percentage point increase from 92.4 per cent in 1992 to 95.6 per cent in 1996. Declines in ANC utilisation were also observed with the most marked changes between 1996 and 2001. A decline of 2.2 percentage points was observed from 95.6 per cent 1996 to 93.4 per cent in 2001-2. From 2007 period to 2013-14 a 2 percentage point increase was observed from 93.7 per cent to 95.7 per cent. A remarkable characteristic of maternal health utilisation in Zambia is the high proportion of ANC utilisation in the past two decades the country has recorded. Zambia has maintained high proportions of women receiving ANC from skilled health providers. Although MDG 5 targeted universal access to reproductive health by 2015, a general observation of the ZDHS report from 1992 to 2014 reveals a high trend of over 90 per cent of expectant mothers receiving ANC from skilled personnel (doctor, clinical officer, nurse, or midwife) during their last pregnancy. Although ANC attendance is high in Zambia especially in urban centres, the quality of care that expectant mothers receive varies from place to place as most areas in the rural parts of the country have a shortage of skilled personnel.

### **2.2.2 Skilled birth attendance (SBA) utilisation.**

Skilled attendance at childbirth is a crucial component of maternal health services that plays a significant role in reducing maternal and neonatal mortality. Adegoke and Broek (2009) point out that the international community set a target of 80 per cent by 2005, 85 per cent by 2010 and 90 per cent coverage by 2015 for skilled attendance at birth. This target has not been achieved in most middle and low income countries including Zambia due to various reasons. Most women from both low and middle income countries tend to deliver outside of health facilities, in the absence of skilled help. Delivery care through access to health facilities and skilled health personnel are important interventions for safe motherhood. Available evidence shows that countries with high levels of deliveries by skilled attendants have low levels of maternal deaths. In developed countries, most births take place in the hospitals while the trend in developing countries reveals lower statistics, as the majority of births have been occurring at home. The situation is worse in rural areas where births are attended to by relatives and traditional birth attendants (TBAs). According to Adegoke and Broek (2009) data on the proportion of women who deliver with a skilled birth assistance show that while many richer countries have near universal coverage, just slightly over 50 per cent of all births in developing countries take place with a skilled attendant, although this varies by region. Similarly a study by Canavan (2009) revealed that a proportion of births attended by skilled

health practitioners between 1990-2004 estimates averaged 56 per cent across the developing world. WHO (2005), revealed that the regions with the lowest proportions of skilled health attendants at birth in least developed countries included Eastern Africa (34%), Western Africa (41%) and South-central Asia (47%), which also recorded the highest numbers of maternal deaths. In the least developed countries, the presence of skilled birth attendants is lower in rural than in urban areas (UN,2005).Most developing countries statistics still indicate fewer births being handled by skilled birth attendants both at home and in an institutional setting. In Zambia, only 47 per cent of births are attended by a skilled health worker at health institutions with a high home delivery (53 %) while communities in rural areas have limited access to health care (UNICEF,2015).Similarly ,a study conducted in Zambia's Kalabo district by Stekelenburg *et al.* (2004) revealed that 96 per cent of the respondents had a preference of delivering in a clinic or hospital even though, the actual percentage of institutional deliveries, for the last delivery, had been 54 per cent.

#### **2.2.2.1 Provision of Emergency Obstetric Care (EOC) during delivery.**

The subject of Emergency Obstetric Care (EOC) has not received significant spotlight in Zambia and as well as many other developing nations. Obstetric care from a health professional during delivery is recognised as a critical element in managing complications including fistula, that may arise during childbirth and therefore reducing maternal and neonatal mortality. However, data on EOC in developing countries were often scarce. Studies have shown that around 15 per cent of live births are likely to need EOC, and caesarean sections may be required in 5–15 per cent of births (UNICEF:2009). It is evident that there are many important gaps in coverage, especially in rural areas of Zambia, where rates of successful caesarean section are generally low. The 2013-14 ZDHS included a series of questions on fistula, a condition that develops when the tissues of the vagina, bladder, and/or rectum are damaged during prolonged obstructed labour, resulting in the formation of an opening between the bladder or rectum and the vagina through which urine and/or faeces pass uncontrollably (ZDHS 2013-14,p 134).This inclusion is very vital to health service providers as it gives information on the knowledge of fistula and experience of fistula-like symptoms considering the fact that women who develop fistula are often socially rejected in developing countries including Zambia. A study by Thaddeus and Maine (1994) revealed that in parts of Africa, prolonged obstructed labour is taken to be a sign of the woman's infidelity. It is thus



interpreted as punishment for adultery and not recognized as a medical problem and as a result women who develop fistula are isolated within the society in which they reside.

#### **2.2.2.2 Trends in women use SBA in Zambia 1992-2014**

In the ZDHS reports, proportions of SBA showed an important increase during the period, from 50.6 per cent in 1992 to 64.2 per cent in 2013-14. There was a 4.1 percentage point decline from 50.6 per cent in 1992 to 46.5 per cent in 1996. The utilisation of SBA further declined from 46.5 per cent in 1996 to 43.5 per cent in 2001-2. By contrast SBA increased from 43.4 to 64.2, a 20.8 percentage point change between 2001 and 2013-14. The proportion of women utilisation of SBA rose from 44.3 per cent in 2007 to 64.2 per cent in 2013-14. The general picture of the ZDHS reports reveals that between 1992-2014 period, under half of births were assisted by medically trained personnel. This means close to half of births in Zambia are delivered at home and half are delivered in health facilities with home deliveries much more common in rural areas.

#### **2.2.3 Post natal care (PNC) utilisation**

PNC programmes rank among the least emphasised of all reproductive and child health programmes in least developed countries. Wang *et al.* (2012) affirms that comparing ANC and SBA to PNC, the latter has been largely neglected in safe motherhood programs, even though, it is critical to the management of postpartum haemorrhage, an important cause of maternal deaths in developing countries, especially within the first 48 hours after birth. The skill level of the provider who performs the first PNC check-up is paramount as it has important implications for maternal and neonatal health. Skill level determines the ability to diagnose complications and to recommend appropriate treatment or referral to the qualified medical personnel in an event when the expertise cannot handle the complications. Mothers and babies are at high risk during the first few days after delivery and the lack of a defined PNC package is a vital gap, which also contributed to discontinuity between maternal and child health programmes (Kerber *et al.*, 2007). In developing countries, more than 60 per cent of maternal deaths occur in the six weeks post-delivery and 80 per cent of postpartum deaths are caused by obstetric factors occurring in the first week postpartum (Li *et al.*, 1996).

A study by Wang and Hong (2013) found that 71 per cent of women in Cambodia, regardless of where they delivered received a health check – up within two days of delivery. The

findings from the study revealed that the use of PNC differed between health facility deliveries and home based deliveries. 90 per cent of women who delivered at a health facility had a PNC check-up compared with 43 per cent who delivered at home. Another study by Tarekegn *et al.*, (2014) found a low utilisation of PNC services in Ethiopia. Similarly a study by Abor and Nkrumah-Abekah (2013) revealed that the coverage for PNC in Ghana still remains low, recording marginal increase of 1.7 per cent in 2004 over the 2001 figure of 53.3 per cent.

#### **2.2.3.1 Trends in women use of PNC in Zambia**

According MoH (2011) Zambia's safe motherhood guidelines recommend that women receive at least four PNC check-ups, the first within six hours of delivery, the second on the second day following delivery, the third on the sixth day following delivery, and the last within six weeks after delivery. In the ZDHS reports (2001-2014), PNC use increased from 11.9 per cent in 2001 to 44.3 per cent in 2007, and rose further to 59.7 per cent in 2013-14 indicating a 47.8 percentage point increase during the period. Generally, even though PNC showed the most increase, utilisation is still lower in comparison to ANC and SBA. Very low proportions of women had a postnatal check-up from skilled personnel in the three surveys (2001-2013-14) that collected data on postnatal care use.

Having discussed the individual components of maternal health use, the next section discusses utilisation of MHC along the continuum of care.

### **2.3 Trends in women completing utilisation of maternal health services as a continuum of care.**

The strategy of continuum of care calls for a service delivery system connecting or combining the three components of maternal care namely ANC, SBA and PNC (Wang and Hong, 2013). As pointed out earlier, their provision in a comprehensive and continuum pattern of care from pregnancy, to child birth and after delivery has been proven to reduce maternal and child (neonatal) death (Dahiru and Oche, 2015). According to Adegoke and van de Broek (2009), the 2008 global estimates of all women attended to by skilled attendants during pregnancy, childbirth and the postpartum period stood at 65.7% with some countries having less than 20%. Few studies have looked at effectiveness of care linkages between ANC, SBA, and PNC. Wang and Hong (2013) found many women in Cambodia dropping

out of the pathway of continued care. The study found that 90 per cent of women received ANC, 71 per cent received a combination of ANC and SBA while 60 per cent of completed the continuum of care by receiving all three types of services. The study by (Wang and Hong, 2013) that linked a combined intervention of ANC, SBA as well as PNC along a ‘continuum of care’, however analysed the subject from a cross sectional point of view as opposed to a longitudinal approach; the position from which this study is informed.

In 2001, Zambia recorded a proportion of 93.3per cent in ANC utilisation, 43.3 per cent SBA and 11.9 per cent PNC check-ups under medically trained personnel. In 2007, a proportion of 94.4per cent attended ANC consultation from skilled health providers while, 53.6 per cent delivered with skilled help and lastly 44.3 per cent had their PNC check-up from skilled health. Similarly in 2014, 96 per cent of women attended skilled ANC check-ups, 64 per cent delivered with the help of SBAs, while 63 per cent had a skilled PNC check-up (ZDHS, 2001-2,2007,2013-14).The ZDHS surveys however, were not able to satisfactorily address the issue of service utilisation as they looked at the subject of maternal health service utilisation from individual service interventions(ANC, SBA and PNC) as opposed to looking at the issue from a combined perspective of integrated service delivery along the continuum of care. Having discussed maternal health service utilisation along the continuum of care, the determinants and barriers of maternal health service utilisation will be discussed next.

#### **2.4 Factors influencing the use of maternal health services along the continuum of care.**

Andersen and Newman (1973) grouped the factors that influence utilisation of health services under three heads namely pre-disposing factors, enabling factors as well as the need factors. An important understanding of MHC use is that no universal explanation may apply to different places and times as the determinants of service use vary across socio-economic, cultural and spatial contexts. Several bio-demographic factors have been positively associated with maternal health service utilisation. Research has proven that educated and working mothers are more likely to utilise modern healthcare services than uneducated ones because they are considered to have more awareness of existence of MHC services and the benefits involved. Education empowers women with more confidence and capabilities to make informed decisions to use modern healthcare services with their children (Caldwell, 1979, Mosley and Chain, 1984).

In India, a study of analysis of choice of delivery location showed that maternal and paternal education, and scheduled caste status were the predisposing factors that determined the choice of private facilities, public and home deliveries (Thind *et al.*, 2008). Similarly, a study by Shariff *et al.* (2002) conducted in India linked the low levels of maternal health utilisation to lower household income levels, high illiteracy, ignorance as well as traditional and cultural factors. Another study in Pakistan by (Babar *et al.*, 2004) consistently found, cultural beliefs and perceptions, poor socio-economic status, lack of physical accessibility, low literacy levels in mothers as well as large family size as the leading causes of poor use of primary health care services. In Africa, a similar study conducted in Ethiopia, linked the use of maternal health services to the socio characteristics of women, cultural beliefs, and the accessibility to these services (Assfaw (2010) quoting Yared *et al.*, 2002). In contrast a study by Elmusharaf *et al.* (2015) found that women's education, employment, and affordability are the most commonly identified factors affecting ANC uptake. A study by Manzi *et al.* (2014) in Rwanda found that proximity to the antenatal clinic was an important determinant of utilisation of ANC. In contrast, Myer and Harrison (2003) found that despite the widespread availability of free ANC services, most women in rural South Africa attend their first antenatal clinic late in pregnancy and fail to return for any follow up care, potentially leading to avoidable perinatal and maternal complications.

Wang and Hong (2013) found socio-economic disparities in the use of maternal health service as a continuum of care that women from wealthiest households were more likely to use maternal health services compared with women from poorest households. Similarly, Elo in Peru (1992) and Fosu (1994) have also established that higher levels of family income, women's education and maternal age which could serve as a proxy for accumulated knowledge of health care services are positively associated with increased utilisation of modern health care services. A woman from a wealthy background is expected to have more access to resources and therefore more likely to use maternal health services as opposed to one from a poor background. Wealth status is a quintile index based on various indicators asked in the 2007 and 2013-14 ZDHS related to household assets and housing characteristics. A study by Tarekegn *et al.* (2014) found that household wealth status, residence (urban/rural) and women's education are significantly associated with the use of ANC, SBA and PNC services. Gabrysch and Campbell (2009) as cited by Adjiwanou and Le Grand (2013, p 7) note that the Gabrysch and Campbell 's conceptual framework helps to identify, four sets of factors related to SBA, namely: "socio-cultural factors (age, marital status, education), the

perceived benefits/needs (quality of care, pregnancy wanted, previous use of health service), economic accessibility (work status, household wealth) and physical accessibility (distance to health care, rural/urban)". These and similar variables have also been proven to influence both ANC and PNC utilisation in developing countries. Elo (1992) also found a positive association between birth order and maternal health service utilisation in Peru.

This study is a significant departure from most of the studies reviewed above that addressed the subject of maternal health service utilisation for individual services namely ANC, SBA and PNC as opposed to looking at these interventions as an integrated service delivery across the continuum of care apart from one study, Wang and Hong (2013) that studied the subject based on cross sectional data from only one survey.

#### **2.4.1 Male involvement in maternal health care.**

Male involvement in maternal health seeking behaviour is a key enabling factor on pregnant partner's health and access to health. The involvement of males plays a critical role in both the delivery and use of maternal healthcare services. The subject of male involvement typically highlights the difficulty women experience especially in developing countries as a result of reliance on male household heads to access medical attention financially and practically (Rahman, 2000). Nesane *et al.*, (2016) argue that men tend to make decisions within families that often govern behaviour regarding the use of contraceptives, the availability of nutritious food, women's workload and the allocation of finances, transport and time for women to attend health services in general. Most men in developing countries including Zambia may reject participation in female-oriented health services due to cultural/structural barriers, the male partner's employment status and mere unwillingness to participate in MHC services. Most African culture perceptions do not permit a male in the delivery room as well as participation in child birth. A study by Hagey *et al.*, (2013) found that women's knowledge gaps, previous births, limited involvement of the male partners and cultural perceptions were the main barriers to maternal health service utilisation. Tarekegn *et al.*, (2014) found education of women and their husbands to have a significant association with the use of skilled ANC attendants. This means, women whose husbands were educated were more likely to use maternal health services than those whose husbands were not educated. In contrast, Manzi *et al.*, (2014) found that having an employed partner with at least secondary education was associated with delayed ANC use. Generally, the absence of men involvement at planning and implementation level of MHC programs has had a negative bearing on the actual use of

the service. Nesane *et al.*,(2016), relates that the failure to incorporate men in maternal health promotion, prevention and care programmes by policy makers, programme planners and implementers has previously had a serious impact on the health of women and the success of these programs.

#### **2.4.2 Differentials in utilisation of maternal health services from skilled personnel.**

Differentials and inequalities in utilisation of maternal health services are of paramount importance as they can provide a basis for planning. Barros *et al.*,(2013) argue that although reducing inequalities was not a key element in the health-related MDGs, it is an important focus of the post-2015 agenda, which involves studying how inequalities change, how they relate to policies and health systems, and how they relate to global processes, such as conflict or economic growth or recession. There are multiple dimensions to health equity according to gender, wealth, education, place of residence, ethnicity, and sexual orientation, and socio-economic position among other factors. Place of residence (urban or rural) has a bearing on utilisation of MHC. People who reside in urban areas have a relatively high probability of using healthcare facilities than their rural counterparts. According to ZDHS (2013-14) women are more likely to report four or more ANC visits if they reside in urban areas, have a higher education level or live in a richer household though the trends are very worrying for the less privileged in society (ZDH2013-14).Abor and Nkrumah-Abekah (2013), quoting Stock (1983) point out that a number of studies have shown that physical proximity to health care services, especially in developing countries, plays an important role in service utilisation. Navaneetham and Dharmalingam (2001) also found that place of residence at the time of the survey reflects differentials in the diffusion of modern medical care between rural and urban areas.

#### **2.4.3 Barriers to Maternal health service utilisation.**

According to the World Bank (1999) at the individual level, low demand for maternal health services can be attributed to women's low education, an enduring preference for traditional medicine, autonomy and decision making power. Montgomery and Hewett (2005) point out that socio-economic barriers such as low household living standards, income and socio-economic status as some constraints to seeking maternal health services, a lack of awareness of the need for routine care visits in the absence of danger signs, lack of insurance coverage, transportation difficulties and a preference for traditional childbirth practices. MHC-seeking behaviours are also shaped by demographic factors such as parity, maternal age and marital status (Stekelenburg *et al.*, 2004), which may be shaped, in turn, by culture (Griffiths and

Stephenson, 2001). However, most studies on maternal health services utilisation in sub-Saharan Africa have dwelled more on individual-level factors and are limited, in their ability to draw inferences about community barriers to care. Culture also plays a significant role in determining the use of maternal health services. A study conducted in the United Kingdom by Petrou *et al.* (2001), found that Women of Pakistani origin made 9.1 per cent fewer ANC visits than women of white British origin. In Nigeria, although a functioning government maternity centre among the Yoruba community availed a wide range of ANC and delivery services, a study by Brieger *et al.* (1994) found that most of the women opted not register for ANC until their sixth month of pregnancy or later, while 65 per cent had a home delivery. Lastly, policy interventions and how they relate to health service utilisation are discussed in the next subsection.

#### **2.4.4 Policy interventions on maternal health utilisation**

The cost of health service acquisition plays a pertinent role in maternal health service attendance in developing countries. In the mid-1980s, low and middle income countries introduced user fees as a response to declining national health budgets. Through the Bamako initiative of 1987, user fees were presented as a means of cost recovery of public health expenditure, as well as enhancing efficiency and equity. It included user fees among its instruments as a vehicle to produce quality improvements in services through the retention of local generated revenue and also placed a strong emphasis on community participation (Mc pake *et al.*, 2013). After decades of global user-fee experience, the move was rigorously critiqued as regressive hence the removal of user fees from public health institutions. A host of countries including Benin, Burkina Faso, Burundi, Cameroon, Ethiopia, Ghana, Kenya, Liberia, Mali, Nepal, Niger, Senegal, South Africa, Sudan, Uganda and Zambia pursued fee removal or exemption policies for delivery care and/or caesarean section. According to Mc pake *et al.* (2013) “Most studies reviewing utilisation following the abolition of user charges for deliveries and other related maternity care have observed a rise in assisted deliveries and caesarean sections at health facilities and, in some cases, show that gains are concentrated in poorer groups”. Nevertheless, Canaan (2009) quoting Freedman *et al.* (2007) argue that the field of maternal health has many examples of pursuing an intervention which has little effect on health outcomes due to failure to address the necessary health system support.

In summary the literature reveals that trends in the use of antenatal care skilled birth attendance and postnatal care services is improving steadily in least developing countries while that of developed countries is almost reaching universal coverage targets. The strategy

of continuum of care calls for a service delivery system connecting or combining the three components of maternal care namely Antenatal care, Skilled Birth Attendance and Postnatal care. The determinants of maternal health services vary across space and time. The bio-demographic variables influencing maternal health utilisation from the literature include: maternal age at delivery, birth order, mother's education, wealth quintile, type of place of residence, exposure to media and birth parity among other factors.

In Zambia, the application of most health related issues have depended on various policies and approaches. According to Nsemukila (2014), following independence in 1964 and prior to 1992, Zambia has used successive national development plans as major policy instruments to guide provisions of various health care services, guided by the Public Health Act CAP 395 of 1930 of the laws of Zambia. The implementation of the 1992 National Health Policies and Strategies came into effect after 1991 during the return to the multi-party dispensation. According UNICEF (2015a) since 1995, Zambia has relied on national health strategic plans under the National Health Services Act of 1995. In 2012; the government adopted a National Health Policy that sets clear direction for the development of the health sector. Nsemukila (2014) points out that the aim of the National Health Policy is to reduce the burden of disease, maternal and infant mortality and increase life expectancy by providing a continuum of quality effective health care services as close to the family as possible. In a bid to improve MHC use the government also established Ministry of Community Development, Mother and Child Health (MCDMCH) strategic plan (2013-2016), and further introduced the Roadmap for Accelerating Reduction of Maternal, New-born and Child Mortality (RARMNCM) 2013-2016 in 2013 in order to reduce maternal, new-born and child mortality rates by 2015. Nsemukila (2014) summarised the objectives of these policies as follows; to provide skilled ANC, SBA and PNC, at various levels of the health care delivery system and to strengthen the capacities of individuals, families, communities, line ministries and the private sector to share responsibility and play their role in efforts to significantly improve MNCH outcomes for universal coverage to achieve the MDG goals.

## **2.5 Summary**

This chapter presented a review of literature relevant to the study. The review of such literature provided an in-depth comprehension of maternal health service provision. The review of both local and international studies on the levels and trends in the use of maternal services was pivotal in identifying and situating the existing knowledge gap in Zambia's literature. The subsequent chapter will present the methodology used in the study.



## **CHAPTER THREE: METHODOLOGY**

This chapter presents the methodology that was used in the study. Included in this chapter are; background into the data used in the study, research design, data collection procedure and participant selection, ethical consideration ,target population and study sample, the inclusion/exclusion criteria, methods and statistical analysis and identification of variables, data analysis techniques and the variables that were used.

### **3.1 Research Design.**

This is a quantitative study and employing a time series (trend) design through analysis of cross-sectional data from the Zambia Demographic and Health Survey (ZDHS) data sets as it analyses measurements of the same variables taken at different points in time (Gujarati, 2004).The data from the Zambia Demographic Health Surveys (ZDHS) provide consistent and reliable estimates of maternal and child health care services, and other related indicators at both the national and provincial levels.

### **3.2 Data collection procedure and participant selection**

This study used the Zambia Demographic Health Surveys data and permission was sought from DHS, Monitoring and Evaluation to use raw data of the Demographic and Health Survey from consecutive surveys (1992-2014) of which the women data sets were downloaded and merged. The Zambia Demographic Health Survey data sets are national sample surveys designed to provide up-to-date information on background characteristics of the respondents, fertility levels, nuptiality, sexual activity, fertility preferences, maternal mortality, maternal and child health, awareness and behaviours regarding HIV/AIDS and other sexually transmitted infections among other issues (ZDHS, 2014). A DHS is usually supposed to be held every five years. In Zambia the Demographic Health Surveys have been running for some time even though this study mainly focuses on the period between 1992 and 2013 - 14.According to the DHS (1992 - 2013/14) this selected all women aged between 15 - 49 and who were either permanent residents in the households or visitors who were present in the households on the night before the survey, qualified to be candidates for the interviews. Some variables in used in this study were generated and others re-coded in order to meet the desired classification suitable for the study using the software Stata.

### **3.3 Ethical Aspects**

Permission was sought from Measure DHS, Monitoring and Evaluation to use results of the consecutive Zambia Demographic and Health Surveys results from (1992-2014). All data was reported in aggregate and no respondent-identifiable information was obtained and handled by the researcher.

### **3.4 Source population and sample size**

The study used the woman as the unit of analysis and the source population was all women in the reproductive age group (aged 15 to 49 years) who had at least a live birth in five years preceding the surveys in randomly selected households across Zambia. A total of five survey data sets from which women files were extracted and sub-data sets of women who had a live birth, five years preceding the surveys was created in stata. An initial sample of 34762 women from all the five data sets were therefore eligible for the analysis.

### **3.5 Sampling procedure**

Generally, the ZDHS reports used two stage stratified cluster sample designs adopted from the Census of Population and Housing with Enumeration Areas (or clusters) selected at the first stage while households were selected during the second stage.

### **3.6 Inclusion criteria/Exclusion criteria**

The study subjects were women aged 15 to 49 years who had at least one live birth in the 5 years preceding the surveys. Women who reported not to have had a birth in the five years preceding the survey were dropped from the analysis.

### **3.7 Methods and Statistical Analysis**

Data were analysed in STATA version 12. Sampling weights were applied in all the analyses to enable generalization of all results to the country's population using the pre-existing individual sampling weight in the DHS data sets. Univariate analysis was carried out to describe women's bio-demographic characteristics.

**Research question one;** Are there significant changes in the use of the components of maternal health services from skilled personnel among women in Zambia, overtime, was tested by computing the Pearson's Chi-square ( $\chi^2$ ) trend test for categorical variables at 95% (CI). It was used to test whether the distribution in the components of MHC were statistically different to determine change overtime. In response to **research question two**, frequencies were run to explore the trends of women completing the continuum of care of maternal health service utilisation. Finally, to determine factors that influence the utilisation of skilled MHC along the continuum of care, a multivariate analysis by way of binary logistic regression was employed (Lemeshow, 2001) (**Research question three**). Logistic regression at bi-variate level was first employed to check for association between the dependent and the explanatory variables. This was measured by means of odds ratios for which 95 % confidence interval was used. Variables that were statistically significant at bi-variate level, ( $p < 0.05$ ) were further analysed at multivariate level using binary logistic regression to determine the net effect of predictor variables on the utilisation of MHC services. The results are presented in form of estimated odds-ratios (OR) with p-values for which 95% confidence intervals (CI) was used.

### Model

In this study a logistic regression model was fitted. Logistic regression estimates the odds of an event occurring and it was used to predict utilisation of maternal health services. The rationale for using binary logistic regression stems from the fact that the dependent variable is binary or dichotomous (Hosmer and Lemeshow, 2000) for which the outcome was dichotomised as “service use/Yes or otherwise/No”. The dependent variable noted ‘1’ if the women used skilled maternal health services and ‘0’ if otherwise. The general form of a logistic regression equation is as follows;

$$\text{Log} \left( \frac{p}{1-p} \right) = b_0 + b_1 x_1 + b_2 x_2 + \dots + b_k x_k$$

Where  $b_0$  is constant,  $b_1, b_2, \dots, b_k$  are the coefficients of  $x_1, x_2, \dots, x_k$ .  $p$  is the estimated probability of any measures of maternal health service utilisation.

In this study, representation of odds ratios is as follows. Estimated odds ratios equal to 1 indicate that the use of MHC services is no different from the reference category. Estimated odds ratio  $>1$ , means the likelihood of use of MHC services is higher relative to the reference category whereas the estimated odds ratio  $< 1$ , means the probability of using MHC services

is lower relative to the reference category. All odds ratios were rounded to three decimal places.

### **3.8 Identification of variables**

Based on the conceptual framework (Figure1.1) and empirical evidence from relevant literature, nine potential predictors of maternal care utilisation were identified in the 1992-2014 ZDHS data sets. Some variables in this study were generated and others re-coded to meet the desired classification.

In this study MHC is the outcome measure (dependent variable) and refers to an integrated or combined reception of three interventions (ANC, SBA, and PNC) from skilled personnel that constitute the continuum of care. The analysis that included a combination of ANC, SBA and PNC variables was however limited to the surveys in which the respondents were asked questions about PNC for all births(institutional/non-institutional).Hence only three surveys (2001-2014) were included for that analysis. The 1992-1996 surveys did not collect data on PNC hence the MHC variable only included a combination of ANC and SBA. The exposure (predictor) or independent variables used in the analysis included household wealth quintile, mother's highest educational level, type of place of residence, maternal age at delivery, birth order, birth parity, exposure to media, husband/partner's education level and husband/partner's approval of MHC use. The choice of variables for this study also arose from the fact that in developing countries including Zambia, MHC utilisation is constrained and determined by similar cultural, socio-economic, and demographic settings (Ayele et al.,2014).Literature discusses the following dimensions as being likely to impact the issue, maternal age at delivery, birth order, mother's education, wealth quintile, type of place of residence, exposure to media ,birth parity ,male partner's educational level and husband /partner 's approval of health service use among other factors (Tarekegn *et al.*,2014, Elo,1992; Fosu, 1994,Manzi et al,2014).From empirical evidence, these variables have proved to influence the dependent variable. One challenge faced during the selection of variables is that some variables were not available in some data sets considering the fact that the study focuses on a period between 1992 and 2014. For instance the independent variables household wealth status (quintile) and Husband/Partner's approval to seek medical health were not available in the 1992-1996 surveys and were therefore used for the 2001-2014 analysis. As an integral part of the dependent variable MHC, the variable PNC was not available in the 1992 – 1996 data sets. Due to a strong collinearity between the number of

children ever born and birth order only a single variable birth order was adopted for multi – variate analysis. Data regarding variable identification are summarised in Table 3.1 below.

**Table 3.1: Description and measurement of variables**

Variables	Description	Measurement
<b>Dependent variable</b>		
<b>Maternal health care</b>	A score variable arrived at by combining maternal health services (ANC, SBA and PNC). Ideally all women should have used all the three components of care.	A binary indicator for maternal health was created distinguishing between “use” and “non-use”
<b>Independent variables</b>		
<b>Maternal age at delivery.</b>	Refers to the age of the mother during birth of the child.	Ordinal variable distinguishing women’s age categorised as < 20, 20-34 and 35+.
<b>Respondent’s Highest Educational Level.</b>	Refers to the highest education attained by the respondent.	Ordinal variable categorised as (no education, primary, and secondary, higher).
<b>Birth order.</b>	Classification of children by birth rank	Ordinal variable that has classified birth rank as 1, 2-4 and 5+.
<b>Household wealth index</b>	Asset based measure of a household.	Asset based categorical variable classified as (poorest, poorer, middle, richer, richest).
<b>Exposure to media</b>	Derived from question on frequency of exposure to radio, television and newspaper at least once a week.	Categorised as (no media = 0, one type = 1, two types = 2 and all three types = 3).
<b>Type of place of residence.</b>	This is the defacto type of residence.	A nominal variable distinguishing urban from rural communities.
<b>Birth parity.</b>	Represents number of children ever born.	Ordinal variable ordered as (1, 2-4 and 5+).

<b>Husband/Partner's education level.</b>	Refers to the highest education attained by Husband/Partner	An ordinal variable categorised as (no education, primary, and secondary, higher, don't know).
<b>Husband/Partner's approval of health service use.</b>	Refers to getting permission to seek medical help.	An ordinal variable categorised as "no problem", "big problem, "not a big problem".

### 3.9 Summary

The chapter presented the methodology used in undertaking the study from data collection to data analysis. It provided a detailed focus on the research design, sampling techniques and procedures, and the methods to be used to collect and analyse the findings of the study.

## **CHAPTER FOUR: RESULTS**

The previous chapter discussed the methodology adopted for the study. This chapter presents the findings of the study which sought to find out levels, trends and determinants of maternal health service utilisation in Zambia as evidenced in the ZDHS: 1992-2014. The findings are divided in four broad sections. The first part highlights results from descriptive statistics on levels and trends of each individual component/service utilisation (ANC, SBA and PNC) from skilled health personnel; the second part presents an examination on the proportion of women who complete the pathway of maternal health service as the “continuum of care” from antenatal through delivery up to PNC from skilled health professionals. The third and fourth parts collectively dwell on the determinants of maternal health service utilisation; the third part particularly focuses on Logistic regression at bi-variate level, employed to check for associations between the dependent and explanatory variables and lastly the fourth part uses multivariate logistic regression models to estimate the effect of covariates on the dichotomous dependent variable.

The findings were based on the following research questions:

1. Are there significant changes in the use of the components of maternal health services from skilled personnel among women in Zambia, overtime?
2. What are the trends of women in Zambia completing the continuum of skilled MHC across time?
3. What factors influence women’s trends in utilisation of skilled maternal health services as a continuum of care during the period?

### **4.1 Demographic/Background characteristics of the study population.**

Due to missing values for some of the independent and dependent variables utilised in the study, the value of (N) representing the number of women in a particular cohort varied throughout the analysis. The initial analysis, included a total of 34,762 women aged between 15 - 49 who had a live birth five years preceding the surveys between 1992 and 2014. Trend data clearly revealed or shown that there have been considerable socio-demographic

changes in Zambia over the last two decades. There was a downward trend in the proportion of women without education from 19 per cent in 1992 to 10 per cent in 2014. There was an upward trend in the proportion of women acquiring secondary education, from 19 to 32 per cent was attained. The proportion of women in rural communities reduced from 49 per cent in 1992 to 42 per cent in 2014. An upward trend is observed in the proportion of women residing in urban areas from 51 per cent in 1992 to 58 per cent in 2014, while those with secondary education show a remarkable increase in the 2013/14 period.

Little changes were observed in the age distribution of mothers. Teenage pregnancies remain high despite dropping from 21 per cent in 1992 to 16 per cent in 2014. An increase in the proportion of children born to older mothers was observed from 17 per cent in 1992 to 18 per cent in 2014 in the age cohort 35 - 49. This suggests an upward trend of one percentage point in children born by high-risk aged women. Information on wealth quintile as a single variable in the first three surveys 1992, 1996 and 2001-2 was not available, however between 2007 and 2014, there was evidence of a one percentage point increase of poverty levels in the poorest quintile in the country. Proportion of people in the richest quintile remained static while those in the middle quintile increased slightly from 19 per cent in 2007 to 20 per cent in 2014. Women who had no exposure to any form of media significantly reduced from 36 to 28 per cent within the period of study. All proportions across media exposure increased in exception for those with no exposure. Children ever born, Birth rank, Husband/Partner's Education Level and Husband/Partner's approval of health service use did not show any major shift in distribution during the period. The socio-demographic description of the study subjects are illustrated in Table 4.1 below.



**Table 4.1: Background characteristics showing frequencies and percentages of women respondents with p-values, 1992-2013.**

Background characteristics	1992	1996	2001-2	2007	2013-14	P value*
	(N-5163)	(N-5939)	(N-5776)	(N-5421)	(N-12463)	
	n (%)	n (%)	n (%)	n (%)	n (%)	
Highest education attained						
No education	978 (19)	910 (15)	802 (14)	673 (12)	1294 (10)	< 0.0001
Primary	3117 (60)	3591 (60)	3505 (61)	3206 (59)	6538 (52)	
Secondary	958 (19)	1258 (21)	1312 (23)	1292 (24)	4042 (32)	
Higher	108 (2)	180 (3)	157 (3)	248 (5)	579 (5)	
Type of place of residence						
Rural	2514 (49)	2512 (42)	2164 (37)	2032 (37)	5295 (42)	= 0.0403
Urban	2649 (51)	3427 (58)	3611 (63)	3388 (63)	7168 (58)	

<b>Maternal age at birth</b>						
<20	1065 (21)	1192 (20)	1104 (19)	846 (16)	2015 (16)	< 0.0001
20-34	3224 (62)	3769 (63)	3690 (64)	3653 (67)	8204 (66)	
35-49	874 (17)	978 (16)	982 (17)	921 (17)	2244 (18)	
<b>Birth order</b>						
1	1084 (21)	1243 (21)	1181 (20)	996 (18)	2324 (19)	< 0.0001
2-4	2045 (40)	2473 (42)	2508 (43)	2455 (45)	5671 (46)	
5+	2034 (39)	2223 (37)	2086 (36)	1970 (36)	4468 (36)	
<b>Household wealth index</b>						
Poorest	**	**	**	1053 (19)	2444 (20)	< 0.0001
Poorer	**	**	**	1051 (19)	2379 (19)	
Middle	**	**	**	1040 (19)	2466 (20)	
Richer	**	**	**	1180 (22)	2637 (21)	
Richest	**	**	**	1096 (20)	2538 (20)	

Media Exposure						
No exposure	1842 (36)	2308 (39)	2283 (40)	1320 (24)	3432 (28)	< 0.0001
Exposed to any one	1495 (29)	1857 (31)	1728 (30)	1981 (37)	3725 (30)	
Exposed to any two	1160 (23)	1036 (17)	1084 (19)	1258 (23)	3176 (25)	
Exposure to all the three	636 (12)	723 (12)	681 (12)	860 (16)	2130 (17)	
Children Ever Born (CEB)						
1	1084 (21)	1243 (21)	1181 (20)	996 (18)	2324 (19)	< 0.0001
2 - 4	2045 (40)	2473 (42)	2508 (43)	2455 (45)	5671 (46)	
5+	2034 (39)	2223 (37)	2086 (36)	1970 (36)	4468 (36)	
Husband/Partner’s Education Level						
No education	468 (10)	422 (8)	406 (8)	354 (7)	684 (6)	< 0.0001
Primary	2278 (47)	2451 (44)	2415(45)	2177 (43)	4247 (37)	
Secondary	1746 (36)	2152 (39)	2058(38)	1873 (37)	5108 (45)	
Higher	239 (5)	400 (7)	398 (7)	480 (10)	986 (9)	
Don’t Know	64 (1)	114 (2)	95 (2)	108 (2)	318 (3)	

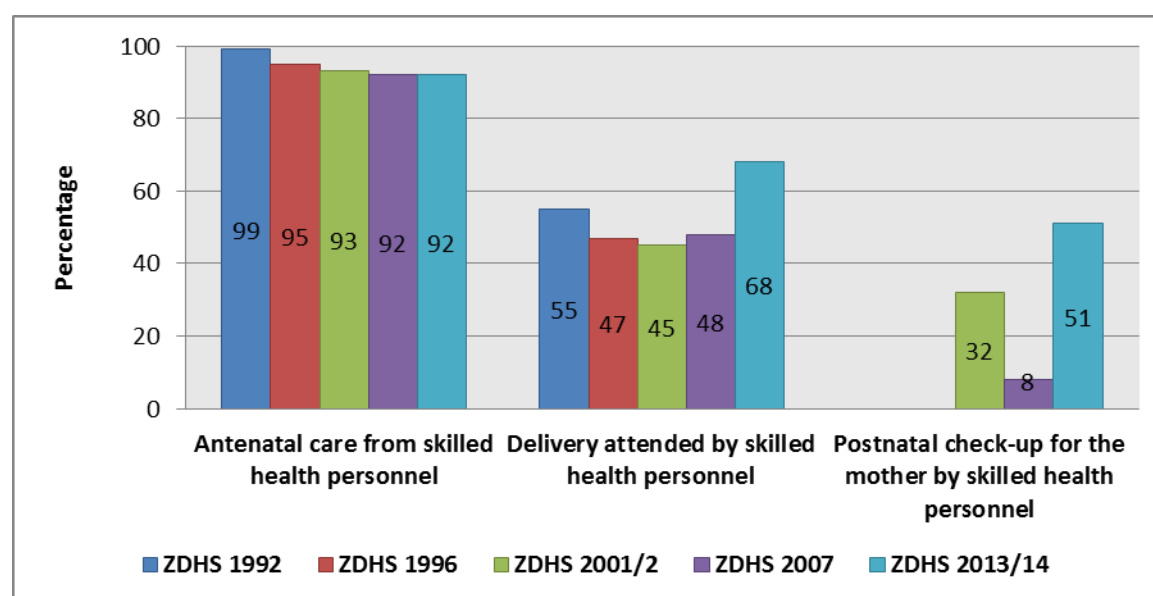
**Husband/Partner's approval of  
health service use**

No problem	**	**	5558 (96)	0 (0)	0 (0)	< 0.0001
Big problem	**	**	212 (4)	238 (4)	327 (3)	
Not a big problem	**	**	0 (0)	5172 (96)	12117 (97)	

## 4.2 Changes in the use of the components of MHC.

Over a period of 22 years (1992-2014) trend data shows a general improvement in the use of maternal health services in Zambia. In contrast, the findings show a general reduction in ANC use despite being well above the 2015 WHO target of 90 per cent coverage. Service utilisation shows an increase in SBA (delivery care) and PNC use. Data regarding the use of ANC, SBA and PNC from skilled health personnel in Zambia between 1992 and 2014, are presented graphically in figure 4.1 below.

**Figure 4.1: Percentage of women utilising the components of maternal health services in Zambia, 1992-2014.**



NB: Data on postnatal check-up was unavailable in the first two ZDHS data set.

ANC utilisation from skilled personnel provides the women with an opportunity to receive appropriate and timely care. These visits are vital as they are intended to prepare the women adequately for childbirth. Zambia has achieved a wide reach of ANC services. Between 1992 and 2014, a total of 25,412 women provided information on ANC use regardless of whether the service was provided by a skilled health professional or not. 23,784 women reported having utilised ANC from skilled health personnel which included nurses, mid-wives, doctors and clinical officers, while 1628 reported having received ANC services from non-skilled health professionals which included traditional birth attendants (TBAs), relatives and friends.

Between 1992 and 2014, over 90% of women who delivered a live birth 5 years prior to the surveys received ANC consultation from skilled health personnel meeting the WHO target of

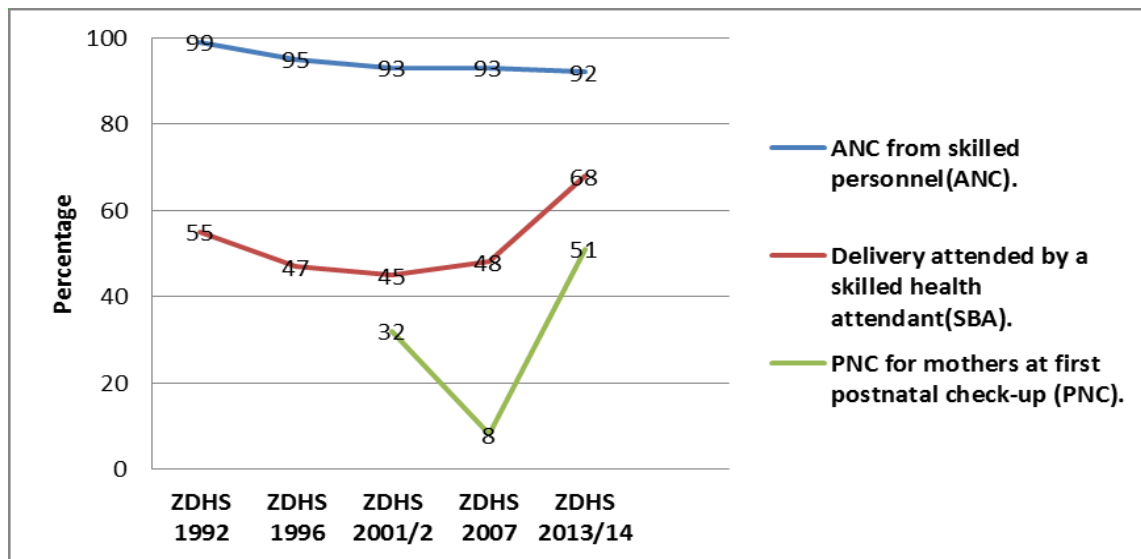
90 per cent coverage of ANC by 2015. However, Figure 3 illustrates that during the period in question, the proportion of mothers who accessed ANC consultation from skilled health personnel dropped from 99 per cent to 92 per cent, indicating a 7 percentage point drop. This drop indicates a statistically significant reduction in the use of ANC ( $\chi^2(4) = 234.94$ ,  $N = 25,412$ ,  $p < 0.0001$ ). The levels in the proportion of women using ANC show a downward trend from 1992 to 2014.

Delivery care attended by skilled health personnel is crucial for safe motherhood. Between 1992 and 2014 a total of 25,960 women provided information on the utilisation of birth attendants whether skilled or unskilled. About 14,360 women reported having delivered with the help of SBAs (nurses, midwives, clinical officers, doctors) while 11,600 reported having delivered with the help of unskilled personnel (TBAs, relatives and relatives). The use of SBAs showed an increase from 55 per cent in 1992 to 68 per cent in 2014. The indicator dropped between 1992 and 2001-2 but showed an upward trend in the last two surveys. The findings reveal a statistically significant increase in the use of SBAs during the period ( $\chi^2(4) = 971.72$ ,  $N = 25,960$ ,  $p < 0.0001$ ). The proportion of women utilising SBAs during the period increased overtime.

PNC attended by skilled health personnel within hours of delivery is vital for the management of postpartum haemorrhage. Between 2001 and 2014 a total of 23,658 provided information of PNC use of one kind or another. About 8601 reported having received a postnatal check-up from skilled health professionals (nurses, midwives, clinical officers and doctors) while 15,058 reported having received a postnatal check-up from non-skilled health professionals which included TBAs, relatives and friends. Skilled PNC utilisation shows a decline from 32 per cent in 2001-2 to 8 per cent in 2007. From 2007 to 2013-14 the use of PNC increased to 51 per cent. Overall, PNC utilisation increased from 8 per cent in 2007 to 51 per cent in 2013-14 indicating a 43 percentage point increase during the period. There was a statistically significant increase in PNC use ( $\chi^2(4) = 971.72$ ,  $N = 23,658$ ,  $p < 0.0001$ ).

Generally, despite this upward trend in the utilisation of PNC, it is still far below the recommended WHO threshold of 90 per cent coverage by 2015. Very low proportions of women had a PNC check-up from skilled personnel in the three surveys that included data on PNC. Figure 4.2 is the plot showing trends in utilisation of individual components of maternal health service in Zambia over the two decades.

**Figure 4.2: Percentage plot of women using the components of MHC in Zambia, 1992-2014.**



These trends reflect long-term improvements in PNC and SBA service utilisation shaped by various circumstances. Utilisation of skilled ANC has remained stable in the last three surveys with nurses as leading health providers in health delivery.

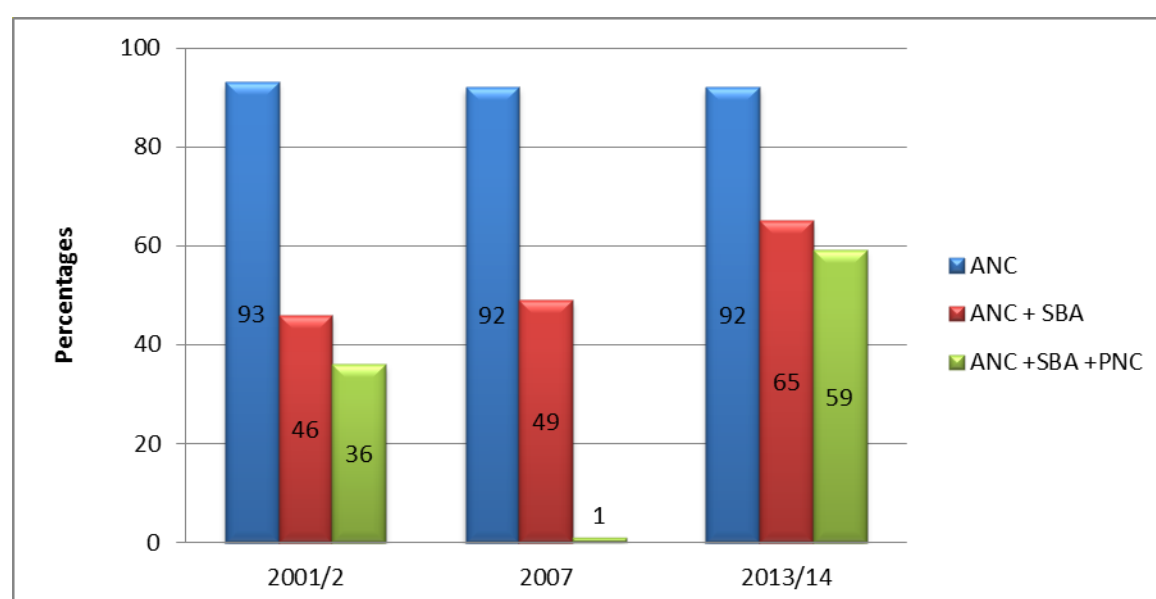
#### **4.2.1 Summary of findings from research question one.**

The summary of findings from research question one which sought to find out whether there are statistically significant changes in the utilisation of skilled maternal health services among Zambian women across time was that; There are significant reductions in the utilisation of ANC ( $\chi^2(4) = 234.94, N = 25412, p < 0.0001$ ). With regards to the utilisation of SBA and PNC there was a significant increase in utilisation of the two indices ( $\chi^2(4) = 971.72, N = 25960, p < 0.0001$ ) and ( $\chi^2(4) = 971.72, N = 23658, p < 0.0001$ ) respectively. On average over 90 per cent of women in the country had received ANC between 1992 and 2014, while a proportion of between 55 per cent and 68 per cent during the same period had a delivery under the supervision of an SBA. A proportion of between 8 and 51 per cent received skilled PNC services.

### 4.3 Trends in women completing the continuum of care of skilled maternal health services overtime.

Due to the fact that data on PNC was not collected in the 1992 and 1996 ZDHS, the analysis on the continuum of MHC concentrated on the 2001-2, 2007 and 2013-14 ZDHS. Data regarding the levels of utilising maternal health services along a continuum of care is presented graphically in Figure 4.3 below, which shows that in 2001-2 out of a total of 4141 women who sought ANC consultation, a proportion of 3841 respondents representing 93 per cent received ANC from skilled health professionals, while 54 per cent did not continue on the pathway to receive SBA. This means a proportion of 1899 respondents representing 46 per cent of the women who got an ANC consultation from skilled health personnel were also attended by an SBA during delivery. Upon delivery another 10 per cent did not seek PNC from skilled health personnel. Overall, 1464 women representing 36 per cent utilised the full range of services from ANC through SBA to PNC to complete the continuum of care.

**Figure 4.3: Percentage of women using the continuum of skilled MHC in Zambia: 2001-2014.**



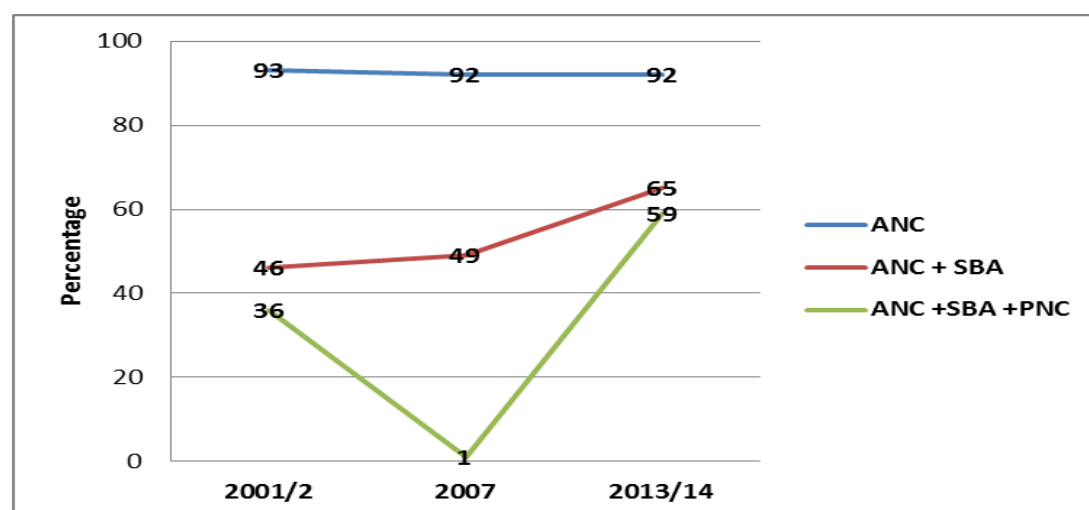
Similarly, in 2007 a total of 3989 women received ANC consultations. A proportion of 3691 representing 93 per cent received ANC from skilled health personnel, while a proportion of 44 per cent did not continue on the pathway to receive SBA. This means a proportion of 1927 respondents representing 49 per cent of the women who received an ANC consultation from skilled health providers were also attended to by an SBA during delivery. Upon delivery another 48 per cent did not seek PNC from skilled health professionals. Overall, 40



respondents representing 1 per cent of the women utilised the full range of services from ANC through SBA to PNC to complete the continuum of care.

In 2013-14 the pattern is similar despite an upward trend towards maternal health services. From a total of 9305 who sought ANC consultations a proportion of 8533 respondents representing 92 per cent received ANC consultations from skilled health personnel a proportion of 35 per cent did not continue on the pathway to deliver with the help of a skilled health professional. In other words 6033 respondents representing 65 per cent of the women who got a skilled ANC consultation were also attended by an SBA during delivery. Upon delivery another 6 per cent did not seek PNC services. Overall, 5503 respondents representing 59 per cent of the women utilised the full range of services from ANC through SBA to PNC to complete the continuum of care. Utilisation of maternal health services along a continuum of care is plotted in Figure 4.4 below.

**Figure 4.4: Per cent of women using skilled maternal health as a continuum of care, 2001- 2014.**



#### 4.3.1 Summary of findings from research question two.

Even though there is evidence of gradual improvement in utilising MHC along the continuum of care over the years, the general pattern of care across time indicates low proportions of women using continued skilled maternal health services from pregnancy to the postnatal period.

#### **4.4 Factors that influence the use of maternal health services along the continuum of care.**

Factors that influence the use of MHC along the continuum of care are first presented at bivariate level to check for the association between the dependent and independent variables. Those that were significantly associated with MHC use at  $p < 0.05$  were advanced for analysis at multivariate level.

##### **4.4.1 Bivariate relationships between demographic characteristics and the continuum of care for maternal health services.**

The bivariate analysis shows the effect of each single independent variable on the use of MHC. The presentation is divided into two distinct parts based on the availability of variables in the data sets. The first part of the bi-variate analysis focuses on the period between 1992 and 1996 during when the variables for PNC, husband/partner 's approval for health care use and household wealth index were not available. The second part 2001-2014 includes the PNC variable, husband/partner's approval for health care use and household wealth index during which the data for the same were collected. All the categorical predictor variables were dummy coded with the lowest category as the reference. In all the analyses, 1.000 was the proportional odds ratio for the reference group. Table 4.2 below, presents the results of the odds of women utilising skilled MHC with p-values in Zambia between 1992-1996. The number of women who used skilled MHC (N) and the proportional percentage (%), the p-values, odds ratios (OR) and 95 % confidence intervals are presented. Between 1992 and 1996, the logistic regression analysis, detected a significant association between MHC utilisation and the following factors at  $p < 0.05$ : Type of place of residents ( $p < 0.001$ ), Highest educational attained ( $p < 0.001$ ), Birth order ( $p < 0.001$ ), Children ever born ( $p < 0.001$ ) and Exposure to media ( $p < 0.001$ ), Husband/partner 's education level ( $p < 0.001$ ) and maternal age cohort at delivery 35 - 49 ( $p = 0.007$ ). On the other hand, the bi-variate analysis did not detect a significant association between maternal age at delivery 20 – 24 ( $p = 0.777$ ) and MHC utilisation during the period under focus.

**Table 4.2: Odds of women using maternal health care with p-values: Zambia, 1992-1996.**

Variable name		<u>Skilled Maternal Health Care (ANC+SBA)</u>				
		N	%	OR	95% CI	P-value
<b>Type of place of residence</b>						
	Urban	2914	71	<b>1.000</b>		
	Rural	1170	29	0.969	0.797 – 0.118	< 0.001
<b>Highest education attained</b>						
	No education	293	7	<b>1.000</b>		
	Primary	2288	56	2.401	1.998 – 2.886	< 0.001
	Secondary	1340	33	10.587	8.486 – 13.208	< 0.001
	Higher	162	4	42.749	18.631 – 98.083	< 0.001
<b>Maternal age at birth</b>						
	< 20	876	21	<b>1.000</b>		
	20 - 34	2717	67	1.021	0.904 – 1.154	= 0.734
	35 – 49	492	12	0.777	0.648 – 0.932	= 0.007
<b>Birth order</b>						
	1	1031	25	<b>1.000</b>		
	2 - 4	1761	43	0.732	0.650 – 0.825	< 0.001
	5+	1293	32	0.626	0.545 – 0.719	< 0.001
<b>Children Ever Born (CEB)</b>						
	1	1031	25	<b>1.000</b>		
	2 - 4	1761	43	0.732	0.650 – 0.825	< 0.001
	5+	1293	32	0.626	0.545 – 0.719	< 0.001

Media Exposure						
	No Exposure	850	21	<b>1.000</b>		
	Exposed to any one	1155	28	2.038	1.805 – 2.300	< 0.001
	Exposed to any two	1204	30	6.327	5.264 – 7.604	< 0.001
	Exposed to all three	875	21	22.731	16.784 – 30.787	< 0.001
Husband/Partner's education level						
	No education	126	3	<b>1.000</b>		
	Primary	1152	31	1.743	1.380 – 2.201	< 0.001
	Secondary	2009	55	6.572	5.101 – 8.466	< 0.001
	Higher	366	10	19.166	13.071 – 28.102	< 0.001
	Don't Know	34	1	1.919	1.095 – 3.364	= 0.023

Table 4.3 also contains odds of women using skilled MHC with p-values in Zambia between 2001 and 2014 at bivariate level. The number of women who used skilled MHC (N) and the proportional percentage (%), the p-values, odds ratios (OR) and 95% confidence intervals are also presented. The regression analysis, detected an association between MHC use and the following independent variables at  $p < 0.05$ : Type of place of residents ( $p < 0.001$ ), Highest education attained ( $p < 0.001$ ), Birth order ( $p < 0.001$ ), Children ever born ( $p < 0.001$ ), Exposure to media ( $p < 0.001$ ), Household wealth index ( $p < 0.001$ ), Husband/partner with primary education ( $p < 0.001$ ), Husband/partner with secondary education ( $p < 0.001$ ), Husband/Partner's approval of health service use ( $p < 0.001$ ) and Maternal age at birth of child aged 35 - 49 ( $p < 0.001$ ). The study did not detect an association between Maternal age at delivery at 20-34 ( $p = 0.107$ ) with the utilisation of maternal health services. Data regarding results of the bi-variate analysis for the period between 2001-2014 are summarised in Table 4.3.

**Table 4.3 : Odds of women using skilled maternal health care as a continuum of care with p-values: Zambia, 2001-2013.**

Variable name	<u>Skilled Maternal Health Care (ANC+SBA+PNC)</u>				
	N	%	OR	95% CI	P-value
<b>Type of place of residence</b>					
Urban	3839	55	<b>1.000</b>		
Rural	3168	45	0.261	0.217 – 0.313	< 0.001
<b>Highest education attained</b>					
No education	485	7	<b>1.000</b>		
Primary	3316	47	1.600	1.384 – 1.850	< 0.001
Secondary	2793	40	4.322	3.618 – 5.162	< 0.001
Higher	411	6	7.972	5.617 – 11.316	< 0.001
<b>Maternal age at birth</b>					
<20	1352	19	<b>1.000</b>		
20-34	4740	68	0.929	0.850 – 1.016	= 0.107
35-49	915	13	0.663	0.590 – 0.745	< 0.001
<b>Birth order</b>					
1	1747	25	<b>1.000</b>		
2-4	3323	47	0.717	0.653 – 0.788	< 0.001
5+	1938	28	0.492	0.442 – 0.547	< 0.001
<b>Children Ever Born (CEB)</b>					
1	1747	25	<b>1.000</b>		
2-4	3323	47	0.717	0.653 – 0.788	<0.001
5+	1938	28	0.492	0.442 – 0.547	<0.001

<b>Media</b>						
No Exposure	1572	22	<b>1.000</b>			
Exposed to any one	1918	27	1.288	1.168 – 1.421	< 0.001	
Exposed to any two	2029	29	2.680	2.351 – 3.056	< 0.001	
Exposed to all three	1489	21	4.609	3.753 – 5.658	< 0.001	
<b>House hold wealth index</b>						
Poorest	838	15	<b>1.000</b>			
Poorer	887	16	1.179	1.028 – 1.351	= 0.018	
Middle	1067	19	1.610	1.371– 1.891	< 0.001	
Richer	1366	25	2.689	2.121 – 3.410	< 0.001	
Richest	1385	25	4.044	2.987 – 5.474	< 0.001	
<b>Husband/Partner's Education Level</b>						
No education	296	5	<b>1.000</b>			
Primary	1953	32	1.007	0.833 - 1.217	= 0.942	
Secondary	3104	50	2.312	1.881 - 2.841	< 0.001	
Higher	714	11	4.434	3.318 – 5.924	<0.001	
Don't Know	11	12	1.162	0.838 – 1.610	= 0.367	
<b>Husband/Partner's approval of health service use</b>						
No problem	14 6	20	<b>1.000</b>			
Big problem	174	2	0.749	0.583 – 0.962	= 0.024	
Not a big problem	5406	77	1.316	1.133 – 1.530	< 0.001	

#### **4.4.2 Multivariate relationships between demographic characteristics and utilisation of continuum of care for MHC.**

This section presents results of the multi-variate analysis for the two periods based on the availed data in ZDHS reports.

##### **4.4.2.1 Predictors of MHC utilisation, 1992 -1996.**

As shown in Table 4.4, a Logistic regression analysis was performed to ascertain the effects of the Type of place of residence, Highest education level attained, Maternal age at birth, Birth order, Children ever born (CEB), Exposure to media and Husband/partner 's level of education on the likelihood that a woman will use MHC. All the categorical predictor variables were dummy coded with the odds of utilising maternal health services in the lowest categories as the reference. In all the analyses, 1.000 was the proportional odds ratio for the reference group. Table 4.4 contains results of the full and reduced (only includes factors that are significant using the stepwise backward regression).

In the reduced model several factors were associated with the use of MHC: having higher education (OR = 8.994, 95% CI: 3.681-21.979) or secondary education (OR = 3.011, 95% CI: 2.393–3.789) or primary education (OR=1.418, 95% CI: 1.186-1.695) versus no education. Between 1992 and 1996, the odds ratios for education indicate that while holding all other variables constant, in Zambia a woman who has completed higher education has nine times the odds of utilising MHC from skilled personnel than is a woman with no education and this difference is statistically significant at  $p < 0.05$ . Similarly women with secondary education have three times the odds of using MHC than those without education, while those having primary education have one and half times the odds of using skilled MHC than women with no education. This means in Zambia women with higher, secondary and primary education have higher odds of utilising MHC from skilled personnel than women with no education. On the other hand, a woman with higher education is more likely to use skilled MHC than those with secondary or primary education.

For the predictor Husband/partner 's education level, having attained higher education (OR = 2.499, 95% CI: 1.605 – 3.892) or secondary education (OR = 1.757, 95% CI: 1.319 - 2.341) or primary education (OR = 1.092, 95% CI: 0.849-1.404) or those who didn't know the husband/partner's level of education (OR = 1.272, 95% CI: 0.633-2.557) versus those without



education. The predictor Husband/partner 's level of education indicates that whilst holding all other variables constant, women having husbands/partners with higher education have two and half times more odds of likelihood in using MHC from skilled health providers than women with partners/husbands without education and the result is statistically significant at  $p < 0.05$ . Similarly the odds of women having partner/husbands with secondary education have two times more odds of likelihood in using skilled MHC than their counterparts with husbands/partners without education and the result is statistically significant at  $p < 0.05$ .

Women exposed to three types of media (OR= 4.405, 95 CI: 3.226 - 6.015) or those exposed to any two types (OR = 2.179, 95% CI: 1.789 - 2.653) or those exposed to any one (OR=1.353, 95% CI: 1.187 - 1.544) versus those with no exposure to media were associated with the utilisation of skilled maternal health services. The odds ratio for media exposure indicate that when holding all other variables constant, a woman exposed to all the three types of media combined, is four times more likely to use MHC from skilled health providers than is a woman with no exposure and this difference is statistically significant at  $p < 0.05$ . A woman who is exposed to two types of media is two times more likely to use MHC from skilled health providers than is a woman with no exposure. Similarly women exposed to one type of media have higher odds of utilising MHC from skilled health personnel than those with no exposure.

Different factors were associated with the less likelihood of using MHC. Birth order 5+ (OR = 0.731, 95% CI: 0.626 - 0.853) or birth order 2-4 (OR = 0.690, 95% CI: 0.596 - 0.799) versus birth order 1. The predictor birth order indicates that whilst holding all other variables constant, the odds of women with a birth rank of five and above have thirty per cent (30%) lower odds of using MHC from skilled health providers than women with the first birth rank and the result is statistically significant at  $p < 0.05$ . Similarly the odds of women with a birth rank of 2 - 4 have 31 per cent lower odds of using MHC from skilled personnel than women having the first birth rank. This is an indication that women tend to use more of MHC by a skilled provider during their first time of delivery or if the birth is the first time.

The predictor Residence, Rural residence (OR = 0.167, 95% CI: 0.138 – 0.203) versus urban residence. The odds ratio for residence indicate that when holding all other variables constant, an urban woman is six times or having 83 per cent more odds of likelihood to use MHC than is a rural woman and the difference is statistically different at  $p < 0.05$ .

In the full model maternal age at birth of the child was not significantly associated with the utilisation of maternal health services. Maternal age 20-34 (OR=1.112, 95% CI: 0.908 - 1.362) or maternal age 35-49 (OR = 1.239, 95% CI: 0.920 -1.670) versus maternal age < 20. On the other hand, women with husbands/partners with primary education and those who didn't know the level of education of their husbands/partners were not significantly associated with the utilisation of maternal health services. Data regarding multi-variate logistic regression results between 1992 and 1996 are summarised in Table 4.4.

**Table 4.4: Odds of women using skilled maternal health care with p-values and confidence intervals:Zambia,1992-1996**

<b>Maternal Health Care(ANC+SBA)</b>						
<b>Full model</b>		<b>Reduced Model</b>				
<b>Characteristics</b>	<b>OR</b>	<b>P</b>	<b>95% CI</b>	<b>OR</b>	<b>P</b>	<b>95% CI</b>
<b>Type of place of residence</b>						
Urban	<b>1.000</b>			<b>1.000</b>		
Rural	0.179	< 0.001	0.146 – 0.218	0.167	< 0.001	0.138 – 0.203
<b>Highest education attained</b>						
No education	<b>1.000</b>			<b>1.000</b>		
Primary	1.271	= 0.013	1.051 – 1.536	1.418	< 0.001	1.186 – 1.695
Secondary	2.221.	< 0.001	1.734 – 2.843	3.011	< 0.001	2.393 – 3.789
Higher	6.511	< 0.001	2.553 – 16.606	8.944	< 0.001	3.681 – 21.979
<b>Birth order</b>						
1	<b>1.000</b>			<b>1.000</b>		
2-4	0.637	<0.001	0.519 – 0.782	0.690	< 0.001	0.596 – 0.799
5+	0.661	< 0.001	0.527 – 0.830	0.731	< 0.001	0.626 – 0.853

<b>Exposure to media</b>						
No Exposure to any media type	<b>1.000</b>			<b>1.000</b>		
Exposed to any one	1.312	< 0.001	1.144 – 1.503	1.353	= 0.040	1.187 – 1.544
Exposed to any two	2.129	< 0.001	1.736 – 2.612	2.179	< 0.001	1.789 – 2.653
Exposed to all three	3.959	< 0.001	2.826 – 5.547	4.405	< 0.001	3.226 – 6.015
<b>Maternal age at birth</b>						
< 20	<b>1.000</b>					
20 – 34	1.112	= 0.302	0.908 – 1.362			
35 – 49	1.239	= 0.158	0.920 – 1.670			
<b>Husband/Partner's education</b>						
<b>Level</b>						
No education	1.000					
Primary	1.092	= 0.491	0.849 – 1.404			
Secondary	1.757	< 0.000	1.319 – 2.341			
Higher	2.499	< 0.001	1.605 – 3.892			
Don't Know	1.272	= 0.498	0.633 – 2.557			

Reduced model	Full model
<b>estat gof</b>	<b>estat gof</b>
<b>Logistic model for MHS_ass_anc, goodness-of-fit test</b>	<b>Logistic model for MHS_ass_anc, goodness-of-fit test</b>
<b>F(9,272) = 0.78</b>	<b>F(9,273) = 1.20</b>
<b>Prob &gt; F = 0.6319</b>	<b>Prob &gt; F = 0.2968</b>

The Hosmer and Lemeshow (HL) test was used to detect the goodness of fit of the data. The F-statistics for both the reduced and full models were not significant at the 5% level indicating that the model is a satisfactory fit to the data.

#### **4.4.4.2 Predictors of maternal health care utilisation along the continuum of care, 2001 - 2014.**

Table 4.5 below, contains results of the full and reduced models (only factors that are significant using the stepwise backward regression). All the categorical predictor variables were dummy coded with the odds of utilising MHC as a continuum of care in the lowest categories as the reference. In all the analyses, 1.000 was the proportional odds ratio for the reference group. During the 2001- 2014 period, similar results to the 1992 – 1996 period, were obtained for both the full and reduced models. In the reduced model several factors were also associated with the use of MHC as a continuum of care: Having higher education (OR=2.668, 95% CI: 1.902-3.742) or secondary education (OR=2.167, 95% CI: 1.825 – 2.573) or primary education (OR=1.270, 95% CI: 1.101 -1.466) versus no education. The odds ratio for education between 2001 and 2014 indicate that when holding all other variables constant, in Zambia, women who have completed higher education have two and half times the odds of utilising MHC from skilled personnel than women who had no education and this difference is statistically significant at  $p < 0.05$ . Women with secondary education have two times the odds of utilising MHC than those without education. Similarly women with primary education have higher odds of using MHC from skilled personnel than women with no education. Generally, a woman with higher education is more likely to use skilled MHC than those with secondary or primary education.

Exposure to any three types of media (OR=1.606, 95% CI: 1.332 - 1.936) or exposure to any two types (OR=1.529, 95%CI: 1.353 -1.728) or exposure to any one type (OR=1.111, 95% CI: 1.005 -1.229) versus no exposure to media. The odds ratio for exposure to media indicate that when holding all other variables constant, a woman exposed to all the three types of

media combined, is one and half times more likely to use MHC as a continuum of care from skilled health providers than is a woman with no exposure and this difference is statistically significant at  $p < 0.05$ . A woman who is exposed to two types of media is one and half times more likely to use MHC from skilled health providers than a woman with no exposure to media. Similarly women exposed to one type of media have higher odds of utilising MHC from skilled health personnel than women with no exposure to media.

Different factors were associated with the less likelihood of using MHC as a continuum of care. Birth order 5+ (OR=0.811, 95% CI: 0.728-0.904), Birth order 2-4 (OR=0.849, 95% CI: 0.766 - 0.940) versus first order births. The birth rank in the last five years before the survey was significantly associated with utilisation of skilled MHC. Inverted odds ratios for first order births indicate that the odds of utilising MHC were 1.2 times higher than those for birth order five and more, and 1.1 times higher than that of first order births and the results are statistically significant at  $p < 0.05$ .

The predictor Residence; rural residence (OR=0.386, 95% CI: 0.321 – 0.463) versus urban residence. The odds ratio for residence indicate that when holding all other variables constant, an urban woman is two and half times or 61 per cent more likely to use MHC as a continuum of care than is a rural woman and the difference is statistically different at  $p < 0.05$ .

For the predictor Husband/Partner's approval of health service use; those who did not have a big problem (OR =1.237, 95% CI: 1.068 -1.431) or those who had a big problem (OR = 0.841, 95% CI: 0.645 – 1.099) versus those who considered getting permission from their spouses as No problem. The odds ratio for Husband/Partner's approval of health service use, indicate that when holding all other variables constant , women who did not have a big problem to seek permission for medical care were one time more likely to use MHC as a continuum of care than those who had no problem and the difference is statistically different at  $p < 0.05$ .

Women with Husbands/partners with primary education (OR = 0.757, 95% CI: 0.699 -1.015) versus women with Husbands/partners with no education. The odds ratio for women with husbands/partners with primary education, indicate that while holding all other variables constant, women with partners having primary education are 1.3 times or have a 24% chance, of less likely to use MHC as a continuum of care than those women with Husbands/partners without education and this difference is statistically different at  $p < 0.05$ .

In the full model, maternal age at birth of the child, household wealth index and Husband/partner's education level were not associated with the utilisation of MHC as a continuum of care. Maternal age 20-34 (OR = 1.053, 95% CI: 0.994 - 1.380) or maternal age 35-49 (OR = 1.015, 95% CI: 0.838 -1.228) versus maternal age < 20. For household wealth index, poorer (OR = 1.092,95% CI : 0.949 - 1.257) or middle (OR = 1.150, 95% CI : 0.927 - 1.360) or richer ( OR = 1.070, 95 % CI : 0.853 -1.342 ) or richest (OR = 1.024, 95% CI : 0.747 - 1.405 ) versus poorest. For the predictor Husband/partner's education level, women who didn't not know their Husband/partner's education level (OR = 0.7770, 95% CI: 0.635 - 1.209) or those with Husbands/partners with higher education (0.842, 95% CI: 0.841- 1.460) or those with Husbands/partners with secondary education (OR =0.919, 95% CI: 0.891- 1.311) versus women with Husbands/partners with no education. For the predictor Husband/Partner's approval of health service use, the variable women had a big problem to seek medical help was not significantly associated with the use of maternal health services(OR = 0.841,95% CI: 0.645 - 1.099, P = 0.204).Data regarding predictors of maternal health services utilisation along the continuum of care ,2001-2014 are presented in Table 4.5 below.

**Table 4.5 Odds of women using skilled MHC as a continuum of care with, p-values and confidence intervals: Zambia, 2001- 2014.**

<b>Maternal Health Care(ANC+SBA+PNC)</b>						
<b>Full model</b>	<b>Reduced Model</b>					
<b>Characteristics</b>	<b>OR</b>	<b>P</b>	<b>95% CI</b>	<b>OR</b>	<b>P</b>	<b>95% CI</b>
<b>Type of place of residence</b>						
Urban	<b>1.000</b>			<b>1.000</b>		
Rural	0.430	< 0.001	0.342 - 0.540	0.386	< 0.001	0.321 - 0.463
<b>Highest education attained</b>						
No education	<b>1.000</b>			<b>1.000</b>		
Primary	1.155	= 0.082	0.982 - 1.359	1.270	< 0.001	1.101 – 1.466
Secondary	1.733	< 0.001	1.429 - 2.102	2.167	< 0.001	1.825 – 2.573
Higher	2.217	< 0.001	1.498– 3.282	2.668	< 0.001	1.902 – 3.742
<b>Birth order</b>						
1	<b>1.000</b>			<b>1.000</b>		
2-4	0.798	= 0.010	0.671 – 0.947	0.849	= 0.002	0.766 – 0.940
5+	0.754	= 0.006	0.616 – 0.924	0.811	< 0.001	0.728 – 0.904



<b>Exposure to media</b>						
No Exposure	<b>1.000</b>			<b>1.000</b>		
Exposed to any one	0.917	= 0.170	0.809 – 1.038	1.111	= 0.040	1.005 – 1.229
Exposed to any two	1.271	= 0.002	1.092 – 1.478	1.529	< 0.001	1.353 – 1.728
Exposed to all three	1.317	= 0.014	1.058 – 1.640	1.606	< 0.001	1.332 – 1.936
<b>Husband/Partner's approval of health service use</b>						
No problem	<b>1.000</b>			<b>1.000</b>		
Big problem	1.562	0.040	1.150 – 2.121	0.841	= 0.204	0.645 – 1.099
Not a big problem	1.000			1.287	= 0.004	1.068 – 1.431
<b>House hold wealth index</b>						
Poorest	<b>1.000</b>					
Poorer	1.080	= 0.294	0.935 – 1.247			
Middle	1.137	= 0.144	0.957 – 1.351			
Richer	1.022	= 0.859	0.805 – 1.297			
Richest	0.982	= 0.915	0.704 – 1.369			
<b>Maternal age at birth</b>						
< 20	<b>1.000</b>					
20 – 34	1.113	= 0.221	0.937 – 1.321			
35 - 49	1.060	= 0.591	0.858 – 1.309			

<b>Husband/Partner's education level</b>			
<b>No education</b>	<b>1.000</b>		
<b>Primary</b>	0.757	= 0.009	0.699 – 1.015
<b>Secondary</b>	0.919	= 0.440	0.891 – 1.311
<b>Higher</b>	0.842	= 0.277	0.277 – 1.460
<b>Don't know</b>	0.770	= 0.135	0.685 – 1.209

Full model	Reduced model
<b>estat gof</b>	<b>estat gof</b>
<b>Logistic model for MHS_postnatal, goodness-of-fit test</b>	<b>Logistic model for MHS_postnatal, goodness-of-fit test</b>
<b>F(9,990) = 1.11</b>	<b>F(9,1173) = 3.77</b>
<b>Prob&gt;F = 0.3499</b>	<b>Prob &gt; F = 0.2001</b>

The Hosmer and Lemeshow (HL) test was used to detect the goodness of fit of the data. The F-statistics for both the reduced and full models were not significant at the 5% level indicating that the model is a satisfactory fit to the data.

#### **4.5 Summary of findings from research question three**

With regards to research question three the findings in the two periods under study were similar. Women with first order births and those having few children, urban women, better educated women, and women exposed to all three types of media are more likely to complete the continuum of care, women who did not have a big problem in getting approval from their husbands to seek medical attention, those with birth order 2 - 4 and 5 were less likely to use MHC as the continuum of care. However maternal age, household wealth index and husband/partner 's education level with secondary, higher and those who did not know the level of their spouses 's level of education were not significantly associated with the utilisation of MHC as a continuum of care.

## CHAPTER FIVE: DISCUSSION OF FINDINGS

The previous chapter presented the findings of the study. This chapter sets out the discussion of the findings of the study. A critical discussion of the findings and their linkages to the existing literature and prior research in order to ascertain whether the new data gathered supports or contradicts the existing information is presented.

### 5.1 Changes in the use of the components of MHC.

The first objective was to establish if there are significant changes in the use of the components of Maternal Health Care from skilled personnel among women in Zambia, overtime. The research findings show that there are significant reductions in the utilisation of ANC ( $\chi^2 (4) = 234.94$ ,  $N = 25412$ ,  $p < 0.0001$ ). The findings further unveiled that there was a significant increase in utilisation of the two indices SBA and PNC ( $\chi^2 (4) = 971.72$ ,  $N = 25960$ ,  $p < 0.0001$ ) and ( $\chi^2 (4) = 971.72$ ,  $N = 23658$ ,  $p < 0.0001$ ) respectively. On average over 90 per cent of women in the country had received ANC between 1992 and 2014, while a proportion of between 55 per cent and 68 per cent between the same period delivered with the help of a Skilled Birth Attendant. A proportion of between 32 and 51 per cent received skilled PNC services. The examination of trends in ANC, SBA (delivery care) and PNC as individual components of maternal health care utilisation in Zambia between 1992 and 2014 showed an increase across two indices (Skilled Birth Attendance and Postnatal Care) and a decline of ANC overtime with the greatest percentage increase occurring during PNC service utilisation followed by improvements in SBA. Even though the decline in the use of ANC is significant, the overall utilisation of ANC during the period of study is consistently above the World Health Organisation (WHO) acceptable levels of over 90 per cent coverage.

Above all, the proportion for ANC utilisation was already high and so no major changes were expected. The study therefore identified a strong and upward trend in skilled birth attendance and postnatal care utilisation in the period 1992 - 2014 and the results are consistent with studies by Wang *et al*, (2011), Wang and Hong (2013) in Cambodia and Tarekegn *et al*, (2014) in Ethiopia, who found a growing trend towards the use of Skilled Birth Attendants (SBA) during delivery. The finding is also consistent with Nsemukila *et al*, (1998) who found that the knowledge and

benefits of attending ANC was almost universal and well perceived by all age groups among women in Zambia leading to high attendance.

From these findings it entails that Zambia may have probably taken enormous strides in extending the outreach of MHC utilisation. With a high ANC coverage, most women rely on medically trained providers such as doctors, clinical officers and nurses/midwives for ANC with nurses providing a leading role. The high ANC coverage is good for the country as it provides a window of opportunity for delivery of a wide range of interventional services including Prevention of Mother To Child Transmission (PMTCT) services, administration of anti-malaria and intestinal anti-parasitic drugs, iron supplements, tetanus toxoid vaccinations and bed nets for prevention of malaria. In terms of SBA and PNC services, there is a growing trend towards women deliveries under skilled health professionals and PNC check-ups within 48 hours of delivery. This is a remarkable achievement for a country where 60 per cent of the citizenry live below the poverty datum line (CSO, 2011). The improved statistic could be a reflection of probable government commitment in collaboration with different stakeholders to improve utilisation of the individual components of MHC irrespective of mother's age and the household socioeconomic status. The findings are also attributable to a range of factors including government efforts, such as an increase in health training institutions that are offloading a good number of skilled health personnel on the labour force market, an increase in the development of health infrastructure that provides health services closer to the family as possible and the general acceptance of utilising MHC among Zambian women. In addition to these specific maternal health related interventions, there have also been other government policies which have had some bearing on MHC use such as, the launch of the Safe Motherhood Initiative (SMI) and the Prevention of Maternal Mortality Program (PMM) of 1987 and the adoption of the MDGs in the 1990s, the 2010 Campaign on Accelerated Reduction of Maternal Mortality in Africa (CARMMA), the Road Map for Accelerating Reduction of Maternal New-Born and Child Mortality 2013-2016, and the National Health Strategic Plan 2011-2015 specifically implemented to underscore provision of skilled attendance across the continuum of care. Other measures such as the elimination of cost sharing (user fees) at public health institutions that acted as barriers to health care service utilisation have also played a significant role in the availability and accessibility of MHC services, possibly partially explaining the insignificant

contribution of household socio economic status towards MHC use. Thus, some of these interventions could be working positively, hence the need to scale them up.

## **5.2 Trends in women completing the continuum of care of skilled maternal health services overtime.**

The second objective examined trends in women completing the continuum of skilled MHC overtime. It was established from the findings that between 2001 and 2014 in Zambia, the percentage of women completing the continuum of care ranged between 36 and 59 per cent. There is a clear downward trend in utilisation of MHC as a continuum of care considering the proportion of women who attend ANC and SBA. Women satisfactorily attend ANC services but the proportion that continues to deliver under skilled health personnel at the next level declines and furthermore drastically, reduces during PNC. The findings are in line with Wang and Hong (2013) and Kieber *et al.* (2007)'s positions that after the reception of ANC, many women in Cambodia dropped out of the pathway of continued care and consequently did not deliver under a skilled health providers or even attend PNC. This finding could also explain why Zambia still experiences a high Maternal Mortality Ratio (MMR) of 398 maternal deaths per 100,000 live births in comparison to the Ministry of Health (MoH) 's 2011-2015 National Health Strategic Plan (NHSP) targets to reduce MMR to 159 deaths per 100,000 live births by 2015 (ZDHS:2013-14). Though service utilisation of MHC along the continuum of care is low, the expectation is that there will be an improvement as behavioural change is a process and women in Zambia are gradually accepting MHC use now compared to the past.

## **5.3 Factors that influence the use of maternal health care along the continuum of care.**

The third and final objective was to determine factors that influence the utilisation of skilled MHC along the continuum of care during the period. The study found a significant association between continuum of MHC and the following factors ;type of place of residence, highest level of education attained ,birth order, exposure to media and Husband/partner 's approval to use health services when it is not a big problem. The study did not detect an association between

continuum of MHC and the following variables; household wealth index, maternal age at birth of the child and Husband/Partner's education level.

#### **i) Highest education attained**

This study has revealed that as a predisposing factor female education is a strong predictor of the continuum of MHC utilisation. The finding of the study confirms the position of the conceptual framework by Andersen and Newman's (1973)'s health seeking behaviour model and the literature review that women education is strongly related to the use of MHC services. The results are consistent with Fekadu and Regassa (2014), Anwar *et al.* (2015) who found out that, women's education was a strong determinant of the use of skilled maternal health services in Bangladesh. This view has also been supported by Tarekegn *et al.* (2014) and Worku *et al.* (2013) who showed that skilled MHC utilisation increases steadily with education. Similarly, a recent study by Nielsen *et al.* (2014) conducted in Tanzania revealed that educated women were more likely to make decisions to use assistance from medical personnel at delivery compared to their uneducated counterparts. Various studies have consistently reported a positive link between educational level attained and the use of MHC in developing countries. The relationship between the educational level attained and service utilisation makes intuitive sense as education serves as an influential factor that affects people's knowledge, attitudes and thus may affect health seeking behaviour among women in Zambia, in various facets of life. As an authority for information, education provides knowledge of available health care services in society and may therefore give women a higher socio-economic status that improves the ability to afford the cost of health care services in private clinics. Furthermore, education enhances level of autonomy in women which raise their decision-making power that results in improved freedom to make informed choices including the use of MHC services. Educated women also tend to be better positioned about knowledge and information on modern health care services.

#### **ii) Birth order**

The order of birth was associated with the use of MHC services as a continuum of care from skilled health personnel. The findings for predictor birth order indicate that women tend to use MHC services during the first birth. It was further observed that as the birth rank of the child increases, service utilisation decreases. These results are consistent with prior research in Haiti

by Babalola (2014) and Elo (1992) in Peru. In Zambia, many women, seem to believe that the first pregnancy is more risky compared with subsequent pregnancies that may follow later in life. The results confirm the position of the conceptual framework that some individuals have a propensity to use services more than other others where propensity toward use can be predicted by individual characteristics which exist prior to onset of specific episodes of illness. Socio-biological factors such as higher birth order and the number of children ever born also have an influence on the women's health care seeking behaviour. For instance women having a higher birth order could have developed self-confidence to deliver at home, without any motivation to use skilled health personnel. Some women without experience maybe afraid of pregnancy related complications and outcomes, hence the more likelihood of utilising skilled health providers for maternal health care services. This finding could also be linked to time and resource constraints faced by people having larger families and as well as those with some experience of bearing children. The reasoning is similar for the number of children ever born.

### **iii) Type of place of residence**

Between 1992 and 2014 this study has identified the type of place of residence as a factor for MHC utilisation as a continuum of care. Women in urban parts of Zambia were more likely to use MHC services than those in rural areas. Urban residence was significantly associated with the utilisation of MHC. This result also confirms the position of the conceptual framework and has been consistently supported by other studies including; Abor and Abekah-Nkrumah (2013) in Ghana, Chakraborty *et al.*(2003) in Bangladesh and Navaneethan and Dharmalingan (2001) in Southern India, that have identified the significance of urban/rural residence in determining physical proximity in MHC utilisation. Physical accessibility is therefore, key to health service utilisation as it plays an important role in the utilisation of a wide range of health services. The variations in utilisation of maternal health services between urban and rural residents could be explained as follows: Firstly, rural women were less likely to use MHC services than urban women because urban women are closer to health facilities than their rural counterparts. Zambia is highly urbanised hence this high service utilisation among urban women results from a comparative advantage of the availability of health services which can be linked to robust infrastructure development such as road network, availability of transport and the geographical distribution of the skilled workforce which reduces distance to health facilities. The



doctor/patient ratio for urban areas is also higher than that of rural areas. Urban women may also have enough access to mass media which increases awareness on people's health matters through dissemination of vital information. On the other hand, women in rural parts of Zambia are more conservative hence the diffusion of MHC utilisation and its perceived benefits are slow. This finding points to the fact that rural women could have been more inclined to traditional and cultural beliefs. The use of traditional medicines has for a long time been a common practise during pregnancy and child birth especially in rural setups where drug shortages are rampant. In their work on traditional medicine, Ssengooba *et al.* (2003) point out the indigenous system of medicine has persisted for a long time in Africa and still continues partly because of inadequate modern medical services coupled with drug shortages in health facilities. This view has also been supported by Petrou *et al.* (2001) who identified culture as a reason for not seeking maternal health services. The other explanation could be that most women in rural Zambia would rather receive ANC and even deliver in their homes aided by relatives or Traditional Birth Attendants (TBAs) without formal midwifery training. Even though TBAs are perceived to have limited knowledge on risk factors and danger signs of complications during pregnancy, women tend to have a more equal relationship and socially acceptable dialogue with TBAs compared to professionally trained personnel and as a result many mothers continue to deliver from their homes with the help of these unskilled birth attendants whom they trust. According to ZDHS (2013) 23.5 per cent of rural women compared with 3.6 per cent women of urban origin delivered under the TBAs. Communities in rural areas still have limited access to health care and male aided deliveries by male nurses and clinical officers still pose a huge challenge to the women in rural areas.

#### **iv) Exposure to media**

The study revealed a strong positive association between MHC utilisation as a continuum of care and the frequency of exposure to media. The results are consistent with prior research in Rwanda by Manzi *et al.* (2014) who found that exposure to media has a significant influence on the use of MHC services. The results also confirm the position of Andersen and Newman (1973)'s behavioural model that singled media as one of the enabling factors or predictors of MHC service utilisation. The availability of different types of media across space increases awareness on people's health matters through dissemination of vital information. Women who are exposed

to different media have access to written information through various sources. The use of public media including radios, television, newspaper reading and many other various social media and internet facilities increases awareness of people on health and other important social issues.

**v) Husband/Partner ‘approval to use health service**

It was established from the findings that there was a positive association between continuum of MHC and women whose husbands approved the use of MHC without a big problem. The findings are in tandem with Hagey *et al.*, (2013) who found that woman’s knowledge gaps, previous births, limited involvement of the male partners and cultural perceptions were the main barriers to maternal health service utilisation. Women whose husbands find a big problem in the use of maternal health service were not significantly associated with the use of maternal health service as a continuum of care. The failure to incorporate men in maternal healthcare programmes by policy makers and programme planners directly may undermine the success of MHC utilisation programs in Zambia. On the other hand, cultural norms among most African communities do not permit the presence of males in the delivery room, let alone direct participation in child birth. The male partner’s approval and disapproval to use health services and unwillingness to participate in MHC services plays a pivotal role in determining women access of various health services. Some men may not attach to MHC the seriousness it deserves because of their cultural inclinations and may not approve the use of maternal health services at the health centres. The finding confirms the position of the conceptual framework in the assumption underlying the needed factors that individuals may accord certain health conditions little seriousness because they may regard such conditions normal based on their cultural understanding and experience of that particular condition.

**vi) Husband/Partner’s education level**

The analysis did not detect a significant association between husband/partner’s level of education and MHC service utilisation. The finding is at variance with Tarekegn (2014) who found Husband/Partner’s education level to have a significant association with the use of skilled ANC utilisation in Ethiopia. The finding is however similar with the work of Manzi *et al.* (2010) who found that having an employed partner with at least secondary education was associated with delayed ANC use in Rwanda. This could be explained by the fact that despite men’s level of

education, the cultural inclined perceptions that MHC is a feminine issue may override the practical decisions that men may make in relation to the subject. Further investigation may be needed to establish why the relationship is absent in Zambia.

#### **vii) Wealth quintile**

From the 2001-2014 analysis some factors were not significantly associated with utilisation of MHC services, most notably household wealth index. This result is at variance with the position of the Andersen and Newman's (1973) health seeking behaviour model. The result is also contrasting other studies conducted in Ethiopia by Tarekegn *et al.* (2014), in Ghana by Arthur (2012), which found wealth to have a positive and significant influence on the use of MHC. The findings linked women's poverty as a limit in accessing maternal health services. However, in Zambia the abolishment of user fees may have offset the impact of household wealth status on seeking MHC services. These findings are therefore pivoted on the introduction of free MHC pronouncement whose main objective was hinged on reducing the barrier posed by the financial status of different households on the use of MHC. The draft policy of 1998 and the National Strategic Plans of 1995-1999 as well as the 2001-2005 recognised the widespread poverty and income differentials that exist within the Zambian society which consequently led to the abolishment of user fees for primary health care in April 2006 (MoH; 1995, MoH ;1998, MoH; 2001).

#### **viii) Maternal Age at delivery**

Surprisingly, the multi-variate analysis reveals that maternal age at delivery in Zambia was not significantly associated with the utilisation of MHC services as a continuum of care in the period under consideration. The findings are consistent with studies by Tarekegn *et al.* (2014) in Ethiopia, Manzi *et al.*, (2010) in Rwanda who did not find an association between maternal age with the use of all three maternal health services. The findings confirm the position of Andersen and Newman (1973, p.15) 's behavioural model which states that "in as much as age per se is not considered a reason for seeking health care, rather people in different age groups have different types and amounts of illness and consequently different patterns of medical care." These findings are at variance with prior research in Zambia (Stekelenburg *et al.*, 2004) and elsewhere (Elo, 1992, Fosu, 1994) who found a significant association between maternal age at

delivery and utilisation of skilled health personnel for maternal health services. All women in Zambia are less likely to use MHC services based on age with women aged 20 – 34, the early years of marriage and child bearing not associated with maternal health service utilisation. There is need for further research in order to comprehend the lack of association between maternal age at delivery and utilisation of skilled maternal health services considering the fact childbearing in Zambia begins early in the young cohorts with more than one – third of women by age 18 and more than half giving birth by age 20 (ZDHS, 2013-14). Moreover, first births that occur to young mothers are expected to be subjected to skilled service utilisation because of the risks associated with first pregnancies. Teenage pregnancy and motherhood has for a long time been, a major social and health issue, that needs to be addressed in Zambia.

### **5.5 Summary of findings for research question three**

Women with first order births and those having few children, urban women, better educated women, women exposed to all three types of media and women whose husbands/partners have no big problem with approving the use of health services are more likely to complete the continuum of care.

### **5.6 Acceptance or rejection of research hypotheses**

This section of the chapter addresses whether or not the data gathered and analysed earlier in this chapter serves to prove or disprove the hypotheses as initially set out in chapter one. Below is a brief discussion based on the hypotheses of the study.

1. **H<sub>0</sub>**: There are no statistically significant changes in utilisation of the components of skilled maternal health services among Zambian women over time. There is no evidence to support this hypothesis based on the findings from Pearson's chi-square test.
2. **H<sub>1</sub>**: Demographic factors are highly likely significant predictor variables for determining change in likelihood, that a woman will use MHC from skilled health personnel, overtime. There is evidence to support this hypothesis based on the findings from the bivariate logistic regression analysis.

## CHAPTER SIX: CONCLUSION AND RECOMMENDATIONS

The previous chapter discussed the findings of the study. This chapter presents the conclusion and recommendations based on the findings and discussions of the study.

### 6.1 Conclusion

A study of the levels, trends and determinants of MHC service utilisation between 1992 and 2014 sought to answer the following research questions:

- (i) Are there significant changes in the utilisation of the components of maternal health services from skilled personnel among women in Zambia, overtime?
- (ii) (ii)What are the trends of women in Zambia completing the continuum of skilled MHC across time?
- (iii) (iii) What factors influence women's trends in utilisation of skilled MHC as a continuum of care during the period?

The study yielded the following findings:

With reference to **research question one**, the results indicate that apart from ANC that showed a significant downward trend period - by - period decrease in service utilisation, SBA and PNC utilisation depicted some significant increases. In absolute terms service utilisation of SBA increased by 13per cent from 55 per cent in 1992 to 68 per cent. For ANC the decline during the period was about 7 per cent (i.e. from 99 per cent in 1992 to 92 per cent in 2014).In the case of PNC, the overall change for the period was 13 per cent (i.e. from 32 per cent in 2001 to 51 per cent in 2014). The findings showed a significant increase in utilisation across two indices (SBA and PNC) and a minimal but significant reduction in the use of ANC over time. For the **second research question**, the findings show that in 2001-2 out of 4141women interviewed, overall, 36 per cent of the women utilised the full range of services from ANC to PNC to complete the continuum of care. Similarly, in 2007 out of a total of 3989 women, only 1 (one) per cent of the women used the full range of services from ANC to PNC to complete the continuum of care. And lastly, in 2014 a similar pattern is depicted, out of 9305 women, 59 per cent, managed to use the full range of services from ANC to PNC to complete the continuum of care. Generally, the

proportion of women using a combined intervention of the three key components of MHC service is still low despite showing some improvement over the years.

In terms of the **third objective**, the results confirm the position of the literature and the conceptual framework that MHC-seeking behaviours in Zambia are shaped by various demographic factors including, mother's education, residence type, exposure to media, the number of children ever born, the birth rank and husband/partner's approval to use health services for one period or the other. On the other hand, maternal age at birth of the child, household wealth status and husband/partner's education level were not significant predictor variables for the utilisation of maternal health services.

From these findings the following conclusions were drawn:

ANC use from skilled personnel was already high and so no major changes were expected. The increase in the use of SBA and PNC shows that measures being put in place by various stakeholders are probably working and there is need to scale them up so that the proportion of women using the two indices can further improve to acceptable levels. Health seeking behaviour is a process or an aggregate of attitudes, beliefs, cultures, perceptions as well as practices and therefore the expectation is that the proportion of women using SBA and PNC will gradually improve as more women are accepting MHC services now than has been in the past. Women in Zambia seem to be getting more conscious about their health and appreciating the risks during pregnancy, at delivery and after. Maternal mortality rates are gradually declining possibly as a result of measures and interventions adopted including ANC check-ups which is responsible for administration of anti-malaria and intestinal anti-parasitic drugs, iron supplements, tetanus toxoid vaccinations, SBA and postpartum care for mothers and children.

The proportion of women using MHC as a combined intervention of three key components (ANC, SBA and PNC) is still low despite showing some improvement over the years. This is attributable to the fact that most women in Zambia perceive ANC as the most important intervention as opposed to both SBA and PNC, possibly an indication of the perception that the health of the baby is primary compared to that of the mother. Future program efforts should include reemphasising the importance of SBA and PNC during ANC visits.

The study has also shown that maternal health care utilisation along the continuum of care is influenced by predisposing, enabling and need factors including education of women, exposure to media, Husband/partner's approval to use health services and urban residence. The findings of this study therefore provide evidence on the current levels, trends and determinants of maternal health service utilisation between 1992 and 2014 in Zambia. This knowledge serves as a basis for addressing MHC utilisation challenges. Both, women and men's education and exposure to media are therefore major policy variables that can be used to change health beliefs and personal characteristics of the users.

## **6.2 Recommendations from the study**

Based on the findings, the study therefore highlights the need:

- ❖ for coordinated efforts from government and stakeholders to further scale up measures that have steadily improved the use of SBA and PNC.
- ❖ for necessary investment to train health personnel and therefore improve access, monitoring of rural health posts and therefore curbing unsafe home-based birthing practices.
- ❖ for further sensitization on the importance of SBA and PNC during ANC visits so that the continuum of MHC can be completed.
- ❖ to recognise the role of TBAs in the maternal health service revolution in rural parts of the country by providing them with training in order to increase skilled personnel by both the government and various stakeholders.
- ❖ to improve women's education by channelling more resources towards education in order to expand the base of educated women in Zambia.
- ❖ To promote maternal health programs on various media platforms in order to educate women on the benefits of MHC utilisation.

## **6.3 Recommendations for further study**

- ❖ The findings of this study clearly point to the need for a further qualitative study to enrich the current study on why many women from the same social economic standing attend ANC and yet fewer continue to attend skilled delivery and PNC despite most deaths occurring during and after delivery.

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