

Determinants of Maternal Health Care Services Utilization in Malawi

*A thesis submitted to the Faculty of Human and Social Sciences in fulfilment of the requirements
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By

Kennedy Machira

BSc (Malawi), MSc (Lund)

(26381540)

Promoter: Professor M.E. Palamuleni

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Declaration

I, Kennedy Machira, declare that this thesis: “Determinants of Maternal Health Care Service Utilization in Malawi” is submitted for the degree of Doctor of Philosophy in Population Studies of the North-West University. The thesis has not been submitted before, in part or in full, for any degree or examination at this or any other institution. All materials used from other sources have been duly acknowledged and referenced in the thesis.

Student Name :.....

Signature :.....

Date :.....day of April, 2017

Approval

This is to certify that the thesis has been submitted as a fulfilment of requirements of the award of the degree of Doctor of Philosophy in Population studies of North West University Mafikeng Campus with my approval

Name of Promoter :

Signature :.....

Date :.....**day of April, 2017**

Dedication

To Jehovah Jireh, to Him be the Glory and Power Forever and Ever.

To my sons, Emanuel and Daniel for being nice boys during my postgraduate student years

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Unto the King Immortal, unto the King Invisible, the Only Wise God, may He be glorified for giving me the courage and resilience to do this work. Indeed, He has been so faithful and the source of my inspiration during the course of my doctoral studies.

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ABSTRACT

Maternal deaths remain a public health challenge in most developing countries including Malawi. Although Maternal Mortality Ratio (MMR) is reported to have declined from 1120/100,000 in 2000 to 675/100,000 in 2010, Malawi's MMR is still ranked among the highest in the world. Despite government efforts to address this challenge through health facilities, women access and use of such service is not yet universal.

Utilising data from 2000, 2004 and 2010 Malawi Demographic and Health Surveys, the study investigated factors influencing women's use of maternal health services using logistic regressions and decomposition techniques. The study population comprised 7919, 7309 and 13776 women who gave birth in the last five years preceding each survey. Furthermore, the study interviewed 12 health workers and 60 women selected from health centres across the country to explore their perspectives on the state of maternal health services.

The study established that women's use of antenatal care for more than 4 times during pregnancy remained unchanged at about 57.1% in 2000 and 2004 and declined to 45.0% in 2010. The study also revealed that women's age, birth order, education, exposure to media and quality of care predicted women's use of health care services during pregnancy period. Women's use of public health care facilities during childbirth stood at 42.3% in 2000 and 2004 and increased to 61.4% in 2010. It was found that timing of antenatal care, women's age, birth order, education, media exposure, religion, women's earning status and quality of care were the major predictors of women choice of public health care services during childbirth.

The study also found that the use of postnatal care services was very low at 2% in 2000 increasing to 20% in 2004 and 30% in 2010. This was largely attributed to by antenatal care, maternal education, place of residence and quality of care. Overall, based on these findings, it was established that women's individual and community factors were the major contributors associated with utilization of maternal health services.

Discussions with the health workers and women revealed in general that maternal health care services in Malawi are constrained by resources such as financing, adequate medical equipment and supplies, inadequate incentives to motivate health workers, failures which inadvertently lead to bad attitude during service delivery.

Based on these findings, the study recommends that policies that will ensure improvements in maternal health services in Malawi should be promoted and strengthened. Some of these strategies must include programmes that enhance the social and economic status of the population. Above all, initiatives that encourage women to use maternal health services, particularly in the socially and economically disadvantaged communities should be promoted. There is also a need to undertake further research regarding health financing and gaps affecting effective delivery of health care services in Malawi.

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LIST OF ACRONYMS

ANC	Antenatal Care
AMOS	Analysis of Moment Structure
BEMOC	Basic Emergency Obstetric Care
BLM	Banja La Mtsogolo (<i>an affiliated to Marie Stopes International</i>)
CEMOC	Comprehensive Emergency Obstetric Care
CHAM	Christian Health Association of Malawi
FGD	Focus Group Discussion
EHP	Essential Health Package
OR	Odds Ratio
FANC	Focussed Antenatal Care
CMST	Central Medical Stores Trust
FHI	Family Health International
FPAM	Family Planning Association of Malawi
GoM	Government of Malawi
HSSP	Health Sector Strategic Plan
ICPD	International Conference on Population and Development
IDI	In-depth interviews
KI	Key Informant
MDG	Millennium Development Goals
MDHS	Malawi Demographic and Health Survey
MGDS	Malawi Growth Development Strategy
MOH	Ministry of Health
MPRS	Malawi Poverty Reduction Strategy
NSO	National Statistics Office
OECD	Organisation for Economic Co-operation and Development
OPD	Out Patient Department
PAP	Poverty Alleviation Program
PCA	Principal Component Analysis
PNC	Postnatal Care
PPA	Public Procurement Act
PRB	Population Reference Bureau
PSI	Population Services International
SMI	Safe Motherhood Initiatives

SOPs	Standard Operating Procedures
UNFPA	United Nations Population Fund
UNICEF	United Nations Children’s Fund
USA	United States of America
USAID	United States Agency for International Development
USD	United States Dollar
WHO	World Health Organization

CHAPTER 1

Introduction

1.1 Background

Maternal health remains a significant public health challenge in most developing countries (WHO, 2015). In 2013 alone, world statistics indicated that about 289,000 women died due to causes associated with pregnancies and childbirth (WHO, 2014). Conversely, the recent World Health Organization (WHO) estimates on maternal mortality showed that developed countries had a consistent low maternal mortality ratio that averaged less than 10 deaths per 100,000 live births for over a decade (WHO, 2014). Such remarkable progress has been attributed to advanced instituted modern obstetric care available and accessible to the pregnant women (AbouZahr *et al.*, 2003), in addition to extensive capacity building through up-scaling of maternal health service facility and associated skilled midwifery and nurses (Sepehri *et al.*, 2008). For instance, available statistics indicate that developed countries contributed the least maternal deaths (WHO, 2014). A study by Hogan *et al.* (2010) observed that Poland, Sweden, Japan, United Kingdom and New Zealand have had the best performance in reducing and maintaining low maternal mortality levels over the past decades. Some scholars advocated for the availability of comprehensive maternal health care institutions with capable skilled professionals to deliver emergency obstetrical and gynaecological care services as they believe that they have the potential to improve on quality of maternal health care outcome (Jha *et al.*, 2008; Campbell & Graham, 2006).

Despite the improvement experienced in the developed countries, sub-Saharan Africa is still beset with maternal health care challenges. In 2013 WHO reported that about 157,000 women died due to causes related to pregnancy and childbirth (WHO, 2014). This figure represents 53% of the global estimate of maternal deaths. For instance, over the past decades, maternal deaths were found to be within a range far much higher when compared to other developed regions. Maternal deaths were found to be as high as 300 deaths per 100 000 live births to over 1000 deaths per 100 000 live births in less developed countries (Hogan *et al.*, 2010). More specifically, countries such as Burundi in east sub-Saharan Africa registered about 740 deaths per 100 000 live births, whereas Cameroon in central sub-Sahara had about 590 deaths per

100 000 live births. In west sub-Saharan, Senegal reported a rate of about 320 deaths per 100 000 live births (WHO, 2014). Studies within sub-Saharan Africa have attributed such variations in maternal health outcomes and any issues related to pregnancy and childbirth within the region to socioeconomic disparities (Graham *et al.*, 2001; Campbell & Graham, 2006). Another factor that contributes to the increase in the adverse maternal health outcome is the reliance of women on non-institutional maternal health services (Goli *et al.*, 2014).

In Malawi, high maternal mortality levels remain a major public health challenge. Despite the country's quest to reduce maternal mortality by two thirds between 1990 and 2015 based on the recommendation made in Millennium Development goal number 5 (WHO, 2000), maternal mortality still remains high. For instance, in 1990, MMR increased from about 950 deaths per 100 000 live births to 1120 deaths per 100 000 live births in 2004. In 2010, MMR declined to 675 deaths per 100 000 live births and slightly increased to 510 deaths per 100,000 live births in 2013 (WHO, 2015). Such variability in maternal mortality ratio outcome is far from approaching the targeted estimate to improve maternal life-time and reduce risk of dying among women as a result of childbirth (Stephenson *et al.*, 2006). This factor can be brought under control if robust health care facilities are capacitated to operate seamlessly with the aim of meeting any emergent maternal health care need regardless of the geographical differences. This will ensure a universal maternal health service delivery (WHO, 2011; Yadav *et al.*, 2013).

In spite of the the adopting the global target that aimed at reducing maternal mortality by two thirds between 1990 and 2015, available evidence indicate that Malawi has not been able to meet the projected target of 155 per 100 000 live births but also the country has experienced fluctuating Maternal Mortality Ratios. For instance, MMR increased from 620 maternal deaths per 100 000 live births in 1992 to 1120 maternal deaths per 100,000 live births in 2000, declining to around 984 in 2004 and to 675 in 2010 (Malawi Government 1995, 2002, 2006, 2011).

1.2 Historical and general overview of health care in Malawi

Health is a state of being in complete physical, social and economic well-being and not sheer absence of disease and infirmity (WHO, 2013; Tobias, 2015). On the other hand, health care is an input in health production function which is limited to medical interventions that are meant to address physical well-being components disregarding economic components. Malawi's health care during pre-independence period was largely provided by missionaries. After independence in 1964, most health indicators were very poor and as such the GoM addressed those challenges

through a number of development policies along with sector specific policies such as the first Statement of Development Policies (1971–1980), the second Statement of Development Policies (1987–1996), the Poverty Alleviation Program (PAP) of 1995, the Vision 2020 alongside its medium term strategies such as the 2002–2005 Malawi Poverty Reduction Strategy (MPRS), the 2006–2011 Malawi Growth and Development Strategy (MGDS) and the 2011–2016 Malawi Growth and Development Strategy II (MGDS II) which deal with social development which includes maternal and child health improvements goals and family planning. Additionally, the right to health for all is enshrined in Section 13(c) under chapter 3 of the Republic of Malawian Constitution (Government of Malawi, 1995), which advocates good health to women and children. Despite these good policies, Malawi is facing a number challenges that include inadequate finances to support poverty reduction programmes, high levels of illiteracy and critical shortage of capacity in institutions implementing development programmes. Maternal health care is also crippled by these afore-mentioned challenges and as such the country is still faced with high maternal mortality ratio.

Faced with such persistent maternal public health problems over the past 15 years, the Government of Malawi, a signatory to numerous global health initiatives, adopted a number of health programmes. For example, in 1978, Malawi was a signatory to the *Alma Alta Declaration* which aimed at improving availability and accessibility of primary health care services facilities targeted at providing maternal health care services, more specifically among the vulnerable rural and underserved communities, during prenatal/prepartum, intrapartum/childbirth and postnatal/postpartum periods (WHO, 1978; Government of Malawi, 2013).

In 1982, Malawi adopted a “child spacing” programme. This was an integral programme that emphatically started using maternal health care facilities as points of engagement to solve the adverse health outcome among women following frequent, early, late and many pregnancies. Additionally, in 1987, the GoM adopted a “*Safe Motherhood Initiative programme*”. The initiative targeted sustainable maternal health care infrastructures that were operational and capacitated with skilled health personnel, but also targeted enhancement of availability, accessibility and affordability of supportive maternal health services, thus ensuring improvement of women’s health (Starrs, 2006). It is worthy to note that in 1994 Malawi participated in the International Conference on Population and Development (ICPD) in Cairo, Egypt, in which the issues of women’s health and safe motherhood was one of the main agenda (Thomas *et al.*, 2014). And in the same year, not only was *Family Planning* adopted (Solo *et al.*, 2005), but also the National Population Policy (NPP) was adopted. The national Population Policy that was

adopted in the country supported numerous sectoral policies aimed at enhancing maternal and child health. These policies are the Sexual and Reproductive Health Policy, Nutritional Policy, HIV and AIDS policy among others (Government of Malawi, 2012 and Government of Malawi, 2013). These policies have seemingly related goals aimed at providing different frameworks in order to scale-up on interventions improve population and development challenges. Among them are the, reduction of maternal mortality, lowering high fertility levels and promotion of reproductive issues, nutrition, healthy lifestyles, HIV and AIDS among others.

However, regardless of these numerous envisioned goals and policies aimed at improving availability, accessibility and affordability of maternal health services, Malawi's high maternal mortality ratio remains a public health challenge (WHO, 2014). In a concerted effort to save the situation and address this challenge, the Government of Malawi, in 2000, launched the Millennium Development Goals which specifically had pillar number five which advocated for the country's aim to put in place measures in order to reduce maternal mortality ratio to about 155 deaths per 100 000 live births in 2015 (WHO, 2000). As a matter of fact, a supporting programme such as Focused Antenatal Care, which was launched in 2003, was adopted by Malawi to promote women utilization of maternal health care service facilities so as to ensure women are well informed, tested and assisted for improved maternal health outcome (WHO, 2003). Contemporaneously, the roll-over of 2001 in *Abuja Declaration* mandated countries including Malawi to invest about 15% of the total annual national budget to support health care system operations (WHO, 2001). This was from the background that most developing countries in sub-Saharan Africa, including Malawi, had less finances directed to support health care system. Additionally, in 2006, the Government of Malawi modified and scaled-up the Reproductive Strategy to Sexual Reproductive Health Strategy under the pretext of enhancing reproductive health in general among women (Government of Malawi, 2006). In 2007, the country adopted "A Road Map to Accelerate Reduction of Maternal and Child Mortality" programme (Government of Malawi, 2007). These strategies used essential health care packages through sector wide approach programme to ensure that an effective and efficient health institutional support is provided and improve quality of maternal healthcare service delivery (Government of Malawi, 2012; Rawlins *et al.*, 2013).

Despite efforts made to promote maternal health outcomes through women utilization of maternal health service at prepartum, intrapartum and postpartum facilities in Malawi, the recent national reports revealed that the pattern of care utilization among women stood at 57.1% in 2004 and 45.5% in 2010 (NSO & OCR, 2005; NSO & ICF Macro, 2011). Similarly, the

country's median months for an expectant primiparous women stood at 5.9 months in 2004 and slightly less at about 5.6 months in 2010 (NSO & OCR, 2005; NSO & ICF Macro, 2011). This implies that women in general delay in seeking prepartum care services, a factor that increases a risk of maternal health outcomes. In terms of institutional childbirth, in 2010, about 15%, 83% and 2% of the women who reported childbirth in health care facilities were assisted by doctors/clinicians, nurses/midwives and patients attendants, respectively. On the same note, in as far as postpartum care utilization was concerned, about 68.6% in 2004 and about half (47.6%) of the women did not receive postnatal check-up. Maternal mortality remains a major threat and is far from being reduced to reach the expected level despite the Government of Malawi and collaborating development partners dedicating efforts to improve maternal health care services in the country. Therefore, with such an elaborate background, the study's need to explore the determinants affecting women willingness to utilize maternal health care service in Malawi cannot be overstated.

1.3 Problem statement

Despite the advocacy to promote maternal health care since the 1970's, there still exists inconsistency in levels of utilization of prepartum, intrapartum and postpartum care among women in Malawi (NSO & OCR, 2005; NSO & ICF Macro, 2011). This consequently led to a high maternal mortality experiences caused partly by the low maternal health care utilization status and economic status (Sakala *et al.*, 2011). The low utilisation of maternal health services has contributed to high maternal morbidity and mortality in the country (Sakala *et al.*, 2011). The delayed maternal health seeking behaviour among women increases the risk of death among women to preventable direct and indirect causes aggravated by pregnancy conditions. For instance, maternal health preventable direct causes such as haemorrhage, hypertensive disorder, sepsis and spontaneous abortions coupled with indirect causes like anaemia and malaria, dominate in increasing maternal deaths in Malawi (Geubbel, 2006; Bowie *et al.*, 2011). However, in Malawi, there are dearth studies assessing the correlates affecting prepartum, intrapartum and postpartum health care utilization from individual, household and community perspectives.

Due to slowed process in assimilating reproductive health challenges, Malawi's demographic and reproductive health indicators are among the worst in the world. For instance, Total Fertility Rate was recorded at about 6 which is considered among one of the highest in sub-Saharan Africa (World Bank, 2016). This implies that women are still experiencing a lot of challenges

due to childbirth and are still faced with increased risk of dying as a result. Sight should not be lost of the fact that despite the high maternal mortality ratio in Malawi, the country still records a high fertility rate. Studies have shown that the country's annual population growth rate of 2.8% resulted in a population increase from 9.8 million in 1998 to 13.1 million in 2008 and is projected at 17 million by the end of 2016 (Government of Malawi, 1998; 2008; World Bank, 2014). Subsequently, population density per square kilometre increased from 105 persons in 1998 to 184 persons per square kilometre in 2008. As a consequence of such population change, the country experiences a lot of social and development challenges including health sector's service delivery challenges to meet the emergent needs of the growing population including maternal health needs; increased pressure on an existing health care facilities infrastructure to meet the health needs of the people. This results in extensive long queues of patient-in-progress awaiting health care services and is also associated with the job service delivery fatigue experienced by health care service providers, a factor which affects quality of care delivery (Muula, 2005; Muula *et al.*, 2006; Palamuleni, 2011).

Even though the Government of Malawi pledged to support health care service operation through health care financing, which is partly co-supported by external health financial resources from different donors, the country's health care service facilities face a lot of challenges due to delays and sometimes withdrawals of such health care financing, which is a situation that affects effective operation of the health systems in general (Government of Malawi, 2012). Such a scenario results in lower health system operating environment standard in the following aspects: shortage or erratic availability of necessary medical resources such as drugs and equipment (Chikoko, 2011), migration of the health care personnel either to non-health care practising job markets or other competitive and highly remunerated jobs within or outside the country (Muula *et al.*, 2005), resulting in subsequent low standard quality of expected care more importantly in rural settings. Such situation results in people travelling hours on end to seek health care services in most rural settings (Gabrysch *et al.*, 2009).

Studies in sub-Saharan Africa that tried to investigate correlates of maternal and child health care service utilization failed to take into account a number of basic factors of trying to understand maternal and child health care utilization issues from a prenatal care, institutional delivery and postpartum care dimensions. For example, recent studies in Uganda and Ethiopia by Kalule-Sabiti *et al.* (2014) and Tarekegn *et al.* (2014) in their quest to establish factors affecting maternal and child health care utilization, employed an individual perspective only as their unit of analysis, thus excluding household and community factors that might have pertinent

dimensions noteworthy to understand. In Malawi, Sakala *et al.* (2011) and Rawlins *et al.* (2013) conducted similar studies using data from Zomba Central Hospital for the former and considered only 98 reproductive health care providers and the latter. This is not suitable to generalize the outcome for the entire country. From a different perspective, Babalola *et al.* (2009) tried to establish factors impacting maternal and child health care beyond individual and household levels in Nigeria. However, their study did not investigate the relative contribution at individual, household and community level of factors that influencing women's use of health care services. Furthermore, the study employed two merged datasets, namely, 2005 national HIV/AIDS and Reproductive Health. These two failed to sufficiently provide requisite measures at individual, household and community levels and have not tested their relationship to maternal health care service utilization.

Therefore, this study investigates determinants of maternal health care service utilization beyond perspective, approach and scope adopted by previous scholars at individual (Sakala *et al.*, 2011; Kalule-Sabiti *et al.*, 2014; Rawlins *et al.*, 2013), household and community levels (Babalola *et al.*, 2009). In addition, the study uses multi-level modelling that utilise four waves of data to estimate factors affecting maternal health care utilization in Malawi.

1.4 Study objectives

1.4.1 General objective

The general objective of the study is to explore determinants affecting the utilization of maternal health care services in Malawi.

1.4.2 Specific objectives

The specific objectives of the study are to:

- i) explore sociodemographic, economic and cultural factors affecting prenatal healthcare service utilization in Malawi;
- ii) establish factors influencing institutional childbirth delivery in Malawi;
- iii) investigate correlates of postpartum care service utilization in Malawi;
- iv) examine supply-side factors influencing delivery of maternal health care services in Malawi from the health workers' perspective; and

- v) explore demand-side factors influencing utilization of maternal health care services in Malawi from the women's perspective.

1.5 Research questions

In order to achieve the afore-mentioned objectives, the study set out the following research questions:

- i) What are the socio-demographic and economic factors affecting prenatal care service utilization in Malawi?
- ii) What are the determinants of healthcare institutional childbirth delivery in Malawi?
- iii) What are the correlates affecting postpartum service utilization in Malawi?
- iv) What are the perceptions of the health workers with regards to delivery of maternal health services in Malawi?
- v) What are the perceptions of the women with regards to delivery of maternal health services in Malawi?

1.6 Study hypotheses

Therefore, based on the set study objectives and research questions, the study hypothesises that:

- i) The age of a woman has a positive effect to influence their use of maternal health care services in Malawi.
- ii) Education attainment of women increases their understanding of their maternal health situation which influences use of maternal health services.
- iii) Increase in income earning status among women contributes significantly on women use of maternal health services in Malawi.
- iv) Distance to health care facilities negatively affects women's use of maternal health care services.
- v) Quality of care has a direct effect in influencing women's use of maternal health care services.

1.7 Study significance

A study of the factors affecting maternal health care service utilization in Malawi is significant for a number of reasons: Firstly, by examining socio-demographic and behavioural factors at an individual, household and community levels associated with women prenatal care services is paramount to extend an understanding of factors influencing women's use of the health care service. The study seeks to establish the association among the individual, household and community levels and the way they influence women's use of the health care facilities. Therefore, such an approach is to add a significant new dimension in addressing the challenges affecting women's universal reliance on maternal health care service during prenatal, intranatal and postnatal care beyond individual and contextual perspectives as previously discussed by scholars in Malawi (Rawlins *et al.*, 2013; Sakala *et al.*, 2011).

Secondly, and peculiar to the study, there is a need to establish an understanding of the relative contribution that each determinant contributes in influencing utilization of maternal health care service. As such, the rank at which level the determinants contribute in influencing maternal health service utilization is to be noted. To that point, the findings are to provide some direction to the health policy key players in implementing future maternal health care programme with an understanding of the levels that influence women choice of health utilization. Such an understanding is of paramount importance to direct and redirect interventions aimed at scaling-up maternal health care service delivery nationally. Early scholars, both in Malawi and elsewhere, that have tried to investigate determinants associated with maternal health care service utilization completely forwent the aspect of understanding the relative contribution of each factor in order to assist key stakeholders in solving maternal public health challenges (Agha *et al.*, 2011; Aregay *et al.*, 2014; Babalola *et al.*, 2009; Kambala *et al.*, 2011).

Lastly, the findings and recommendations drawn from the study provide insight to develop a robust integrative and sustainable maternal health care service infrastructure with the capacity to contain any emergent maternal public health issues in the long term. This is because the study approach of understanding the determinants of maternal health care utilization is based on the available three national Demographic and Health Survey datasets for the years 2000, 2004 and 2011. These are secondary data that are used as spring board of the study and are complimented by the primary data collected from the three regions of Malawi, namely, Northern Region, Central Region and Southern region to determine factors associated with women's use of maternal health care.

1.8 Health systems in Malawi

1.8.1 Health systems

According to WHO (2010), the health system is defined as a system that consists of six components. These components are leadership and governance, health information systems, health financing, essential medical products and technologies, human resources and service delivery. However, many countries, including Malawi, redefine these components into three different implementation levels, namely primary health care, secondary health care and tertiary health care (Government of Malawi, 2012).

Considering the primary health care, the level provides health care services to patients and acts as the initial point at which a patient can start to access the health care services. This level consists of health units, health centres and community clinics and dispensaries with the capacity to provide antenatal, maternity, postnatal care services, with beds to hold patients while under health care observation and out-patient dispensary services. The second level, the secondary health care facilities, normally provides referral services to primary health care facilities. At this level, service facilities such as laboratory, ambulatory, X-rays and operating theatre, are conducted. In addition, the level is responsible for a wide range of health care services cutting across the health needs of the people regardless of their ages and gender differences (Government of Malawi, 2013). Furthermore, this level is comprised of the district hospitals for public, non-profit making hospitals under the Christian Health Association of Malawi and profit-oriented private health care facilities. The third category is the central hospitals which provide tertiary health care and referral services to secondary health care facilities. Therefore, it can be said in terms of service delivery the system was designed to follow a bottom-up approach, whereas allocation of resources adopted a top-down approach (Government of Malawi, 2012).

1.8.2 Health care financing

According to 2015 World Bank statistics, Malawi's health expenditure per capital, increased from US\$30 in 2000 to US\$90 in 2013. Furthermore, the country's government expenditure on health increased from 9.0% of the total annual national budget in 2000 to 16.2% in 2013. This government health care financing budget was supplemented by external health care budgets to the tune of 26.9% in 2000 and 68.9% in 2013. This level of health care expenditure indicates that

the health system has been receiving a lot of health care financing support despite challenges that the country health system experienced, which resulted in slow progress in maternal mortality reduction from 890 per 100 000 live births in 2000 to 686 per 1000 000 live births. This was against the background of the 2001 Abuja declaration of which the country signed a declaration to invest up to 15% of its national total budget to health financing in order to deal with similar horizontal health care challenges including maternal mortality.

1.8.3 Health care staffing

According to Sector Wide Approach Health programme 2012 report, Malawi's public health cadres comprise health surveillance assistance (7540), medical assistants (1262), nurses and midwives (13,357), clinic officers (2726), physicians (561), laboratory technicians (546), pharmacy technicians (543), radiographers (289) and medical engineers (39) (Government of Malawi, 2012). In 2013, the WHO report on the health profile indicated that the country deficiencies in the ratio of the physician to the patients still exist. For instance, the report indicates that there were only 0.2 physician per 10,000 people and about 3.4 nurses and midwives per 10,000 people. This implies that these lower ratios still exert a lot of pressure to the health workers in order to meet the growing demands of the entire population, which stood at 16.2 million at the time (World Bank, 2016).

Consequently, by way of rising to the challenge of health workers in public sector, the Government of Malawi which stood for decades on end, instituted medical colleges and universities to assist in training health workers in order to meet the growing demand of the health workers. These are Mzuzu University which offers undergraduate Bachelor of Science courses in nursing and midwifery, biomedical sciences and optometry. The University of Malawi has two constituents' colleges offering medical sciences programmes. For instance, the College of Medicine offers a Bachelor of Medicine, Bachelor of Surgery, biomedical sciences, and pharmacy. The other constituent college is the Kamuzu College of Nursing which offers Bachelor of Science in nursing, midwifery and community nursing. The other parastatal college, Malawi College of Health Sciences, trains lower level health cadres at diplomat level in the field of clinic medicine, nursing sciences, pharmacy and dental therapy. On average less than 500 health workers graduate every year in Malawi, contributing to the aggregate total of the entire graduates from these institutions to increase the low patient-doctor ratio the country is still experiencing.

1.8.4 Health system availability, accessibility and affordability

The health system in Malawi is divided into three levels, namely primary, secondary and tertiary levels. According to the Decentralisation Act of 1997, the Government of Malawi vested the Ministry of Local Government and Rural Development with delegated authority to facilitate operations of secondary and primary health care with the financial support from the Ministry of Health (MoH). The MoH is the commanding ministry responsible for development of health care policies, standards, protocols and management of the central hospital also known as tertiary health facilities in Malawi (Government of Malawi, 2003).

Since the early 1900s to 1964, Malawi had 21 established district hospitals. At the same time, these were meant to act as referral facilities to health centres, dispensary and other clinics within the district and it was serving less than two million people (Ngalande-Banda & WHO, 2005). In 2016, the country had 27 district hospitals except for an island district on Lake Malawi, namely, Likoma. According to the country's 2011–2016 Health Sector Strategic Plan (HSSP) report, about 54% of the households are located outside the radius of 5 kilometres to the health facilities. Such a development accounts for the access barrier to a household member to reach an existing health facility (Government of Malawi, 2011). This development makes the health care facilities accessibility a challenge in most developing countries (WHO, 2003). On the same note, in terms of affordability, the Government of Malawi offers free health care services to her citizens. However, socio-economic variations across the districts affect availability, affordability and accessibility of both supply and demand for health care services in the country.

Table 1. Number of public and private health care facilities in Malawi

Level	Public	Private	Total
Tertiary Health Care			
Central Hospitals	4	-	4
Mental Hospitals	1	1	2
Rehabilitation Units	1	1	2
Sub-Total	6	2	8
Secondary Health Care			
District Hospitals	23	-	23
Community/Rural Hospitals	19	18	37
Other Hospitals	1	20	21
Sub-Total	43	38	71
Primary Health Care			
Health Centres	314	109	423
Dispensaries	65	12	77
Maternity	15	4	19
Total	394	125	519
Total	443	155	598

Source: Government of Malawi, 2011. Malawi Health Sector Strategic Plan 2011–2016

1.8.5 Health System Strategic Plan

Since independence, the GoM implemented a lot of health related strategies and plans in a quest to improve the state of health in the country. This present study chose to focus on HSSP because of its overarching presentation of health issues in Malawi which assisted in defining the scope of the study and is currently under implementation. Therefore, the current 2011–2016 HSSP articulates a number of health goals aimed at improving health care service delivery which includes maternal health services (Government of Malawi, 2012). Among the goals are:

- a) Place emphasis on health promotion and disease prevention, as the majority of the diseases affecting Malawians are preventable;
- b) Focus on community participation;
- c) Promote integration of Essential Health Packages (EHP) services delivery at all levels;
- d) Redefine the EHP based on the Burden of Disease study and the STEPS survey, and as a result mental health and Non-Communicable Diseases (NCDs) will constitute part of the new EHP;
- e) Promote the expansion of Service Level Agreements (SLAs);
- f) Define EHP by level of service delivery;
- g) Encourage exploration and implementation of alternative sources of financing;
- h) Place emphasis on the reform of central hospitals;
- i) Promote the implementation of quality assurance interventions;
- j) Promote increased coordination and alignment, and the reduction of transaction costs.

Of these goals, the study adopted goals including community participation, integrated implementation of essential health package, health care financing and quality of health care delivery to explore different perspectives that health workers and women have on the supply of and demand for maternal health care services in Malawi.

1.9 Outline of the thesis

The thesis comprises nine chapters. The current chapter, Chapter One provides an outline for an introduction, problem statement, study objectives categorised into general and specific

objectives, study rationale/significance, health systems and definition of terms. This information is paramount in understanding main argument associated with maternal health care in Malawi. Chapter Two, Literature Review; Chapter Three, Research Methodology; Chapter Four, Sociodemographic, economic and cultural factors affecting prenatal healthcare service utilization; Chapter Five, Understanding factors influencing institutional childbirth delivery in Malawi; Chapter Six, Determinants of postpartum service care utilization in Malawi; Chapter Seven, Understanding the supply-side factors influencing delivery of maternal health care services: Health workers' perspectives; Chapter Eight, Women Perspective on demand-side factors influencing utilization of maternal health care services in Malawi; Chapter Nine, Conclusions and Recommendations.

CHAPTER 2

Literature review

2.1 Introduction

The chapter reviews different studies that set parameters to maternal health care service utilization from various parts of the world. The underlying principle of the review is to identify the gaps and dearth in studies associated with the country of concern. These identified gaps are the fundamental targets addressed by the present study.

Maternal health care service is defined as the services that women obtain in order to acquire quality of maternal health at prenatal/antenatal, childbirth in public health facilities and postnatal/postpartum care facilities (Aregay *et al.*, 2014; Dairo *et al.*, 2010; Dhaher *et al.*, 2008). As such this chapter reviews the literature associated with women's use of prenatal, public health care use during childbirth and after childbirth and theories adopted for the study.

2.2 Maternal health care utilization

Over time, maternal health services utilization has been a public health challenge, more prominently among the marginalised and vulnerable population sectors (Sepehri *et al.*, 2008). Various studies have attributed this to perceived barriers that continuously prevent the marginalised societies to utilize maternal child health services, especially in low income countries. The barriers include direct and indirect costs that affect having socioeconomic burden (Parkhurst *et al.*, 2009; Nabukera *et al.*, 2006; Kowaleswski *et al.*, 2002). The direct costs are related to transport costs and distance to inaccessible health care facilities as well as quality of care (Gabrysch *et al.*, 2009).

In Vietnam, studies found that lack of capacitated healthcare facilities have resulted in few women patronising maternal health care facilities during childbirth (Trinh *et al.*, 2007; Nhan *et al.*, 2000). On the contrary, in Nigeria, extensive capacity support in health care operations has earned a significant improvement in use of maternal health care even among women who are marginalised and disadvantaged financially women in rural regions (Findley *et al.*, 2013; Okoli *et al.*, 2012). Furthermore, the study found that the quality of care improved with the scaling up of healthcare; not only in infrastructure development, but also in investment in equipment (Ujah

et al., 2005). Such scaling up development has improved and reduced maternal mortality levels to preventable direct causes such as haemorrhage, sepsis, eclampsia, obstructed labour and spontaneous abortion (Kerber *et al.*, 2007; Ujah *et al.*, 2005). Available evidence revealed that inadequacy in policy and lack of priority settings, poor governance and lack of political will have stalled balanced investment in health sectors, which in the long term affects effective and efficient operation of maternal healthcare facilities in most low income countries (Prata *et al.*, 2010; Nhan *et al.*, 2000; Campbell *et al.*, 2006).

2.2.1 Prenatal health care and maternal health utilization

Over time, prenatal care has been viewed as a preventive health care facility capable of providing a wide array of maternal health checks in order to attain a safe childbirth outcome (Fiscella, 1995). These prenatal health care checks services such as early detection of maternal complications, early treatment on morbidity affecting women during pregnancy through a wide array of immunisations in addition to provision of micronutrients supplementations (Van den Broek *et al.*, 2003). Such nutritional support among pregnant women is not only a major contributor to women's better wellbeing, but also improved maternal health outcome along the gestation period (Rasch, 2007).

Therefore, access and utilization of prenatal care services assist women to understand the requisite about pregnancy states, significance of institutional delivery among others, a situation which results in improved maternal child health outcome (WHO, 2003). Yet, low income countries are confounded in a loop of dire poverty, a situation which is seen to have created a barrier towards prenatal care services utilization among women (Gage, 2007; Griffiths *et al.*, 2007). For instance, Sepehri *et al.* (2008) used a randomised intercept logistic model to capture factors affecting prenatal care utilization in Vietnam and found out that low income potentials in addition to low education among the rural-based pregnant women contribute largely towards their low utilization of prenatal care services. From another perspective, women in a stable financial position drawn from the formal employment sector were found to be more likely to adopt usage of prenatal care services as compared to those having an agricultural-based occupational status (Pickett *et al.*, 2001; Sepehri *et al.*, 2008). Tarekegn *et al.* (2014) argued that culture and prejudice are deeply rooted in women in relation to childbirth and negatively affect maternal child health care utilization in Ethiopia.

In another context, Mpembeni *et al.* (2007) used a cross-sectional study and found that while operating in a balanced socioeconomic environment, women are more likely to attend the required number of care visits and thereby increase their likelihood of delivering using health institutional facilities. This is in tandem with Stanton *et al.* (2007) who discovered that women with strong usage of prenatal care services are strongly and positively related to institutional health care delivery in the United States of America. The development is only appealing in situations where health care infrastructure is well equipped with the capacity of delivering quality of care (Matsuoka *et al.*, 2010). As such, lack of essential services in prenatal care contributes negatively towards access to health care facilities and subsequently impacts on institutional based delivery choices (Gage, 2007). It is imperative to explore how confluence of essential services, socio-economic and demographic factors influences individuals, households and communities in women use of prenatal care service in Malawi.

2.2.2 Childbirth delivery and maternal health service utilization

Previous studies established that use of modern care facilities for childbirth attributed to low maternal mortality around the world. The findings of Loudon (1992) provided further evidence to support the effective impact of institutional childbirth delivery. Loudon (1992) observed that quality of maternal health outcome and reduction of maternal mortality improved by half over the past century in most developed countries. Yet, the situation remains uncertain in developing world (Hogan *et al.*, 2010). Separate studies, supporting this claim, observed that extensive investment in maternal resource skills development, availability of quality maternal health care referral facilities and political will significantly contributed towards such strategic maternal health outcome improvement (Van Leberghe *et al.*, 2001; Buekens, 2001).

Conversely, it has been observed that among low income countries there is less likelihood to access skilled births services regardless of numerous policy advocacies associated with women empowerment (Witter *et al.*, 2009). Current research validates the claim that great economic inequalities that exist among households in low income countries not only is a challenge affecting women anticipation to undergo institutional delivery, but also incapacitate their right to access medical resources elsewhere as they are constrained economically (Goli *et al.*, 2013). This situation is often exacerbated by low motivation among healthcare services providers due to lack of financial incentives (Muula *et al.*, 2006 b).

In Ethiopia, a study indicated that low utilization of institutional delivery is correlated with factors such as low education status among women, birth order and challenged financial access across individuals and communities (Mekonnen *et al.*, 2002). In a related study, it has been observed that women who attended ANC services more than four times were found to be more likely to deliver in health care facilities regardless of their economic variability (Trinh *et al.*, 2007). This concurs within a community based study in Kenya that observed that rural women not attending an antenatal health care clinic being less likely to adopt use of health care by magnitude of about 1.6%, about 10% among those with at most three visits and 27% among women with at least four ANC recommended visits (Navaneetham *et al.*, 2002).

In Burma the lack of necessary maternal health services motivated institutional delivery among women; resulting in about 80% of women preferring to deliver their babies at home rather than at an institution (Mullany *et al.*, 2007). This became a human rights violation issue in Burma. Mullany *et al.* (2007) further posited that fewer women, about 5.1% of a total of 2914 sampled women, had access to skilled birth attendants during delivery, while 16% had a recommended antenatal health care visits. Thus, utilization of inadequate basic maternal health care results in a subsequent increase in the choice of home-based childbirth over institutional based childbirth (Kosum *et al.*, 2013).

2.2.3 Postnatal health care and maternal health utilization

In most developing countries around the world, postpartum health care services remain the health care system challenge (WHO, 2013). Studies that investigated factors affecting postpartum health care services utilization found existent and diverse determinants associated with postnatal health care. For instance, Yanagisawa *et al.* (2006) hypothesized that location and place of residence was found to be strongly correlated to postnatal care utilization in Philippines. In a related study, both paternal and maternal education, place of delivery, knowledge about postpartum service availability predicts positively on postnatal care in Ethiopia (Aregay *et al.*, 2014). In Malawi, Sakala *et al.* (2011) argued that although the government has adopted strategies such as the “*Safe Motherhood Initiatives*” in order to promote robust reproductive health outcome before and after delivery, less than two thirds of the women return to the hospital after delivery to patronise postnatal health care services. Nabukera *et al.* (2006) observed that challenges experienced by the mothers in Uganda, such as lack of transport to access the postnatal services, lack of knowledge and distance to access the health facility, were constraints experienced by the women.

Dhaher *et al.* (2008) utilised cross-sectional data comprising 264 samples from three health clinics. 66% of the respondents indicated postnatal care as necessary preventive mechanism that improves maternal health outcome after delivery in Palestine. The study further observed that those women who deliver normally at home never need the role of postnatal health care service. It has been observed that majority of the women that seek postnatal care services have long term and complicated health history (Van der Woude *et al.*, 2015). The study further observed that women with good health status and complication free vaginal delivery were more likely not to utilize postpartum care service than their counterparts with complicated childbirth history. Therefore, theories have been formulated to explain these phenomena in maternal health care usage. These theories are: the Health Behaviour Theory; the Three Delay Theory and the Ecological Theory.

2.3 Theoretical explanation of health service utilization

2.3.1 Health Behaviour Theory

There exists a plethora of theories in this social science, but for the purpose of this study the theory to be adopted is the health service utilization theory developed by Anderson (1968). The theory comprises of three categories that define health seeking behaviour, namely, predisposing factors, enabling characteristics, and need based characteristics.

The predisposing factors define the proclivity to use health at an individual level which is further determined by demographic, social structure and belief characteristics. According to Anderson (1968) individuals with better predisposition attributes are more likely to understand significance of health care and utilize the offered services than otherwise. The enabling characteristics define the available household and community resources that capacitate an individual within that community or household to access health care services of their choice. For instance, family or household resources and economic stability within the household defines the enabling characteristics. Need based characteristics define the perceived need for an individual to seek health services or not.

This health behaviour utilization model is to be used to categorise major indicators at individual, household and community levels determining maternal child health utilization in Malawi. The

conceptual framework, in Figure 2.1, provides a schematic presentation of how the Health Behaviour Theory is applied to define major variables of interest for the study.

2.3.2 Three Delay Health Theory

The Three Delay Theory was adopted from Barnes-Josiah *et al.* (1998) who used the model to identify factors affecting women's immediate use of health care services as a mediating factor to maternal mortality. The Three Delay Model states that in order to have an effective maternal healthcare outcome three principle factors need to be considered. These involve patients' timely decision to seek care which, in most cases, is affected by socioeconomic and behaviour characteristics; delay in identifying and reaching health care, which has the likelihood to increase risk women health outcome, and delay in receiving appropriate care which results in a patient experiencing dire consequences that could affect any future decision to seek health care services in the future. This model is significant as it assists in supply-side and demand-side for health so that a full annotation of the study is feasible.

2.3.3 Ecological theory

The Ecological Theory was developed by Bronfenbrenner's (1979). The theory was used to study and understand the environment that the people live in and the way it affects their behaviour. The theory indicates that any change in the indicators or factors existing in the environment have a bearing to the behaviour of the people. As applied to the study, the theory assists in identifying environmental factors from the ecological perspective such as intrapersonal, interpersonal and institutional aspects to test its relation to health care utilization among women in Malawi. For instance, intrapersonal aspects such as ANC visitation, maternal age, among others, interpersonal aspects such as media exposure, number of living children, among others, and institutional factors like distance to the health facility, cost of services, transport among others to test their relationship to postnatal health seeking behaviour.

Based on the three preceding theories discussed, there is need to give a conceptual framework that illustrates the relationship with the predisposing and enabling factors associated with maternal health care utilization.

2.4 Conceptual framework

As described in Anderson theory, the predisposing factors comprise individual factors including demographic and economic factors. In addition, the theory demonstrates the enabling community factors as they relate with the outcome variables such as prenatal care access, childbirth in public health care facility and postpartum care access thus defining the maternal health care utilization. The conceptual framework, illustrated in Figure 2.1, shows the relationship of the factors with the outcome variables. Linkages are highlighted between a predisposing individual, enabling household and community factors and maternal health care utilization indicators. In the conceptual framework, it is illustrated that maternal health care utilization is defined in three forms, namely:

1. Prenatal care utilization is measured by the number of women using ANC care and defined as 1 if the woman had an ANC frequency of four or higher. According to the WHO 2003 report, a minimum of four or higher was deemed the best recommended number of ANC visits for checking the woman during pregnancy in order to ensure timely monitoring of pregnancy complications in order to attain safe motherhood.
2. Intrapartum care is defined as maternal childbirth in a public health facility, which is measured as 1 if the woman chose to deliver her baby in any public health facility or 0 for otherwise.
3. The postpartum care utilization is measured as the timing in accessing postpartum care services after childbirth. In this study, the postnatal check-up is defined in three levels as 24 hours after childbirth, 1–6 days and 1 week or higher after childbirth.

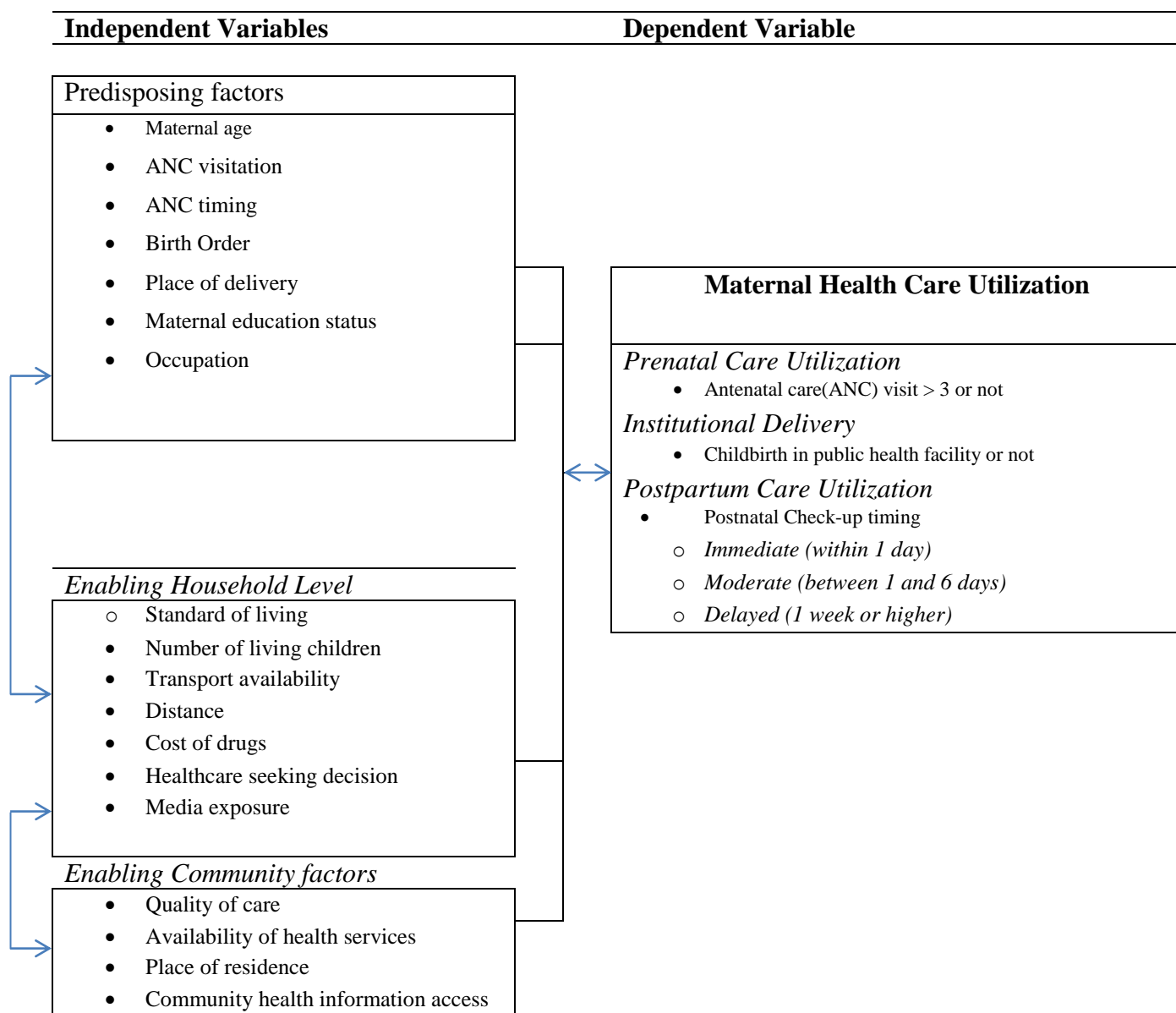


Figure 2.1 Conceptual Framework illustrates the relationship between independent variables and maternal health care

2.5 Chapter summary

Having reviewed different studies and the three theories associated with maternal health care from across the world identified gaps, it is apparent that Malawi is still lagging behind in terms of achieving its goal of lowering the levels of maternal mortality compared to other countries. It is imperative that the study adopts particular research methodology in order to determine factors that positively or negatively influence women's use of maternal health service facilities in Malawi.

CHAPTER 3

Research methodology

3.1 Introduction

This chapter details the research methodology that was adopted to analyse data in order to answer the research questions. The chapter provides information on the study settings, sources of data, study design, analytical procedures comprising methods and techniques used to analyse data, variables adopted in the study, data quality, summary of analytical plan, limitation of the study and ethical consideration.

3.2 Study setting

Malawi is a land-locked country in Southern Africa with an area of 118,484 square kilometres of land, 20% of which comprises the water body. The total length of the country is 900 kilometres and has a maximum width averaging about 250 kilometres. The country is bordered by Tanzania in the north, Zambia in the west and Mozambique in the south. Furthermore, Malawi is divided into three administrative regions, namely, Northern, Central, and Southern.

According to population census reports, Malawi population increased with an average of 3.7% in 1990's, 2.8% in 2000's and about 3.0% average for between 2010 and 2014 (Population Reference Bureau, 2014). This translates into a total population registered for the country of about 9,447,123 in 1990, 11,321,494 in the year 2000, 15,013,694 in 2010 and 16,829,000 in 2014. According to the 2008 Population and Housing Census, Northern region registered a total population size of 1,698,502 representing 13% of the total country's population (Government of Malawi, 2008). The report further indicates that Central Region, with a population size of 5,491,034 constituted to about 42% of the country's population, while the Southern Region which had a population of 5,876,784 translated to about 45% of the total population. Out of this population distribution, 51% were females. Of this female population, about 14% of the women are within the reproductive age group, 15 to 49 years. Despite the population increase, Malawi is still affected by high maternal mortality ratio. In terms of the inequality differences between the rich and the poor measures by Gini coefficient, Malawi Gini Coefficient stood at 46% in 2010,

implying that great income inequality still exists (World Bank, 2014). Such profound socioeconomic challenges affect those below poverty line in choosing quality of health and thus impacts on the health seeking behaviour and or making them heavily dependent on public health care services (Findley *et al.*, 2013; Muula *et al.*, 2006 a).

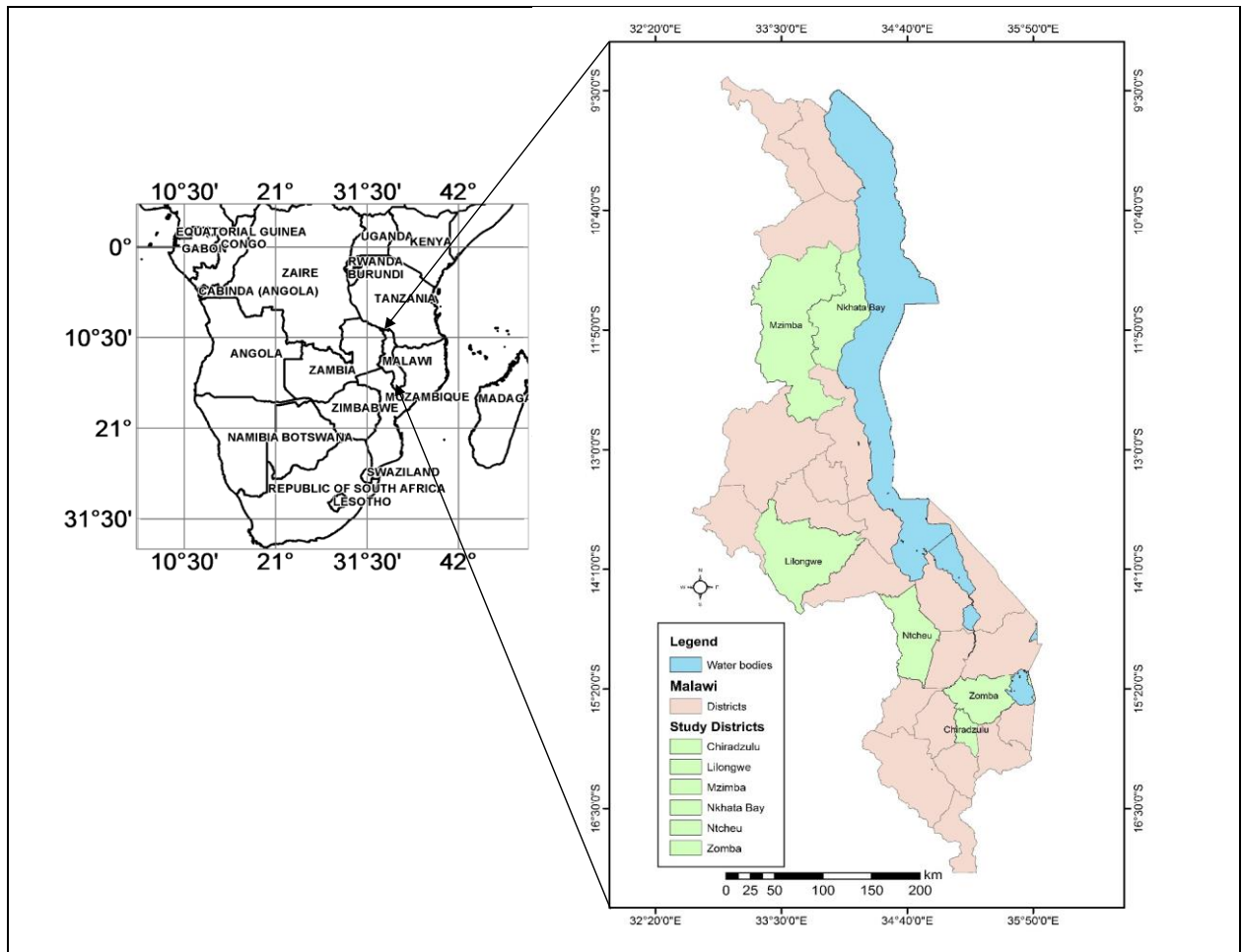


Figure 3.1 The Map of Malawi provides details of the selected districts from which qualitative data was collected

3.3 Sources of data

The study employed primary and secondary data to answer the research questions. As such the primary data explains the data that is collected from the respondents affected and related to the study objectives. In this study these are women aged 15–49 years and associated with maternal health care service utilization. Secondary data sources explain the data that was collected for other purposes and was adopted to test other research themes. In this case, the study adopted used three waves of Malawi Demographic and Health Surveys (MDHS) (2000, 2004 and 2010),

which are publicly available and assisted in answering the research questions (NSO & Macro, 2001; NSO & OCR Macro, 2005; NSO & ICF Macro, 2011).

3.4 Study design

The study is designed to take a mixed method analytical approach; more specifically, a sequential mixed method design is adopted. According to Creswell (2013), the sequential mixed method design is the best technique in data analysis for a study like this one. It starts with one analytical approach and quantitative approach and progresses to further analysis using a different approach as the gaps are identified in the initial analysis. In this case, the qualitative approach was also used. This study design benefits creating an understanding in trying to answer the research questions as what factors affect women's use of maternal health care service facilities which, in turn, result in adverse maternal health outcome.

3.4.1 Quantitative Perspective of the Study

The quantitative analysis uses the three waves of MDHS data (see Section 3.3). The 1992 MDHS data were excluded in the study due to inconsistencies and lack of coherence with some indicators from the 2000, 2004 and 2010 data.

3.4.2 Data and sample size

The quantitative data comprised women belonging to reproductive ages ranging from 15–49 from the MDHS for the year 2000, 2004 and 2010. In total, 13 220 women in 2000, 11 890 women in 2004 and 20 230 women in 2010 were assessed respectively. These groups of women were asked questions related to their maternal, child health experiences, and their socioeconomic status among others. In the present study, population was drawn from women who gave birth in the last five years preceding each survey. For instance, the survey required an interview of women who gave birth between 1995 and 2000, 2001 and 2004, and 2005 and 2010.

3.4.3 Data quality issues

Shryrock *et al.* (1976) pointed out that in any process of collecting demographic data the issue of misreporting of age affects the quality of data. According to Kpedekpo (1982), such misreporting of data needs to be scrutinized regardless of the datasets in order to ensure that demographic is not biased due to errors associated with age misrepresentation. The need to scrutinize the quality of that data was paramount in order to test its validity and reliability. An early researcher pointed out that use of demographic data is paramount to direct policy makers on issues associated with population and development thereby call for quality test is core prerequisite (Moultrie *et al.*, 2013). In addition, researchers have often argued that detailed information regarding distortions in the age-sex distributions may be obtained by plotting the age-sex distributions (Fajardo-González *et al.*, 2014; Moultrie, *et al.*, 2013). In line with this observation, graphs have extensively been used to illustrate the extent of age errors in the study population.

Figure 3.2 illustrates the frequency by single year age distribution of women in 2000, 2004 and 2010 according to the information on age obtained from the female questionnaire. A common feature of such age distributions in censuses and surveys in developing countries is heaping on ages ending with 0, or 5, and to some extent those ending with even numbers. The MDHS datasets are no exception (see Figure 3.2). A marked heaping at ages ending with 0, 5, and even numbers is clearly seen. It can be observed from Figure 3.2 that many women are concentrated particularly on age 18, 20, 28, 30, 32, 38, 40, 42, 45 and 48. But the heaping is not serious although caution needs to be exercised when performing any analysis that involves women's age.

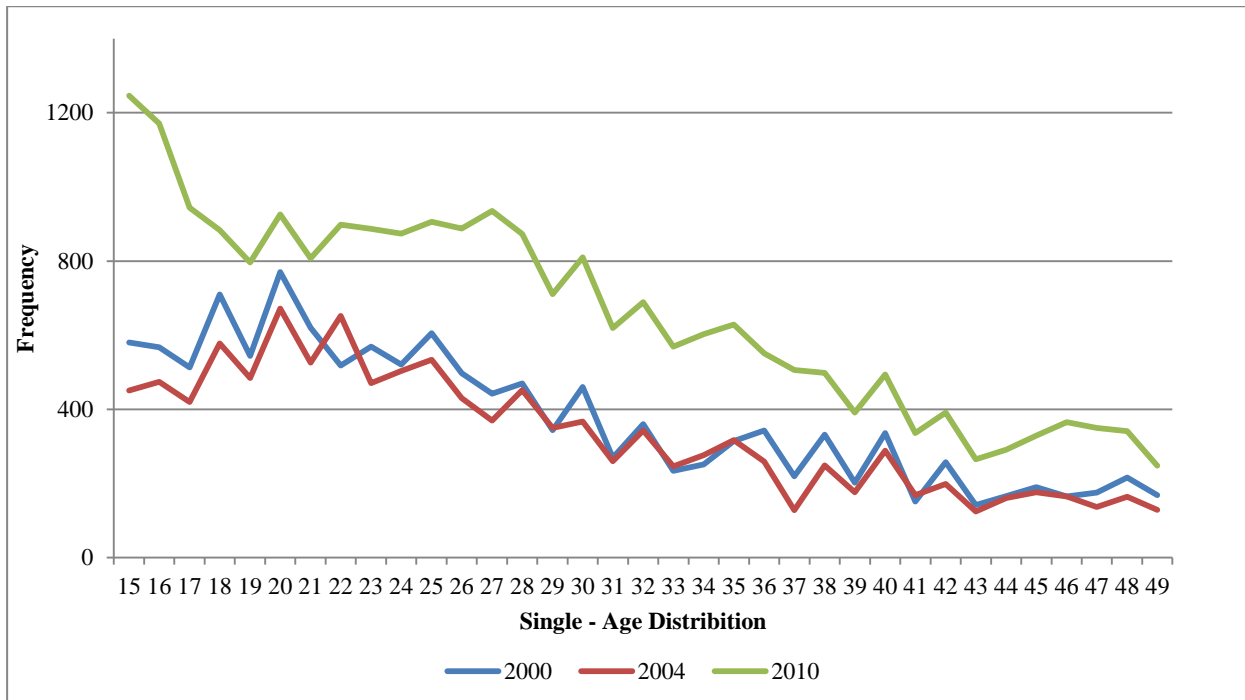


Figure 3.2 Frequency distribution in single ages of women

The problem of heaping in particular ages can be partly reduced by grouping women in five-year age groups as shown in Figure 2. It can be observed from the figure that age distortions have been smoothed to a large extent compared with Figure 2. The percentage of women decreases consistently from age group 15-19 to age group 45-49.

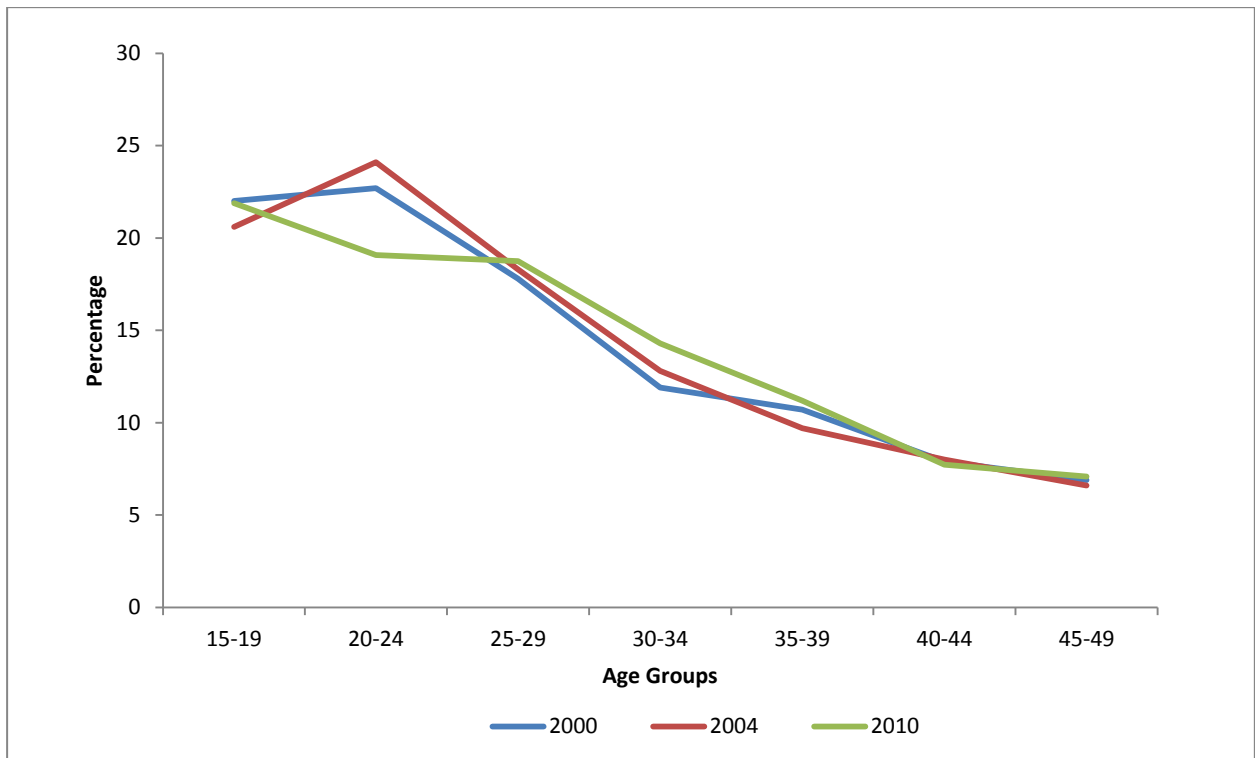


Figure 3.2b Percentage distribution of women in 5 year age group for the study years 2000, 2004 and 2010

In order to evaluate the quality of the reported age distributions, the Myer's and Whipple's Indices were employed.

3.4.3.1 Myer's Index

This quality check technique was introduced by Myer in 1940. The method assesses the data based on single-year approach in order to test the extent at which the respondent preferred digits between 0 and 9. However, the method presumes that no systematic errors associated with age reporting existed. Total population of each age ending in one of the ten digits should be almost 10% of the aggregate blended population. As such, an aggregate of more than 10% of the blended population at any instance, denotes the existence of respondents preference of an age in that designated digit. Nevertheless, a contrary perspective denotes people avoiding that digit.

Algorithm involved in deriving the Myer's index:

- a) Sum the population ending in each of the digit over a set (X) denoting a range of ages starting from lower limit as follows: $X \in \{10,20,30,40, \dots; 11,21,31,51, \dots\}$.
- b) Ascertain the sum excluding the first population combined in steps a), represented in set (Y) as follows: $Y \in \{20,30,40, \dots; 21,31,51, \dots\}$.
- c) Then weight the sum of the population derived in step a) and b), above and derives a blended sum after summing the two. In which case the weight is derive using a counter 0 through 9 for the 0 digits, correspondingly 10 to 0 for the digits 0 to 9.
- d) Change the distribution obtained in step c), into a percentile scale.
- e) Derive the deviation from each percentage in step d) from 10.0 and transform each value to percentile.
- f) A summary index of preference for all terminal digits is derived as one the modulus sum of the deviation from the 10.0%.

The computational procedures for determining the Myer's Index are shown in Table 3.1. Based on the Table 3.1, according to the year 2000, a lot of women had a digital preference when reporting their ages on terminal digits number 1 (7.1%),3 (7.9%),4(8.9%),7(9.8%) and 9 (0.6 %). On the contrary, on other terminal digits there was a lot of digital avoidance. Further to this, the study computed index of preference valued at 13.8. According to Kpedekpo (1982), who used Myers index to explain numerous examples associated with data quality, the Myers index highlighted a preference for ranges between 0 and 180 and that any computed index less than 105 is defined as very accurate. Implying that age heaping is not adequately affecting the quality

of data concerned. Therefore, based on 2000 MDHS data, a Myers Index of preference of 13.8 defined highly accurate data quality for that year. This implies that the collected 2000 MDHS data was of high quality and had negligible age heaping. In 2004, the researcher computed the Myers Index of preference in order to ascertain the degree of quality of that year's data. Table 3.2 demonstrated the computed Myers Index result.

As is indicated, in 2004, the terminal digits that women preferred when reporting their ages were 1 (2.2%), 3 (1.8%), 7 (1.8%) and 9 (0.4%). On the contrary, there was a digital avoidance in other digits (See Table 3.2 for those digits with less than 0 percentage deviation from 10). Further to this, it was found that in year 2004 the index of preference value that was computed by Myers Index technique was 12.3%. According to Kpedekpo (1982), the index value is slightly less than 105. This implies that about 7 % ($12.3/180*100$) of the data was heaped and that the data had level of accuracy was perfect applicable to this study.

However as indicated in Table 3.3, the absolute sum of the deviation was 9.5 which is relatively small. This denotes that the data quality was good. On the same note, it was observed that across the terminal digits, there are very small deviations from 10, with a terminal digit of 1 (2.03%) as a maximum and a terminal digit of 0 (1.6%) as a minimum in as far as digital preference was concerned. Conversely, there was a digital avoidance from terminal digit 5, 6, 7 and 8. Furthermore, it was found that women with the Myers Index of preference of 9.5 computed from the 2010 MDHS data denotes a lower and negligible age heaping in general. This implies that the dataset was of better quality. Based on the above, the Myers Index of preference computation shows that quality MDHS data is improving at each and every subsequent wave. This is verified with the reduction in the index of preference the years from 55.0% in 2000, 12.3% in 2004 and 9.5% in 2010. This implies that the data sets are feasible for any further analysis in as far as quality issues are concerned.

Table 3.1 Myers Index computation 2000 using Malawi Demographic and Health Survey

Terminal Number	Ages sum 20–49	Weight	Product A	Ages sum 30–49	Weight	Product B	Blended population	% Distribution	Deviation from 10	Absolute Sum
0	1566	1	1566	796	9	7164	8730	11.4	-1.4	1.4
1	1040	2	2080	420	8	3360	5440	7.1	2.9	2.9
2	1135	3	3405	617	7	4319	7724	10.1	-0.1	0.1
3	945	4	3780	376	6	2256	6036	7.9	2.1	2.1
4	938	5	4690	417	5	2085	6775	8.9	1.1	1.1
5	1109	6	6654	504	4	2016	8670	11.4	-1.4	1.4
6	1005	7	7035	508	3	1524	8559	11.2	-1.2	1.2
7	836	8	6688	394	2	788	7476	9.8	0.2	0.2
8	1018	9	9162	548	1	548	9710	12.7	-2.7	2.7
9	714	10	7140	370	0	0	7140	9.4	0.6	0.6
Sum	10306			4950			76260	100		13.8

Source: Authors own computation

Table 3.2. Myers index computation 2004 using Malawi Demographic Health Dataset

Terminal Number	Ages sum 20-49	Weight	Product A	Ages sum 30-49	Weight	Product B	Blended sum	% Distribution	Deviation from 10	Absolute value
0	1327	1	1327	655	9	5895	7222	10.6	-0.6	0.6
1	954	2	1908	428	8	3424	5332	7.8	2.2	2.2
2	1194	3	3582	542	7	3794	7376	10.8	-0.8	0.8
3	841	4	3364	370	6	2220	5584	8.2	1.8	1.8
4	940	5	4700	437	5	2185	6885	10.1	-0.1	0.1
5	1027	6	6162	493	4	1972	8134	11.9	-1.9	1.9
6	854	7	5978	424	3	1272	7250	10.6	-0.6	0.6
7	634	8	5072	264	2	528	5600	8.2	1.8	1.8
8	865	9	7785	413	1	413	8198	12.0	-2.0	2.0
9	655	10	6550	305	0	0	6550	9.6	0.4	0.4
Sum	9291			4331			68131			12.3

Source: Authors own computation

Table 3.3. Myers index computation 2010 using Malawi Demographic Health Survey dataset

Terminal Number	Ages sum 20-49	Weight	Product	Ages sum 30-49	Weight	Product	Blended sum	% Distribution	Deviation from 10	Absolute value
0	2230	1	2230	1304	9	11736	13966	10.0	0.02	0.02
1	1762	2	3524	955	8	7640	11164	8.0	2.03	2.03
2	1978	3	5934	1080	7	7560	13494	9.6	0.36	0.36
3	1721	4	6884	834	6	5004	11888	8.5	1.51	1.51
4	1768	5	8840	894	5	4470	13310	9.5	0.49	0.49
5	1864	6	11184	958	4	3832	15016	10.7	-0.73	0.73
6	1804	7	12628	916	3	2748	15376	11.0	-0.98	0.98
7	1791	8	14328	856	2	1712	16040	11.5	-1.46	1.46
8	1712	9	15408	839	1	839	16247	11.6	-1.60	1.60
9	1350	10	13500	639	0	0	13500	9.6	0.36	0.36
Sum			94460				140001	100		9.5

Source: Authors own computation

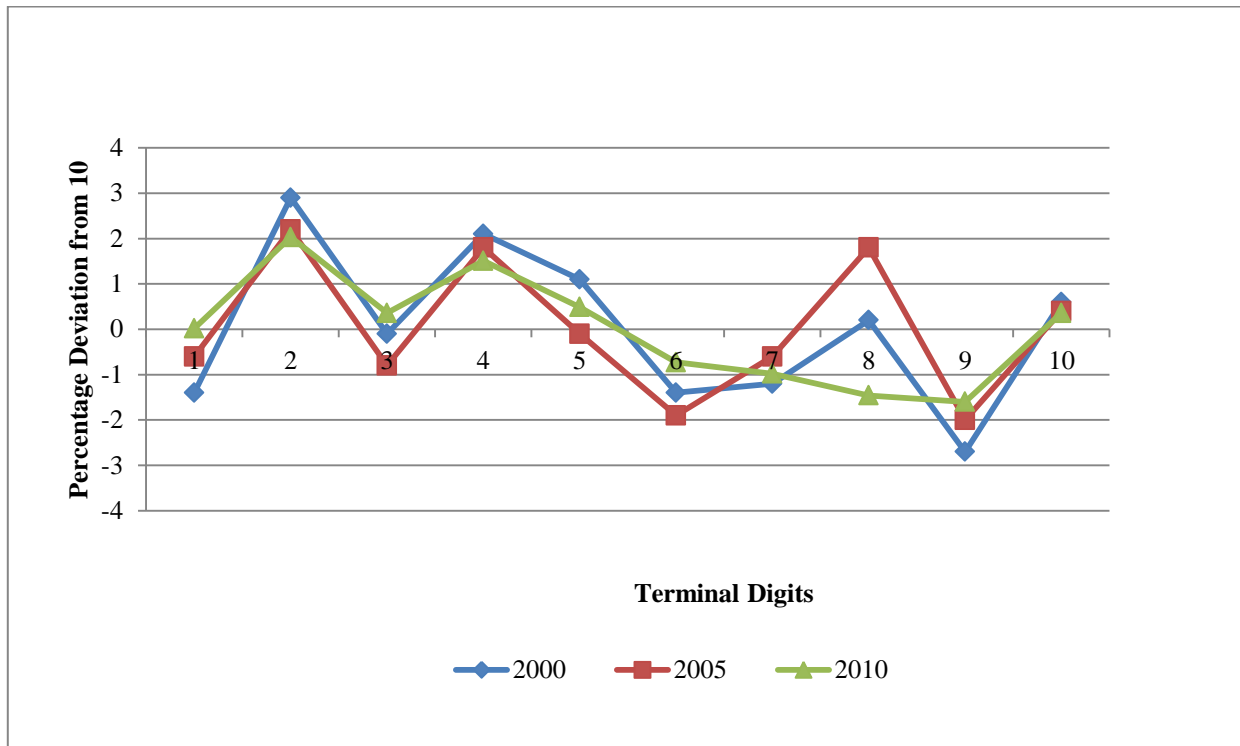


Figure 3.3 The percentage deviation and terminal digits for the year 2000, 2004 and 2010

Figure 3.1 illustrates the pictorial presentation of the percentage deviations for the year 2000, 2004 and 2010 against the terminal digits. The chart denotes women in year 2000 preferred 2, 4, 5 and 10 and avoided the other digits. In 2004, 2, 4, 8 and 10 were preferred digitals. In 2010, women preferred digit 2, 4, 5 and 10. On the same, terminal digit 1, 3, 6 and 9 were the common avoided digits women preferred digits over the different datasets. This implies that in as far as digital preferences was concerned, there were variations among women on the preferred digits across different years of study. However, considering at the aggregate absolute Myer's indices for the year 2000, 2004 and 2010 which was 13.8, 12.3 and 9.5 denoted an accuracy in the quality of data collected (Shryrock *et al.*, 1976).

3.4.3.2 Whipple's Index

Whipple's Index is another technique used to test quality of demographic data. It was derived by an American, an economic demographer George Whipple's, and was recommended as a best method of testing quality of data (Shryrock *et al.*, 1976). The technique reflected preferences of the terminal digits 0 and 5 and the index is measured on a scale ranged between 0 and 500, which is defined as follows: less than < 105 denotes very accurate of data, 105–110 for relatively accurate, 110–125 for normal data, 125–175 for bad data quality and 175+ for very bad data quality (Kpedekpo *et al.*, 1982).

The technique uses single year data of age returns between 23 and 49 inclusive. Figure 3.2 illustrates the frequency by single year age distribution of women. The younger and the older ages are excluded due to the higher prospect of errors reported over time (Denic *et al.*, 2004; Kpedekpo, 1982).

The original technique utilises single year age data between 23 and 62 inclusive. The younger and the older ages are excluded due to the higher prospect of errors reported over time (Denic *et al.*, 2004; Kpedekpo, 1982). However, present studies have used the modified Whipples to test quality of age data ranged from 14 – 49 (Nasir *et al.*, 2014).

If there were neither digit preference nor age heaping, the Whipple index would be 100. If all persons in the population reported their ages as ending in 0 or 5, the Whipple index would be 500. The values of the Whipple index are thus in a range between 100 and 500. The United Nations (1955) notes that if Whipple index values are less than 105, then age distribution data is deemed to be “highly accurate”; if the values are between 105 and 109.9, they are “fairly

accurate”; if between 110 and 124.9, “approximate”; if between 125 and 174.9, “rough”; and if 175 or more, “very rough” (United Nations 1955: 39-45).

The underlying assumption driving this technique is the rectangularity between ages 0 and 5. The derivation of the Whipples Index is as detailed as follows:

$$Whipples\ Index\ (WI_{0,5}) = \frac{\sum(p_{25}+p_{30}+p_{35}+p_{40}+p_{45})}{\frac{1}{5}(p_{23}+p_{24}+p_{25}+\dots+p_{45})} * 100 \dots \text{Equation (i)}$$

The formulations for deriving the WI_0 and WI_5 for digits of 0 and 5 are illustrated in Tables 3.4a and 3.4b.

Tables 3.4a and 3.4b illustrate the Computed Whipples Indices for the Year 2000, 2004 and 2010 respectively.

Table 3.4 Total female population for ages 25,30,35,40 and 45 for the study year 2000, 2004 and 2010

Age	2000	2004	2010
25	605	534	906
30	460	367	810
35	314	317	629
40	336	288	494
45	190	176	329
Total	1905	1682	3168

Source: NSO & Macro, 2001; NSO & OCR Macro, 2005 and NSO & ICF Macro, 2011

Table 3.5 Total female population for the years ranged from 23-49 for Years 2000, 2004 and 2010

Ages	2000 Number	2004 Number	2010 Number
23	569	471	887
24	521	503	874
25-29	2358	2136	4313
30-34	1574	1492	3290
35-39	1410	1129	2575
40-44	1052	940	1777
45	190	176	329
46	165	165	365
47	175	136	350
48	216	164	341
49	168	129	248
	8398	7441	15349
$WI_{0,5}$	113.4	113.0	103.9

Source: NSO & Macro, 2001; NSO & OCR Macro, 2005 and NSO&ICF Macro, 2011

As the results indicate, the Whipple's Index ranged from 113.4, 113.0 and 103.9 in year 2000, 2004 and 2010 respectively. Therefore, based on the interpretative scale indicated above, the 2010 data were very accurate in as far as data quality was concerned. As such, this result corresponds with an earlier computed value of Myers Index (9.5) for the same year which indicated better quality data for the year 2010. Further to this, year 2000 and 2004 indices fall within the range of 110–125, which according to the interpretive scale implying that the data qualities for each year were moderate. To this end, in as far the quality of data as attested by the two methods, namely Myers and Whipple's, denote that the quality of MDHS data that was adopted to test quantitative hypotheses for prenatal, intranatal and postnatal health care utilization, were of perfectly good quality.

3.5 Qualitative Study

The study uses a qualitative approach in order to collect data to complement the secondary data. Two techniques were applied in the qualitative data collection: Firstly, Focus Group Discussions (FGDs), which were meant to collect information from women that come for prenatal, intranatal and postnatal care services; and secondly, Key Informant interview (KI) interviewing health personnel's responsible to manage operations of the health facilities.

3.5.1 Focus Group Discussions

A total of 24 FGDs in selected primary and secondary health care facilities in the Northern, Central and Southern administrative regions of Malawi. According to the Health Sector Strategic Plan 2011–2016 (Government of Malawi, 2012), primary and secondary health facilities provide perennial maternal health care services and are suitable to reach eligible respondents that provided significant information in order to achieve the study objectives.

Furthermore, the study applied convenient sampling in selecting the district as defined in the report from 2011–2016 Malawi Health Sector. As is indicated in Section 1.8, districts have hospitals belonging to secondary level of the health Strategic Plan. In the current economic situation and delay in receiving financing for health care, the health systems do experience common operational challenges (Government of Malawi, 2012). The districts that were selected include: Mzimba and Nkhatabay, in the Northern Region; Ntcheu and Lilongwe, in the Central Region and Chiradzulu and Zomba, in the Southern Region. Their care system does support all

forms of primary health care facilities such as health units, health centres, and community clinics among others. Upon arrival at the district health office, the investigator discussed the purpose of the study with the senior manager of the district health office and a letter of intent was delivered to the management team. Once all district health facilities were conveniently selected, the management team authorised that the researcher to proceed with the research. After this development, the principal investigator proceeded in asking the management to point out the health centre that had the highest frequency of maternal health referral cases, on average, for the last quarter of the year that the researchers were conducting the study. This was conducted between 1 and 30 September 2015. The principle investigator further asked for authorisation from the district management team, who by their professional health system structure in Malawi, oversee all the operations of health centres and that remote health centre manager oversee reports to the district health office, as the central controlling officers. As such the district health office made calls to the health centres and booked appointment for the research team with both FGD and KI with the managers in charge of the maternal health centres.

It is important to note that before conducting a FGD or a key -informant interview, a consent agreement statement was read to the respondents in the language of choice of the respondents. After the consent agreement was completed, in almost all cases, all respondents complied and agreed to participate in these two research exercises. In total, the researchers conducted 12 FGDs. This implies that in each district, one KI interview was conducted in a health centre and one in a district hospital. In which case, the senior member of staff responsible for maternal health care service management was targeted for interview. Parallel to this KI interview, the FGD was underway and that targeted women that came to the health facility seeking maternal health care services. They were conveniently selected and recommended by the health facility management. These respondents were a combination of those that came for prenatal care services, those that were awaiting childbirth and those that were expecting a postnatal discharge round. On average, each FGD session had 8 to 12 women and this was substantial judging from the nature and health condition of the women which required much attention, hence there was no need for the researchers to request more women to participate per session.

Three research assistants were recruited and were trained for two days before the whole process was launched and were mock tested on the probing by the lead investigator in order to ensure higher probability of getting quality data from the FGD session. In as far as the KI Interviews were concerned, the principal investigator led all sessions. However, in Southern Region, there was an exchange of roles as the principal researcher originates from this region where people

speak Chichewa, the language with which he is well conversant with. It was imperative that he facilitated the FGDs in Chiradzulu and Zomba districts in order for him to gain better understanding of the women's responses to the whole exercise and a gist of first-hand information from the women regarding their perception maternal health care service in general (see Appendix B and C).

3.5.2 Key Informant interviews

A total of 12 key informants were consulted in three regions of the country, namely, Northern, Central and Southern regions. This means that at each region four KI interviews were held. At district level, one KI interview was conducted at a health centre and another at the hospital, making a total of two per district. Key informants were interviewed to understand their perception of maternal health care services that they deliver at the health facility thus, provide an insight into the negatives and positives associated with maternal health care service delivery in Malawi (See appendix B and C on guiding principles).

3.6 Analytical procedures

3.6.1 Quantitative procedures

The study utilised univariate, bivariate and multivariate analytical approaches to estimate determinants of maternal health care service utilization. The multivariate analysis includes different types of logistic regression to suit each objective requirements, decomposition technique and path analysis. The following sections provide details of analytical process the study uses. STATA 13.0 was used for all the data analysis entailed.

3.6.1.1 Univariate approach

A univariate statistical approach is used in the study to provide fundamental background characteristics of the respondents associated with prenatal, institutional delivery and postnatal care. The percentages and frequencies were used to present the univariate results. It is therefore important to note the univariate section for prenatal and child birth in public health care facility were the same. This is because the base criteria used to identify women that had prenatal care and institutional delivery in the last 5 year preceding the survey was the same. As such the

univariate descriptive statistics for the variables such as birth order, education, earning status, religion affiliation, standard of living, exposure to media, quality of care, place of residence and availability of health care providers were identical and for the purpose of the study flow were replicated in chapter 4 and 5.

3.6.1.2 Bivariate approach

A bivariate approach explained the relationship between dependent and independent variables. Using this approach, a Pearson Chi-square is adopted to test the association between the dependent and independent variables and a critical value of $p < 0.1$ for statistical testing.

3.6.1.3 Multivariate approach

Multivariate analytical techniques are applied in order to meet each specific objective requirement. Binary regression analysis technique is used to explore the relationship between dependent and independent variables in the succeeding chapters four, five and six to test the hypothesis set for each chapter. The succeeding formation explains briefly the outcome for the variables adopted for the prenatal, institutional and postnatal care corresponding to objective i), objective ii) and objective iii) of the study.

Objective i) *Exploring the sociodemographic and economic factors affecting prenatal care service utilization.*

To achieve the objective, the study uses Bernoulli multi-level model to test the hypothesis. This is a similar approach used by Trinh *et al.* (2007) to assess the correlated of antenatal care in Vietnam. As such, frequency of ANC visits was adopted as an outcome variable in this study. This was derived from the question “*How many times did you receive antenatal care during this pregnancy.*” in which the responses that were a count and ranged from 0, 1, 2, ... were further recoded as 0 if the ANC usage frequency was less than 4 and 1 for otherwise.

Objective ii) *Establishing the determinants associated with institutional based childbirth delivery in Malawi.*

In order to measure institutional based childbirth delivery, women indicated whether they have delivered their children at any public health care facilities were defined as 1 and 0 for otherwise.

In the questionnaire, women were asked to explain the facilities that they used when delivering their last child. Different responses were given and these were public health facility, private health facility, and mission health facility, respondents' home and other.

Objective iii) To explore correlates of postpartum care service utilization in Malawi.

Binary logistic regression is applied using two dependent variables measuring postpartum service utilization such as; ability to be checked by the skilled health personnel within less than 24 hours, 1–6 days after delivery and 1 week and later after delivery (see, chapter 6 for detailed methodology used).

Therefore, to investigate levels of inequalities on maternal child health care utilization, each outcome variable is dichotomized as follows: *Antenatal Care*: as defined above; *Institutional delivery*: whether skilled or unskilled birth attendants were used; *Postpartum Care*: defined as whether a woman was checked within 24 hours; between day 1–6 after delivery and week 1 and higher after delivery, the following detail of the decomposition technique used is detailed below. In addition, the regressed resultant coefficients and odd ratios were taken for further analysis called decomposition techniques in order to understand and determine the relative contribution that the factors associated with prenatal (chapter 4), institutional delivery (chapter 5) and postnatal care facilities (chapter 6), in turn. It is important to mention that each of the aforementioned outcome variables is presented as an independent chapter as this study adopted a chapter format to deal with each objective. The succeeding section 3.7 provides detailed procedure of an algorithm to explain the decomposition technique the study uses.

3.7 Decomposition technique

In chapters 4, 5 and 6 this study uses the decomposition technique to further the analysis and compute the relative contribution of each tested variable of prenatal care, childbirth in public health facility and postnatal care services respectively.

The decomposition technique, adopted from different scholars Goli *et al.*, 2014; Van Malderen *et al.*, 2013; O' Donnel *et al.*, 2008; Hosseinpoor *et al.*, 2006; Wagstaff *et al.*, 2003), is used to decompose different health related indicators as follows:

- a) The parameter coefficients of covariates (β_j) are estimated through binomial logistic regression using each maternal health care utilization outcome variable in turn, based on the equation estimating maternal health care utilization
- b) The mean of each postpartum outcome variable and its respective predictors μ and x_k are estimated.
- c) Concentration Indices for the maternal health care utilization outcome variable and their respective predictors (C and C_k) are to be used as estimates in equation (i) along with the generalised concentration index of error terms (GC_ϵ), where λ_i and μ are the value of the predictors for i th individual and the mean of predictor's, respectively.
- d) Therefore, the absolute contribution for each predictor is to be estimated by multiplying the maternal health care utilization outcome variable marginal effect with respect to the predictor and its concentration index:

$$\left(\frac{\beta_j x_j}{\mu}\right) C_j \dots \dots \dots [1]$$

- e) The percentage contribution of each predictor will be derived by dividing its absolute contribution by the concentration index of the maternal health care utilization outcome variables.

$$\left(\frac{\beta_j x_j}{\mu}\right) \frac{C_j}{C} \dots \dots \dots [2]$$

The decomposition analyses are separately undertaken for each dependent maternal health care utilization outcome. Therefore, the afore-mentioned steps are carried out using the adopted mathematical equation 3. The concentration index is to be computed as twice the covariance of the maternal health care utilization outcome variables and a respondent's relative rank in terms of wealth status, divided by variable mean.

$$C = \frac{2}{\mu} cov(\lambda_i, R_i) \dots \dots \dots [3]$$

where λ_i is the postpartum outcome status of the i th individual and R_i is the fractional rank of the i th individual in terms of the index of household wealth status; μ is the unconditional mean of the postpartum outcome variable of the sample and COV denotes the covariance. The concentration index span between -1 and +1, where negative value implies a concentration outcome is skewed towards the disadvantaged group and advantaged otherwise. Therefore, a zero concentration index value denotes no inequality.

As a preamble, estimating parameter coefficients relating postnatal dependent variables and a set of j determinants, x_j , the following binary logistic regression model is to be modelled.

$$\log\left(\frac{P_{ij}}{P_{1j}}\right) = \sum \beta_j x_j + \epsilon_{ij} \quad \text{for } j = 1, \dots, J \text{ and } i = 1, \dots, N; \dots\dots\dots [4]$$

where x_j is the vector of j th independent is vectors and β_j is a parameter coefficient for j th respective independent vector and P_{ij} is the probability that the individual i th choosing an alternative j th postpartum care service that is to be checked or not and getting a child for immunization or not.

Given the relationship between λ_i and x_j in equation [4], the concentration index is to be derived as $\lambda(C)$ as:

$$\sum \left(\frac{\beta_j x_j}{\mu}\right) C_j + \frac{GC\epsilon}{\mu} = C_\lambda = \frac{GC\epsilon}{\mu} \dots\dots\dots [5]$$

Therefore, equation 5 shows that C is made up of two components. The first is the deterministic components and is equal to sum of the regressors denoting a % change in the dependent variable with respect to the change in predictor variable, $\left(\frac{\beta_j x_j}{\mu}\right)$ of λ with respect to each x_j . The second is a stochastic component $\left(\frac{GC\epsilon}{\mu}\right)$, where GC is the generalised concentration index. The deterministic components reveals that the fraction of inequalities in the reliant variable (postpartum variable) that is explained by the system variation in the selected explanatory variable. The stochastic component reveals part of the inequalities that could be explained by the selected predictors across socioeconomic cluster.

3.8 Path analysis

A Path Analysis technique was used in chapter 5 to explore the structural relationship of the factors associated with use of public health facilities for childbirth. In this aspect, multiple simulation variables in its relationship with the outcome variable were performed using Analysis of Moment Structure software. In this case, correlation coefficients, operating at maximum likelihood in order to attain the robustness of different associations, were employed.

3.9 Quantitative variables

3.9.1 Dependent variables

The study defines maternal health care utilization in three categories, namely prenatal care, childbirth and postnatal care.

- ANC utilization status is measured by frequency of ANC visits, childbirth in public health facility and women use of postnatal care after childbirth. Studies in other countries make use of antenatal care visits as a way of measuring maternal health care service utilization and have adopted and used it to direct policy in as far as antenatal care service utilization is concerned. Among them is Ikamari (2004) in Teso, Trinh *et al.* (2007) in Vietnam and Ononokpno *et al.* (2014) in Nigeria. Therefore, this study adopts the use of ANC as a measure of prenatal care service utilization in Malawi.
- Choice of an institutional delivery is considered as a variable used to measure choices favourable for childbirth in health care facilities. In the MDHS, women were asked to explain where they delivered their last child. Women that indicated that they gave birth at a public health care facilities were recoded as 1 and 0 for otherwise. There is a dearth of studies that examined institutional delivery from a facility based perspective. However, studies that tried to investigate factors associated with institutional delivery used health care personnel skills at delivery as an institutional delivery measure (Stephenson *et al.*, 2006; Stanton *et al.*, 2007). It is therefore paramount to understand women's choice of public health facilities during childbirth from Malawi's perspective.
- Lastly, postpartum care access is measured by three binary variables, namely whether women were checked within 24 hours after childbirth or not; whether they were checked after 1day to 6 days or not, or whether they were checked for an extended period after 1 week or not. These three variables define the “maternal health care utilization” in the study.

3.9.2 Independent variables

i) *Individual Level*

- *Women's Age*

Age in the study was categorised into three dimensions namely “< 25”, “25–34” and “35+”. These were defined as such to define women as “young mothers”, “middle aged mothers” and “elderly mother” respectively. In a related study, the use of age of the mother was found to be the significant predictor associated with maternal health care utilization in Turkey (Celik *et al.*, 2000). Therefore, the use of age in this study to test its relationship with women utilization of prenatal health care services is of paramount importance.

- *Timing of Antenatal Care (ANC)*

The timing of ANC visitation at the health facilities was divided into three categories in months at which the woman took to visit the health facility after childbirth. These monthly visitation timing were defined as follows “less than and equal to 3 months”, “between 4–6 months” and “between 7–9 months”. A study by Doku *et al* (2012) used the timing of ANC to measure women readiness to seek better maternal health status in Ghana. In the present study timing of ANC was used to similarly test the behaviour of women in as far as health care seeking was concerned.

- *Birth Order*

A previous study indicated that birth order have an influence among women to seek antenatal health care health services (Simkanda *et al.*, 2008). As such, it is imperative to explore how birth orders influence Malawi women in maternal health care service utilization in the country. This called for the definition of birth order among women as 1, 2, 3, 4, 5 and 6+. The birth order was considered up to 6 and above because Malawi's mean fertility rate is reported at 5.5 (PBR, 2014). This implies that the majority of the women in the country on average have 6 children per woman who have completed their child bearing period.

- *Women Education Status*

Education level achieved by a woman was classified into three categories, namely as no education, primary education level attainment and secondary and higher education level attainment. Previous studies posited that education attainment even up to primary education level and above is proved to increase maternal health care services and increased their maternal health outcome (Gage, 2007; Matsumura *et al.*, 2001). Therefore, the inclusion of this education enlightened the study on how best education can be articulated in order to improve maternal health outcome, especially in relation to childbirth processes.

- *Women's Earning Status*

The financial earning status defines the women's capacity to earn income after work. Each woman was asked what type of earning they received for their work. In this study, three categories were used to explain the types of earnings, namely, "no earnings", "working but paid in kind" and "working and paid in cash". An earlier study by Mencher (1988) posited that as the women earn something after participating in work, either in a formal or informal work environment, their likelihood to use health care services for their maternal health well-being could be empowered. This study chose to use this variable in order to understand the levels of earning potential in association to prenatal care utilization in the country.

- *Religious Affiliation*

This defines the religious belief of the respondents in three categories, namely, Catholics, Protestants (*Presbyterians, Adventists, Pentecostals, Anglicans and Baptist*), and the Moslims. Previous theories emphatically indicate that ethnicity and religious belief have a bearing on women choice of uptake of modern reproductive health choice (Glei *et al.*, 2003; Magadi *et al.*, 2000). Therefore, the need to document the contribution of religious beliefs on prenatal care service utilization in Malawian setting is important. Additionally, Gyimah *et al.* (2006) pointed out that there is need for a continuous effort to examine relationship between religion and maternal health care utilization in Africa due to the influence of religion on the cultural fabric of an African behaviour.

ii) *Household level*

- *Standard of Living*

A study by Navaneetham *et al.* (2002) revealed that there is a relationship between the standard of living of the respondents and maternal health care usage in India. This study adopts this variable in order to understand the levels at which standard of living of women relates to prenatal care utilization. In this case, the standard of living is classified in three categories, namely “low”, “middle” and “high”. In this instance, the low category comprises women from the poor and poorer class in the society, and high-women belong to the rich and richest class of the society based on the wealth status indicator (ICF Marco, 2015).

- *Number of Living Children*

Number of living children defines the level of dependency on each household that might prevent them from seeking health care service during the recurrent woman pregnancy period (Mathew *et al.*, 2001). In the study, a number of living children was adopted in the same way to measure women responsibility and show what exactly prevents women from seeking timely access and utilization of care services. This variable was measured in three dimensions as “at most 1 child”, “2–3” and “4+”.

- *Household Decision Spending*

Household decision at the household level was classified and measured in three aspects such as “self” when a woman is capable of making own decision without the influence someone, “shared” if a woman’s spending decision is shared by either the partner or others in the community, “partner” if the woman spending conditions within the household are determined by the partner alone. McCathy *et al.* (1992) motivated that an understanding on the household income dynamics that include spending power that the women have within the family is significant to understand factors associated with maternal health outcome. In this present study, an inclusion of household decision making on spending is paramount in order to understand the extent of women decision to spend at household with health care utilization in Malawi.

- *Distance to Health Facility*

The study hypothesizes on the impact of distance in influencing maternal health care services in Malawi. Based on the MDHS data (NSO & Macro, 2001; NSO & OCR Macro, 2005; NSO & ICF Macro, 2011), distance to access the health facility is recorded in order to demonstrate whether the women have “problem” or “no problem”. The study aspires to investigate if distance to the health care facility was really a problem influencing women’s choice of maternal health care services in Malawi.

- *Transport Availability to Seek Maternal Health*

The study considers the effect of distance affecting women to access maternal health care services in general. Transport to access the health care facility is regarded as significant factors as it provides the support to women in order to ease their mobility challenge for them to access the health facility (Gage, 2007). The study uses the transport to measure the burden of women in accessing maternal health care services and is defined as “problem” or “no problem”.

- *Household Exposure to Media*

Under this variable, we define the respondent’s exposure to media in the following respect; “neither have television nor radio”, “either have television or radio” and “respondents have television and radio”. However, very few studies have indicated the role of exposure to media as a way to influence maternal health care utilization more importantly prenatal care services access (Sharma *et al.*, 2007; Simkanda *et al.*, 2008). Therefore, it is hoped that the inclusion of this variable will contribute to the scanty scholarly work conducted in relation to exposure media is concerned.

- *Permission to Seek Health Care*

Health care seeking practice is paramount if maternal health outcome is to improve tremendously among expectant women. In this case, the study defines the permission to seek health care facilities in three aspects as “self”, “shared” and “partner”, in situations where a woman does not seek any permission to seek own maternal health care, a woman

asks the permission to seek care from either the husband or other people within and surround the household and in situations where a partner alone permits a woman to seek maternal health care services. Previous studies indicate that women's decision to seek maternal health care is influenced by men (Odimegwu *et al.*, 2005; Quisumbing *et al.*, 1999). The need to understand the independence of women to seek care services in Malawi cannot be over emphasised; hence the inclusion of this variable in the study.

- *Cost Associated with Health Care Access*

Cost associated with maternal health care services have been viewed to have widely contested by many scholars over the past decades. For instance, Thaddeus *et al.* (1994) argued that the worst maternal health outcome are as a result of both direct and indirect cost that affects women use of maternal health facilities in order to improve their maternal health statuses. In 2006, Borghi *et al.* (2008) advocated for a call of mobilising resources in order to ensure availability, accessibility and affordability of maternal health care facilities to ensure that the vulnerable population including women and children access primary health facilities. In 2009, a study by Gabrysch *et al.* (2009) postulated that women are still walking a long distance in their quest to seek health care facilities, more importantly, in developing world. The study indicates the existence of women experiencing either problem as a result of cost in accessing the health facilities and subsequent decision to seek alternative health care facilities other than the modern health care facilities. Therefore, in this study, the issue associated with cost either directly or indirectly associated with use of maternal health facility access is included. As such using the dataset, the study adopts a question which seeks clarity on cost associated with accessing own health and was recorded as “problem” to represent women with challenges due to cost in accessing the health care facilities and “Not a problem” in the category of women who indicated to have no problem in as far as cost influence in accessing maternal health care facilities was concerned.

iii) *Community level*

- *Quality of Health Care*

Quality of health care administered at the hospital was measured by principle component analysis of quality of care factors provided to the woman on arrival at the care facility.

The type of health care includes a woman's weight measured, height measured, blood pressure checked, blood tested, urine tested, whether they received tetanus injection during pregnancy and iron tablet to boost blood deficiency, were administered at the care facility. The notion of quality of care in relation to maternal health care utilization was found to affect service use in Kenya (Audo *et al.*, 2005). As such, quality of care inadequacy does affect maternal health outcome (McCathy *et al.*, 1992). The study, therefore, seeks to investigate the levels that quality of care has on women care utilization in Malawi.

- *Place of Residence*

This defines the place that the respondent stayed longer during the period. In the study, childhood place of residence is classified conventionally as urban, semi-urban and rural. Story (2014) pointed out that the inclusion of the community factors such as place of residence of the respondents is significant in order to understand the community impact on maternal health care service utilization in this case, care service utilization in Malawi.

- *Community Awareness of Modern Reproductive Health*

Information awareness of reproductive health was defined as a complex indicator using principle components analysis and health care related programmes featured on the radio. In this case, the principle objective is to capture women awareness of different maternal health radio programmes such as: *Uchembere wa Bwino* (safe motherhood), *Phukusi la Moyo* (a bag of life), *Pa Mtondo*, (A pounding place), Talking Point, Windows Through Health, Health in Malawi, *Tikeferanji* (Why are we dying), Radio Doctor, *Chitukuko Mmalawi* (Progress in Malawi), Women Forum, *Tichitenji* (What should we do) and *Kulera* (Family planning). Using these factors and principle components analysis technique, an awareness to reproductive health indicator is computed and classified into three awareness factors. "Adequate awareness" is used for women with requisite awareness and was following these programmes, "Moderate awareness" used for women with an average understanding and following these radio programmes and "Inadequate awareness" used to define those women with low interest and/or little interest in following such reproductive health radio programmes. Ahmed *et al.* (2010) pointed out that scanty attention in relation to women empowerment at all levels, that include access to reproductive health information, affects women's uptake of maternal health care

services. It is because of this aspect that the study seeks to understand the role of such awareness programmes towards care utilization.

- *Community Availability of Maternal Services*

The availability of maternal health care services was classified using a linear combination of two health care indicators as availability of female health care providers at the hospital and access to maternal health treatment, which in this case, uses administered tetanus treatment during visitation of the women. An outcome index is categorised as “neither availability of health providers nor maternal treatment administered”, “either available of health providers or maternal treatment administered”, “available of health providers and maternal treatment administered”. Magadi *et al.* (2003) and Nielsen *et al.* (2001) pointed out that unavailability of maternal health services is a major barrier affecting women access to modern reproductive health care. The study includes this dimension to account for the role of availability of services and its relation to care utilization choices among women.

- *Community Barriers to Health Care Access*

The community barrier to access health care services is classified using a linear combination of two variables as transport availability to accessing the healthcare and distance from the women household to access maternal health care services are used. In this case the outcome index is classified as “neither transport nor distance barrier to access maternal health care services was experienced”, “either transport or distance barrier to access maternal health care services was experienced”, “transport and distance barriers to access maternal health care services was experienced”. Ensor *et al.* (2004) and Magadi *et al.* (2000) investigated on how to overcome barriers that women face in accessing health care services highlighted the significance of understanding the barriers affecting women’s access to health care supply. This motivated this study to include this aspect in order to understand the role of exogenous factors affecting access to prenatal health care supply access among women in Malawi.

The Table 3.6 provides a summary of the variable names, definitions and their measures as they are applied in the succeeding chapters 4, 5 and 6.

Table 3.6 Variable names, definition and measure as used in the study

Variable	Definition	Measure
Maternal age	Age of the respondent	Categorised as “15–24”, “25–34” and “35+”
Timing of ANC	Time women first start ANC service utilization after pregnancy conception	Defined as “1–3 months”, “4–5 months” and “6 months and later”.
Antenatal care visits	Frequency of women’s use of antenatal care services facilities	Categorized as “0” if frequency is less than 3 and “1” if at least 4.
Birth order	The orders of birth of children were ever born by a woman.	Recoded as 1, 2, 3, 4 and 5+.
Maternal education	Education attainment of the women	Recoded as “0” for “No education”, “1” for Primary education”, and “2” for “Secondary education and higher”
Women Earning status	Defined earning potential of women’s income after working.	This was defined and categorised as 1 for “not paid”, 2 for “Working and paid in kind”, and 3 for “Working and paid cash”.
Religious affiliation	The religious belief to which the women is affiliated.	This was categorised as 1 for “Catholic”, 2 for “Protestants”, 3 for “Muslims” 4 for “others”
Standard of living	This defines the woman’s wealth status.	This was categorised as 1 for “poorer households”, 2 for “middle category”, and 3 for “richer household”.
Number of living children	Number of women in the households	Defined as “1”, “2”, “3”, “4”, “5 and higher”
Women spending decision	The state or capacity of the woman to spend income for the household to support daily operations.	The survey captured this to account for the entitlement related to spending independence of the household members including the respondents. This was adopted in the study and was classified in 3 levels. This was categorised as 1 for “Self”, 2 for “ “Shared with others” and 3 for “partner”.
Concerns of distance	Defined challenges of distance to access postnatal care	Defined as “0” for “No problem” and “ 1” for “Problem”
Concerns of transport	Defined challenges in accessing transport to access postnatal care	Defined as “0” for “No problem” and “ 1” for “Problem”
Media exposure	Women exposure to health information on radio and	Defined as “Neither radio nor television”, “Either radio or

Women decision to seek own maternal health	television The variable defines respondents rights to seek own maternal health and was classified in three levels.	television”, “Radio and television”. This was categorised as 1 for “Self”, 2 for “shared” and 3 for “partner”.
Cost of accessing drugs	Define the cost of accessing drugs at a household	Defined as “0” for “No problem” and “ 1” for “ Problem”
Quality of care	This defines the quality of care that the women received within the previous maternal health utilizations encounter.	Recoded and defined as “1” for “Inadequate”, “2” for “Moderate”, and “3” for “Adequate”
Place of residence	Women place of residence	Defined as “Urban”, “semi-urban” and “ Rural”
Availability of Health Workers	Availability of health resource person to support maternal health service in the communities.	Defined as “problem” and “Not a problem.
Barriers to access health care facilities	This is a variable to measure barriers associated with access of health care facilities with the communities defined using transport availability or not and problems associated with distance to access health facilities.	This was categorised as 1 “for neither transport nor distance barriers”, 2 for “either transport or distance” barriers and 3 for existent “Transport and distance barriers”.
Community awareness to health information	Community awareness of health information programmes associated with maternal health. It was derived using Principle Component Analysis (PCA)	Defined and labelled as “Inadequate care”, “Moderate care” and “Adequate Care”.

3.10 Qualitative data analysis

Both FGD and KI interviews were recorded, transcribed and captured into Atlas-Ti 7.0 software. Transcription of recordings and typing of field notes was done soon after data collection for easy recall and to minimise loss of relevant data. Therefore, a thematic analytical approach is applied in order to capture issues associated with each outcome variable. As such the identification of the theme and other outlier contribution that the researchers fail to contextualise in the earlier design is incorporated after multiple scrutiny of analytical results skewness. Such qualitative information helps in highlighting issues and compliments the secondary analysis.

3.10.1 Data and quality checks

In case of qualitative data, a number of procedures are used to check data quality. Firstly, the scripts were checked after being transcribed verbatim by another researcher who understood the language in order to ascertain quality of transcriptions. Thereafter, any quotation that was drawn from the narratives was verified by the principal investigator in order to authenticate the quotations that came out of the codes and the original transcript. Any difference that existed was verified through replaying either the discussions or KI interviews. The use of multiple approaches in verifying the data is to ensure that quality of data is guaranteed.

3.10.2 Qualitative analytical procedure

The qualitative process involves recording of any information that transpired during either the FGD or key informant interviews. Data was collected from these two data collection tools which were in phrases and statements were recorded in voices using a voice recorder. Then, the research team transcribed verbatim data to generate raw data. Out of the exercise, there were 12 FGDs and 12 KI transcripts that were entered into the computer programme Atlas- ti version 7.0. However, the narratives were categorised into themes. Those common narrative contexts and axial codes were drawn and the researchers reconceptualise the fundamental code alongside with the text. Narrative texts were employed to develop different themes in which different quotations reflecting different perspectives of either the health workers or women on the quality of maternal health services delivery in the selected facilities that were visited were drawn. More details are indicated in see chapter 7 and chapter 8 for more clarification of the different perspectives on issues obtained from both the FGD and KI interviews narrative analysis. More details on how qualitative data was collected and analysed are provided in chapters 7 and 8 as well.

Thereafter, the qualitative approach is used to understand either perspective of the service provides challenges and strength associated with maternal health care service delivery or women perspective, in general, on the quality of maternal health care services that they receive in selected health care facilities in Malawi. Therefore, the use a sequential mixed method approach in this study is significant in that the qualitative data complements the gaps associated with the quantitative data overtime (Creswell, 2013).

3.11 Limitation of the Study

The study uses three waves of MDHS conducted in 2000, 2004 and 2010. However, with changes in data administration over time, there have been consistency checks on the datasets in order to improve on the quality of gathered data. This development resulted in some variables completely dropped whereas other were renamed or addressed in order to capture emergent issues affecting people in the country. This resulted in inconsistency problems in variables. Such developments, affect the comprehensiveness of the research design in as far as which factors to include in the quantitative analysis. For instance, one such variable is “women told of pregnancy complications” defined differently as m43_1 and m44_1” which was further found to have no observation in 2000, and well-populated in 2004 and 2010 datasets. Such a variable would have been so significant if the study tested its hypothesis in predicting the outcome of this present study. In addition, the study collected primary data in 2015 from women and health workers, majority of whom, were not part of the previously collected MDHS data that was adopted to address quantitative part of the study.

Furthermore, the study had challenges in the number of observation that was very small as compared with other years. For example, in 2000 about 274 respondents had postnatal care corresponding to 2386 and 7016 respondent in year 2004 and 2010 respectively. It would have been a balanced analysis if and only if each year had equivalent and balanced number of respondents.

Lastly, the MDHS adopted was a nationally represented datasets which had three waves up to 2010. Therefore, the use of qualitative data which targeted women who gave birth between 2010 and 2015, was imperative, in order to understand women’s experiences and perspectives with regards to recurrent use of maternal health care services in Malawi.

3.12 Ethical consideration

The quantitative study used a secondary analysis of an existing datasets. No personal information or name of the respondents was identified in the dataset. As a result, anonymity and confidentiality of the study respondents were guaranteed. Besides, ethical permission for the use of the Malawi Demographic and Health Surveys had already been obtained from ICF Macro Inc., USA (See Appendix 5).

The ethical clearances were obtained from two sources. Firstly, the North West University Ethical Review Board which gave the study an ethical clearance number: NWU-00394-15A9. Secondly, this ethical clearance letter was submitted to the district health office alongside institutional letter that was written by the Lilongwe University of Agriculture and Natural Resources requesting authorisation of the district health offices to allow the research socially collect data for the study. A consent statement was either submitted or read to the participants before commencement of the data collection process. All participants that were approached agreed to participate in the study and the district health offices were very supportive and provided necessary directions to facilitate the data collection process at health centre level in each district.

CHAPTER 4

Factors associated with prenatal care services' utilization

4.1 Introduction

This chapter presents analysis of the levels and determinants of prenatal care services based on the women who had ever given births in the last three years. The chapter is divided into four sections. The first chapter presents detailed review of the literature on prenatal care services, followed by description of the methodology used to approach the chapter's objective. This is followed by the study findings which are presented in three levels such as univariate, bivariate and multivariate. Thereafter, the discussion, conclusions and summary of the chapter is presented.

4.2 Literature review

Prenatal care services are provided to women during pregnancy from the time of conception up to the time prior to childbirth (Gurmesa *et al.*, 2009). It is at the care services facility where a woman is tested to identify any maternal health problems and advised on issues associated with maternal health in order to ensure safe motherhood (WHO, 2005). It is highly advocated that use of such services provides an opportunity among women to access skilled advice on their pregnancy and the aim is to facilitate an improved birth outcome (WHO, 2003). Despite the potential benefits in using prenatal care services, there exist socio, demographic and economic barriers preventing women from accessing the services (Asundep *et al.*, 2013; Delva *et al.*, 2010; Pallivakadavath *et al.*, 2004). Furthermore, according to Gurmesa *et al.* (2008), utilization of services has not only been observed to be a precursor to better maternal health, but also reduces the risk of dying from causes related to pregnancy condition. It has been postulated that extensive timely patronage of service facilities among women during their gestation period, not only provide an opportunity among them of being examined of any complications associated with pregnancy by skilled health professionals, but also acquire some requisites reproductive, nutrition related and maternal child health education paramount to enhance prospects of better maternal health outcome (Fatusi *et al.*, 2003; Villar *et al.*, 2001).

Earlier studies indicated that the maternal mortality ratio of 510 deaths per 100 000 live births is highest in sub-Saharan Africa region compared to Latin America (77 deaths per 100 000 live births) and Southern Asia (190 deaths per 100 000 live births) (WHO, 2014). It is argued that inadequacy and unavailability of health care services and access challenge among women due to social and economic challenges attribute positively to low health care utilization (Kongnyuy *et al.*, 2009; WHO, 2005). Consequently, women prefer other alternative traditional and home-based means for their maternal health needs to the facility-based maternal health care service, among them the care service facility (AbouZahr *et al.*, 2003). As such women who are vulnerable and experience pregnancy related complications fall prey to direct preventable causes such as unsafe abortion, haemorrhage, hypertensive disorder, anaemia and other indirect diseases such as malaria which is aggravated by pregnancy condition (Hogan *et al.*, 2010). Furthermore, Coronado *et al.* (2000) pointed out that inherent pregnancy disorders and experiences with complications in the women's previous pregnancy affect a women allegiance to utilize care services. This not only has a negative impact on women's choices regarding maternal health, but more importantly increases household and community level disorganisation in low resource settings, marginalized and underserved communities (Babalola *et al.*, 2009; Yadav *et al.*, 2013).

The Government of Malawi, with the support of development partners, has rolled out numerous programmes and initiatives through health care institutions to scale-up the quality of maternal health care. Among such programmes are the Safe Motherhood Initiatives (SMI) and Focused Antenatal Care (FANC) which has a fundamental tenet of promoting women's timely realization of pregnancy and immediate utilization of services in order to identify and manage complications among women during pregnancy through basic obstetric care and administering of preventive services (NSO & ICF Macro, 2011). Additionally, Gurmesa (2009) postulated that FANC initiative improves not only healthy birth education among women, but also advises on other maternal and child related postpartum care, breastfeeding in addition to other nutrition therapy. Other scholars observed that women with an opportunity to access focussed services with basic quality of maternity care, have had their maternal health enhanced and are heavily monitored for any complications during pregnancy thus resulting in better maternal health outcome (Findley *et al.*, 2013; Getachew *et al.*, 2014).

It is worthy to note that more initiatives and programmes have been implemented in a quest to improve maternal health challenges in sub-Sahara. Among such programmes is the promotion of reproductive health education, targeting communities through health centres, health units and clinics, as health information broadcast centres (WHO, 2001). Such educative programmes have

a bearing on to reducing not only enlightenment on maternal morbidities and mortality level among women but also on health issues that are significant to enhancement of their health status (Oladapo *et al.*, 2009). Asundep *et al.* (2013) further argued that ANC visits provide numerous service health opportunities to women relevant to ensure improved health outcomes. Other scholars posited that frequent ANC visits not only enable women access skilled health professionals, but also administer wide-ranging maternity services such as therapy related on pregnancy-induced hypertensive disorder, tetanus injections (Magadi *et al.*, 2000; Raatikainen *et al.*, 2007), prophylaxis and other micro-nutrient supplements (Raatikainen *et al.*, 2007). Such pregnancy gestation therapies have been proved to be associated with high maternal child health outcome (Carroli *et al.*, 2001).

In Malawi, the adopted strategy of FANC emphasises the quality rather than quantity of health care visits as a precursor to reduce maternal mortality and morbidity (Government of Malawi, 2007). According to NSO and ICF Macro 2011, still an equivalence of 56% of women who gave birth in the 5 years before the survey had challenges to meet the recommended four ANC visits per pregnancy. This challenge is not peculiar to Malawi as confirmed by Coronado who attributes these challenges to differences in socioeconomic and demographic characteristics among communities (Coronado *et al.*, 2000) and demean quality of modern care which consequently affect their health well-being (Carroli *et al.*, 2001). Previous studies that have investigated maternal morbidity and mortality cases in developing countries have emphatically recommended the need to promote women the timely patronage of services among pregnant women and the need for at least four ANC visits if women health outcome is to be improved (Getachew *et al.*, 2014; Trinh *et al.*, 2007; Erbaydar, 2003). This access challenge of not fully accessing and utilizing services or getting the indispensable maximum number of modern services is also prevalent in Malawi (NSO & ICF Macro, 2011). As such there is a compelling reason to plan and provide requisite services thoroughly. This has motivated the exploration of the influence of socio-demographic and economic factors and the need for understanding the relative factors contributing to women's use of services over the periods 2000, 2004 and 2010 in Malawi. As such, the findings from the study are paramount in redirecting development of sustainable maternal services infrastructure with the capacity of keeping abreast to provide robust care services. Such health infrastructures necessitate support on emergent complicated pregnancy cases and attain an enhanced maternal child health outcome. Therefore, this chapter specifically focuses on two aspects, namely, the sociodemographic and economics factors associated with utilization in Malawi and the relative contributions that each woman's determinants have on utilization in the country.

Following the 1994 International Conference for Population Development (ICPD) in Cairo, most developing countries including Malawi were encouraged to implement health care services aimed at scaling up maternal and child health in order to reduce increased mortalities affecting them (UNFPA, 1994). In another attempt to encourage countries struggling with maternal public health challenges, World Health Organisation (2003) recommended the implementation of health initiatives targeting increasing frequency of women's use of care service facilities, at least four times during women gestation period across all countries experiencing great imbalance on maternal health position in developing countries, still including Malawi. Despite this call, recent data in Malawi indicate that high proportions of women do not utilize prenatal and other maternal health services efficiently and effectively. Data from available MDHS show that about 56% of the eligible women in 2000 used care services at least four times or more. This was followed by 57.1% in 2004 and 45.5% in 2010 (NSO & Macro 2001; NSO & OCR Macro 2005; NSO & ICF Macro 2011). It is worthy to note that majority of these women had had their first ANC visit, on average, a pregnant woman started using the ANC maternity services in the sixth month of the pregnancy. In Malawi, ANC is mainly provided by skilled medical professionals such as nurses, midwives, clinic officers and doctors at primary, secondary and tertiary health care facilities or other private health facilities (Government of Malawi, 2013). Yet in remote and under-served communities, women still rely on the traditional healers for their ANC services despite campaigns to promote use of modern care facilities in the country (Godlonton *et al*, 2016).

Limited information regarding utilization of health care services still exists in Malawi. However, a number of studies have found that this lack of information has had an indirect relationship with women's use of prenatal care (Kongnyuy *et al.*, 2009; Kongnyuy *et al.*, 2008). Other studies focused the evaluating institutional consequence maternal health outcome (Lema *et al.*, 2005) whereas others pointed at the general state of emergency and obstetric health care facility on maternal health from the medical perspectives (Leigh *et al.*, 2008; Sakala *et al.*, 2011). However, the socioeconomic and demographic perspective from a multi-level perspective with the aim of understanding which determinants ranked highly at individual, household and community level perspective have not been discussed adequately in Malawi. Consequently, this aspect further motivates this investigation.

Furthermore, some previous studies found individual factors as major predictors of care utilization among women. For instance, maternal age has been found to be a major predictor of care utilization. According to Findley *et al.* (2013), their study on prenatal care found that younger women were associated with late initiation to use care service, a situation which degenerated into worse or adverse maternal health outcomes. Nisar *et al.* (2003) found that women aged 25–34 years were more likely to use prenatal care facilities compared to younger women. It has been argued that younger women mostly delay seeking early care during the first trimester due to low socioeconomic status and lack of support from the communities to promote and motivate them to use the facilities in time as was the case in Kenya (Ochako *et al.*, 2011; Magadi *et al.*, 2007). Therefore, there is a need to hypothesize the way in which maternal age influences women to use of prenatal care in Malawi. According to Hogan *et al.* (2010), the likelihood of women experiencing adverse birth outcomes are minimal when they are of age.

In another context, it has been indicated that use of maternal health care facility among women is influenced by numerous factors other than age. For instance, Swenson *et al.* (1993) pointed out that demographic attributes of the women such as their education attainment status, occupation status predicted positively towards use of prenatal care service facilities in Vietnam. In sub-Saharan Africa, Asundep *et al.* (2013) augmented access barriers such as distance and either direct or indirect costs remained as significant barriers associated with low utilization of service facilities in Ghana. However, the study did not take into consideration the investigation of either the household or community factors that influence women's low utilization of care services. Such findings contradict what others found in developed countries that characterised maternal health facility not only to be affordable, but also being accessible to women (Bergstrom, 2001; Andersen *et al.*, 2005).

In East Africa, it was observed that women in rural communities (53%) and those in urban communities (49%) do attend prenatal care services just once prior to institutional delivery and in some cases patronise first ANC visit after 28 weeks of pregnancy (Delva *et al.*, 2010). Pallikadavath *et al.* (2004) argued that the low propensity of women in seeking early visits to ANC is affected by individual's socio-demographic characteristics such as women's education. In Pakistan district of Punjan, women education level was important determinants of ANC visits (Jejeebhoy *et al.*, 2001). On the contrary, in Nigeria, low utilization level of women towards ANC was attributed to the country's perceived low quality of maternal care with inadequate referral systems as the major contributors affecting women's use of ANC (Oladapo *et al.*, 2009).

Birth order and its associated interval predicts on use of ANC significantly. For instance, different studies in Kenya and India postulate that the higher the order of birth, the later the time at which women start ANC visits in their succeeding pregnancies or that women do not value the significance of using the ANC services (Magadi *et al.*, 2000; Navaneetham *et al.*, 2002). Additionally, Magadi *et al.* (2003) highlighted that as the birth interval between births among women is over three years, the women utilization level of ANC service facilities is frequently relative to such women with an interval less than three years.

Furthermore, previous studies indicate quality of care administered in care service facility significantly affect utilization of level of prenatal mothers in sub-Saharan Africa. For instance, the study by Nikiema *et al.* (2010) on the quality of care and obstetrical coverage in rural Burkina Faso found ANC services to have great operations challenges affecting its optimal performance. The researcher found poor health facilities with no equipment despite women patronising the health facilities in search of ANC services, low qualified medical resource workers and inability of the health centres to conduct all requisite components for complete ANC services. In Uganda, it was found that not only the ANC facilities were hit by resource constraints which limited their optimal operational status, but the patients' engagement in reproductive health birth preparedness was also inadequate, while the health facilities were unable to diagnose and test the patients as recommended by the WHO (Tetui *et al.*, 2013). In Zambia, a comparative study of two data sets aimed at understanding the quality of administered ANC services produced noteworthy findings affecting utilization of care services in the country (Kyei *et al.*, 2012). The researcher ascertained that only 3% of ANC facilities had the capacity to meet basic requirements for optimal care services, with 47% of the ANC facilities having the capacity of providing adequate ANC services and 50% providing inadequate ANC services. However, despite the inadequacy of existing care services, the ANC coverage is increasing in most developing countries such as Malawi (91%), Zambia (94%) and Uganda (90%) (ICF Macro, 2015). The countries coexistence of high maternal and child mortality provide a concern about the quality of maternal health care, but tremendous strides have been made in ANC coverage (Kyei *et al.*, 2012). This is evident in Ethiopian's Bahir Dar zone where public health facilities were providing inadequate treatment to women visiting ANC services. Lack of appropriate screening, conjunctiva checks for anaemia and observed lack of reagent during the process of service delivery are major factors affecting quality of care in the region (Ejigu *et al.*, 2013).

Literature over the past decades reiterated that educated women who are participating in paid employment are more likely to utilise health care services for their childbirth preparedness than the uneducated and those unemployed (Navaneetham *et al.*, 2002). This is attributed to the fact that these women are more enlightened about the existence and advantage of using such modern maternal health services facilities. Pallikadavath *et al.* (2004) argued that such women with advanced socioeconomic status have the impetus to become autonomous both within the household and outside the household in addition to having the courage to communicate their maternal health challenge to the health care services providers. In 1984, Mosley and Chen postulated that once the woman is educated, their acquisition of modern reproductive health information become easier and have the great advantage to realise the need to seek modern medical care upon realising the physiological change in their body and recognise some maternal illness (Mosley and Chen, 1994). Therefore, as the women status appreciated, their likelihood to understand the need to seek modern care to better their maternal health outcome increases (Sharma *et al.*, 2007).

On the contrary it has also been observed that if women with better socioeconomic status are operating in a poverty stricken environment, their likelihood to use modern care is reduced (Eldredge *et al.*, 2016). Women with improved socioeconomic status have been viewed to be significant predictors of utilization of care services during their pregnancy (Celik *et al.*, 2000). On the contrary, women that are working in their family related environment often get paid in kind or do not get paid at all. This situation creates a resource imbalance among the women; hence those with no economic resource have little autonomy compared to their paid counterparts (Navaneetham *et al.*, 2002). Such situations affect their willingness to seek and utilize modern health care services.

With regards to religion is concerned previous studies have indicated religion to have negative impact on women choice in utilizing care services. For instance, Dairo *et al.* (2010) investigated factors influencing women's utilization of ANC service in Ibadan State-Nigeria; they found that Muslim women were more likely to use ANC services compared to their Christian counterparts. In an earlier study, Adamu *et al.* (2002) in Kano State hypothesized that religious belief was the major predictor affecting women care service utilization. In a related study, Banda *et al.* (2014) examined factors associated with delayed use of care services in Zambia and found that cultural beliefs of the women increased the odds of late patronage of women towards care utilization. In the case of Malawi there is a lack of studies associated with religion and use of utilization have

been conducted. It is therefore, important to make a contribution to knowledge in order to understand women's use of health care facilities differently based on their religious affiliation.

Studies that have investigated the impact of number of living children on women's use of health care ascertained that as the number of living children increases, then their health care utilization levels decrease with the women's subsequent pregnancies (Magadi *et al.*, 2000; Miles-Doan *et al.*, 1998). On the contrary, Gage's (2007) study on barriers influencing use maternal health care services in Mali, found that the higher the number of children the woman had is associated with an increased burden of child care, a situation which in turn reduces their likelihood to utilize service timely during any subsequent state of pregnancy.

Social attributes among households and communities continue to differ along socioeconomic aspect in developing countries over the past decade. For instance, while the variation between the rich and the poor widens (World Bank, 2015), acquisition of reproductive health information through media remains one of the limiting factors affecting women's use of services (Sharma *et al.*, 2007). On the same note, Agha *et al.* (2011) argued that exposure to media among women enable them not only to utilise modern reproductive health methods, but also to get important information about modern reproductive health that include significant focus on primary health care. Such community based health promotion campaigns have been seen to improve maternal health outcome in Bangladesh (Baqui *et al.*, 2008).

Furthermore, empowerment and spouses' support have had an influence on reproductive health choices, including prenatal care utilization among women in developing countries. For example, in Nepal, Mullany *et al.* (2005) found that empowerment of women through freedom to make independent decisions regarding maternal health during pregnancy period proved to have not only improve positive pregnancy outcome, but also results in increased patronage of primary health care services. Related studies found that women autonomy not only increased use of contraceptives and reduced fertility, which in the long term reduced the frequency of women getting pregnant and thus acquiring improved maternal health (Beegle *et al.*, 2001; Hindin, 2000).

Regarding the respondent's place of residence, some studies have shown that women in rural areas are vulnerable to risk of home delivery due to unavailability of resourced ANC services facilities (Hotchkiss *et al.*, 2001). Witter *et al.* (2009) argued that logistic bottlenecks that affect inequitable distribution of both medical resources and supplies contribute to quality of care

administered in most rural and remote areas. Furthermore, studies that investigated the relationship between place of residence and health care were found to be consistent in their claim that place of residence has on level of utilization of primary health care services (Mekonnen *et al.*, 2002; Adamu *et al.*, 2002). However, due to this challenge most women do prefer home delivery as a way of avoiding the predicament of the quality of modern health care (Barbhuiya *et al.*, 2001).

Availability of health care services due to unavailability of health care personnel has been viewed as human right issues affecting the right to health care access that promote home-based health seeking behaviour. For instance, in Ghana, Agha *et al.* (2011) observed that health workers availability predicts a positive inclination towards utilization of health care services. Griffin *et al.* (2001), who tried to understand users' perspective to maternal health care utilization, observed inadequate service delivery as a major factor contributing to low utilization of care services in India. A recent study found that low infrastructure development in rural areas, still remains a significant predictor to low utilization of maternal health care services (Story, 2014).

Furthermore, there are numerous barriers that affect robust utilization of health care services in most developing countries. For instance, Sepehri *et al.* (2008) indicated that distance to access the health facility has a negative effect on the use of primary health care facilities among women. On the same note, Lubbock *et al.* (2008) pointed out that poor access to care is attributed to economic stress that is being experienced by communities in rural areas, a situation which results in low health care utilization. In a similar study, Gage *et al.* (2006) hypothesized that the challenges of access to a health care facility with regard to distance and access to transport, in turn, impacts negatively on women's utilization of primary health care services in Ghana. Anderson *et al.* (1968) thus developed a theory that tries to explain behaviour towards utilization of maternal health care service.

4.2.1 Theoretical framework

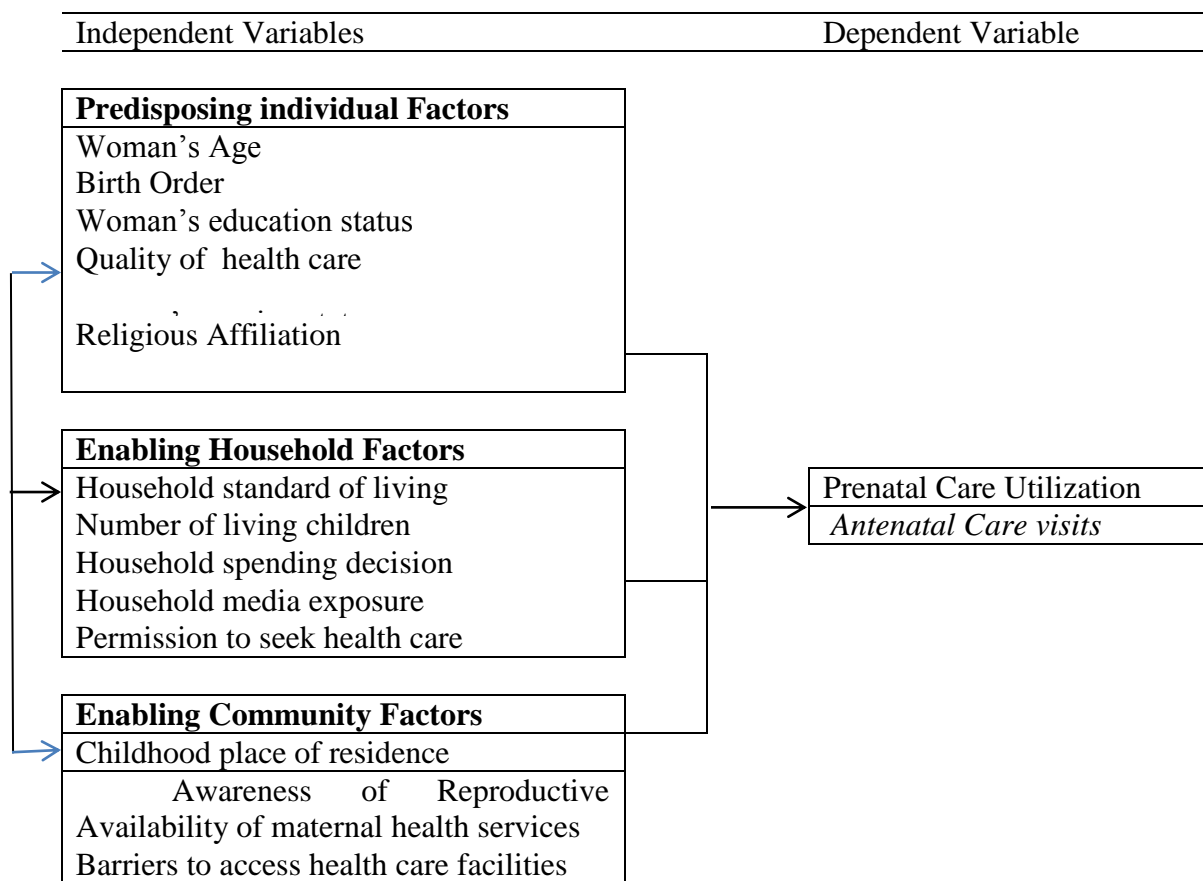
The model for utilization of maternal health care services is based on the conceptual framework of health seeking behaviour that was developed by Anderson *et al.*, (1968). The behavioural model indicated that use of health care is a function of predisposing attributes (such as women age, number of previous pregnancies, women education, etc), enabling attributes (such as income status, quality of health care facility and availability of health care service facilities), and the

need attributes (such as perceived health status of the woman and foreseeable expected health care service benefits acquired as a result of interaction with the health care facilities). On the other hand, a study by Fosu (1994) posited that predisposing factors reflect that household with variations in demographic characteristics have different propensity to the utilization of health care services. Additionally, Fosu (1994) observed that enabling attributes (such as income and health care services) and related attributes (such as affordability, availability and accessibility) create variation in usage at the household level. However, based on the model of Andersen (1995), the need attribute is the most proximate cause to utilize health care services (Andersen *et al.*, 1968). Chakraborty *et al.* (2002) indicated that the need factor defines the perceived health status as it assists in explaining the state of maternal morbidity. As such the theory used the Anderson *et al.* (1968) defines the individual, household and community attributes to be the hypothesis in relation to care utilization in Malawi for the years 2000, 2004 and 2010. Fosu (1994) and Babalola *et al.*, (2009) recommended that understanding individual, household hold and community determinants of health care utilization is paramount if maternal health care outcome is to improve in developing countries. As such, the study on a multi-level contribution of correlates influencing care utilization in Malawi cannot be over emphasised.

4.2.2 Conceptual framework

The conceptual framework of three level factors namely: predisposing individual factors, enabling household factors and community factors and their linkage to care utilization is illustrated in Figure 4.1.

Using the framework, predisposing individual factors are defined as woman's age, birth order, woman's educational status, quality of maternal care, woman's earning status, religious affiliation of the respondents and awareness of reproductive health information. The enabling household factors are defined as household standard of living, household number of living children, media exposure and women permission to seek health care. Lastly, the enabling community factors are defined using three factors; namely respondent's childhood place of residence, availability of maternal health care services and barriers to access of health care service facility.



SOURCE: Researchers own Formulation

Figure 4.1 Conceptual Framework illustrating the relationship between covariates of prenatal care utilization

4.2.3 Hypotheses

The chapter hypothesis was as follows:

- There are sociodemographic and economic factors that do positively influence prenatal care services utilization in Malawi.

4.3 Methods

4.3.1 Data

As is indicated in chapter 3 section 3.4.2, the chapter employs Malawi Demographic and Health surveys for the year 2000, 2004 and 2010.

4.3.2 Sample size and selection

The study sample was drawn from women who were reported to have a child in the 5 years preceding the survey. In this case, the selection criteria used to generate the sample from this group of women was based on the question that asked women the frequency of antenatal care clinics during the times they were pregnant. Therefore, based on the responses, women who indicated to have attended less than 4 times were defined as 0 and those with at least 4 antenatal care visits were defined as 1. The flowchart below illustrates the selection criteria used to select the study respondents associated with prenatal care service utilization.

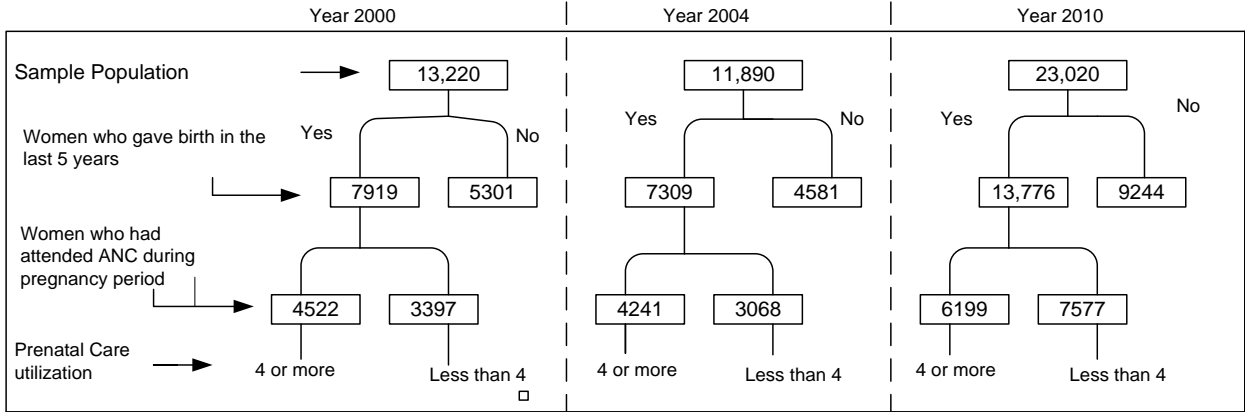


Figure 4.2 sample selection criteria-prenatal care

Therefore, based on this criteria from 7919, 7309 and 13 776 that were reported to have given birth in the last 5 years preceding the survey in years 2000, 2004 and 2010 respectively; about 57.1% (4522), 58.0% (4241) and 45.0% (6199) had at least 4 antenatal care services or higher in the years 2000, 2004 and 2010 respectively. The flowchart provides more detail.

4.3.2 Sampling

The study uses a two-staged sampling design, stratified by:

- Enumeration areas consisting of clusters in which the primary sampling units are defined as rural and urban perspective and by households level attributed by the individuals and defined in this study as a unit of analysis, controlled by the household and community level factors.

Table 4.1 presents the clusters and households for the MDHS 2000, 2004, and 2010

Table 4.1 Total enumeration area, number of households, number of respondents used to defined the data in multi-level perspective

	2000	2004	2010
<i>Enumeration Area</i>	560	522	849
<i>Households</i>	14,352	13,664	27,434
<i>Respondents</i>	13,220	11,698	23,020

The multi-level approach used in this study has three primary keys defined to uniquely identify each level. These keys are:

- Southern is the key used to uniquely identify the data collected from each region, namely Southern, Central and Southern regions; and define the community level;
- Cluster is the primary key used to define the household level within the clusters from which each respondent woman uniquely originated; and
- The individual is the primary key used to uniquely identify each individual respondent.

4.3.3 Analytical strategies

4.3.3.1 Univariate and bivariate

The study uses univariate analysis to describe characteristics of women who utilized ANC services. As such, percentages and aggregate totals are used to describe the women attributes described in this study. Additionally, the study computed the rates for each explanatory variable, which was subjected to a bivariate chi-square test with the outcome variable in this case being *pregnancy care utilization*. Table 4.2 and 4.3 presents the univariate and bivariate tabulations employed respectively.

4.3.3.2 Multivariate analysis

In order to investigate sociodemographic, economic factors associated with prenatal care utilization, and associated contribution of each determinant towards prenatal care use in Malawi over time, two approaches are adopted and these are a multi-level and a decomposition approach. Multi-level approach was used to determine the individual level relationship while controlling for household and community level women attributes in relation to utilization of prenatal health care services over the period of study in Malawi. Regarding the decomposition approach (See Section 3.7), each parameter coefficient derived from the multi-level outcome was analysed further to determine the relative contribution that each explanatory variable constitutes on women utilization of prenatal health care services over the period of study in the country. The aforementioned approaches are annotated in the algorithms stated and detailed below:

4.3.3.3 Multi-level approach

The multi-level models apply a hierarchical structure model to explore the relationship between the independent variables and outcome variable. In this case, the study uses antenatal care access, a binary variable, which takes the value of 1 if an individual woman, visited an clinic facilities in seek of maternal health care services for at least four times during pregnancy period and coded 0 otherwise. Therefore, factors hypothesized to describe differences among individuals, household and community levels were modelled at level i , j and k respectively. The model below illustrates the binary Multilevel logistic regression model reporting parameter coefficients of covariates of i th individuals from j th households and k th communities was defined using the equation (1) below:

$$\text{logit}(\lambda_{ijk} = 1 | x_{ijk}, \zeta_k) = \alpha + \sum \beta_{ijk} x_{ijk} + \zeta_k \dots (1)$$

where α is the constant or intercept, β is the vector of regression coefficients corresponding to individual, household and community level covariates x_{ijk} , and ζ_k is the stochastic random intercept. This random intercept represents factors at community and household levels that we have neglected yet very influential in on an individual to seek maternal child health services. The random intercept is independently and identically distributed and is assumed to be normally distributed with a mean (μ) = 0 and variance = ψ . The degree of association between observed variables for 3 level multi-level influencing the individuals from either a community or a household perspective is defined the variance partition (VPC) correlation coefficient (η). The formula explains the correlation coefficient (η):

$$\eta_c = \frac{\psi_c^2}{\psi_c^2 + \psi_h^2 + \psi_\epsilon^2} \dots\dots\dots [2i] \text{ and } \eta_h = \frac{\psi_{hc}^2}{\psi_c^2 + \psi_h^2 + \psi_\epsilon^2}$$

Where η_c and η_h are the community variance partition coefficients and household level variation coefficient respectively. The VPC defines the degree of dependency either among the communities or among households and its influence on women choice of the use of prenatal care services facilities when due. Previous study postulates that the higher the level correlation between either communities or households the higher the proportion of the total variance that is between them (Sepehri *et al.*, 2008).

4.3.3.4 Decomposition approach

Therefore, the parameters coefficients are derived using the multi-level logistic models in stage one. A decomposition technique was employed to account for the relative contribution of each covariate on the care utilization in Malawi. The detailed algorithm on the decomposition techniques used to further the analysis and deriving relative contributions of the determinants associated with prenatal care services facilities is presented in chapter 3, section 3.7.

4.4 Variables and measures

The study used prenatal care service utilization as a dependent variable which was estimated using the following explanatory variables; maternal age, birth order, women’s education, women’s earning status, religious affiliations, standard of living, spending decision at household level, exposure to media, women’s decision to seek own health, quality of care, women’s childhood place of residence, availability of maternal health services and barriers to access of maternal health care (see Chapter 3, Section 3.9 for details).

4.5 Results

4.5.1 Characteristics of the respondents

Table 4.2 provides background characteristics of women according to their sociodemographic and economic statuses levels for the years 2000, 2004 and 2010. The results in Table 4.2 show, at an individual level, that the majority of the women’s who participated in the study were both young and middle aged mothers, aged 15–24 and 25-34 years, respectively in 2000. These were both represented by 40.1% each. In 2004, majority of the women were from the middle aged

women and accounted for 40.8% which was not far from the younger women that were represented by 40.3%. In 2010, women aged 25-34 years were the majority (45.8%). In terms of the women birth order, the study found that over a third of women who visited the ANC facilities had a birth order of 5 or higher across all the surveys. On the same note, women of birth order of 1 and 2 were on average around 20% over the entire period. On education attainment, 62.7%, 63.3% and 68.6% of the women had reached primary education levels. It was further observed that about 28.6% of these women had no education in 2000, 25.4% in 2004 and 16.2% in 2010. It was also found that a small proportion of the women attained secondary or higher education across the years of study. In terms of earning potential associated with women, the study found the mean number of women that were working and paid in kind constituted about 42.8% in 2000, 42.6% in 2004 and 33.7% in 2010. In terms of women working status and being paid in cash, there were 22.4% of the women in 2000, 13.7% in 2004 and 30.8% in 2010. Based on this information, majority of the women belong to non-working and cash stricken category. Further, it was observed that women who earned nothing after work in 2000 was 32.96% of the respondents, corresponding to 39.8% and 34.38% among their counterparts in years 2004 and 2010 respectively. On earning status, Table 4.2 indicates that women that reported to be working and paid in kind represented a large proportion of the women across the entire study period. For instance, the study found that 44.3 % of the women were working and paid in kind in 2000. On religion affiliation, it was observed that majority of the women were Protestants and represented about 61.8% in 2000, 60.6 % in 2004 and 68.1% in 2010 respectively. On the same note, women affiliated to Catholic faith constituted about 21.6% in 2000, 21.3% in 2004 and 19.0% in 2010. Muslims women constituted about 15.1% in 2000, 16.9 % in 2004 and 12.1% in 2010.

At household level, it was found that the majority of the women had a middle standard of living and those that had poorer standard of living represented about 38.1% in 2000, 41.3% in 2004 and about 43.6% in 2010. However, majority of the women belong to middle class based on the standard of living. In as far as women's spending decision at household level is concerned, the study found that partners had major control regarding women household spending decisions. For instance, it was established that in 2000, about 77.9% of the women indicated to have their partners controlling spending of income in their household. In 2004, it was observed that 76.5 % of the women were controlled by their partners for all household spending. On the same note, there was a slight decrease in partners controlling household spending to about 76.0 % in 2010. With regards to women exposure to media at the household level, the study observed that women that had either a radio or a television and increased their likelihood of accessing health information from these media represented majority across the entire period of study. For

instance, in 2000 there were about 55.2 % of the women with access to either a radio or a television. In 2004, there were about 61.3 % and about 48.1 % in 2010. On the contrary, women that have both a radio and television access represented the least number in the sample population. In as far as women's decision to seek their maternal health services in Malawi, the study found that about 67.2 % of the women were controlled by their partners at the time they wanted to seek their maternal health in 2000. Similarly, in 2004 women that indicated that they were controlled by their partners at the time they want to seek maternal health care service assistance represent about 67.7 % of the sampled population. In 2010, the women that indicated still to be under the control of their partners were about 76.1%. It is observed that less than 30% of the women were independent and making their own decision without the influence of another party when it comes to seeking material care.

Table 4.2 Background characteristics of respondents' sociodemographic and economic status over the year 2000, 2004 and 2010

Prenatal Variable	2000		2004		2010	
	N	%	N	%	N	%
<i>Individual factors</i>						
Maternal age						
15–24	3176	40.11	2948	40.33	4633	33.63
25–34	3174	40.08	2980	40.77	6306	45.77
35+	1569	19.81	1381	18.89	2837	20.60
Birth Order						
1	1775	22.44	1470	20.11	2416	17.54
2	1508	19.01	1445	19.77	2526	18.32
3	1243	15.71	1191	16.29	2335	16.95
4	908	11.43	970	13.27	1985	14.42
5+	2485	31.41	2233	30.55	4514	32.77
Women Education						
No education	2262	28.57	1854	25.37	2228	16.16
Primary	4965	62.70	4629	63.33	9450	68.61
Secondary and Higher	691	8.73	826	11.30	2098	15.23
Women Earning Status						
None	2754	34.77	3195	43.71	4871	35.57
Working and paid in kind	3390	42.80	3115	42.62	4239	33.65
Working and paid cash	1776	22.42	999	13.67	4666	30.78
Religious affiliations						
Catholics	1736	21.59	1559	21.33	2609	18.95
Protestants	4968	61.80	4429	60.60	9380	68.06
Muslims	1295	15.11	1232	16.86	1658	12.05
Other	119	1.5	89	1.22	129	0.94
<i>Household factors</i>						
Standard of living						
Poorer	3014	38.06	3017	41.28	9045	43.56
Middle	3855	48.68	3152	43.12	9420	41.66
Richer	1050	13.26	1140	15.6	4555	14.77
Women Spending decision						
Self	981	12.39	1054	14.42	1238	8.99
shared	773	9.76	662	9.06	2878	20.89
Partner	6165	77.85	5593	76.52	9661	70.13
media exposure						
neither radio nor television	3172	40.06	2443	33.42	5880	42.68
either radio or television	4368	55.16	4477	61.25	6621	48.06
radio and television	379	4.78	389	5.32	1274	9.25
women decision to seek own maternal health						
Self	2089	26.38	1771	24.23	970	7.04
shared	512	6.46	587	8.03	2330	16.91
Partner	5319	67.16	4951	67.74	10477	76.05
<i>Community factors</i>						
Quality of care						
Inadequate	338	4.17	309	4.23	222	1.61
Moderate	3517	44.46	3640	49.80	7365	53.46
Adequate	4064	51.37	3360	45.97	6188	44.92
place of residence						
urban	3560	4.50	241	3.30	222	1.61
semi-urban	1108	14.00	931	12.74	1233	8.95
Rural	6455	81.60	6137	83.96	12321	89.44
Availability of health care providers						
No problems	929	11.69	6284	14.02	2980	21.63
Big problems	6990	88.31	1025	85.98	10796	78.37
Barriers to health facilities availability						
neither transport nor distance barriers	3772	47.63	2261	30.93	7041	51.11
either transport or distance barriers	1965	24.81	1270	17.38	2057	14.93
transport and distance barriers	2182	27.56	3778	51.69	4678	33.96
TOTAL (N)	7919	100	7309	100	13776	100

At community level, the majority of the respondents considered the quality of maternal care that was delivered at the health facilities to be unfavourable. For instance, the study ascertained that in women who ranked quality of community maternal care delivery, if available, as moderately delivered were about 44.5% in 2000, 49.8 % in 2004 and 53.5% in 2010. Furthermore, quality of care delivery at the prenatal facilities represented majority of women pointing out high level of inadequacy on quality of prenatal care delivery by 51.4% in 2000, 46.0% in 2004 and 44.9% in 2010. It was observed that majority of the women were predominantly from rural communities. For instance, about 81.6% of the women were predominantly rural in 2000. Likewise, in 2004 and 2010, about 84.0% and 89.4% of the women were from the rural communities, respectively. On the same note, it is worthy to note that women in urban communities represented a smaller majority of those that used prenatal care facilities across the entire period of study. It is also noted that 88.3 % of the women experienced problems to access health care service providers in year 2000. On the contrary, it was observed that about 86% of the women did encounter problems in accessing health care providers whereas 78.4% of the women reported to experience challenges in accessing skilled health care providers. In terms of barriers in accessing available prenatal care facilities due to distance and transport within the communities, variation to barriers as a result of facility access exist. For example, about 47.6% of the women had neither transport nor distance barriers in 2000, 30.9% in 2004 and 51.1% in 2010. On the same note, about 27.6%, 51.7% and 34.0% of the women had transport and distance barriers in year 2000, 2004 and 2010 respectively. Table 4.2 provides more detailed information about background characteristics of women over the years of study.

4.5.2 Bivariate relationship between sociodemographic, economic and ANC utilization

In this section Pearson chi-square test of association was used to measure association between different explanatory variables and women's use of ANC as presented in Table 4.3 for the year 2000, 2004 and 2010. The bivariate analysis of the ANC utilization and the respondent characteristics were found to be statistically significant at $p = 0.001$. However, very few respondent attributes were partly insignificant in some years in their association with ANC utilization. For instance, the study found that maternal age and women's household spending status were insignificantly related to ANC service utilization among women in 2000. In succeeding years, all variables, with the exception of age, were insignificantly related to women's use of ANC services. In 2010, it was observed that women religious affiliations status

and decision to seek their own health care was associated with insignificant association with women use of ANC service facilities in the country.

Table 4.3 Bivariate results present Pearson chi-square of the association between the independent variable and women's prenatal care utilization

Variables	2000		2004			2010			
	Antenatal Care service utilization								
	< 4	>= 4	Chi-sq	<4	>= 4	Chi-sq	< 4	>= 4	Chi-sq
	N	7919		7309			13776		
	3397	4522		3068	4241		7577	6199	
	%	%		%	%		%	%	
maternal age									
15-24	40.77	39.58		41.10	39.78		35.5	31.40	
25-34	39.09	40.84	2.48	40.45	41.00	1.47	45.1	46.60	28.77***
35+	20.14	19.57		18.45	19.22		19.5	22.00	
Birth order									
1	20.46	23.88	14.47**	18.42	21.34	29.9**	16.8	18.40	8.91*
2	19.28	18.77		19.33	20.09		18.9	17.60	
3	16.22	15.33		17.31	15.56		17.1	16.80	
4	11.33	11.52		13.69	12.97		14.3	14.50	
5+	32.71	30.50		31.26	30.04		32.8	32.70	
women education									
No education	33.21	25.08	97.8***	27.87	23.56	45.4***	16.2	16.10	39.5***
Primary	60.76	64.18		63.46	63.24		70.3	66.60	
Secondary and Higher	6.04	10.80		8.67	13.20		13.5	17.30	
Women earning									
None	35.5	34.23	18.5***	43.64	43.76	25.7***	36.2	34.90	6.30**
Working and paid in kind	44.39	41.62		44.92	40.96		34.0	33.30	
Working and paid cash	20.11	24.15		11.44	15.28		29.9	31.90	
Religious affiliations									
Catholics	19.78	22.91	25.5***	22.00	20.84	9.05**	18.7	19.30	3.01
Protestants	61.5	62.10		59.52	61.38		68.5	67.50	
Muslims	17.13	13.56		16.85	16.86		11.8	12.30	
Other	1.59	1.44		1.63	0.92		1.0	0.80	
standard of living									
Poorer	37.18	38.70	17.4***	44.82	38.72	79.3***	45.6	41.10	112.1***
Middle	51.02	46.93		43.87	42.58		41.3	42.10	
Richer	11.8	14.37		11.31	18.70		13.1	16.80	
Household spending									
Self	13.6	11.48		14.18	14.60	17.4***	7.2	6.90	4.8*
shared	7.89	11.19	29.02	7.46	10.21		16.3	17.70	
Partner	78.51	77.33		78.36	75.19		76.5	75.50	
exposure to media									
neither radio nor television	44.72	36.55		36.77	31.01	51.9***	44.4	40.60	42.5***
either radio or television	51.52	57.91	59.3***	59.71	62.37		47.6	48.60	
radio and television	3.77	5.54		3.52	6.63		8.0	10.80	
Decision on own health									
Self	27.08	25.83	7.07**	24.28	24.19	21.3***	13.9	14.60	2.17
shared	5.65	7.05		6.32	9.27		31.2	31.70	
Partner	67.27	67.12		69.39	66.54		54.9	53.80	
Quality of care									
Inadequate	8.51	0.93		8.44	1.18	302.52***	2.5	0.50	115.5***
Moderate	45.51	43.70	301.1***	53.26	47.30		54.8	51.90	
Adequate	45.98	55.37		38.3	51.52		42.7	47.70	
Place of residence									
urban	3.69	5.07		2.44	3.91	29.3***	1.3	2.00	16.3***
semi-urban	12.34	15.17	23.57***	11.54	13.61		8.4	9.60	
Rural	83.97	79.76		86.02	82.48		90.3	88.40	
Availability of health Workers									
No problems	13.58	10.42	18.5***	84.32	87.17	11.1**	21.8	21.4	0.35

Big problems	86.42	89.58		15.68	12.83		78.2	78.60	
Barrier to access health care									
neither transport nor distance barriers	50.31	45.58	37.4***	27.22	33.60	34.9***	51.2	51.00	6.75**
either transport or distance barriers	25.64	24.21		17.89	17.00		15.6	14.20	
transport and distance barriers	24.05	30.21		54.89	49.38		33.3	34.80	

***p<0.001;**p<0.05;*p<0.1

Furthermore, it was observed that availability of health care service providers relate insignificantly with women's use of ANC service facilities during gestation period in year 2010 contrary to year 2000 and 2004 which was found to be statistically and significantly related at $p < 0.001$ and $p < 0.05$ respectively. See Table 4.3 for detailed presentation of the association of each variable with the dependent variable against each respective chi-square coefficient value and level of significance.

In this study the bivariate analysis of the 2010 data found that all variables except community availability of health care service providers were statistically significant. It was found that distance to access maternal health care services was statistically significant at $p < 0.05$, whereas other variables were highly significant at $P < 0.001$. In the year 2004, women's earning status and community availability of health care service providers were found to be associated with ANC service utilization at $p < 0.05$. See Table 4.3 for detailed presentation of the association of each variable with the dependent variable against each respective chi-square coefficient value and level of significance.

4.5.3 Multivariate analysis results of predictors of prenatal care service utilization

Table 4.4 illustrates a multi-level regression output, concentration index and percentage contribution of the factors influencing prenatal care service utilization among women for the years 2000, 2004 and 2010 in Malawi.

4.5.3.1 Multi-level regression outcome

The first step in the multi-level approach was to consider whether the data set justifies the random effects at household and community levels. Table 4.4 presents the results of the random effects null model that were simulated and computed for community and household level.

Table 4.4. Parameter coefficients for the multi-level model for the explanatory variables associated with prenatal care service utilization in Malawi: the null model, without inclusion of covariates

	Prenatal Care service utilization		
	2000	2004	2010
<i>Random effects</i>			
Community level variance	0.073	0.044	0.0373
Household level variance	0.065	0.069	0.0621
Residual variance	0.427	0.432	0.4624
Variance Partition Coefficient - community	12.9%	8.1%	6.6%
Variance Partition Coefficient - household	11.5%	12.7%	11.1%

The results in Table 4.4 indicate that there was a slightly positive amount of significant variation influencing women's choice to use of prenatal care services at both community and household level in Malawi over the years 2000, 2004 and 2010. The results, based on the computed variance partition coefficients values suggests that there was a total variance in the use of prenatal care services due to differences in communities measured by 12.9% in 2000, slightly lower to 8.1% in 2004 and by as low as 6.6% in 2010. At the household level, the empty models suggests that the total variance associated with women use of prenatal care services was valued at 11.5% in 2000, slightly up to 12.7% in 2004 and 11.1 in 2010.

Table 4.5 depicts odds ratios estimates, concentration index and percentage contributions of the individual, household and community variables for prenatal care service utilization in Malawi, for the full model over the years 2000, 2004 and 2010.

Considering the year 2000 in perspective, the study found that, at an individual level, maternal age and women education were the positive predictors of prenatal care service utilization among women. At household level, women with shared responsibility on household budget, media exposure, and women that reported to have partners influencing their decision to use maternal health care services were found to increase their likelihood of utilizing prenatal care services at individual level in 2000. At a community level, it was observed that despite barriers to accessing maternal health care services due to challenges of transport and distance, the women likelihood

to seek services challenges increased. More specifically, the study found that women aged 25–34 were 1.06 times more likely whereas those aged 35 years and higher were 1.14 times more likely to use services in the year 2000 relative to their counterparts aged between 15–25. Women who attained primary education /or secondary education or even higher were more likely to use prenatal care service facilities by 1.05 times and 1.06 times more likely to use prenatal care services respectively. This implies that even little education, from primary school and above, in the year 2000 influenced women positively to use prenatal care services positively. In as far as religious affiliation was concerned; they were slim chances of women's use of health care facilities among Protestant (OR= 0.97) and Muslims (OR=0.96) were significantly less likely to use prenatal care services compared to the Catholic women, both at $p < 0.05$. At household level, women with shared spending decision at their households increased their likelihood of utilizing service facilities by 1.03 times relative to their counterpart with lone spending decisions. Similarly, the study found women that were reported either to have a shared or influenced by their partners on their decision to seek maternal health care services were 1.02 times or 1.0 times more likely respectively to use prenatal care services as compared to those that were self-reliant in decision making. Regarding women media exposure, having either a radio or a television at the house hold was associated with 1.04 times increase in their use of prenatal care service facilities compared to women having neither a radio nor a television. Likewise, it was found that women from households with both a radio and a television (OR=1.03) were more likely to use services. On the contrary, the study found that women from households that were defined to have middle standard of living (OR=0.98) were less likely to use of prenatal care services compared to women from poorer households. This is because the poorer household had no any other alternative services to rely on other than the public health facilities compared to the other middle class and the rich who use other services if the public health facilities services are not suffice.

At community level, distance and transport barriers had no influence to cause lower use of services among women in Malawi. This present study found that existent distance and transport challenges that the women experienced in 2000 to seek maternal health care services had no effect as these women were 1.03 times more likely to use compared to their counterparts that neither indicate to experience neither distance nor transport challenges. On the contrary, the study found that quality of care that was delivered in most communities lowered women chances of using services in the year 2000. For instance, women that indicated the quality of maternal health care provided within their community as either average or adequate were associated with 0.72 and 0.75 lowered chance of using prenatal care services respectively compared to their counterparts that indicated to experience inadequate quality of care.

In the year 2004, at individual level, the study found that maternal age at birth, maternal educational attainment, working status in which cash was the mode of payment and women who were affiliated to other religious groupings were positively related with prenatal care service utilization significantly. For instance, women aged 25–34, and 35 years and older were found to be 1.05 times and 1.13 times more likely to use prenatal care services than younger women aged 15–24 years old, both at $p < 0.001$. Similarly, women that reached primary and secondary education levels were associated with 1.03 and 1.04 times more likely to use prenatal care facilities than those with no education status, both at $p < 0.001$. Furthermore, the study noted that women that were working and paid cash as their earnings (OR=1.03) used prenatal care services positively and significantly at $p < 0.001$. Conversely, at the individual level, birth order of the women was associated with lower chance of utilizing prenatal care services facilities. The study found a consistent lower likelihood among women use of prenatal care services regardless of the birth order levels.

Furthermore, the study found that at household's level, standard of living influence use of maternal health care services positively and significantly. For instance, from middle to richer standards of living, women were found to increase their likelihood of using prenatal care services by 1.02 and 1.06 times respectively. Similarly, women's who reported to be exposed to media had a significant positive association with service utilization. In this case, the study found having either a radio or a television at the household level and those household that reported to have both radio and television were 1.02 and 1.04 times more likely to utilize services facilities than women with neither of these communication devices. In as far as decision to seek maternal health care services is concerned, women who shared decision to seek maternal health with either their partners or others in their households were positively associated with use of prenatal care services in year 2004. For instance, the study found these women to be 1.06 times more likely to use maternal health services during prenatal period relative to their counterpart that were making decision on their own without any external influence.

At the community level, it was found that quality of care, place of residence, availability of health care providers and barriers to access health care facilities due to distance and transport were associated with less likelihood of women use of prenatal care services in year 2004. For example, quality of care was highly significant at a lower significance level of $p < 0.001$ lowering women's use of services either among those that indicated to rate quality of care as average (OR=0.72) or those that rated it as adequate (OR= 0.78) compared to those that indicated

to have rated quality of care as inadequate. Similarly, women who were from semi-urban (OR=0.96) and rural areas (OR=0.97) were less likely to use services as compared to those women from the urban areas. Furthermore, the study found that community availability of health workers did not do much to promote women's use of prenatal care services in year 2004. For instance, women that indicated to have problem with the availability of health workers within the community had lower likelihood of using prenatal care services by 0.98 times relative to those having no problem with the health workers availability within the community at higher significance level of $p = 0.1$. Women who had problems with distance and transport (OR = 0.97) to access maternal health services were associated with reduced likelihood of using prenatal care services at $p < 0.05$.

In year 2010, the study found that women aged 25–34 (OR = 1.08) and 35 or higher (OR=1.15) were more likely and significantly at $p < 0.001$ to use prenatal care services at an individual level in Malawi. On the same level, women education attainment from secondary level and higher (OR=1.02) was positively and significantly associated with service utilization. On the contrary, attainment of primary education was associated with reduced likelihood of women's use of service facilities in the country (OR = 0.98, significant at $p < 0.001$). At the same level, the study found that birth order was associated with consistent and significant less likelihood in reducing utilization of services by a range of birth order 1 (OR = 0.93) and birth order 5+ (OR = 0.89), all significant lowly at $p < 0.001$. At a household level, the study found that women from middle income households (OR = 1.02) and those from richer households (OR = 1.03) were more likely and significantly to use prenatal health care service facilities compared to those from poorer households at $p < 0.05$ and $P < 0.01$ respectively. Women that had an exposure to radio and television within their households were found to increase their likelihood of using services by 1.04 times at $p < 0.05$ significant level. At community level, women who indicated the quality of maternal health care delivery within their community as either average or adequate were associated with lower utilization likelihood of 0.62 and 0.65 times respectively compared to their counterparts who indicated the quality of care as inadequate.

Table 4.5 Multi-level logistic regression results, concentration index and percentage contribution of women's factors on prenatal care utilization in year 2000, 2004 and 2010

Variables	Prenatal care utilization								
	2000			2004			2010		
	OR	K	% C	OR	K	% C	OR	K	% C
Individual factors									
Maternal age			8.19			14.62			19.5
15-24 ®									
25-34	1.06***	-0.14	-1.42	1.05***	-0.14	7.49	1.08***	-0.23	9.22
35 and higher	1.14***	0.94	9.61	1.13***	-0.13	7.12	1.15***	-0.26	10.24
Birth order)			15.51	1.00		44.45	1.00		44.7
1®									
2	0.91***	0.00	-0.02	0.92***	0.01	-0.35	0.93***	-0.01	0.27
3	0.89***	0.18	1.85	0.88***	-0.01	0.28	0.92***	-0.02	0.70
4	0.89***	0.58	6.00	0.88***	-0.08	4.47	0.91***	-0.13	5.18
5 and higher	0.87***	0.75	7.68	0.87***	-0.76	40.05	0.89***	-0.98	38.52
Women education		0.80	8.16		0.01	-0.75	1.00	-0.06	2.3
No education ®									
Primary	1.05***	0.08	0.78	1.03**	-0.06	3.41	0.98***	-0.09	3.63
Secondary and higher	1.08***	0.72	7.38	1.04**	0.08	-4.16	1.02***	0.03	-1.37
Women earning status			5.79	1.00		-1.86	1.00	0.05	-1.99
None®									
Working paid in kind	0.99	-0.02	-0.19	0.99**	-0.02	0.98	0.98	0.01	-0.50
Working paid cash	1.01	0.58	5.98	1.03**	0.05	-2.85	1.01	0.04	-1.49
Religious affiliation			32.14	1.00	0.05	-2.86	1.00	-0.04	1.6
Catholic ®									
Protestant	0.97**	0.06	0.63	1.01	0.04	-2.10	0.99	0.02	-0.83
Muslims	0.96**	1.19	12.18	1.02	0.01	-0.76	1.01	0.00	-0.14
Others	0.96	1.88	19.33	0.91**	-0.00	-	0.95	-0.07	2.61
Household									
Standard of living ®: Poorer)			11.00	1.00	0.12	-6.23	1.00	0.14	-5.6
Middle	0.98**	-0.07	-0.70	1.02*	-0.14	7.13	1.02**	-0.12	4.52
Richer	0.91	1.14	11.70	1.06***	0.25	-13.37	1.03*	0.26	-10.16
Women's' spending decision			2.96	1.00	-0.06	2.93	1.00	-0.07	2.8
Self ®									
Shared	1.03**	0.06	0.62	0.98	0.06	-3.10	1.02	-0.14	5.59
Partner	0.96	0.23	2.34	0.97**	-0.11	6.03	1.01	0.07	-2.77
Media Exposure			5.77	1.00	0.04	-1.88	1.00	0.02	-0.65
Neither radio nor television ®									
Radio or television	1.04***	-0.01	-0.15	1.02**	-0.03	1.84	1.01	-0.04	1.39
Radio and television	1.03*	0.58	5.92	1.04**	0.07	1.47	1.04**	0.05	-2.04
Decision to seek own health		0.21	2.11	1.00	0.00	-0.03	1.00	-0.07	0.20
Self ®									
Shared	1.02	0.03	0.29	1.06**	0.02	-0.80	0.99	-0.14	5.59
Partner	1.01*	0.18	1.82	1.01	-0.01	0.77	0.99	0.07	-2.77
Community									
Quality of care			-0.50		-0.94	49.74		-1.06	41.7
Inadequate ®									
Average	0.72***	-0.04	-0.44	0.72***	-0.08	4.46	0.62***	-0.03	1.07
Adequate	0.75***	-0.01	-0.06	0.78***	-0.86	45.29	0.65***	-1.04	40.61
Place of residence			5.30	1.00	0.07	-3.70	1.00	0.08	-3.3
City ®									
Semi-urban	0.99	0.15	1.55	0.96*	0.14	-7.26	0.98	0.12	-4.52
Rural	0.97	0.37	3.75	0.97*	-0.07	3.56	0.97	-0.03	1.22
Availability of health care providers		0.03	0.27		0.00	0.14		0.00	0.13
Problem ®									
Not a Problem	1.01	0.03	0.27	0.98*	-0.00	0.14	1	0.00	0.13
Barriers to health facility		0.32	3.29	1.00	-0.10	5.43	1.00	0.02	-0.88
Neither Transport nor distance ®									
Transport or distance	0.97	-0.02	-0.23	0.98	0.01	-0.70	0.98	-0.01	0.43
Transport and distance	1.03**	0.34	3.51	0.97**	-0.12	6.13	0.99	0.03	-1.31

Statistics				
Overall factor Contribution (C)		9.74%	-1.87%	-2.55%
Variance Partition	Coefficients-	10.3%	3.9%	7.6%
Variance Partition	Coefficients-	11.5%	4.8%	9.5%
Bayesian Information Criteria				
Number of Observations		13,220	11,689	23,020
Log likelihood		-6279	-5797	-9134

HINT: *** p < 0.001; ** p < 0.05; * p < 0.1; K or CI = Concentration Index and % C = Percentage Contribution,

4.3.4 Decomposition outcome

The concentration index (K) and relative percentage contributions (C) of the factors related to women's use of prenatal care utilization are presented in Table 4.5. In this case, C indicates the level of inequalities that the determinants indicated on prenatal health care utilization for the three survey periods.

As is presented in Table 4.5, the decomposed outcomes indicate the concentration index and percentage contribution of the factors associated with women's use of prenatal care service facilities in Malawi for the year 2000, 2004 and 2010. Across the years, the overall percentage contribution of the factors was higher in year 2000 which had an overall positive contribution of 9.47. This implies that the overall percentage contribution of different sociodemographic and economic factors motivated women's use of prenatal care service utilization in that year. On the contrary, in 2004 and 2005, the overall contribution of the sociodemographic and economic factors was negative. For instance, in 2004 and 2010 the overall contribution was -1.89 and -2.55 respectively.

Therefore, considering each year factor contribution, there were variations among the variables. The relative contribution of each variable between the years varies. For instance, in 2000, the individual level comprised the most explained factors with positive relative contribution of women's use of prenatal care service facilities. As indicated in Table 4.6, religious affiliation's had an overall contribution of 32.1%, in significantly decreasing women's use of the prenatal care services. Similarly, birth order had an overall contribution of 15.5% in negatively influencing women's use of prenatal care services. At the household level, all factors included in the model had a positive contribution towards prenatal care services. For instance, household standard of living standard contribution was 11%, women media exposure 5.8%, women spending decision 2.9% and women's own decision to seek health care 2.1%. At community level, place of residence and barriers to health facilities had a positive contribution of 5.3% and

3.3% respectively. On the contrary, in 2000, quality of care had had the negative contribution of -0.5% in reducing women utilization.

In year 2004, of the 1.89 overall contribution for that year, quality of care administered at the community level was explained by quality of care (49.7%), individual level birth order of the women (44.5%), maternal age (14.6%), barriers to access health facilities (5.4%), women spending decision at household level (2.5%) and availability of community health workers (0.14%). However, other factors reduce the utilization of the maternal health care services. This negative contribution range from -6.2% from household standard of living to -0.3 the household level decision among women to seek maternal health care services.

In year 2010 which had an overall contribution of -2.55 of women prenatal care service utilization, birth order and quality of care mostly explained the service utilization by a contribution of 44.7% and 41.7% respectively. On the same instance, it was found that 19.5% was explained by maternal age, 2.8% by women spending decision at household level, and 2.3% by women individual education. On the contrary, standard of living of the households had a negative contribution of -5.6%, place of residence (-3.3%) and women earning status (-1.99%).

Figure 4.1 illustrates the overall contribution of the individual, household and community level over the years 2000, 2004 and 2010. As is indicated, the individual factors were the most dominant level explaining most positive contributions. As is illustrated, in 2000 individuals account for 70% contribution and this was followed by year 2010 which accounted for 66%. Household level over the years 2000, 2004 and 2010 contributed very little towards women's use of prenatal care service utilization. For instance, it contributed 8% in 2000, decreased to -5 % in 2004 and was almost negligible in 2010. However, at the community level, in 2000, 8% contributed positively towards increasing women utilization of services. In year 2004 and 2010, community level factors account for 52% and 38% positive contribution in reducing women's use of prenatal care service facilities. Figure 4.1 shows the overall contribution of individual, household and community levels over the years 2000, 2004 and 2010.

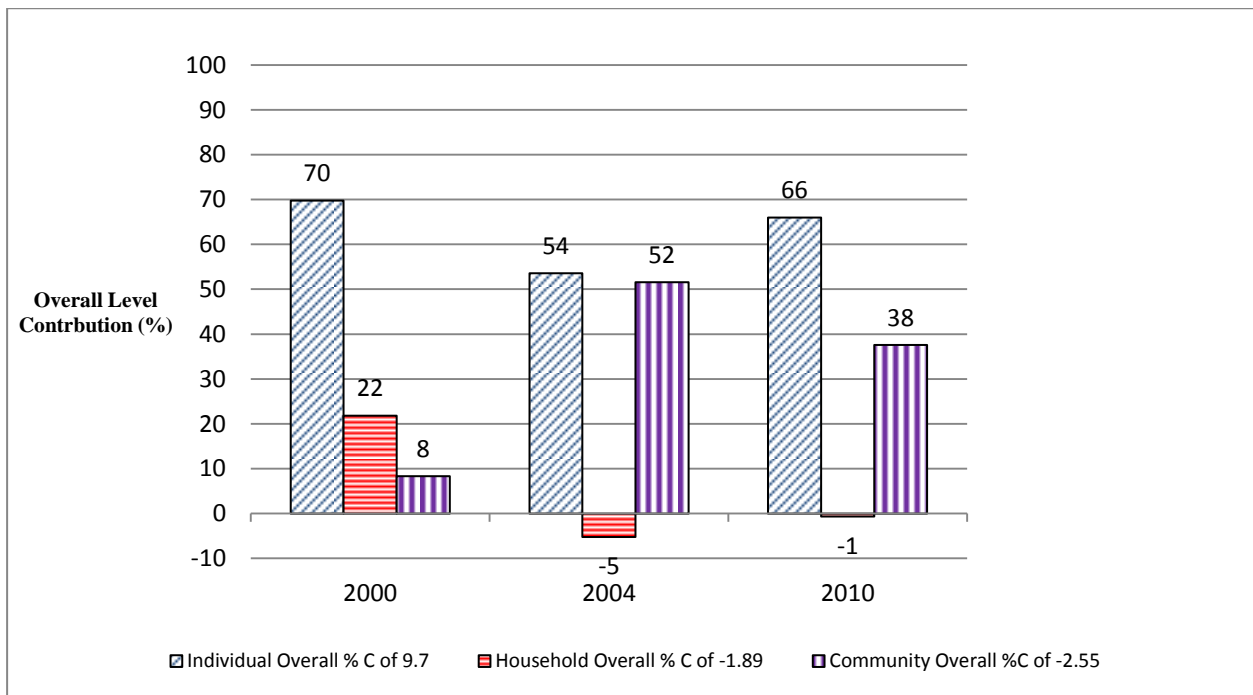


Figure 4.3 Percentage contributions of individual, household and community factors on women use of prenatal care services for the year 2000, 2004 and 2010

4.6 Discussion

The study investigated different factors associated with utilization of prenatal care services among women in Malawi over the period 2000, 2004 and 2010. In the attempt to achieve the study objective, a multi-level regression analysis was employed in order to understand factors that affect women's use of maternal health care beyond individual levels and try to establish which factors overtime contributed towards women's use of prenatal care services. Further to this, the study employed a decomposition technique (See algorithm in chapter 3, multivariate approach section) in order to find out the percentage contribution of these sociodemographic and economic factors on women's use of prenatal care services over the year 2000, 2004 and 2010 in Malawi. Therefore based on these analytical procedures, there exists differential between and within factors associated with use of prenatal care service among women in Malawi. Firstly, the bivariate analysis indicates that maternal age, birth order, education status, women earning status, religious affiliation were consistently highly significant individual factors associated over the years with women's choice to use care service. At a household level, the bivariate analysis found that household standard of living; women spending decision and media exposure were highly significant determinants of care service utilization over the period of study. At community level, quality of care, place of residence and barriers to health centre facilities were significant determinants. Apart from the quality of care, the study findings concur with what other scholars

postulated and associated antenatal care service utilization among women as influenced by maternal age, birth order, maternal education and their economic position such as work and wealth status (Feijen-de Jong *et al.*, 2011; Rahman *et al.*, 2011; Sakala *et al.*, 2011; Sepehri *et al.*, 2008; Trinh *et al.*, 2007). However, these studies did not take into account the factors which rank highly in influencing women's use of prenatal care services in each respective case.

The study established some variation within year as there were inequalities in the variable mix influencing women's choice to use care services. For instance, there are some factors that show these variations due to their insignificant association with the outcome variables. Such variables include women's decision to seek own maternal health care and availability of health care providers within the communities in 2000. Likewise, in 2004 and 2010, availability of community health providers stood out. A previous study indicates that such variations exist due to inequalities among women which affect their social state of seeking health care services in sub-Saharan Africa (Magadi *et al.*, 2003).

With regards to multivariate analysis, the study found that the number of women using ANC service, consistently and significantly increased at an individual level, as they become of age. For instance, the study found that women that were aged 35 and older were more likely to use prenatal care services compared to the younger women age 15–24 years within each year and across years of the study. This concurs with the results of Gyimah *et al.* (2006) who found that in Ghana as the women increase in age, their usage level of prenatal care services correspondingly and significantly increased. In Kenya, Van Malderen *et al.* (2013) observed that young women less than 20 years were slightly positively concurring yet insignificant in accessing skilled birth attendance in a facility based health environment. Out of the overall contribution of 9.7 and -1.89 and -2.55 towards prenatal care services in Malawi, maternal age was associated with a positive contribution of 8.19% in increasing women's use of prenatal care services in year 2000. Conversely, in 2004 and 2010, even though age was found to have a positive contribution towards ages by 14.6% and 19.5% in influencing women use of prenatal care services respectively. In this study, the overall contribution of ages in 2004 and 2010 negatively influenced women's choice to use of prenatal care services.

Previous studies indicated that women with birth order of 1 were more likely to use antenatal care than their counterpart of birth order more than 1 (Mehari, 2013; Ram *et al.*, 2006). However, in the current study, birth order has a consistent lower likelihood in influencing women's use of prenatal care services significantly across the entire period. Such findings are

contrary to the hypothesis of Mehari *et al.* (2013) and Ram *et al.*, (2006) in relation to birth order and utilization of health care services among women in Ethiopia and India respectively. A previous study argued that women with bad experiences during their first parity pregnancy accounted for increased utilization of prenatal care services during their subsequent births (Bloom *et al.*, 2001). Nevertheless, in terms of birth orders contribution towards prenatal care service utilization, the study found that birth order had a relative contribution of $C = 15.5\%$ in 2000, $C = 44.5\%$ in 2004 and $C = 44.7\%$ in 2010. As such, these positive contributions were associated with increased overall factors contribution positively in 2000 and associated reduced overall factors contribution in both year 2004 and 2010.

A previous study reported that the status of women who furthered their education had a major influence among them in improving utilization of care services (Ahmed *et al.*, 2010). Such a situation is validated because educated women have reproductive health knowledge and acquired capacity to evaluate their own health, thus make quick informed choices of where and when to visit maternal health care services including care services compared to their uneducated counterparts (Ensor *et al.*, 2004). It is worthy to point out that with an existent effective health care facility that is capable of providing these women with requisite maternal health care services; their lifetime risk of dying to causes related to pregnancy reduces. This present study found that women who attained education above primary level had increased their utilization level in year 2000 and 2004. However in 2010, the study found that only women who attained secondary school education or higher were associated with increased likelihood of utilizing care service facilities significant at $p < 0.001$. Regarding the contribution of maternal education towards the overall factors contribution on prenatal care service utilization, in 2000, the overall contribution of 9.74 was explained by a contribution as low as 8.16% of women education. In subsequent years (2004 and 2010) which had each a negative contribution of -1.89 and -2.55 respectively, women education was associated with as low as -0.75% and 2.3% of the overall contribution respectively. Therefore, based on the study findings, women formal education is positively contributing towards their use of prenatal care services, but there is need to encourage more women to pursue conventional education in order to increase the impact of education on maternal health care use more specifically prenatal care services.

Regarding women's religious affiliation, the study found that Protestants and Moslem women were less likely to use prenatal care services facilities compared to the Catholic women in year 2000, significantly different for both at $p < 0.05$. However, in subsequent years, the Protestants and Muslims women were found to be insignificantly associated with prenatal care service

utilization. A study by Doku *et al.* (2012) postulated that women's religious belief have had a significant role to motivate their use maternal health care service in general terms. For instance, in Nepal, religion provided a communication network which resulted in dissemination of information about maternal health thus increased use of prenatal care services among women (Neupane *et al.*, 2012). Therefore, women in Malawi have the potential of increasing their likelihood of using health care facility services of prenatal care services. This was noted as increased odds ratios in the year 2000 among women affiliated to both Protestants and Muslims relative to their Catholic counterparts, despite being insignificantly related. However, in terms of relative contribution, religious affiliation accounted for $C = 32.1\%$ in 2000, $C = -2.86\%$ in 2004 and a minimal contribution of $C = 1.6\%$ in 2010.

At household level, excluding year 2000, the study found that women from middle and rich households increased their likelihood of utilizing prenatal care service facilities significantly in year 2004 and 2010. Yet, in 2000, women from the middle income households were associated with reduced likelihood of utilizing care services. However, previous studies postulated that the better standard of living among households, have less economic burden which in the long term, improve on quality of care that they sought (Glei *et al.*, 2003; Pallivakadavath *et al.*, 2004). Therefore, based on the present study, it is positive to note that most households from middle income and above, since 2004, increased the likelihood of using care service facilities due to little disposable income that they expend on maternal health relative to those from poor households. In terms of the standard of living contribution towards overall factors contribution on care service utilization, it was 11% in 2000, -6.2% in 2004 and -5.6 % 2010. It is worthy to note that despite increased odds that were noted in year 2004 and 2010; the standard of living had a negative overall contributions in both years. This is a worrisome situation as in the long term that can affect the increased likelihood thus noted in as far as care service utilization is concerned.

With regards to women spending decision at household levels, the present study found that women who came households that shared responsibility of spending at the household were more likely to use care service facilities significantly in 2000. This finding supports an earlier argument by Beegle *et al.* (2001) who indicated that women who share their household spending decision to be on the advantage of utilizing prenatal care services compared to those that hardly had shared spending decision at household level in Indonesia. In 2004, households that were controlled by partners in as far as daily spending was concerned were associated with reduced likelihood of women's use of care services in the country. It also concurs with what Bloom *et al.*

(2001) found out in India that women who are given ultimate freedom to make their own health decision at the household level, they were more likely to utilize care service facility relative to their counterparts that had no freedom. Furthermore, based on this study spending decision outcome of the women, it was found that in 2010, women that had shared and were supported by their partners at household level spending, were found to be more likely to increase use of prenatal care service even though their corresponding odds ratios were insignificant in Malawi. This implies that there is more potential for the entire communities to adopt and advocate for unified spending decision within their households, if health care services are to be significantly utilized in the country. However, considering relative contribution that spending decision had on overall factors contribution, the study found that spending decision was explained by $C = 2.96\%$ in 2000, $C = 2.93\%$ in 2004 and $C = 2.8\%$ in 2010. This positive contribution denotes positive influence that if proper policy are in place to promote women autonomy at the household levels, the relative contribution earn better maternal health dividend.

In a previous study by Gage (2007), they observed that women that were aware of their maternal health risks were found to be more likely to use health care services in Mali. Often it was postulated that women that were aware of their complicated history with pregnancy increased their usage of care services in order to get started in modern maternal health care therapy earlier in their pregnancy in order to improve their maternal health outcome (Glei *et al.*, 2003). For instance in Nepal, awareness of reproductive health information such as family planning increased the likelihood of utilizing prenatal care services among active women active in reproductive process (Sharma *et al.*, 2007). However, considering a relative contribution that exposure to media had to women utilization of prenatal care services, the study found lower yet positive contribution of 0.22 in 2000, 0.54 in 2004 and 0.02 in 2010. Such low contribution of exposure to media was associated with underutilization of the prenatal care services in Indonesia (Titaley *et al.*, 2010).

In 2000, the study found that women from households where partners had a say on women's decision to seek maternal health care, it was found their level of utilization of prenatal care services increased significantly by 1.01 at $p < 0.1$. However in 2004, it was observed that household that had women who shared and agreed with others in as far as seeking maternal health care was concerned, were associated with increased likelihood to use prenatal care service facilities significantly at $p < 0.05$. Previous study argued that women culture in which women tend to seek permission from others for their maternal health care have a dire consequence of not only experiencing delays in timely use of maternal health care at the time they are pregnant

(Aregay *et al.*, 2014), but also such practice results in worst case maternal health outcome (Erci, 2003; Barnes-Josiah *et al.*, 1998). In another aspect, Jamaican Scholar McCaw-Binns *et al.*, (1995) postulated that women with adequate support at the time they seek maternal care contribute positively towards their allegiance to utilize prenatal care services in Jamaica. As such, despite women support from the partners contribute positively towards their use of maternal health facilities; women decision to seek maternal health care was associated with a positive contribution towards overall factor contribution. For instance, this showed a value of $C = 2.11\%$, $C = 2.83\%$ in year 2000 and 2010 respectively and slightly a low negative contribution of $C = -0.03\%$ in 2004. However, there is need to improve partner's awareness with regards to supporting women timely utilization of health care services at any stage of prenatal care stage if the positive likelihood that the partners had in increasing women's use of prenatal care services noted in year 2000 and year 2004 was to continue in 2010. Such inconsistency on partners support on women's use of care services resulted in a reduced chance in their use of care services in 2010.

At a community level, quality of care was associated with decreased women chance of using care services across the entire period of study. For instance, the results indicate that even those women that rated the quality of services as adequate; had been having a lower chance of using care service for over a long period of time compared women who the quality of care as inadequate. Wang *et al.*, (2011) argued that despite having good physical infrastructure, quality of care affects pattern of use of maternal health care services. Bailey *et al.* (2006) and Muula (2006c) pointed out that quality of care is often low due to inadequate human resource personnel who provide any requisite health care need of the patients in order motivate their subsequent decision for future use of such health facilities. This consequently affects utilization of health care services in general terms. However, this present study denotes unexplained factors that are still causing women who rated the maternal health care services as adequate in having reduced likelihood in utilizing the same services for their care service utilization. Relating to quality of care contribution, the study found that quality of care remain a major contributor to the overall factors contribution on prenatal care service utilization among women in Malawi. This was noted by a contribution of -0.50% in 2000 despite the contribution being negligibly small which was followed by a contribution of $C = 49.7\%$ in 2004 and $C = 41.6\%$ in 2010 in subsequent years. With such percentage contributions, quality of care was among the only community level factor that was found to have contributed highly on the overall factors contribution associated with prenatal care service utilization in Malawi.

Regarding the childhood place of residence, study by Navaneetham *et al.*, (2002) found that as the women migrated from their childhood place of residence their utilization propensity, even was found to be more likely to increase usage of care services in India provinces of Andhra Pradesh and Karnataka, the association was insignificantly associated. In another context, childhood place of residence do over state on decision to seek modern care if traditionally interacted with other socioeconomic challenges affecting the woman, thereby affecting their health care utilization potentials (Behrman *et al.*, 1987). However, in this present study, childhood place of residence was consistently and negatively influence women utilization of care service facilities in the year 2000 and 2010 insignificantly. However, the study found that in 2004, women childhood place of residence did not contribute much, but negatively reduced the likelihood of women's use of care services significantly at $p < 0.1$. Considering the level of contribution that childhood place of residence has on care service utilization, the study found positive contributions of $C = 5.3\%$ in 2000 which was followed by subsequent negative contribution of $C = -3.7\%$ and $C = -3.3\%$ in year 2004 and 2010 respectively. Therefore based on these results, childhood place of residence negatively influence women preference in utilization of care services, in the years 2004 and 2010.

Barriers to health care services facilities increased the likelihood of women's use of care service in 2000 and reduced in subsequent years of 2004 and 2010. For instance, barriers to accessing health facilities as a result of distance and transport challenges were not an issue in the year 2000. Despite the challenge, women increased their likelihood of utilizing care services by 1.03 times relative to those who indicated to have neither distance nor transport challenges in that year. However, in 2004 and 2010, distance and transport challenges were attributed to less likelihood for women to use of care services facilities. This was noted by an $OR = 0.97$ significant at $P < 0.05$ and by an $OR = 0.99$, although insignificant. The study found that barriers to health care facilities was associated with a positive contribution on the overall factors contribution on care utilization explained by 3.29% in 2000, by 5.4% in 2004 and by a negative contribution of -0.9% in 2010. Previous study argued that distance to the health facility was the major predictor influencing women patronage of maternal health care services in Guatemala (Glei *et al.*, 2003). In Mali, it was also found that households challenges to access transport was associated with lower women chance of utilizing maternal health care services in that country (Gage, 2007). There is need therefore to underscore issues of barriers if maternal health services are well patronised, if maternal health outcome is to improve in Malawi.

Considering within year contribution levels towards care utilization, there were variations along each model on the influence of each variable on women's use of care service utilization in Malawi. For instance, based on the rank of top five positive contributors, it was found that religious affiliation, birth order, standard of living, maternal age and women education contributed positively towards women's use of care services in 2000. In 2004, a community quality of care, birth order, maternal age, barriers to health facilities and women spending decision contributed positively on women's use of care services facilities. In 2010, birth order, quality of care, maternal age, women spending decision and women education status contributed positively. Therefore based on this ranking, birth order and maternal age were the factors that are frequent and deterministic positive contributors on women's use of care services in Malawi over the entire period of study. Secondly, quality of care, barriers to health care access and spending decision of the women at household followed. Lastly, factors such as religious affiliation, standard of living and women education attainment were ranked third and were behaving in a stochastic way.

4.7 Chapter summary

In chapter 4 the study investigated factors associated with use of maternal health care service facilities in Malawi for the years 2000, 2004 and 2010. Using a multi-level approach and decomposition analytical procedure, the study found that individual factors (such as birth order) do affect women's choice to use prenatal care services; the education status of women was associated with increased likelihood of women to use the services at an individual level. At the household level, women's autonomy in spending decisions, in which they do share the responsibility with others and from households were found to increase their likelihood to use ANC care, although this result was not significant in the year 2010. Furthermore, from the decomposition analysis, the study observed that birth order, and maternal age were common individual predictors that contributed positively, in almost each year, to factors that influenced women's use of prenatal care services in Malawi. Secondly, it was observed that quality of care and barriers to health centre were community factors that contributed toward overall factors contributing to women's choice of using prenatal care service facilities. Based on this premise, this continues to support exploration of the determinants that influence women's choices for childbirth in public health care service facilities using 2000, 2004 and 2010 MDHS data sets.

CHAPTER 5

Determinants of childbirth delivery in public health care services facilities

5.1 Introduction

The present chapter explores determinants associated with women's use of public health care facility for childbirth by using data from MDHS for the years 2000, 2004 and 2010. The fundamental aim is to bridge the gap in literature with regard to identifying the factors causing low utilization of public health care facilities among women during childbirth in Malawi. The chapter discusses varied literature based on the subject matter, methodology adopted to achieve the objective undertaken in the chapter, results, discussion and the summary of the chapter.

5.2 Literatures review

As described in Chapter 1 (section 1.8), Malawi's health care system comprises a three tier structure, namely primary, secondary and tertiary levels. As such, the core responsibility of this structure follows a bottom-up operational framework, whereas resources are meant to support the structure taking a top-down approach. According to the 2011–2016 Health Sector Strategic Plan (Government of Malawi, 2012) currently implemented, the primary health care component comprises health centres, health posts, clinics, dispensaries and maternity wings that are meant to provide basic medical services to the people in the country. The primary component provides people consultation for any health related cases including prenatal care services, childbirth and other maternal health related postnatal care needs. A previous study in Malawi indicated that health care facilities, such as Basic Emergency Obstetric Care (BeMoC) services aimed at providing basic treatment such as weighing a woman, measuring her height, blood pressure testing, urine testing, blood samples checked, and administration of tetanus toxoid treatment, experiences a lot of shortcomings. This influences low utilization of the public health care facilities in the country (Kongnyuy *et al.*, 2009). Such non-institutional childbirth decision choices are attributed to maternal health outcome that would have been prevented if and only if the facilities were working and had the capacity to provide maternal health needs to promote women's use of the facilities (Sarelin, 2014; Seljeskog *et al.*, 2007; Shaikh *et al.*, 2004). At the next level, the secondary health care covers the district health facilities, where they have beds and provide service facilities to all cases affecting people including the maternal health services

and are defined referrals for primary health care facilities within the district. According to the 2011–2016 Health Sector Strategic Plan, the secondary facilities are responsible for providing comprehensive emergency and obstetric care in order to ensure safe motherhood and minimise institutional based maternal mortality (Government of Malawi, 2012). The tertiary health facility, which is at the top of the health system structure in Malawi, acts as an overarching research hospital and provides referral services to secondary and in some cases primary health facilities.

Over the past decades, the government of Malawi has initiated numerous programmes in order to improve women's use of public health care facilities with the aim of improving maternal health outcome. For instance, the existence of 1.8 comprehensive emergency obstetric care facilities per 500,000 population, which is far from 1% per 500 000 population as recommended (Leigh *et al.*, 2008) despite the country having only 2% of the recommended basic emergency and obstetric facilities across primary health centres in the country (Leigh *et al.*, 2008; Kongnyuy *et al.*, 2009). Kongnyuy *et al.* (2009) study pointed out some of the initiatives include provision of satisfactory services through comprehensive service delivery in the public health centres in order to improve women's use of the facilities during childbirth as, provision of ambulatory services, minimise critical shortage of health workers, medical resources and equipments.

Previous studies indicated that high mortality can be prevented if public health facilities are well capacitated to handle such direct causes as haemorrhage and hypertensive disorder, which constitutes about 90% of these deaths in most developing countries including Malawi (Hogan *et al.*, 2010). Such direct causes can be diminished or minimised if women are well supported in public health care facilities, which often provides childbirth services to the majority of the women because of the facilities availability and affordability in most developing countries (Teferra *et al.*, 2012; WHO, 2011).

Reports indicated that women's use of the public health care services at the time of childbirth is yet to be offered universally (NSO & OCR Macro, 2005; NSO & ICF Macro, 2011). For instance, the 2000 report highlighted that of the 13,220 women who participated in the survey; about 25 % (3329) used public health facilities for their childbirth. In 2004, about 26% (3094) women of 11, 689 who participated in the survey used public health facility for their childbirth. In 2010, there was a slight increase in women's use of public facility based health facility to 36% (8454) of 23,020 women that participated in the survey. This implies that the numbers of women that are using public health care service facilities during childbirth are below 50%, despite the

effort made by the government of Malawi aimed to improve women's use of the facilities. A study by Geubbels (2006) indicated that women's health in Malawi is still threatened as a result of obstructed or prolonged labour, ruptured uterus, extensive pre-eclampsia, and eclampsia, complicated abortion, sepsis and other cases such as ectopic pregnancies, which can be prevented if women's reliance of the health care facilities was advocated.

Despite efforts made by the government of Malawi in setting up a three tier health system structure, the system continues to experience challenge due to unavailability of essential medical resources to support daily operations of the system. For instance, a study by Leigh *et al.* (2008) highlighted the inadequate basic Emergency and Obstetric care facilities to meet the growing need of women during pregnancy and childbirth. Additionally, other scholars pointed out that this is associated with shortage or delays in getting requisite medical supplies and resources which pose as a great threat towards smooth operation of the health care facility and extensive shortage of skilled health care personnel's within the hierarchy of the health systems (Zere *et al.*, 2007; Muula, 2006a). This contributes not only to low quality of care, but also to substandard maternal health care services. In the long term, this influences women's choice to rely on home-based means for their childbirth (Houwelling *et al.*, 2007). Consequently studies explored at the factors influencing women's use of maternal health care services were either health facility or districts based and their findings cannot be generalised for the entire Malawi (Seljeskog *et al.*, 2006; Kongnyuy *et al.*, 2008). On the same note, other studies focussed much on maternal deaths and are not current (Hoffman *et al.*, 2005; Lema *et al.*, 2005). Therefore based on this background it is imperative to examine factors influencing women's use of public health care facilities during childbirth in Malawi.

5.2.1 Institutional delivery utilization

Improved health care service delivery, whether from a public or private perspective, is the key to the reduction of maternal and child mortality and morbidity in most developing countries, including Malawi (Hogan *et al.*, 2010).

In some sub-Saharan Africa countries, institutional delivery is not being utilized as is expected. For instance, Teferra *et al.* (2012) found out that lack of knowledge about the pregnancy and delivery services among couples in most households, and under-utilization of ANC services for the required visits during the pregnancy gestation period, contributed greatly to low utilization of institutional service delivery among women in Sekela district of Ethiopia. In West Africa,

Olusanya *et al.* (2010) pointed out that non-use of institutional maternal health services in Lagos, Nigeria, was associated with capacity challenge for the facility to provide requisite care due to increased demand of services off-setting available resource, resulted in low utilization of the services among women. It has also been highlighted that if the health system has a capacity to provide optimum quality of care, then women's use of a facility's services increase (Seljeskog *et al.*, 2006). However, despite many efforts targeting at improving maternal health care services in Malawi, the country's maternal health challenge remains one of the highest in the region (WHO, 2014). For instance, the country maternal mortality stood over 400 deaths per 100 000 live births. Borghi *et al.* (2006) indicated that resources meant to support health care operations are insufficient and not only impinge delivery of quality care, but also results in patients lacking confidence in the services which subsequently increases both under-utilization of facilities and worsens the maternal health outcome. Kruk *et al.* (2008) postulated that incentives such as out of pocket money and exceptions on user fee at the facility, both increased women's utilization of a facility during the pregnancy period and improved the health outcome in rural Tanzania. In another aspect, it is observed that proper management of preventive factors among the communities such as finances, physical, institutional and socio-cultural challenges do have the bearing of improving maternal health care service utilization (Matsuoka *et al.*, 2010). However, challenges such as insufficient finance to support service delivery not only affects quality of services (Fillipi *et al.*, 2006), but also places extensive operational pressures on the workers serving as health workers in a constrained environment (Muula *et al.*, 2006b). More specifically, lack of adequate services to meet women's needs for use of maternal health care facilities on issues related to childbirths, faces uncoordinated operational bottlenecks, which is influencing quality of care. For instance, delays in receiving care among women due to operations insufficiency (Barnes-Josiah *et al.*, 1998), results in bottlenecks to support maternal health care services efficiently (Mc Namee *et al.*, (2009). The health care system is challenged to accumulate adequate finances to ensure seamless availability of resources and successive improvement of service quality care (Borghi *et al.*, 2006; Fillipi *et al.*, 2006). However, the succeeding sections provide a detailed review of literature on factors influencing women's use of public health facility during childbirth.

5.2.2 Review of socio-demographic, health care, economic factors and childbirth in public health facility

In sub-Saharan Africa, women's use of facility-based maternal health care services during childbirth has been influenced by numerous socio-demographic, economic and health care factors. For instance, separate studies by Hailu *et al.* (2014) and Onah *et al.* (2006) identified age as a predictor of women's use of public health facilities during childbirth. Further to this, the studies observed and concluded that women aged 15–24 were associated with facility-based childbirth as compared to their counterparts aged 24 or older. It is worthy to note that perceived fear of childbirth among women of first parity contributed greatly on the women's choice to use the service. In Ethiopia, a study by Hailu *et al.* (2014) observed that women aged 35 years or older are less likely to choose facility-based childbirth and this is often attributed to unpleasant experiences acquired at the facilities. In the long term, the older women are motivated to seek an alternative facility for childbirth compared to younger women. Yet, in northern India, maternal age was found to be insignificantly associated with women's use of maternal health care facilities for childbirth. There is dearth literature that explores the relationship between women's maternal age and their use of a maternal health care facility during childbirth, more importantly from a public health care perspective. As such, the anticipation for this present study is to hypothesize the effect of age on women's use of public health care facilities is of paramount importance.

With regards to ANC utilization, it is now common knowledge that women's use of ANC service during their pregnancy support improved maternal health outcome. For instance, Sugathan *et al.* (2001) argued that women's extensive use of ANC services during pregnancy has had an impact to improve their maternal health status and promote facility-based childbirth practice among them in India. However, it is important to highlight that such situation is possible if the health facility conduct ANC services following best practice that in the long term, meet maternal health needs of the women and subsequent motivation to seek institutional based childbirth (Victoria *et al.*, 2012; Brown *et al.*, 2011). Such ANC operational practice improves women's use of maternal health care services (Dhakal *et al.*, 2011). Despite this ANC significance to influence women's choice for facility-based childbirth, their relationship between ANC utilization in line with women choice of public health facilities for childbirth have been scantily documented both in Malawi and beyond. For instance, previous studies failed to provide a link to explain how ANC as factor relates to women's use of childbirth in maternal health care facilities, let alone public health care facilities (Ochako *et al.*, 2011; Raj *et al.*, 2015, Griffiths *et*

al., 2001; Magadi *et al.*, 2000). Therefore, it is significant to provide an account of the relationship between women's use of ANC and its influence on their decision to deliver their babies in public health care facilities over the period between 2000 and 2015 in Malawi. Such results are significant to assist redirecting and promoting management of maternal health care facilities, in general, if the country is to achieve improved maternal health outcome.

In another context, timeliness in the use of care service facility determines the choice of utilization of facility-based delivery or not. For instance, in Kenya a study by Ochako *et al.*, (2011) using 2003 Kenya Demographic and Health Survey data found out that timing of ANC visits was fundamental among women for acquisition of modern care. In the same country, Magadi *et al.* (2000) pointed out that the timely utilization of ANC services provided ample time at which a woman is investigated for any possible maternal health care complications or probable complication that might have been aggravated due to pregnancy condition, a factors which might have translated into improved facility-based childbirth in the long term (Moyer *et al.*, 2014). Likewise, Neupane *et al.* (2012) argued that even though the timing of ANC visit predicts significantly on childbirth delivery in modern maternal health care infrastructures. In Malawi, little is known about the timing of ANC that the women experience and its relationship to their use of public health facility during childbirth. Therefore, the current study examined this relationship.

Regarding the birth order and its influence of women's use of maternal health care service facilities during childbirth, Edmonds *et al.* (2012) used both qualitative and quantitative approach in order to examine factors influencing women choices of childbirth in health care facilities in Bangladesh. Based on Bangladesh position, birth order of the women insignificantly reduced choices of using health facilities during childbirth. On the contrary, in developed countries, a study by Feijen-de Jong *et al.* (2011) argued that women with a multiparous state were associated with increased use of maternal health care services relative to their nulliparous state counterpart. In India, Kesterton *et al.* (2010) study on the institutional delivery in which two waves of Demographic and Health Surveys were employed, 1992 and 1998, the study found that women with birth order of 1 were more likely to use institutional delivery relative to their counterpart with birth order more than 2 (multiparous). Therefore, in as far as birth order is concerned in Malawi, little is known as to how it influenced the behaviour of women in seeking public health care facility services at the time of childbirth. It is therefore imperative to investigate this relationship in order to establish this relationship over time, in Malawi.

In terms of education, studies explored education and its relationship on use maternal health care services around the world, found education as a major predictor influencing women use of maternal health care services. For instance, previous studies indicated that improved maternal education attainment not only provides their socioeconomic gains, but also enhance women understanding on issues associated with reproductive health and significance of seeking health care in modern facilities in Ethiopia (Teferra *et al.*, 2012; Abera *et al.*, 2011), Nigeria (Rai *et al.*, 2012) and Uganda (Tann *et al.*, 2007). Also, it is argued that women without formal education are likelihood to seek improved maternal health care if they are properly engaged on issues related to reproductive health (Gurmesa *et al.*, 2008). This implies that availability and delivery of prerequisite maternal health care education either using formal or informal means has an impetus to improve women's use of maternal health care facility on any issued related to pregnancy and childbirth (Sahoo *et al.*, 2015; Houwelling *et al.*, 2007; Onah *et al.*, 2006). Despite, a wide range of argument in relation to the influence of education on women's use of maternal health facilities, little is been examined in Malawian about the role of women's education to improve use of public health care facilities during childbirth. For instance, the studies that tried to investigate women's use of maternal health care services, did not provide a relationship of education on women's use of public health facility (Sakala *et al.*, 2011) and most of the study were highly institutional based and for selected on district or two, which cannot be generalised for the entire country (Kongnyuy *et al.*, 2008; Seljeskog *et al.*, 2007). As such, it is imperative that the current study to explored the how women education attainment influences their use of public health facilities during childbirth in Malawi.

Women's employment provides them with an opportunity to have disposable income which might influence their health care service access. A study by Gabrysch *et al.* (2009) highlighted that this is only feasible if women are paid and capable to spend their earnings on their own health. Looking at a critical perspective, previous studies argued that women employed in farming sector and are seasonally employed are less likely to use skilled birth care relative to their counterpart employed outside farming sectors (Nowkoby, 1994; Addai, 2000). This is because the farming sector provides limited finances in the form of pay to support women's resource challenge, more importantly in rural settings. In another aspect, more studies over time postulate no association between women occupation status towards their use of facility-based services for childbirth (Chowdhury *et al.*, 2007; Duong *et al.*, 2004; Toan *et al.*, 2002; Elo 1992). Additionally, it is postulated that as women are formally employed their likelihood to deliver using skilled birth increases (Stekenlenburg *et al.*, 2004; Pebley *et al.*, 1996). However, based on the current study, women's earning status and its relationship to their use of public health care

facility for childbirth is inadequately documented. Therefore, it is imperative to examine the earning status of women in the way it affect their choice of childbirth at a public health facility in the country.

In another aspect, community differences in religious affiliation have been associated to affect women's maternal health seeking behaviours around the world. For example, a study found that women belonging to the Muslim faith, a minor ethnic group, were found to be less likely to make to use health facilities for childbirth relative to women belonging to Hindu's in India (Sahoo *et al.*, 2015). Such religious influence is a source of increased number of childbirth in alternative structure other than facility based counterpart in Afghanistan (Azimu *et al.*, 2015). Further to this, it was reported that in Afghanistan, religious beliefs attributed 13.13 times to the likelihood of women's choice of place of delivery (Azimu *et al.*, 2015). In neighbouring Tanzania, it was found that women's choice of the place of birth was not influenced by women religious affiliation. In Ghana, it is reported that religious beliefs have the power to influence and determine birth outcome, a factor which influence women's use of maternal health care (Dako-Gyekye *et al.*, 2013). In Malawi, the association between women religious belief and maternal health care service utilization, more specifically, in public health facility during childbirth had not been extensively documented. Therefore, the study's position to investigate the influence of religion on women's use of public health facility services in the country cannot be overstated. This is to assist in understanding the impact of religion on health care utilization and formulation of subsequent religious based programme interventions aimed in as far as maternal health care services is concerned in Malawi.

The differentials in standard of living among the people have been associated with differences in quality of care to be sought when needed. Campbell *et al.* (2009) pointed out that the societal economic status variations disadvantage the poor when they need to access some basic health care services. This, in the long term, create an imbalance to the extent of care that they sought which have a subsequent impact on status of their health (Sharan *et al.*, 2010). In another aspect, Fillipi *et al.* (2006) and Gabrysch *et al.* (2009) hinted that due to economic challenges among many people in the society, it transcends into communities to go for minimal substandard health care choices, among them maternal health care choices, which in the long term is disadvantageous to them. As such, the challenges of economic stability among communities is being viewed as a catalyst retarding advocacy to improve accessibility, availability and affordability of health care services including maternal health, which result in people still preferring home-based health care services despite call to use facility-based care among the

people (Anwar *et al.*, 2008; Koblinsky *et al.*, 2006). On the same aspect, as early as 1971, Hart (1971) postulated a law of inverse care which postulated that as the household become wealthier, their likelihood to seek modern care improves and the households gain in health care dividend become so apparent. In the past years, studies on health care dividends have augmented the societies that are impoverished and marginalised economically have had worst case challenges to acquire health care services such as modern contraceptive (Palamuleni, 2011) and access improved maternal health care services more specifically in public health facilities (McNamee *et al.*, 2009; Kiwanuka *et al.*, 2008). Therefore, the current study seeks to hypothesise in order to understand how standard of living relates to women choice of childbirth in public health care facilities overtime.

For instance, Gabrysch *et al.* (2011) indicated that women that are predominantly rural based do have lower utilization rate on health care system due to distance barriers to the health care facilities. Such a situation has resulted in women not willing to travel long distances from the rural and remotest areas, the development which result in utilization apathy (Gabrysch & Campbell, 2009). In Zambia, Hjortsberg *et al.* (2002) pointed out that such geographical challenges, coupled with distance to access health care facility, resulted in only 17% of the medical clientele residing outside the perimeter of 40 kilometres from the health care facilities experience great challenges in accessing health care facilities, let alone maternal health care services facilities, relative over 50% of their counterpart having an easier access and were residing within five kilometres around the health care facility perimeters. In Mali, Fournier *et al.* (2009) study on the improved access to comprehensive emergency obstetric care indicated that financial restraints and geographic barriers derail effective delivery of maternal health care services in the country. Therefore, based on this background, the study aspires to understand how distance to the health facility impacts women's use of institutional based childbirth.

Perry *et al.* (2000) posited that health care services are not highly accessible in most developing countries including Bolivia due to topological challenges, cost of delivery care and availability of time consuming and inefficient transport network which translate into delays in services delivered using such network. The study further found out that effective leveraging of barriers such as transport availability to access modern care, community cost sharing schemes has had a substantial impact in improving not only maternal health care service utilization among women during and after pregnancy gestation, but also improved maternal child mortality and morbidity public health challenges in the country. In a related study, it was argued that transport cost to the health facility affected timely decision among women to access skilled birth delivery services in

Tanzania (Kruk *et al.*, 2008). Furthermore, the study pointed out that those women that persevered and managed to deliver within the health care facility was partly due to borrowed money or following selling of household asset in order to acquire skilled birth. In Malawi, it was also noted that transport challenge affected the rural women in their desire to deliver in health care facilities (Seljeskog *et al.*, 2007). As such it is important to investigate if such a situation of transport challenge was a nation-wide problem and was consistent between the period 2000 and 2010. It is because of this background that the study's hypothesis of transport and its influence on women's use of public health care facilities is important.

Earlier in related literature, Boller *et al.* (2003) indicated that the quality of ANC services when coupled with expanded availability of requisite resourced services, not only promoted confidence among the clientele, but also remained the pillar that substantiated facility-based delivery among women in the long term. This can be effectively adhered to if the entire health systems, namely primary secondary and tertiary health care facilities, are seamlessly linked to provide robust quality maternal health care services from either government to government health care facility or private to private health care facilities (Parkhurst *et al.*, 2005; Mokhondo *et al.*, 2002). It is an undeniable fact that quality of care predicts women health outcome. Yet in Tanzania, it is observed that quality of care had no significant relation towards skilled birth delivery (Lwelamira *et al.*, 2012). The aim of the study is to explore the contribution of quality of care on women's use of public health care facilities during childbirth. It is important to constantly review how quality of care is associated with women's use of maternal health care facilities during childbirth, more importantly on using public health care facilities.

Place of residence has been augmented to be associated with women's use of maternal health care service utilization in sub-Saharan Africa. Despite such challenges as distance, women in the rural areas have been exposed to receive low quality of care due to operational bottlenecks associated with the public health care services in rural areas. A study by Makeri (2001) argued that difference in such rural and urban structures result in rural areas being intertwined with shortage of health care resources; personnel, untimely availability of medical resources and supplies, which subsequently result in low quality of care and promotion of non-institutional based childbirth in Nigeria. In Namibia, further study by Low *et al.* (2001) highlighted that the rural/urban differentials in availability of resources contribute highly on the countries inequalities related to quality of delivered maternal health care in a public health care settings. Therefore, it is imperative to study the effect of place of residence and its influence on women utilization of public health care service during childbirth in Malawi.

Availability of services within the health care facility context defines the existence of the services to the clientele/patients at the point of need regardless of affordability, physical accessibility and timeliness of operational services (Gulliford *et al.*, 2002). Inadequate quality of care has been associated in women getting unsatisfactory services, a factor which increased women's use of non-skilled health personnel in Tanzania (Mpembeni *et al.*, 2007). On the contrary, it is observed that availability of service within the rural setting was associated with increased odds of women's use of skilled birth delivery in Asia (Mayhew *et al.*, 2008). In Malawi, Muula *et al.* (2006 b) argued that high level of health workers' migration due to unsatisfactory work environment, contributed negatively towards availability of health services which include maternal health care facilities. According to Kerber *et al.* (2007), such unavailability of requisite maternal health facilities contribute negatively towards attainment of continuum of care and women's successive use of the maternal health care facilities. As such, due to dearth literature, to investigate the role of availability of health services on women's use of public health facility service utilization in Malawi is important. This is because more documented research is required about availability and utilization of health services in order to assist in solving the maternal public health challenge in the country.

In another context, access to media among women over the years has had an impact in increasing utilization of maternal health care services. For instance, Acharya *et al.* (2015) recently argued that extensive exposure of the women to mass media such as radio and televisions had an impetus of increasing the likelihood of women's use of maternal health care institutions in all cases associated with pregnancy and childbirth. In supporting this theory, Ghosh *et al.* (2006) earlier observed that use of information technology had a significant impact in promoting use of maternal health care service other than use and reliance of traditional media alone. Mekonnen *et al.* (2015) highlighted that women highly exposed to reproductive health information through media are well informed and do engage the health care institutions in a timely manner more than their counterparts with low media exposure. As such the continued understanding of different changing roles that the media have in promoting health care utilization is of paramount importance.

Therefore, based on this literature review, a "Three delay" model was suggested to assist in conceptualising the study.

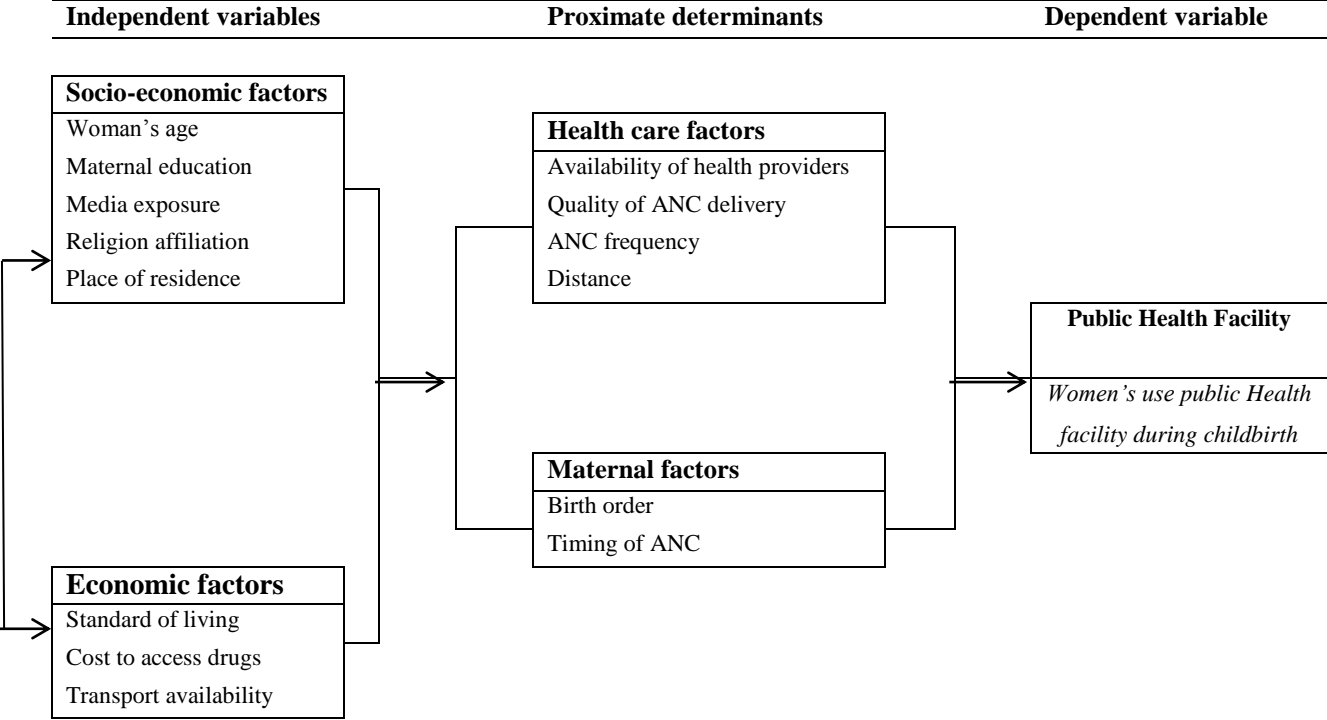
5.2.3 Theoretical framework

In order to have a comprehensive approach to investigate socio-demographic and care factors associated with institutional childbirth deliveries in Malawi, the Three Delays framework is used to explore such relationship. The Three Delay model was first proposed by Thaddeus *et al.*, (1994). It indicates principle delays associated with maternal health service utilization as follows: delays in recognising maternal morbidity situation and urgency to seek health care solution; delays in making a decision to reach and access an appropriate health care facility(s); and delays in acquisition of appropriate maternal health care treatment due to supply-side bottlenecks in the supply-side from the operational perspective of either deterministic or stochastic health systems (Barnes-Josiah *et al.*, 1998).

As such, the Three Delays model is contextualized in this chapter to provide an understanding of different socio-demographic, economic, and care delivery factors influencing utilization of public health care institutional-based childbirth delivery choices in Malawi. This theory has been applied and adopted extensively in the medical and psychological sciences to understudy various determinants affecting health care service utilization in the scholarly sphere (Barnes-Josiah *et al.*, 1998; Van Houtven *et al.*, 2004; Ahmed *et al.*, 2010). However, the application and adoption of the theory in social science research in order to re-establish correlates of health care facilities utilization among women during childbirth has not been widely contested among the social scientists more importantly from developing countries like Malawi.

5.2.4 Conceptual framework and hypothesis

Figure 5.1 illustrates the conceptual framework relating to socio-demographic, economic and health care factors to women’s use of public health facility during childbirth.



SOURCE: Researchers’ own Formulation

Figure 5.1 Illustrates a Conceptual framework showing relationship between factors influencing women use of public health care facilities during childbirth

This framework was formulated based on the researcher’s own design after reviewing the literature on factors influencing women’s use of childbirth in public health care facilities in Malawi. The framework is based on a modified “*Three Delays Theory*” adopted from Barnes-Josiah *et al.* (1998) described in section 5.2.3 above.

5.3 Methods

5.3.1 Data

As indicated above in chapter 3.4.2 the study used Malawi Demographic and Health Survey for the year 2000, 2004 and 2010.

5.3.2 Sample Size

As the study sample was drawn from women who were reported to have had a child in the 5 years preceding the survey as in the preceding chapter, in this chapter the focus was emphasized on women place of residence. In this case, women were asked to explain the place that they used to deliver their babies in the last five years preceding the survey. As such women responded by indicating that they gave birth in “*respondents home, other home, government hospital, government health centre, government health post, other public, private hospital/clinic, traditional birth attendant, mission hospital and mission health centre*”. Therefore, based on these responses, women who indicated that they delivered their babies in any public health care facility were identified as the study sample population. As such, there were 3329 women representing 25% of 13,220 sampled women in 2000, 3094 women representing 26% of 11,689 women in 2004 and 8454 women representing 36% of 23,020 sampled women in 2010 (NSO & Macro, 2001; NSO & ORC Macro, 2005; NSO & ICF Macro, 2011). The flowchart provides more details.

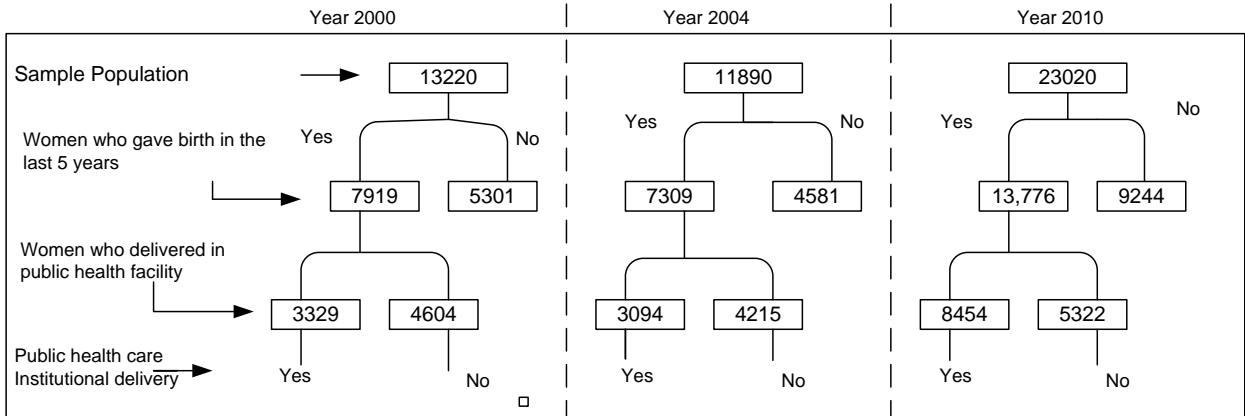


Figure 5.2 illustrates the selection criteria used to identify that delivered in public health facilities in year 2000, 2004 and 2010

Based on this, about 42.03%, 42.33% and 61.4% of the women delivered in public health care facilities in years 2000, 2004 and 2010 respectively.

5.3.3 Analytical strategy

5.3.3.1 Univariate and bivariate

The study employs a univariate analysis to describe characteristics of the births of the children whose mothers participated in the survey and were asked about the type of place where the woman delivered for the *last birth*, *next-to last birth* and *second-to last birth*, that is, parity audit for previous births that the woman had prior to the survey. The percentages were used to represent the descriptive results using tables and charts. Furthermore, a Pearson's correlation coefficient was used to measure the degree of association between the dependent variable and each independent variable at a significance level of $p < 0.05$.

Equation 5.1 illustrates the product moment correlation coefficient that was computed using Analysis of Moment Structure (AMOS), where path analysis were computed firstly, from individual and household and then secondly, from a community perspective.

$$\tau = \frac{n \sum x_i y_i - \sum x_i \cdot \sum y_i}{\sqrt{(\sum x^2 - (\bar{x})^2)(\sum y^2 - (\bar{y})^2)}} \dots\dots\dots(5.1)$$

Where τ is the product moment correlation coefficient computed to denote the association between the dependent variable, public health care childbirth delivery¹ $y_{(i=1)}$ if the child was born by a woman at a public health care facility and $y_{(i=0)}$ for otherwise. Furthermore, x_i is a child's i whose mothers indicated to have an attribute x as an explanatory variable, and n is the number of cases under observation.

5.3.3.2 Multivariate analysis

In order to investigate the determinants associated with public health care facility childbirth choices, the study employs two multivariate techniques. Firstly, a multivariate logistic regression techniques as a preamble where sociodemographic, economic and health care factors are used to estimate the odd ratio associated with woman's choice of public health care facility in childbirth in Malawi for the year 2000, 2004 and 2010, represented as separate year models. In this aspect

¹ **Public health facility** - entails fully subsidised state funded health care facilities that are non-profit oriented in

both within and between year analyses was used to attest factors commonly associated with public health care facilities childbirth choices in Malawi (See equation 5.2).

$$\log(Odds) = \ln \left[\frac{\lambda_i}{1-\lambda_i} \right] = \sum_{i=1}^{i=k} \beta_i x_i \dots\dots\dots (5.2)$$

Where, firstly, λ_i is the probability that the woman delivered at the public health care facility that is $y = 1$ in which the woman delivered at the public health facility. Secondly, $1 - \lambda_i$ is the probability that the woman delivered at other place other than the public health facility. Thirdly, x represents vectors of explanatory variable i through k and β_i represents a corresponding vector of parameter coefficients associated with explanatory vector x , which, in this case, β denotes an odds ratio. This analysis firstly used STATA 13.0 as statistical software and tested the study hypotheses at a p-value less than 0.01. Secondly, a decomposition technique was employed. (See chapter 3 for detailed algorithm explaining the methodology). Thirdly, a path analysis was used to explain the structural relationship of the independent variables on women’s use of public health facilities for childbirth.

5.3.4 Variables definition and measure

5.3.4.1 Dependent variable

In the multivariate logistic regression model, public health care facility childbirth was used as a dependent variable. This was defined and coded as “Yes” (1) if the a woman gave birth in any public health care facility such as government hospitals, health centres, health posts and other public health facilities and “No” (0) for otherwise. In the dataset women were asked where they gave birth to the children for their previous last parity births, “*Where did you give birth to (Name the type of health facility)*” (See NSO & Macro, 2001, appendix E question 426; 427 and 436; NSO & OCR Macro, 2005, NSO& ICF, 2011). Studies that have explored the use of institutional facilities among women did combine their definition context of place of delivery as either private or public health care facilities (Kesterton *et al.*, 2010; Navaneetham *et al.*, 2002). This study therefore aspired to understand factors associated with institutional birth delivery from the perspective of a public health care facility.

Additionally, the following explanatory variables were used; antenatal care visiting frequency, timing of ANC, birth order, women's education attainment, religious affiliation, earning status, distance to health care facility, transport availability to health facility, exposure to media, cost of medical resources, standard of living, quality of care delivery, place of residence, availability of health workers and community awareness on reproductive health information's existence.

5.4 Results

5.4.1 Univariate Background Characteristics

Table 5.1 presents descriptive statistics of the background characteristics of the women that delivered their babies in public health care facilities in Malawi over the year 2000, 2004 and 2010 in Malawi.

The univariate results indicate that women who reported their place of delivery for their babies were 7919 in 2000, 7309 in 2004 and 13 776 in 2010. The univariate results indicate that in 2000, about 7919 women reported their place of delivery for their babies, 7309 women in 2004 and 13 776 women in 2010. As is illustrated in Table 5.1, that 56.2% of the women had at least four ANC visits in 2000. In 2004, about 58% had at least four ANC visits and slightly less to 44.2% in 2010. This implies that the majority of the women had less than four ANC visits. In terms of timing of ANC visits, the study found that the majority of women delayed in seeking antenatal care services after conception and was a common practice in Malawi. As is indicated, about 48.4% of the women started ANC visitation between 4-5 months after conception in 2000. On the same note, in 2004 and 2010, about 47.3% and 47.9% started ANC visitation seeking maternal health care services between 4-5 months after conception in the country. The study also observed that the majority of women delay to start seeking ANC services at an average of six months or higher after conception. Based on the study findings, these were represented by 41% in 2000, 44.2% in 2004 and 39% in 2010.

In terms of the birth order, women that had a birth order of 1 were 22.4% in 2000, 24.8% in 2004 and 17.5 % in 2010. However, with an exception of year 2004, it was observed that women of birth order 6 or higher were 31.4 % in year 2000 and 32.8% in 2010. Furthermore, it was observed that majority of these women had reached at most primary school education level. These were represented by 62.7% in 2000, 63.3% in 2004 and 68.6% in 2010. Further to this, women who managed to reach secondary education or higher represented about 8.7% in 2010,

11.3% in 2004 and 15.2% in 2010. This means that by education status, the proportion of women that chose to give birth in public health care facilities were relatively minimal compared to their counterpart who attained education below secondary school level. It was also found that most women were affiliated to Protestants religious beliefs. This was represented by 61.9% in 2000, 60.6% in 2004 and 65.4% in 2010. Considering women's employment status, it was observed that the majority of the women were seasonally employed and represented about 43.5% in 2000, 41.6% in 2004 and 52.4% in 2010.

In terms of distance to access health care facilities, about 56.1% of the women indicated to have a problem to distance in 2000 and also 59.7% in 2010. On the contrary, the women that had no problems with transport to access health care facilities represented 48.4% in 2000, 57.9% in 2004 and 42.6% in 2010. Similarly, concerns of drugs, about 55.1% of the women had problems in accessing drugs in 2000 and 53.7% in 2010.

In terms of exposure to media, it was observed that the majority of the women had either a radio or a television. These represented 55.2% in 2000, 61.3% in 2004 and 49.6% in 2010. On the same note, it was found that very few women were from the households having both a radio and a television. Regarding standard of living, it was observed high percentage of women was from the poor households and stood at 62.1% in 2000, 41.3% in 2004 and 43.6% in 2010. In 2004 and 2010, women from the middle income households represented the majority of those that delivered in public health care facilities and they were about 43.1% and 41.7% respectively.

At community level, the quality of care delivery in public health care facilities was, on average, found to be above moderate. For instance, women that indicated to have received inadequate care during prenatal care services were 45.3% in 2000, 34.7% in 2004 and 43.3% in 2010. The study found that the majority of the women were predominantly rural and represented about 81.4% in 2000, 82.8% in 2004 and 89.5% in 2010. However, it was observed that 87.6% of the women had problems with accessing community health workers in 2000, 85.32% in 2004 and about 52.9% in 2010. In as far as community awareness of health information existence was concerned, it was observed that women reported to have adequate awareness regarding health information associated with maternal health on the radio programmes represented 22.9% in 2000, 26.6% in 2004 and 28.5% in 2010. Table 5.1 above provides detail of the descriptive statistics of the background characteristics of the women's respondents for the year 2000, 2004 and 2010.

Table 5.1 Background characteristics of the respondents related to public health care childbirth for the year 2000,2004 and 2010

Public Health Facility delivery	2000		2004		2010	
	N (%)		N (%)		N (%)	
	7919	100	7309	100	13776	100
ANC visits						
<4 times	3472	43.8	3068	42	7690	55.8
>= 4 times	4447	56.2	4241	58	6086	44.2
Timing of ANC						
1-3 months	839	10.6	622	8.5	1,802	13.1
4-5 months	3833	48.4	3458.6	47.3	6,595	47.9
6 months or higher	3248	41	3228.4	44.2	5,379	39
Birth Order						
1	1775	22.4	1810	24.8	2416	17.5
2	1504	19	1712	23.4	2526	18.3
3	1244	15.7	1261	17.3	2335	17
4	906	11.4	951	13	1985	14.4
5+	2490	31.4	1575	21.6	4514	32.8
Maternal education						
No education	2262	28.6	1854	25.4	2228	16.2
Primary	4966	62.7	4629	63.3	9450	68.6
Secondary and Higher	691	8.7	826	11.3	2098	15.2
Religious Affiliation						
Catholics	1394	17.6	1586	21.7	2590	18.8
Protestants	4902	61.9	4429	60.6	9010	65.4
Muslims	1481	18.7	1243	17	1929	14
Others	143	1.8	51	0.7	248	1.8
Women earnings						
Not employed	2919	36.9	1141	15.6	3205	23.3
All seasonal	1571	19.8	3128	42.8	3357	24.4
Seasonal	3429	43.5	3040	41.6	7214	52.4
Concerns no Distance						
Problems	4441	56.1	2717	37.2	8229	59.7
Not a problem	3478	43.9	4592	62.8	5547	40.3
Concerns no Transport						
Problems	4086	51.6	3075	42.1	7908	57.4
Not a problem	3833	48.4	4234	57.9	5868	42.6
Concerns no drugs						
Problem	4364	55.1	2637	36.1	7399	53.7
Not a problem	3555	44.9	4672	63.9	6377	46.3
Media exposure						
Neither radio nor television	3170	40	2443	33.4	5881	42.7
Either radio or television	4370	55.2	4477	61.3	6831	49.6

Radio and television	379	4.8	389	5.3	1064	7.7
Standard of living						
Poor	4920	62.1	3017	41.3	6001	43.6
Middle	2631	33.2	3152	43.1	5739	41.7
Rich	368	4.7	1140	15.6	2036	14.8
Quality of care						
Inadequate	266	3.4	2821	38.6	179	1.3
Moderate	4065	51.3	1952	26.7	7627	55.4
Adequate	3588	45.3	2536	34.7	5970	43.3
Place of residence						
			0			
Urban	247	3.1	138	1	221	1.6
Semi-urban	1227	15.5	1121	15.3	1233	9
Rural	6445	81.4	6050	82.8	12322	89.5
Availability of health care providers						
			0			
Problems	981	12.4	6387	87.4	6483	47.1
not a problem	6938	87.6	922	12.6	7293	52.9
Community awareness to health information						
Inadequate	2917	36.84	2575	35.23	5014	36.4
Moderate	3186	40.23	2798	38.28	3926	28.5
Adequate	1816	22.93	1936	26.49	4836	35.1

5.4.1.1 Bivariate results

As is illustrated in Table 5.2 below, the study established that a number of explanatory variables were highly statistically significant in its association with women's use of public health care service facilities during childbirth in Malawi. However, in year 2004, availability of health care providers and quality of care at community level were insignificantly related. In year 2010, the study found that earning status of the women was associated insignificantly with women use of public health care facilities during childbirth in the country. Therefore, based on the bivariate association between independents variables to the outcome variable, the country's public health care services delivery choices is significantly influenced by numerous factors. Table 5.2 provides detailed information.

Table 5.2 Bivariate analysis results of the women explanatory variables in relation to their use or non-use of public health care facilities during childbirth

Variables	Women usage status of public health care facility								
	2000		2004			2010			
	No	Yes	Chi-sq	No	Yes	Chi-sq	No	Yes	Chi-sq
	4604	3329		4215	3 094		5322	8454	
Antenatal Care visits	%	%		%	%		%	%	
<4	47.57	39.02		46.6	35.68		59.09	53.76	
>= 4 times	52.43	60.98	57.3***	53.4	64.32	87.3***	40.91	46.24	37.7**
Timing of ANC									
1–3 Month	6.19	7.54		7	8.37		10.97	14.41	
4–5 Months	68.33	76.78	111.18***	69.99	76.44	70.6***	71.2	74.19	130**
6 months and higher	25.48	15.68		23.01	15.19		17.83	11.4	
Maternal age									
15—24	39.14	41.36		38.39	42.99		30.48	35.62	
25—34	39.83	40.55	11.08**	40.78	40.76	29.1***	46.56	45.28	50.4**
35+	21.03	18.08		20.83	16.26		22.96	19.1	
Birth order									
1	20.55	24.87		17.6	23.53		13.77	19.91	
2	18.46	19.8		18.77	21.14		17.02	19.16	
3	15.62	15.86		16.63	15.84	64.5***	17.08	16.87	133.9*
4	11.77	10.96		13.57	12.86		14.84	14.14	
5+	33.6	28.51	35.08***	33.43	26.63		37.28	29.93	
Women									
No education	32.8	22.77		29.51	19.72		19.99	13.77	
Primar	60.95	65.09	149.8***	62.28	64.77	153.5**	68.83	68.45	171.3*
Secondary and Higher	6.26	12.14		8.21	15.51		11.18	17.78	
Women earning status									
Not employed	34.8	39.77		36.25	38.53		21.31	24.5	
All seasonal	19.31	20.52		14.73	16.81		23.45	24.95	31.3
Season	40.2	33.82	35.5***	44.82	40.05	17.01**	46.2	42.04	
Occasional	5.69	5.89		4.2	4.62		9.04	8.52	
Religious affiliations									
Catholi	21.16	22.08		20.97	21.82		18.83	19.01	
Protestants	61.56	62.36	6.82**	60.24	61.09	6.5*	66.54	69.07	27.4**
Muslims	15.55	14.39		17.34	16.19		13.34	11.21	
Other	1.74	1.17		1.45	0.9				
Standard of									
Poor	64.29	59.27	46.7***	45.79	35.13		49.59	39.77	179.69
Middle	32.32	34.39		43.63	42.44	210***	39.76	42.86	
Rich	3.39	6.34		10.58	22.43		10.65	17.38	
Distan									
Proble	61.84	48.24	145.11***	31.03	45.54	160.7**	64.9	56.48	96.2**
Not a problem	38.16	51.76		68.97	54.46		35.1	43.52	
Trans									
Proble	57.04	44.16	128.4***	35.99	50.36		62.57	54.15	94.7**
Not a problem	42.96	55.84		64.01	49.64	151.07*	37.43	45.85	
Media exposure									
Neither radio nor television	43.51	35.24		35.54	30.54		44.74	41.4	
Either radio or television	52.52	58.85	62.2***	60.66	62.06	57.5***	48.99	49.96	32.7**
Radio and television	3.97	5.92		3.8	7.4		6.28	8.63	
Cost to access service									
Proble	59.4	49.14	82.1***	31.06	42.92		57.99	51.02	53.7**
Not a problem	40.6	50.86		68.94	57.08	186***	42.01	48.98	
Quality of care									
Inadequate	5.73	0.42		4.65	0.45		3.08	0.18	
Moderate	51.04	51.58	162***	55.11	55.04	117.15	55.43	55.32	218.8*
Adequate	43.22	48		40.24	44.51		41.49	44.5	
Place of									
Urban	2.58	3.84		1.8	2.36		1.52	1.66	
Semi-urban	9.21	24.21		4.44	16.13	292***	3.59	12.33	
Rural	88.21	71.94	353.09***	93.76	81.51		94.89	86.02	307.2*
Availability of health care providers									

not Problems	14.01	10.24		85.41	86.75	2.65	49.27	45.67	
	85.99	89.76	25.1***	14.59	13.25		50.73	54.33	16.7**
Community awareness to health information									
Inadequate	41.05	31.03		38.36	30.96		40.91	33.56	
Moderate	39.25	41.51		38.32	38.24		26.98	29.45	77.6**
Adequate	19.7	27.46	57.17***	23.32	30.8	64.4***	32.11	36.99	
N	7933			7309			13776		

***p<0.001; ** p<0.05; *p<0.1

5.4.2 Multivariate Logistic Regression and Percentage Contribution Associated Institutional Childbirth Delivery in Malawi.

Table 5.3 illustrates the multivariate logistic regression output, concentration index and relative contribution associated with childbirth delivery at public health care facilities in Malawi. As it has been found, children from mothers aged 25 years and younger were consistently and more likely to utilize public health care facility across the years OR = 9.16 (2000), OR = 6.73 (2004) and OR = 6.72 (2010). On the same, even though births from women aged 20–34 were consistently and more likely occurred in public health care facilities between the year 2000, 2004 and 2010, the corresponding and respective odds ratio of OR = 3.11, OR = 3.25 and OR = 3.38 relative to the reference category aged 35 or higher, these odds ratios were almost half in value compared to those children from mother aged 25 years and younger. However, between the years, it was found that age had a higher contribution in 2000 (Contribution = 52.9%) and lower in 2004 (Contribution = 29.9%) and almost a quarter in 2010 (Contribution = 24.7%).

Regarding the birth order, the multivariate logistic outcome shows a consistency and increases in the odds of children delivered in public health care facility per every unit increase in the women's birth order across the entire period of study. As Table 5.2 illustrates, children born in 2010 had a slightly lower yet increased odds as compared to year 2004 and 2000 counterpart. Decomposed outcome indicates that birth order contribution was ranked lowly in 2004 (Contribution = -48.7 %), and highly in 2010 (Contribution = 18.9%). Likewise, it is worthy to note that children from mothers having two other living children at their households were two times more likely and significantly found to be delivered from the public health care facilities relative to those children from mothers having at least six children within their household. Therefore, from the contribution perspective, it was found that children born in 2004 contributed the most (Contribution = 33.8%), as compared to their counterpart from year 2000 (Contribution = 12.7%) and 2010 (Contribution = 15.3%). With regards to health care service factors, it was found that adequate quality of ANC administered greatly increase at a decreasing rate and significantly at $p = 0.001$ the likelihood of the children born in the public health care facilities

between the years with an OR = 5.97 contribution of 83.7% in 2000, OR = 3.66 contribution of 57.2% in 2004 and OR = 3.62 contribution of 7.7% in 2010 relative to their children whose mothers were inadequately received quality of ANC services.

Table 5. 3 Multivariate logistic regression results, concentration index and percentage contribution associated with women use of public health facility use during childbirth

Variables	Women choice of childbirth in Public Health facility								
	2000			2004			2010		
	OR	CI	%C	OR	CI	%C	OR	CI	%C
Antenatal care visits									
<4 times ®			0.41			0.52			0.16
>= 4 times	0.99	-0.3	0.41	1.18**	-0.37	0.52	0.94***	-0.344	0.16
Timing of ANC			6.66			31.51			2.81
1-3 months ®									
4-5 months	0.52**	-0.47	7.41	0.507***	-0.52	15.06	0.43***	-0.426	1.88
6 months and higher	0.27**	0.010	-0.75	0.303***	-0.94	16.44	0.21***	0.043	0.93
Maternal age			52.85			29.88			24.7
15-24®									
25-34	9.16**	-0.1	22.33	6.73***	-0.1	10.61	6.72***	-0.087	16.43
35+	3.11**	-0.38	30.52	3.25***	-0.37	19.27	3.38***	-0.395	8.27
Birth order			2.2			-48.73			18.89
1 ®									
2	1.06***	0.00	-0.05	0.97***	0	0.01	0.99	-0.001	1.58
3	1.81***	0.01	-0.16	1.46***	0.1	-1.57	1.38***	-0.003	2.21
4	2.94***	0.01	-0.22	2.17***	0.22	-4.83	2.05***	-0.004	3.27
5	4.27***	0.02	-1.22	3.01***	0.37	-11.52	2.63***	0.009	4.2
6+	7.54***	-0.04	3.85	5.19***	0.57	-30.82	4.78***	0.011	7.63
Women education			-0.84			-0.51			3.11
No education ®									
Primary	0.42**	0.60	-0.36	0.43***	0.129	-0.26	0.51***	0.123	1.32
Secondary and	0.59**	0.09	-0.48	0.61***	0.086	-0.25	0.69***	0.052	1.79
Women earning status			-1.26			-1.05			5.41
Not employed ®									
All seasonal	0.76***	0.01	-0.14	0.76***	-0.005	0.07	0.62***	0.001	1.63
Seasonal	0.89***	0.00	-0.05	0.82***	0.003	-0.05	0.77***	0.004	2.02
Occasional	0.71***	0.05	-1.07	0.89***	0.065	-1.07	0.67	0.099	1.76
Religious affiliations			-3.7			0.04			1.16
Other®									
Catholics	0.19***	0.01	-0.02	0.26**	-0.008	0.02	0.25***	-0.007	0.38
Protestants	0.20***	0.19	-0.65	0.26**	-0.001	0	0.25***	0.001	0.37
Muslims	0.20***	0.87	-3.03	0.28**	-0.006	0.02	0.27***	-0.006	0.41
Living number of children 1			12.67			33.77			15.24
6+ ®									
1	1.97***	-0.01	0.36	1.62***	-0.04	0.91	1.54***	-0.011	3.17
2	2.48***	-0.04	2.1	2.07***	-0.17	4.77	2.19***	-0.037	4.52
3	1.75***	-0.07	2.64	1.53***	-0.34	7.21	1.57***	-0.067	3.24
4	1.34***	-0.09	2.6	1.21***	-0.54	8.91	1.12**	-0.078	2.32
5	1.03***	-0.21	4.97	0.99***	-0.88	11.97	0.96	-0.204	1.99
Distance			-0.44			-1.01			2.41
Problems ®									
Not a problem	0.94	0.05	-0.44	0.76***	0.101	-1.01	1.11***	0.109	2.41
Transport			-0.47			-1.14			2.66
Problems ®									
Not a problem	0.90**	0.05	-0.47	0.92	0.101	-1.14	1.19	0.119	2.66
Media exposure			0.03			0.05			3.41
Radio and Television ®									
Neither radio nor television	0.92***	0.01	-0.03	0.85***	0.01	-0.13	0.95***	0.033	1.92
Either radio or television	0.72***	-0.01	0.06	0.673***	-0.018	0.18	0.73***	0.013	1.49
Cost to access service			-0.44			-1.12			2.14
Problem ®									
Not a problem	0.89**	0.05	-0.44	0.84	0.098	-1.12	1	0.086	2.14

Quality of care			83.73			57.21			7.67
Inadequate®									
Adequate	5.97***	-0.63	83.73	3.66***	-0.55	57.21	3.62***	-0.545	7.67
Place of residence			0.64			1.49			3.11
Rural®									
Urban	0.58***	-0.04	0.64	0.51***	-0.076	1.49	0.53***	-0.109	3.11
Availability of health care providers			-0.03			-0.03			2.47
Problems®									
Not a problem	0.82	0.01	-0.03	1.11	0.009	-0.03	0.85	0.019	2.47
Awareness to health information									4.64
Inadequate ®									
Moderate	0.82**	0.02	-0.2	0.66***	0.033	-0.15	0.66***	0.034	2.2
Adequate	0.85**	0.01	-0.98	0.8***	0.13	-0.71	0.73***	0.094	2.44

Hint: ***p < 0.001; ** p < 0.05; * p < 0.1 CI is concentration Index; OR is Odds Ratio and %C is percentage contribution

On the contrary, based on Malawi context, children from women that had more than four visits were found to be marginally less likely to make their childbirth decisions in public health facilities in 2000 with an OR = 0.99, more likely to be delivered in public health care facility with an OR = 1.18 in 2004 and less likely OR = 0.94 in 2010 as compared to children from mothers that had less than four visits during their gestation period. With regard to the time at which women start visiting the health facility during their pregnancy, it was found that mothers who started visiting the ANC care for maternal assistance between 4–6 months were less likely to deliver their children in public health care facilities and this trend further decreased among children whose mothers started visiting for ANC s care services after the seventh month or higher of their pregnancy than their counterpart who started ANC visitation as earlier as three months and less. On the same aspect, it was found that the year 2004 had the highest contribution in comparison to the other years.

Regarding transport availability to support child delivery within the health care facility, it was found that in year 2010 availability and accessibility of transport among women contributed to increase the odds of children being born in the health care facilities relative to the mothers that reported to have problems in accessing the transport during childbirth period. Additionally, it was found that in the years 2000 and 2001, mothers having no transport access challenges had a negative contribution of -0.47% and -1.14% respectively. Likewise, with regarding to cost associated with accessing drugs and its relationship to childbirth institutional delivery, mothers that indicated to have challenges in cost were found to have no significant impact affecting choice of facility for childbirth delivery in Malawi.

Considering distance to accessing public health facility, the results found that as much as distance is less likely to contribute to decreased use of public health care services in the year 2000 (OR = 0.94, Contribution = -0.44%) and 2004 (OR = 0.76, Contribution = -1.01%), it was

slightly not a challenge in 2010 (OR = 1.11, Contribution = 2.41%). Similarly, availability of female health personnel still have some challenges in not encouraging women utilization of public health care services in Malawi between the year 2000 and 2010. This was observed in a consistent yet significant less likelihood odds of 0.89 ($p = 0.001$) and 0.85 ($p=0.001$) respectively. On the contrary, it was found that in 2004 women who indicated to have no challenge with female health care providers were more likely and significantly increased the odds of having their children been delivered through public health care facilities (OR = 1.11, $p = 0.001$) relative to those that children from women that indicated to have some problem with public health care facilities operating with problems of having no adequate female health providers. However, even though this has been the case, the year 2000 and 2004 was found to have an inverse yet negligibly contribution of -0.03% each whereas having a contribution of 2.5% in 2010, while having less likely odds in that year.

Furthermore, it was observed that religious beliefs of the households do affect their childbirth delivery choices in Malawi. For instance, it was found that across the years of study, there has been a low likelihood of the children being delivered within the public health care facilities from women of Catholic, Protestant and Muslims religious belief as compared to those with other religious affiliation. In addition, in terms of the level of contribution, it was found that women year 2000 and 2004 had an inverse contribution of -3.68% and -2.04% respectively whereas in 2010, this level of contribution was slightly about 1.17%. Regarding maternal education status, it was found that children from women having primary education were less likely to delivered in the public health care facility as compared to those with secondary education or higher over the year 2000, 2004 and 2010. This was observed in the odds ratios of 0.58 $p < 0.001$, 0.52 $p < 0.001$ and 0.53 $p < 0.001$ noted over the study period respectively.

In as far as place of residence in relation to child delivery in public health care services was concerned, children whose mothers were urban based in 2000 and 2004 were less likely to deliver their children in public health care facilities relative to their rural counterpart. Additionally, it was found that children from women that were resident in urban areas significantly and more likely delivered their children in public health care facilities (OR 1.49, $p<0.001$), yet had a contributed positively at 4.6 %. Considering the media exposure in relation to facility based child delivery, it was found that children whose mothers possessed neither radio nor television were slightly less likely to deliver their children in public health care facility relative to those in possession of the radio and television. This was evident in OR 0.92 $p < 0.001$ in 2000, OR 0.84 $p < 0.001$ in 2004 and OR 0.95 $p < 0.001$ in 2010. Likewise, it was found that

women in possession of either a radio or a television at their household were correspondingly less likely to have their children at the public health care facility with an OR 0.72 $p < 0.001$ in 2000, OR 0.67 $p < 0.001$ in 2004 and OR 0.73 $p < 0.001$ in 2010 as compared to those with radio and television counterpart as the reference category. On the same note, media exposure constitute an almost a negligible contribution in 2000 and 2004 of 0.04 and 0.05 respectively and an increase of 3.4% in 2010.

Considering it from the perspective within years, quality of ANC care offered, maternal age, living number of children and timing of ANC visitation constituted a positive contribution towards institutional birth delivery in 2000. On the contrary, it was found that religion, paternal education, women status, concerns about cost of accessing drugs, distance to the health facility and maternal education contributed negatively towards institutional delivery of children in 2000. In 2004, quality of ANC care delivered, living number of children, timing of ANC visitation, and maternal age were found to be the dominant determinants contributed positively towards institutional deliveries of children. Conversely, it was found that concerns about transport, cost associated with drugs, distance to the nearest health, maternal employment, paternal education and religion belief contributed negatively to choices that women have to deliver in public health care facilities in Malawi. On the same aspect, it was found that in 2010 all determinants were found to contribute positively on the institutional birth deliveries along the public health facilities. In that case maternal age, birth order, living number of children, quality of ANC care that was delivered, women employment status were the major determinants with most contribution in the year.

Likewise, at community level, it was observed that children from fathers who had primary education attainment were less likely to be delivered from the public health care facilities with OR = 0.85 $p < 0.001$ in 2000, OR = 0.8, $p < 0.001$ in 2004 and OR = 0.73, $p < 0.001$ in 2010 as compared to those that attained secondary education or higher.

5.4.3 Percentage contribution of individual, household and community factors on women's use of public health facilities during childbirth

Figure 5.2 illustrates the overall contribution in percentage of the individual, household and community factors on women choice of public health facilities during childbirth in Malawi.

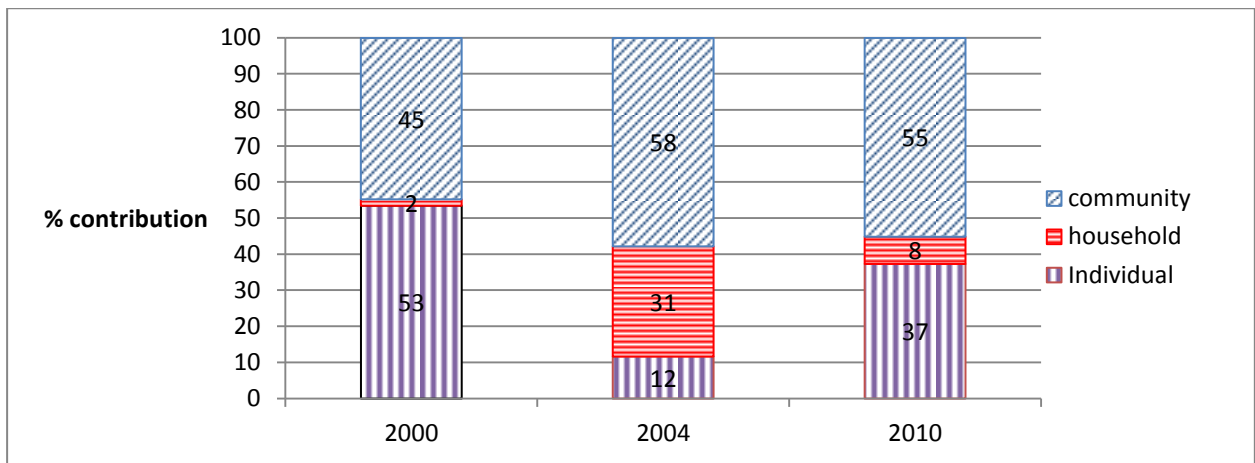


Figure 5. 3 Percentage Contribution of Individual, household and community factors on women use of public health facilities during childbirth

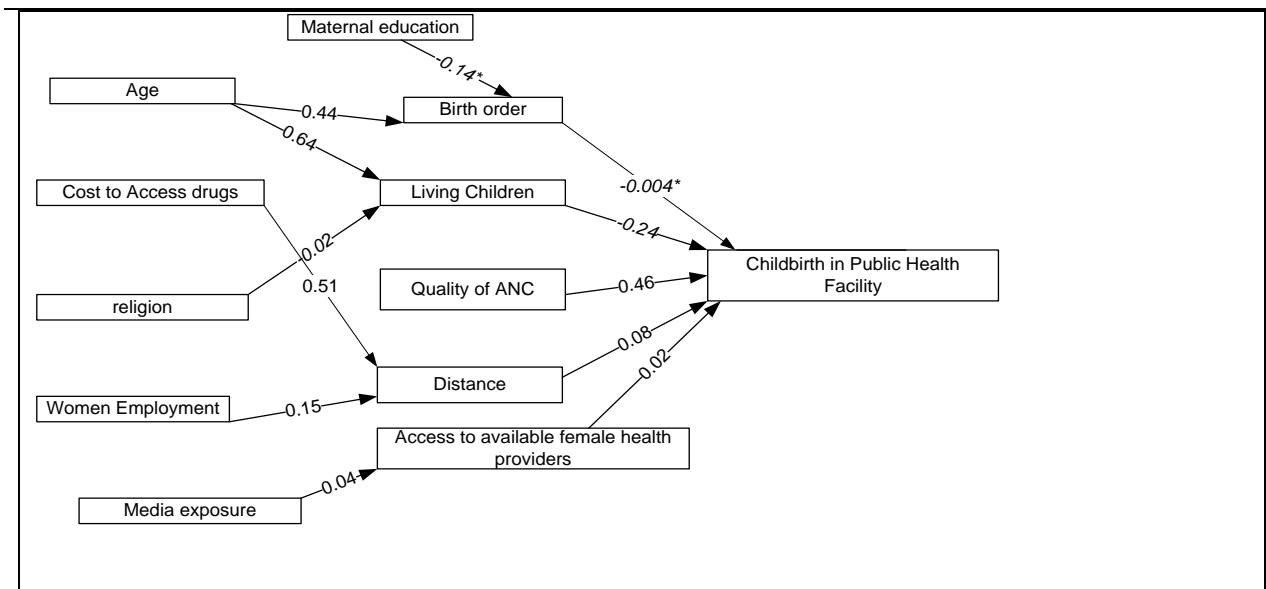


Figure 5.3a Path Analysis of the women factors association with their use of public health facilities during childbirth in year 2000

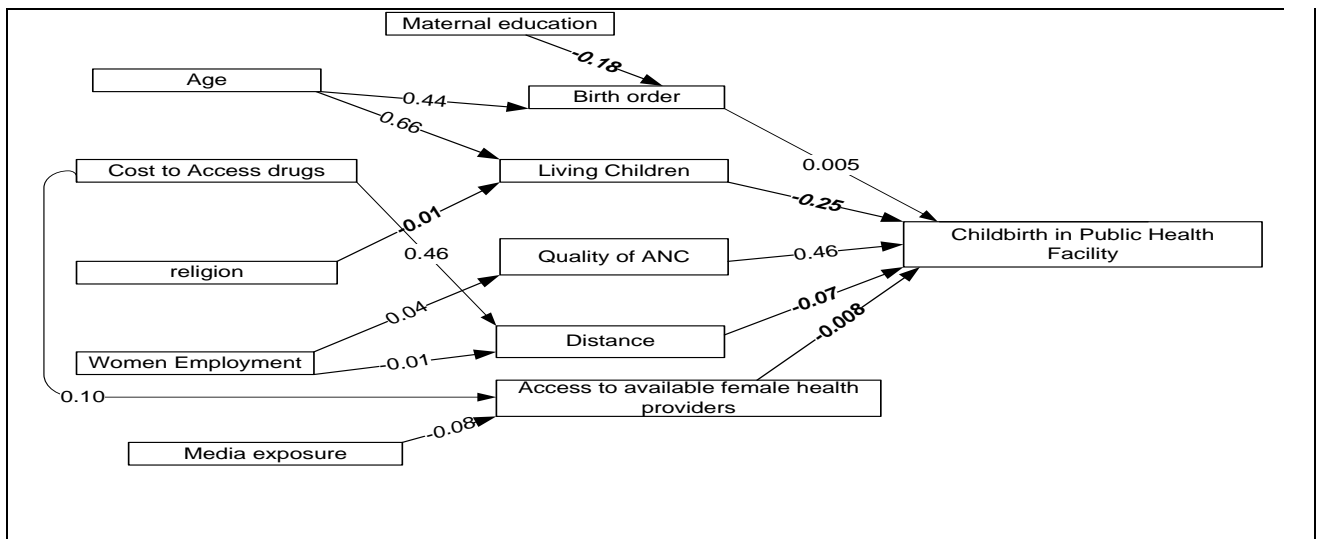


Figure 5.3b Path Analysis of the women factors association with their use of public health facilities during childbirth in year 2004

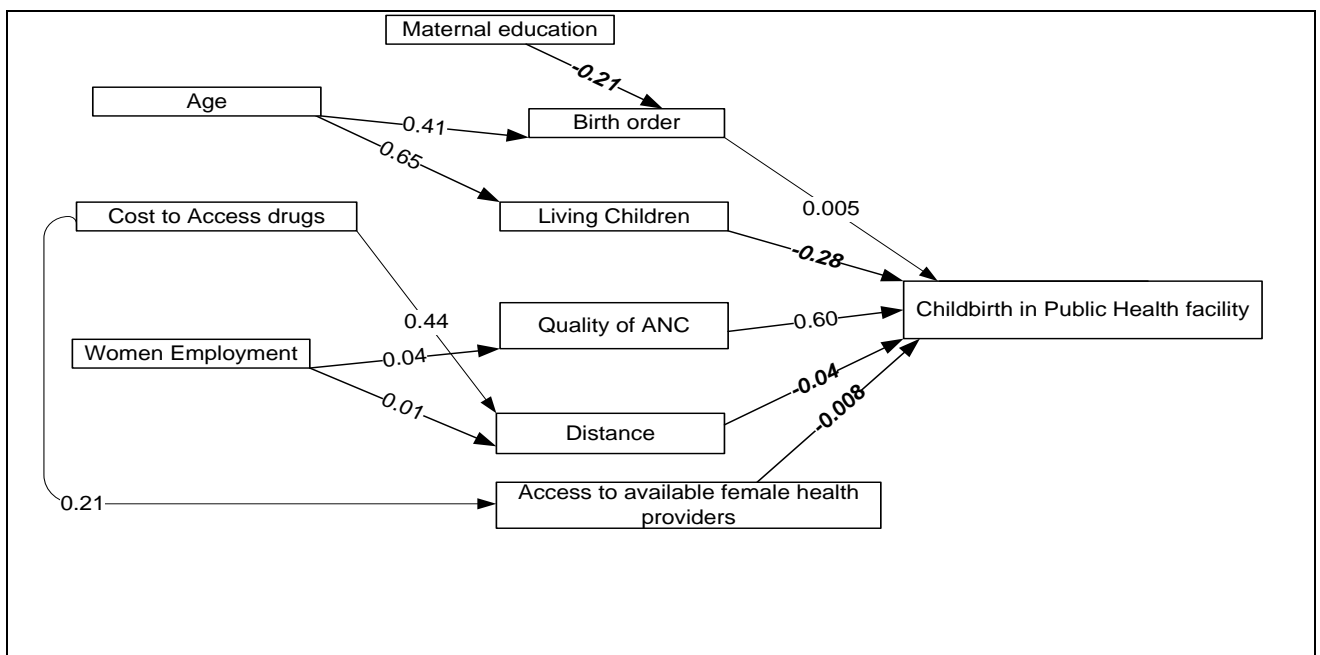


Figure 5.3c Path Analysis of the women factors association with their use of public health facilities during childbirth in year 2010

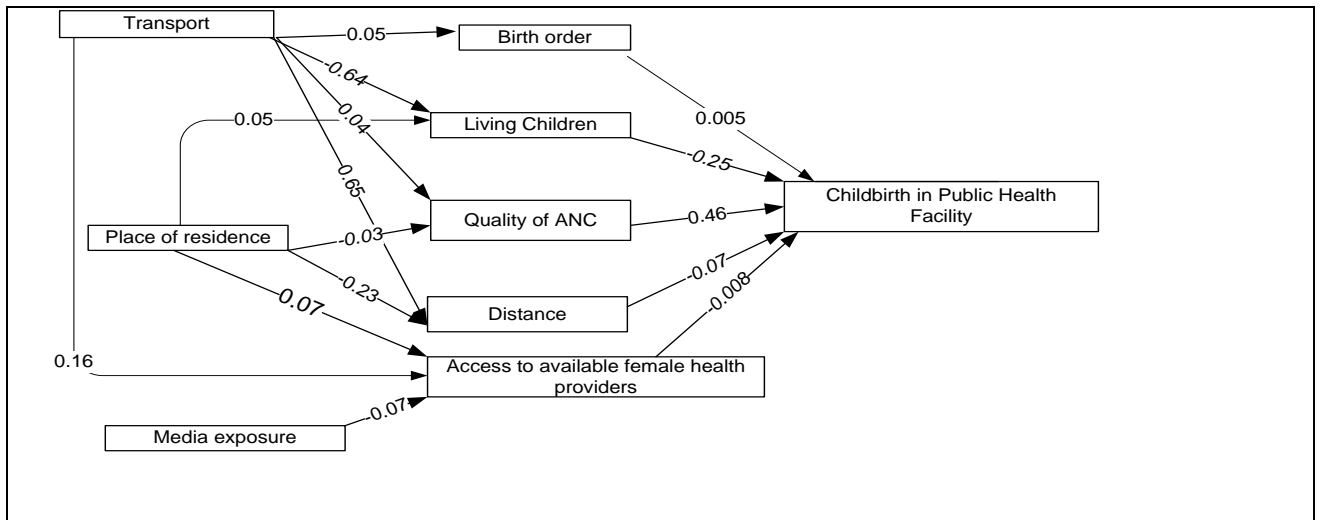


Figure 5.4a Path Analysis of the community factors association on women’s use of public health facilities during childbirth in year 2000

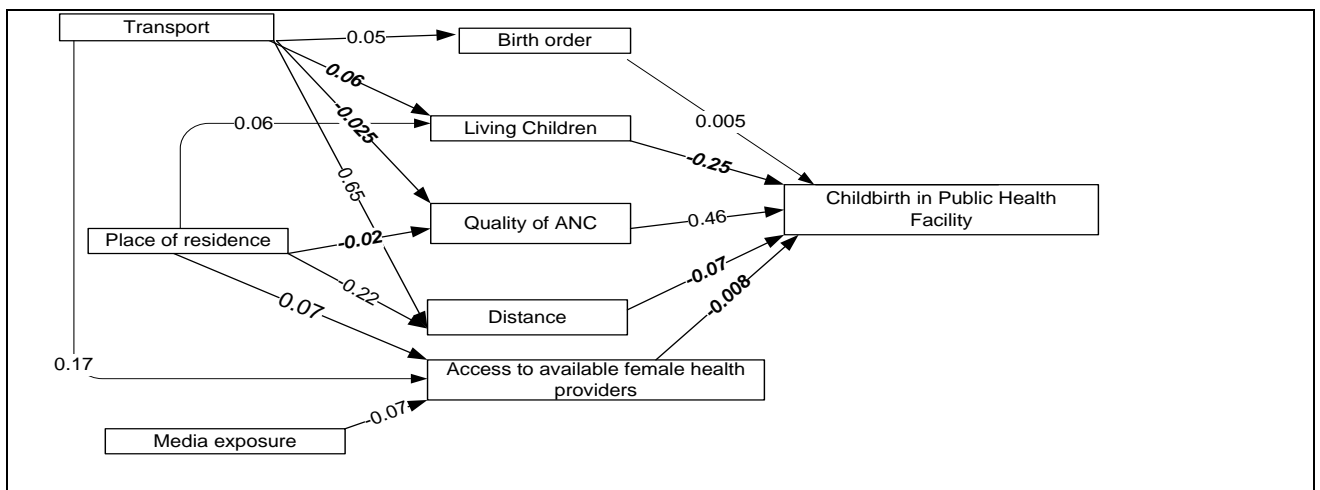


Figure 5.4b Path analysis of the community factors association on women use of public health care facilities in 2004

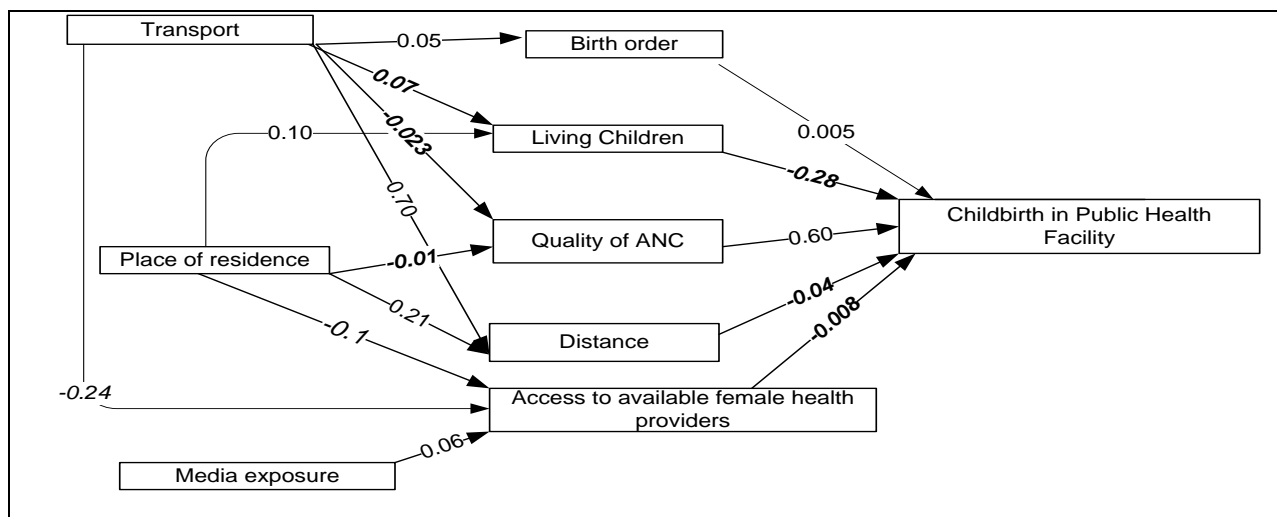


Figure 5.4c Path analysis of the community factors association on women use of public health care facilities in 2010

As is shown in Figure 5.2 the study found that the aggregately individual factors was associated with most explained contribution by C=53% in 2000. In 2004 and 2010 it reduced to 12% and 37 % respectively. At household level, the study found that the year 2000 contributed very little (2%). On the same, the study observed the relative household level contribution of 31% in 2004 and a slight level of contribution of 8% in 2010. All in all, the study found that community factors had the highest percentage of contributions that influenced women choice to deliver their babies in public health care facilities in all years.

5.4.4 Analysis of Moment Structures Associated with women’s use of public health care during childbirth

In this section an analysis of different moments associated with institution delivery of children in public health care facilities was conducted in which product moment correlation coefficients techniques was used to test the degree of association between the moment structures at $p < 0.005$. A path analysis in Figure 5.3a, 5.3b and 5.3c illustrates the individual/household path analysis, while Figure 5.4a, 5.4b and 5.4c illustrates the community path analysis.

As path analysis uses two level structural approaches considering both direct and indirect aspect, it was found that quality of ANC care delivered correlated positively and strongly with women institutional delivery choices across the entire period of study with correlation coefficients of 46% in 2000 and 2004 and 60% in 2010. On the same note, living number of children was found to consistently and inversely relate to institutional delivery in Malawi. On the same note, from an

indirect perspective, determinants such as maternal age and concerns about cost of associated accessing drugs related with distance of the health care facility highly.

Likewise, maternal age was found to have a positive yet strong correlation coefficient with living number of children across the entire period of study. However from the community perspective, transport to access the health facility consistently and positively correlated with distance which in turn relate to institutional delivery positively. In another aspect, media exposure correlated positively towards availability of female health providers which in turn positively affected institutional delivery of children in public health care facilities in Malawi.

5.5 Discussion

Identifying determinants associated with choices among women on institutional childbirth service utilization is paramount in formulation and modification of the recurrent maternal health policies in Malawi. Results indicate that the overall contribution over the years was 0.04% in 2000, 0.08 % in 2004 and 0.07% in 2010. Furthermore, across the years 2000, 2004 and 2010, women's ages, living number of children, exposure to media, quality of administered ANC care, frequency of ANC visits, timing of ANC visits influence women choice of giving birth in public health care facilities with consistent and positive contribution to their choice of institutional childbirth delivery. According to Thaddeus *et al.* (1994), three delay framework of health care utilization, the study findings indicated delays to access institutional based childbirth delivery service utilization still exist in some factors. It was observed that the community factors had a consistent contribution influencing women's use of public health care facilities during childbirth over the year 2000 (45%), 2004 (58%) and 2010 (55%). Further to this, the study found that household factors had a least contribution as low as 2% in 2000, 31% in 2004 and 8% in 2010. At an individual level, the major contribution was in year 2000 (53%) and in 2010 (37%).

For instance, this study reveals that children born to younger women were more likely to be delivered in maternal health care facilities relative to their counterpart aged 35 and over. The study results reveal a consistent increase among women aged 25–34 years on their likelihood to deliver in health care facilities although with much relatively lower odds as compared to the younger women aged < 25 years. This implies that by maternal age, women aged 25–34 delay in utilizing maternal health care facility services when due for child delivery in Malawi. Therefore, the results confirm earlier findings by Idris *et al.* (2007) who observed that women who were pregnant, while young had higher probability of delivering in health care facility than other

delivery facilities in semi-urban settlement of Zaria in Nigeria. However, decomposition results found maternal age to have had overall positive relative contributions as high as 52.85% in 2000, 29.88% in 2004 and 24.7% in 2010.

Considering the within model perspective, quality of administered ANC predominantly contributed the most in 2000 in influencing women decision to adopt institutional childbirth delivery choices. Similarly, in 2004, quality of administered ANC care were found to contribute the most while in 2010, quality of administered ANC care was found to contribute positively yet very minimal. Previous studies argued that at most four ANC visits that the woman attended during the prenatal care services in a resourced health care facility provides an impetus among women in that they are routinely checked of anaemia and timely administered with iron and folate supplement's significant to improve maternal child health outcome (WHO, 2003; Mesfin *et al.* 2004). In another aspect, Carroli *et al.* (2001) pointed out that inadequate ANC visits not only affect routine pregnancy check among women, but also deprives them of accessing requisite quality of ANC care that is to motivate and entice them to deliver in modern health care facilities.

On the other hand, the study showed that some factors still exists and behave inconsistently in influencing women choice of institutional delivery for a considerable period of time in Malawi. For instance, as much as birth order among the women's was found to increase the likelihood of women choice of delivering their children in maternal health care facilities in the year 2004, it was found to have an overall negative contribution of -48.7% on women choice of institutional childbirth delivery in the year 2004, and a corresponding positive contribution of 18.9% in 2010 on the same. However, across the years of study, it was found that as women birth order increased, the women utilization of maternal health care services increased and this was consistent across the year 2000, 2004 and 2010. The study findings confirm an earlier claim by Addai *et al.* (2000) who found some women to be more likely to use maternal health services even among women having primiparous and multiparous maternal condition. Conversely, the other scholars explicitly proved their hypotheses that as the birth order of a woman increases, their corresponding level of utilization in as far as maternal health care services is concerned, become less likelihood (Navaneetham *et al.*, 2002; Celik *et al.*, 2000).

Clearly, the study uniquely discovered that children from the mothers with at most other two living children experienced an increased likelihood of being born in institutional health care facilities relative to their counterparts comprising women who have six or above living number

of other children. Nevertheless, understanding the number of living children within the household and its influence on women use of public health care facilities during childbirth, women with six or above experience extensive delay in making delivery institutional based childbirth relative to their counterparts with five living number of children or less. Previous studies that tried to understand the sociodemographic correlates associated with institutional childbirth delivery did not account and describe the influence that the living number of children has on facility-based childbirth (Mehari, *et al.*, 2013; Kesterton *et al.*, 2010; Van Eijk *et al.*, 2006; Stephenson *et al.*, 2006).

When it came to exposure to media was concerned, previous studies postulated that frequent exposure to radio and television has had an impact on improving use of maternal health care facilities during delivery of the children among women (Mehari, 2013; Gebrehiwot *et al.*, 2009; Mesfin *et al.*, 2004). Contrary to these widely contested hypotheses, this study found that access to media has had less likelihood in decreasing women choice of delivering in health care facilities in Malawi. This was verified in the exposure to media being consistently and less likely crosswise the years of study among children whose mothers exposed to neither a radio nor a television in the first instance and children from households who were mothers, had a media exposure to either a radio or a television.

Likewise, transport availability, cost of access the drugs, distance to access the health care facilities and availability of female health care resource personnel, women employment status, religion and education attainment regardless of gender differentials were found to have contributed negatively between 2000 and 2004, and positively contributed towards women choices of childbirth in institutional health care facilities. Magadi *et al.* (2000) pointed out that in Kenya distance, availability and accessibility of maternal health care services exert expensive pressures which, in the long term, influences health care utilization more especially during delivery period. Gage *et al.*, (2006) argued that distance not only create an obstacles to accessing requisite health care services among women, but also culminate in disincentives towards health care utilization both during development of pregnancy and while it is due for delivery. As such in Malawi, the country's position in as far as distance, cost of access drugs, availability of female health care provider that is to support women childbirth in health care facilities contribute significantly to low likelihood of maternal health care utilization in the country. Therefore, based on the present finding, it is in support of an earlier assertion made by previous scholars (Kerber *et al.*, 2007; Kesterton *et al.*, 2010; Gage *et al.*, 2006; Magadi *et al.*, 2000).

Nevertheless, from a vertical and within perspective, in the year 2000, health delivery factor quality of administered ANC care increased women choice of institutional childbirth with a highest relative level of contribution over the period. Along the same aspect, other prenatal care delivery factors such as timing in months on ANC visits, women who delay in ANC service access between 4–6 months of their pregnancy were 49% less likely to have their children delivered in maternal health facility. However, due to other unforeseen factors such as sociodemographic and behaviour factors (Magadi *et al.*, 2000), delays in timely utilization of health care facilities exist. For instance, the present study found that an extensive delay among women in terms of when they start care services was found to be 82% less likely to associate with institutional based delivery choices among women. Agha *et al.* (2011) pointed out that women become less prone to deliver their subsequent children after their first parity experience and other associated challenges such as service availability, commonly in most developing sub-Saharan Africa countries, is exacerbated to issues of health care inaccessibility and low socioeconomic status (Adamson *et al.*, 2012 ; Fillipi *et al.*, 2006).

However, the present study results ascertained that prenatal health care service utilization such as frequency of ANC utilization during gestation period, and timing in months at first ANC were proven to affect women choice of maternal health care utilization inversely. In Nigeria, a study by Adewemimo *et al.* (2014) observed that experience acquired by women during care services affects their willingness to participate in institutional childbirth delivery. Yet, in another aspect, it was found that women with explicit visits of ANC service facilities corresponds to high levels of maternal health care facility child delivery choices (Teferra *et al.*, 2012). From Malawi's perspective, this study found a consistent less likelihood among women in as far as maternal health care service utilization during childbirth was concerned over the study period. As such, this finding contradicts an earlier assertion by Worku *et al.* (2013) and Teferra *et al.* (2012) who proportionately found a direct relationship between ANC utilization and maternal health care service utilization in their hypotheses. However, considering the decomposition approach used in the study, the ANC utilization in relation to institutional childbirth delivery had a positive overall percentage contribution across the entire periods. Maternal age, birth order and living number of children were found to have a positive overall contribution on women choice of institutional childbirth service utilization.

It is worthy to note that availability of transport to access health care facilities, cost of accessing drugs, distance to the health care facilities and availability of female health care providers were found not only to decrease women choice of institutional based childbirth delivery, but also

found to have a negative percentage contribution in influencing women choice of institutional based childbirth delivery in the year 2000. Previous studies indicate this situation to be aggravated by economic challenges that disadvantage women never to perceive the need to deliver in health care facilities (Kitui *et al.*, 2013 Thind *et al.*, 2008; Gage, 2007). These economic challenges experienced create barriers for women to timely access the health care facilities during delivery and also delay in accessing maternal related health care medical therapy due to cost implication to access the drugs and access other preferred health care resources (Kitui *et al.*, 2013; Berhan *et al.*, 2014). Considering the reproductive health information access, the study found that media exposure did less to influence women choice of institutional childbirth delivery in the year 2000 yet the country had a slight positive relative percentage contribution of 0.4% in the same year. However, a previous study by Agha *et al.*, (2011) found out those women who had had an extensive utilization of maternal health care services during child delivery after extensive exposure to information and resources to motivate their health care utilization in Pakistan. On the same subject, the decreasing trends that media exposure have on maternal health care childbirth delivery contradict with what Navaneetham *et al.*, (2002) observed in Indian women that exposure to either radio or television increase women's use of health care institutions by 1.5 times relative to women with neither radio nor television in that country.

In 2004, the study results found that quality of administered prenatal care increased women choice of having their children in institutional childbirth facilities with a positive relative contribution of about 57%. Notwithstanding, timing in months of ANC visits among women was found to be less likely to influence their choice of institutional childbirth delivery yet decomposition approach indicated an overall positive contribution towards women's choice of facility based childbirth. Likewise, in 2004, the study found that health care service factors such as availability of transport to access the health care facility, cost of drugs, distance to access the health facility and availability of female health resource personnel's to have had a decreased likelihood among women's choice of utilizing institutional care facilities during childbirth delivery. A noteworthy account in the year was a significant negative overall percentage contribution that women's birth order had on their institutional childbirth choices despite an increasing likelihood in utilization levels the higher the birth order become. In another aspect, women's place of residence, the study found women to be less likely to use facility based childbirth infrastructure. Yet, the percentage level of contribution is positive. Regarding exposure to media, women with neither the radio nor the television were less likely to utilize maternal health care facilities for their childbirth with a negative contribution of 0.13. Further to this, the decomposed technique found that women with either a radio or a television were less

likely to use the public maternal health care facility despite radios or television found to have had a positive relative overall contribution on women's choice of modern health care facilities during childbirth in 2004.

Considering the rural-urban differences in health care service utilization, Say *et al.* (2007) in their systematic review of the literature found that some urban health care facilities have lower quality of care which affected women's use of modern health care service facilities when the need was ascertained. This postulation assents to what this study found out that urban women associated with less likelihood in delivering their children in maternal health care facilities relative to their rural women counterparts.

Furthermore, Gage *et al.* (2006) pointed that the assumptions that women resident in communities having health care facilities will not substantiate them to use the facilities due to other exogenous factors such as perceived quality rather than actual quality and other individual women attitude about their perception of the medical facility and childbirth, previous experiences among women with multiparous condition and cultural beliefs. This often translates into either extensive delay to use modern health care facility for childbirth among women or choice of an alternative mean in most cases. Yet, in another context, other renowned scholars posited that in some instances urban women are advantaged to access better, proximate and resourced health care service facilities than their rural counterparts (Sahoo *et al.*, 2015; Magadi *et al.*, 2000).

Issues of individual women's view regarding the service delivery in such facilities perpetrate utilization delay (Barnes Josiah *et al.*, 1998). Additionally, studies indicated that such developments are associated with imbalanced quality of care services to motivate women utilization health care service facilities more intrinsically during childbirth delivery (Hotchkiss *et al.*, 2001; Falkingham, 2003; Celik *et al.*, 2000). Conversely, in the current study, after taking rural place of residence as a reference category, children from urban based women were contrarily less likely to be delivered in modern institutional based childbirth delivery facilities, thus denoting utilization challenge among these women. As is highlighted above, perceived quality of care versus actual quality of care experienced by most urbanised health care facilities do provide some disincentives affecting women patronage during child delivery, a situation which demotivates women to use health facilities during subsequent childbirth delivery (Gage *et al.*, 2006). Regarding community awareness of health information, the study found that a lot of women indicated to less likely to be influenced by community awareness programmes towards

childbirth delivery in public health care facilities compared to their counterparts with low awareness to health information. This was noted in the less likely odds ratios found across the years of study. The study discovered that awareness of health information had a negative percentage contribution in influencing women's use of public health care facility during childbirth in year 2000 (C = -1.18%) and 2004 (C = 0.86%). On the contrary, it was positive in year 2010 (C = 4.64%).

Considering the year 2010 with determinants that were found to have had an overall contribution of about 7% on women choice on utilization of health care service facility during childbirth, the year reported to have more determinants that were positively contributing. Therefore, ranked per percentage contribution rate indicate that sociodemographic factors such as maternal age, birth order and living number of children were ranked first, second and third respectively on its relation towards women choice of delivering their children in modern health care institutions in that year. On the same, it was observed that prenatal health care factors such as quality of administered ANC care, frequency of ANC visits and timing in months the woman takes to start using ANC services delivered, the decomposed techniques indicated that these determinants were consistently positive.

5.5.1 Modified moment structure path analysis suggested model on women's use of public health facility during childbirth in Malawi

Figure 5.5 illustrates the modified path diagram of the determinants with either consistent or inconsistent contribution in as far as women choice on institutional childbirth delivery is concerned in Malawi. As is illustrated in Figure 5.5, if the country is to make consistent and tremendous progress in improving institutional delivery, there is need to improve on advocacy in as far as timing of ANC visits, awareness of the significance of delivering in maternal health facilities through radio and television maternal health programmes, and promoting women of all ages to deliver their children in a modernised health care delivery facility. On the contrary, the study found quality of administered ANC, cost of accessing medical resources as drugs, availability of female health providers, availability of transport services and distance to access health care facilities to have had inconsistent influence on women utilization of modern maternal health care facility childbirth delivery (Figure 5.5).

The illustrated pathway model which is divided into two; based on both stable and unstable parameters associated with institutional delivery choices among women in Malawi. As is

indicated some unstable factors do pose a challenge in women choice of maternal health care service utilization. For example, issues of transport availability, access to drugs and distance to access the health care facility remained consistently negative in their contribution on institutional delivery choices among women over the entire period of study quality of ANC delivery have had undefined positives and negatives cross the years. On the contrary, timing in months at which women start utilizing prenatal care services during birth preparedness, birth order and media exposure were found to have a positive impact in influencing women’s use of maternal health care services during child delivery over a period of time in Malawi.

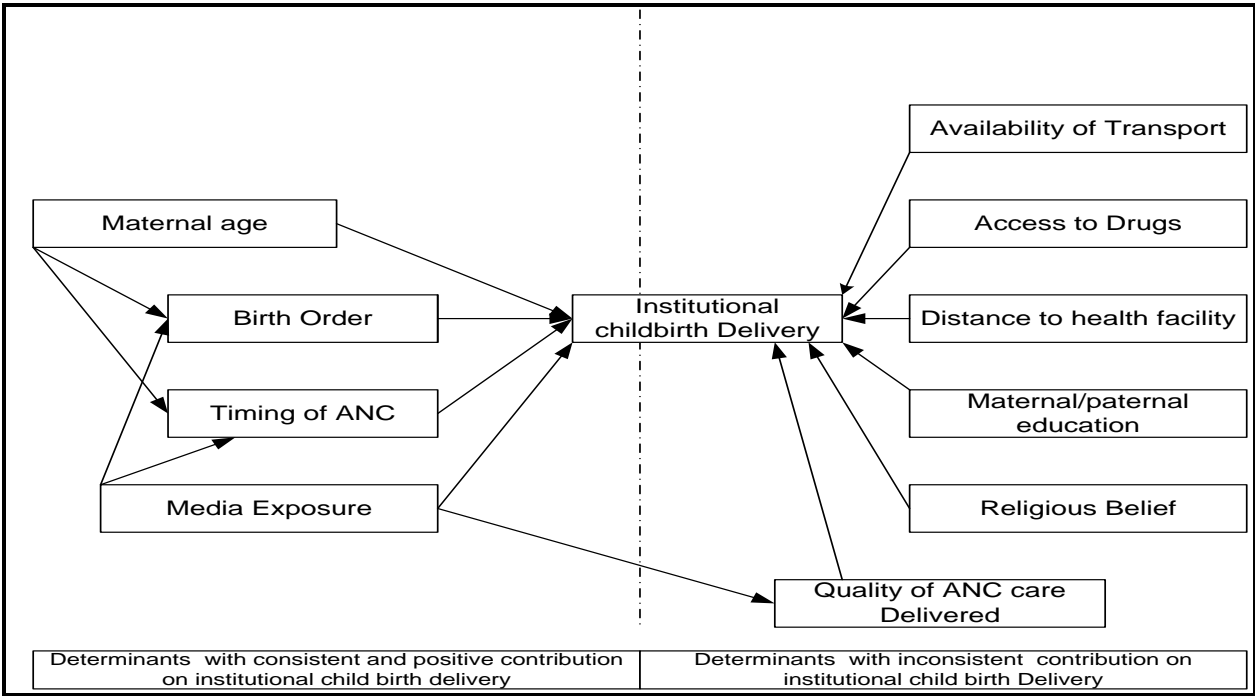


Figure 5.5 Modified moment structure of the determinants with consistent and inconsistent influence on women’s use of public health care facilities during childbirth in Malawi

5.6 Chapter summary

The socio-demographic and prenatal care determinants associated with women’s choice of utilization of institutional child delivery merits extensive attention for maternal and child health outcome to improve in Malawi. The study revealed the role of the following determinants on women’s choice of maternal health care service facility during childbirth delivery.

The number of younger women who delivered their babies in maternal health care facilities was almost double the number of mothers in the age group 25–34 years old. This means that the younger women are better placed to utilize institutional delivery services during childbirth than the older women who delay in making timely utilization choice of maternal health care service facility during childbirth delivery. In addition, women with higher birth order are better placed to utilize institutional delivery services as compared to those with a primiparous maternal situation. The reviewed literature showed that maternal and paternal education has been associated with positive attitude in as far as utilization of health care services is concerned over time. However, the findings of this study show that both paternal and maternal education have less likelihood in influencing women's choice to deliver at the maternal health care facility and contributed negatively to choice of institutional child delivery in 2000 and 2004 and positively in 2010. The finding was correspondingly similar for the influence of media exposure on women's choice to deliver at the maternal health care facility. It is interesting to note that there was no increase in the number of women who had challenges with cost, transport availability and distance to use public health care facilities during childbirth.

On the other hand, quality of ANC that has been administered among women during the care visits denote great variation in its influence on women choice of utilizing institutional health care services during child delivery. Such variations denote some stochastic factors within the health system in the country that through an extensive audit programmes of the entire health care systems in as far as maternal health care service delivery, leverage of medical resources and supplies and health care service operations resulting in timely choice of service utilization among women in Malawi, if the administered country's maternal health care services are to enhance maternal child health wellbeing of the vulnerable and underserved women during childbirth delivery in the country. For example, the issue of cost of drugs should be sorted to advantage and promote maternal health care delivery choices among women. Likewise, the issue of having an available transport system with the ability of ensuring timely access of health care services among women when the need arises. Theretherefore a is need for extensive support of such services as a result of the afore-mentioned prenatal care factors challenges if institutional based delays associated with administering childbirth delivery services are to be reduced to promote women's use of such services. Additionally, there is need for the systems to capacitate reproductive health information dissemination systems, that is, to coordinate with other media such as radio and television in order to spread information on the importance of delivering in health care facilities and on advantages of timely patronage of institutional based child delivery

services among women in Malawi. Such developments are paramount in improving maternal and health wellbeing statuses sustainably.

Based on the decomposition analysis, the study found that community level factors were the main determinants associated with women's choice of using public health facilities for childbirths across the entire period of study in Malawi. However, the study found that household level factors also contributed to the list. It is thus imperative to explore postnatal care services in order to test factors affecting women's use of postnatal care service after childbirth in public health care facilities in order to have a balanced view of maternal health care service delivery, in general, in Malawi.

CHAPTER 6

Factors associated with utilization of postnatal care services in Malawi

6.1 Introduction

Factors that influencing women's choice of using public health facility for childbirth for the years 2000, 2004 and 2010 involve quality of care and ANC utilization. These were two main factors consistently affecting the choice of public health care facilities for childbirths in the country. Women's birth order and their education status also proved to be major predictors of women choice of public health care facilities for childbirths overtime in Malawi. The decomposition approach that is adopted to investigate the overall contribution of each factor on women's choice of using public health care facilities for childbirth and the study found that community level factors also contribute the most to childbirth in public health facilities in the country over the period of study.

Thus, after identifying factors influencing both women's use of prenatal and childbirth in public health care facilities in Malawi, it is necessary to explore the determinants of women's use of postnatal care service utilization in the country.

Postnatal care services spans from the period immediately after the baby is born up to six weeks after that (WHO, 2014). Yet, in most developing countries including Malawi, it is observed that the majority of the women suffer complications as a result of childbirth (Dhaher *et al.*, 2008). The study indicated that about 40% of women do experience complications immediately after child delivery and an equivalent of 15% do have life-threatening complications (Rahman *et al.*, 2011). As such, postnatal care services provide fundamental elements of the continuum of essential obstetric care other than the prenatal and institutional based childbirth discussed earlier in a number of ways. Previous studies augmented that such maternal health care services reduce maternal and new-born morbidity and identification of complications which potentially affect maternal child health outcome (Gabrysch *et al.*, 2011; Say *et al.*, 2007). Yet, compared prenatal and intranatal care utilization, postnatal care utilization tends to be poor in most countries including Malawi (WHO, 2014; NSO & ICF Macro, 2011). This apathy in postnatal care utilization among women exists despite calls to increase postnatal care service utilization this has

to be highlighted and prioritised if maternal health outcome immediately after childbirth and higher is to be improved (Langlois *et al.*, 2015; Matijasevich *et al.*, 2009).

In most developing countries, it has been reported and observed that postnatal care played a pivotal role not only as a preventive check of impairments and disabilities among women due to childbirth experiences, but also have had a tremendous history of reducing maternal and child mortality and morbidity (Langlois *et al.*, 2015). Yet, as early as 2000, it was reported that about 70% of the women hardly had a chance to receive postnatal care and were subjected to premature mortality during the postnatal period (WHO, 2000).

Basically, studies indicate that the majority of registered maternal deaths do occur within 24 hours after childbirth (WHO, 2014). In addition, it also stated that within the early day's postnatal life, women are supposed to be tested on a number of issues not excluding bleeding check, anaemia and breasts checked for mastitis. Furthermore, the studies indicate that such a period might serve to engage women on other reproductive educative programmes, among them, counselling on a wide range of family planning, significance of immunisation and child home-based care (Neupane *et al.*, 2013; Trinh *et al.*, 2007; Witter *et al.*, 2009). In trying to advocate for a robust standard practice regarding postnatal care service delivery, WHO (1998) suggested a model continuum of postnatal care defined through a "6-6-6-6 strategy" model. The model opts for an immediate postnatal care attention on women within 6 hours, 6 days, 6 weeks and 6 months after childbirth. Therefore, within this period, women are diagnosed and treated of life-threatening problems that might worsen maternal health (Langlois *et al.*, 2015; Neupane *et al.*, 2013).

In Malawi, based on 2010 MDHS, utilization of postnatal care services is yet to be universal among women after delivery. The statistics indicate that 48% of the women are still far from postnatal health care service access. Additionally among those that were reported to have accessed the postnatal care services, as low as 6% of the women managed to get postnatal services within two days after childbirth. Yet, the country's maternal mortality level was reported to be as high as 510 deaths per 100 000 live births in 2013 (WHO, 2014). In 2010, it was reported that 6% of the women's who gave birth at the time during that period, had an immediate postnatal check after childbirth in Malawi (NSO & ICF Macro, 2011). In view of this imbalance, the government of Malawi initiated programmes such as *Road Map to accelerate the reduction of Maternal Mortality* (Government of Malawi, 2005). Among other aims, the programme advocates for an increased uptake of postnatal care services among women in order to improve maternal health outcome. However, despite the utilization challenge and worst

maternal health situation the country is experiencing, there exist dearth studies aimed at investigating factors associated with women's use of postnatal care utilization in Malawi. Over the past years, scholars exploring maternal health issues have been concentrating on mortality and other maternal health indicators other than postnatal care (Rawlins *et al.*, 2013; Seljeskog *et al.*, 2007; Lema *et al.*, 2005; Leigh *et al.*, 2008). Yet, these studies did not focus on the entire country in their data and analytical approach thus not feasible to relate the findings to represent the entire country of Malawi. In another study, Sakala *et al.* (2011) investigated factors affecting women's use of postnatal care service use in Zomba Central hospital in Malawi. However, this study did not include other central hospitals in the country in addition to using a once-off dataset from the single district. As such, much valuable knowledge that was left out from other central hospitals and districts would have assisted in giving a country level perspective in as far as postnatal care services is concerned. The relationship between maternal health, sociodemographic attributes and postnatal health care service utilization, still pose a great challenge worthy exploring in Malawi. Therefore, the chapter aims at investigating the association between women sociodemographic factors and their postnatal care utilization choices. Further to this, examine among the determinants, the level of percentage contribution on women's use of postnatal care services across study periods.

6.2 Literature review

Postnatal care, also known as postpartum care, is defined as space beginning an hour after delivery of the placenta and continuity up to 6 weeks (42 days) after the woman gives birth to the child (Sines *et al.*, 2007; WHO, 1998). Furthermore, the report indicates that within such a period's critical maternal health challenges do occur among women which when not fully adhered through an established postnatal care support, increases maternal mortality and morbidity in most developing countries (Mrisho *et al.*, 2009; Dhakal *et al.*, 2007; WHO, 1998). As such this section underscores different theoretical perspectives associated with postnatal care service utilization in developing countries in three dimensions. Firstly, underscoring maternal health factors associated with postnatal care utilization. Secondly, understudying different theories related to sociodemographic factors and health care service utilization after childbirth. Thirdly, highlighting the theoretical framework adopted and how it was conceptualized and applied in the study.

6.2.1 Maternal health care factors and postnatal care service utilization

Improving maternal health outcome requires evidence based interventions addressed and administered through a postnatal care facilities capacitated to undertake such exercises (AbouZahr *et al.*, 2001). On the same note, in most sub-Saharan Africa, a cross-national study posited that about two-thirds of women who happen to deliver at home, about 13% of them do not receive postnatal care within the recommended times after childbirth (Lawn *et al.*, 2006). Other scholars that tried to investigate factors associated with low utilization of maternal health care services pointed out sub-standard services predictor the situation (Koblinsky *et al.*, 2006; AbouZahr *et al.*, 2001).

In Tanzania, the study by Mrisho *et al.* (2009) on the use of antenatal and postnatal care from the perspective of women and health care providers in rural part of the country alluded that health facilities do face extensive challenges that affect women extensive utilization of maternal health care service facilities before and after childbirth. The study further highlighted that despite extensive calls and interventions aimed at promoting ANC utilization yet low postnatal utilization gap within the health systems still persists (Neupane *et al.*, 2013). Such situations often have had a long term dire consequence on maternal health outcome in most developing countries (Lawn *et al.*, 2006).

Overtime, scholars postulated different maternal health care factors to have had pre-eminence in influencing low utilization of maternal health care services in developing world. Andaleeb (2001) observed that attitude of health care resource personnel's while in-service account for women low utilization of maternal health care thus preferred home-based therapy. On the contrary, in rural Bangladesh, a study asserted that improved women behaviour to seek maternal care was accommodative and supportive positive attitude of the health resource personnel's in service (Moran *et al.*, 2007). On the same aspect, Darmstadt *et al.* (2005) who used evidence based approach to establish a cost effective interventions aimed at improving postpartum health outcome, highlighted that an establishment of a supportive facility based clinic care immediately after woman delivers, have the potentials to improve maternal health. However, this can best be achieved if the maternal health system comprise health care resource personnel's capable of meeting pro-poor quality of service postnatal demanded among women (Sines *et al.*, 2007; Chen *et al.*, 2004).

Senarath *et al.* (2006) observed that availability of health care providers in health care facilities; provide an incentive among women to access the services. In the process women are advantaged to acquire reproductive health education targeting topics related to pregnancy and childbirth condition among others (Mrisho *et al.*, 2009). Therefore, it is well assimilated that such reproductive health knowledge results in subsequent use of prepartum, intrapartum and postpartum periods in their future birth encounter and improve their maternal health outcome (Langer *et al.*, 2002; Babalola *et al.*, 2009). Further to this, a study by Souza *et al.* (2011) found that information about pregnancy complication, which was timely delivered among women, was associated with increased use of maternal health care services before, during and after childbirth periods. On the same, the study further supported this hypothesis and attributed women extensive utilization of maternal health care services to improved education status attained by both women and their spouses. According to Senarath *et al.* (2006), education provides an understanding among women about their health care challenges, and this gives them an incentive to seek immediate health care support (Babalola *et al.*, 2009).

Most developing countries have been challenged with a lot of barriers that in the long term affect utilization of maternal health care services among women. Empirical evidence denotes that distance to the health care facilities affects the facility utilization rate during and after childbirth (Chakraborty *et al.*, 2002; Chakraborty *et al.*, 2003). In a similar study, geographical location of the health care facilities not only define access barriers from the demand side of health, but also experience lack of medical resources and other health care support infrastructure due to accessibility bottlenecks (Aseweh Abor *et al.*, 2011). This situation transcends into low utilization towards this life supportive maternal health services in Malawi and Zambia significantly among the rural and poverty inclined communities (Lohela *et al.*, 2012; Stekenlenburg, 2004). On the contrary, Gabrysch *et al.* (2011) closest proximity to health care facility increases women patronage to maternal health care utilization.

Over time, studies related to health care access has found neighbourhood/community factors, to be a derailment of women usage pattern of modern health care facilities. For instance, the removal of user fee costs in public health care facilities facilitated the increase of uptake in as far as health care utilization was concerned among women in Zambia (Masiye *et al.*, 2010; Stekenlenburg, 2004). Indirect cost associated with accessing the health care services such as transport costs, medical costs and other birth preparedness materials cost promote home based maternal therapies among women and subsequent low utilization of institutional based maternal therapies (Shaikh *et al.*, 2004; Islam *et al.*, 2009). Likewise, Fatimi *et al.*, (2002) and Gabrysch

et al (2009) asserted that long distance and numerous indirect costs related to accessibility and affordability of health care facilities promote non-utilization of institutional based health care utilization.

6.2.2 Sociodemographic and postnatal care utilization

Previous studies that hypothesized about the relationship between maternal age and health care utilization noted that younger women are more willing to utilize health care facilities than their older counterparts. For instance, in Tanzania, Mpembeni *et al.* (2007) findings on maternal health care utilization echoed the same sentiments, while the findings of Neupane *et al.* (2013) concurred with what Mpembeni *et al.* (2007) asserted concerning maternal age. Yet, further discussion by Neupane *et al.* (2013) pointed out the likelihood of the younger women to utilize health care facilities with regard to reproductive health compared to the elder counterparts due to perpetrated fear among young women regarding childbirth. Additionally, Ikamari (2004) pointed out that the majority of the elder women who had bad experiences with the quality of the service deliver in the health systems were a factor which affected their non-utilization of health care services among most aged women. Other scholars in Ghana (Addai, 2000), Bangladesh (Chakraborty *et al.*, 2003) and Ethiopia (Mokonnen *et al.*, 2003) found to the contrary that older women had a likelihood of increasing maternal health care service utilization compared to the younger women counterpart.

In Zambia, Sialubanje *et al.* (2014) undertook a study of “Understanding the psychosocial and environmental factors associated with maternal health care utilization in Kolomo.” They found that women with higher number of living children had lower preference to utilize modern health care facility and preferred handling their reproductive health problems using traditional means. Neupane *et al.* (2013) argued that women with fewer children do have a lot of disposable income and are not constrained by family resources to seek modern care relative to women with more children. Family size has been viewed as a determinant of women’s use of maternal health care in Ghana (Aseweh Abor *et al.*, 2011). It is argued that women from big families and with more number of living children tend to underutilize different reproductive health care services due to too many social demands required within their households. In Ghana, Aseweh Abor *et al.* (2011) further argued that larger families do face resource constraints, a development which negatively affects their reproductive health care choices. Chakraborty *et al.* (2003) study found a u-shaped relation between numbers of living children the woman has corresponding to utilization rate of health care services in Bangladesh, and the situation which contributed endogenously on their choice of health care utilization.

Regarding education, Ahmed *et al.* (2010) pointed out that educated women are more likely to use modern health care facilities during their reproductive health choices than the uneducated women counterparts. Education not only exposes the women to information, but also enhances understanding in all issues regarding their reproductive health life-style; such a development enhances their health related decisions (Singh *et al.*, 2012). Furthermore Singh *et al.* (2013) pointed out that it is through education that women acquire self-worth and confidence which acts as a driver that assists them in quick reproductive health choices in critical times such as prepartum, intrapartum and postpartum periods. Therefore, based on the above argument, women with advanced education status are better positioned and are more responsive to reproductive health challenges and understand where to seek better health care services and use reproductive health information more effectively as a prerequisite to acquire improved health status (Addai, 2000; Celik *et al.*, 2000).

In as far as employment is concerned, studies have it that women that are unemployed are not fully participating in formal economy, a factor which disadvantages them to decide on the quality of health that they acquire when in need. Rani *et al.* (2004) found that unemployed women are not only poverty stricken and impoverished, but also are excluded from the social networks which might provide a bandwidth of information regarding enhancement of their reproductive health. According to Rani *et al.*, (2004), such women's unemployment status results in women having less likelihood in accessing reproductive health programmes that could be advocated in other media other than rely on mass media for the diffusion of health related information, a factor which might affect their perspective of choice regarding health care utilization.

It has been observed that unemployed women lack an opportunity cost of investigating in their own health as compared to the employed women and often the unemployed women experience a lot of economic disadvantages (Singh *et al.*, 2012). For instance, Mohanty *et al.*, 2009) pointed out that most of the times pro-poor gaps aimed at promoting equity to health care access among the socioeconomic classes are neglected by policy makers and governments. Such pro-rich centred health care investment creates an imbalance that disadvantages those with low economic power (Pathak *et al.*, 2010).

In as far as media exposure is concerned, Islam *et al.* (2009) pointed out that access to media among women has had a significant impact in increasing health care utilization. It is argued that

exposure to mass media provides great impetus to the communities regarding awareness and dissemination of programmes, initiatives and policies significantly towards enhancement of reproductive health among women in general (Ankomah *et al.*, 2014; Asundep *et al.*, 2013). Hence, there has been dearth literature that explicitly relates to the exposure to media among women and postnatal care utilization in sub-Saharan Africa including Malawi. There is need, therefore, to investigate this exposure to media factor as they interlinked with postnatal care utilization in Malawi.

6.2.3 Theoretical framework

The study in this chapter adopts the Social Ecological Model. Therefore, the factors that affect human behaviour to health care utilization are many and they do stem from intrapersonal, interpersonal and organisational nature. Intrapersonal defines the attitudes, perceived norms and one's desire to change. Interpersonal defines the social networks and other support in that nature that is significant to facilitate effective acquisition of the service delivery. Organisational support defines the reciprocal activities that are delivered by and through the institution to embrace the environment wherein the organisation exists. Such is a process that embraces the support through diffusion of innovative mechanisms in order to meet the societal needs.

The theory was first developed as Urie Bronfenbrenner's Ecological System (Bronfenbrenner, 1979) and it defines the association between the individual and the environment wherein that individual inhabits. Later in 1988, Kenneth Mc Leroy devised an ecological model of health behaviour, which defines different levels that influence human health behaviour. Over a decade ago Daniels Stokols devised another Social Ecological Model with regards to health promotion through identification of different individual and environmental factors underpinning communities ecologically (Stokols, 1996).

As such the theory, within this study context, highlights maternal health care factors and sociodemographic factors that affect women's use of postnatal health care. The Social Ecological model intertwines different dimensions of the environment, such as political, socioeconomic, demographic and biological, as it determines behaviour (Stokols, 1996). Therefore, the interaction of these factors are paramount in defining maternal health and sociodemographic factors related to human behaviour in seeking postnatal care utilization using three dimensions namely: *Intrapersonal factors* that were defined such as ANC visitation, maternal age, education attainment by paternal and maternal. *Interpersonal factors* that were defined as media exposure,

number of living children, employment status; and *Institutional factors* such as distance to health centre, transport availability, cost of drugs, availability of health workers, quality of care in postnatal services in relation to postnatal health seeking behaviour.

6.3 Methods

6.3.1 Data

The chapter uses MDHS data, from the years 2000, 2004, 2010, that was provided with the technical assistance of ICF Macro International through the organisation Measured DHS project. As such the study uses a nationally representative sample of households in which 13 220, 11 689 and 23020 women were eligible and were interviewed in the years 2000, 2004 and 2010 respectively. Out of which, about 274, 2386 and 7018 women utilised postnatal care service check-up after childbirth and were considered for analysis in the years 2000, 2004 and 2010 respectively. The figure 6.1 provides the procedure used to select women that had postpartum experience and were used in the chapter.

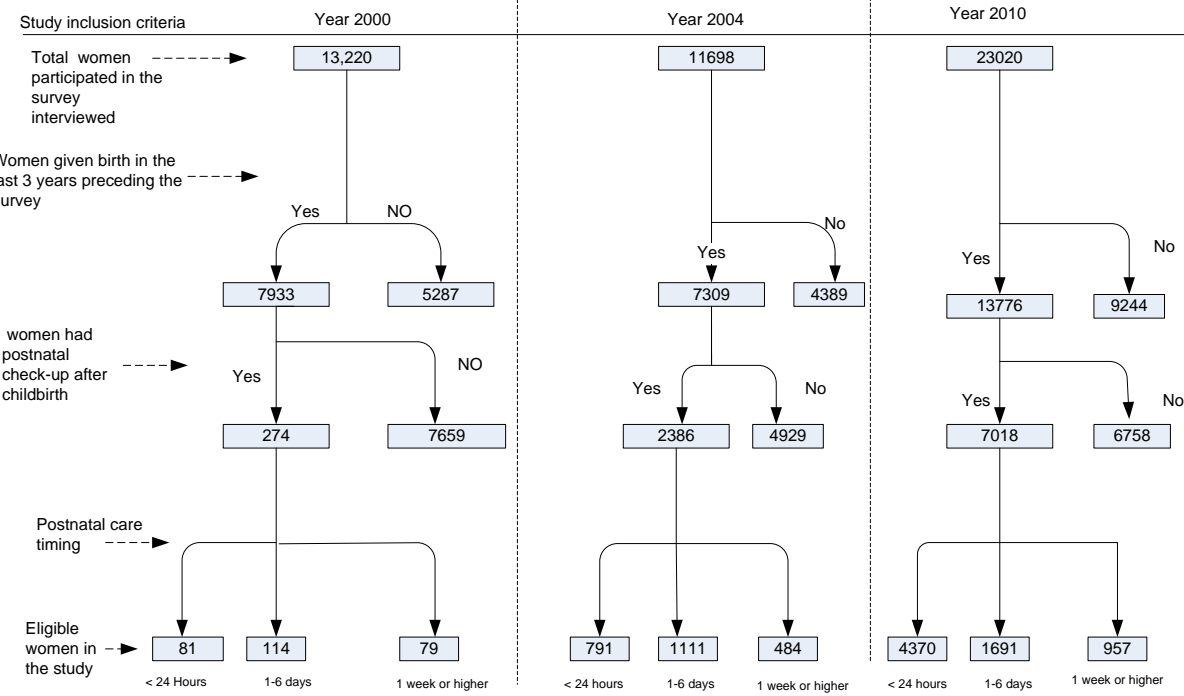


Figure 6.1 illustrates the inclusion criteria for women with postnatal care usage

6.3.1 Variables and measures

6.3.1.1 Dependent variable

The study uses postnatal check-up to define the outcome variable in which the question “How long after delivery did the first postnatal check-up take place” to which the responses were: less than one day, less than a week and one or more weeks, and no check-up at all, were considered. For the purpose of this chapter, three outcome variables are defined and these are: *Immediate postnatal care check-up* if the women check-up was conducted within 24 hours after childbirth (*less than 24 hours*) and was coded as either 1 if the women had a postnatal check-up within 24 hours after childbirth or 0 for otherwise; a *Moderate – Postnatal check-up* to denote service in which women who delivered and were checked after 24 hours (1day) or within 6 days. It was coded as 1 if the service was rendered and 0 for otherwise and *Delayed Postnatal check-up* which defined the service rendered to a woman after childbirth from the period of one week or more after being discharged. This was coded as 1 for postnatal care service access and 0 for otherwise. In 2013, Neupane *et al.* (2013) undertook a study on utilization of postnatal care among Nepalese women and used a similar variable to hypothesize factors influencing women’s use of postnatal care. This study adopts a similar approach to postulate factors associated with postnatal care health care utilization in Malawi for the years 2000, 2004 and 2010.

6.3.1.2 Independent variables used in the chapter

The explanatory variables adopted in this chapter are as follows: maternal age, ANC frequency, women’s public health facility delivery, maternal education, women employment, standard of living, number of living children, concerns of no drugs, concerns of transport, concerns of distance, exposure to media, quality of care, place of residence and availability of health care services within the community. See Chapter 3, section 3.9 for more details on variable definition and measures.

6.3.2 Analytical strategy

Firstly, the study employs descriptive statistics in which frequencies and percentages of both maternal health care and sociodemographic characteristics associated with the women’s use of postnatal care services are described from the three waves of the MDHS datasets. Secondly, the

study employs a Pearson's chi-square to test the association between variables using a bivariate approach. Thirdly, at a multivariate level, a binary logistic regression reporting odd ratio is used test the hypothesis associated with both maternal health care factors and sociodemographic factors in relation to the outcome variable which in the case choice of postnatal health care service utilization for study years 2000, 2004 and 2010. As indicated above, the postnatal health care service utilization is defined based on threefold level, namely, immediate, moderate and delayed postnatal health care service utilization. Furthermore, in order for the study to establish the relative percentage contributions of each factor on women use of postnatal care aggregately, a decomposition technique was used. Chapter 3, section 3.7 provides details procedure of algorithm of decomposition.

6.4 Results

This section provides the results of univariate, bivariate, multivariate analysis on the factors influencing women's use of postnatal care service after childbirth for the years 2000, 2004 and 2010 in Malawi.

6.4.1 Background characteristics of respondents

Table 6.1 presents the distribution of the background characteristics of women who indicated to either use a postnatal care services facility or not after childbirth. As is illustrated in Table 6.1, it was found that 274 women did have postnatal care experiences in 2000, about 2386 women in 2004 and 7018 women in year 2010. The study found that among these women, 41% had a mean age of 25 – 34 in 2000 and 2004. In 2010, majority of the women had a mean age of 48.6%. In terms of frequency of antenatal care visits, those found to have had at least four ANC visits represented about 53.5% in 2000 and increased to 65.7% in 2004 and declined to about 48.5 % in 2010. On the same note in as far as postnatal care service delivery was concerned, the study found that negligible number of women delivered in public health care facilities in year 2000.

Table 6.1 Background characteristics of respondents related to postnatal care service usage in year 2000,2004 and 2010

Postnatal care	2000		2004		2010	
	N	(%)	N	(%)	N	(%)
	274	100.0	2 386	100.0	7018	100.0
Maternal age						
15–24	93	34.1	920	38.6	2346	33.4
25–34	113	41.0	991	41.5	3255	46.4
35+	68	24.9	475	19.9	1417	20.2
ANC frequency						
<3	128	46.5	819	34.3	3616	51.5
>=4	146	53.5	1567	65.7	3402	48.5
Maternal education						
No education	69	25.3	473	19.8	970	13.8
Primary	198	72.5	1507	63.2	4681	66.7
Secondary and higher	7	2.2	406	17.0	1367	19.5
Women employment						
Not employed	55	19.8	459	19.2	1878	26.8
All seasoned	120	44.0	963	40.4	4691	41.3
Seasonal	99	36.3	964	40.4	2249	32.0
Occasional						
Standard of living						
Poor	167	61.2	824	34.5	2627	37.4
Middle	72	42.5	1017	42.6	3029	43.3
Rich	35	49.3	545	22.8	1352	19.3
Number of living children						
1	70	25.6	626	26.2	1570	22.4
2	55	19.8	552	23.1	1473	21.0
3	33	12.1	385	16.1	1313	18.7
4	40	14.7	312	13.1	1050	15.0
5+	76	27.8	511	21.4	1612	23.0
Concern of no drugs						
Not problem	195	71.1	1023	42.9	4040	58.0
Problem	79	28.9	1363	57.1	2978	42.
Concern of transport						
Not a problem	154	56.0	1175	49.3	3756	53.5
Problem	120	44.0	1211	50.8	3262	46.5
Concern of distance						
Not a problem	165	60.1	1033	43.3	3906	55.7
Problem	109	39.9	1353	56.7	3112	44.6
Media exposure						
Neither radio nor television	120	44.0	683	28.6	2824	40.2
Either radio or television	142	51.7	1515	63.5	3393	48.4
Radio and television	12	4.4	188	7.9	801	11.4
Quality of care						
Inadequate	2	0.4	45	1.9	22	2.5
Moderate	26	9.5	366	15.3	3296	60.5
Adequate	247	90.2	1975	82.8	3699	36.9
Place of residence						
Urban	117	42.5	921	38.6	138	1.9
Semi-urban	78	28.6	637	26.7	846	12.1

Rural	79	28.9	828	34.7	6034	86
Availability of health services						
Not a problem	254	72.7	2085	87.4	3911	55.7
Problem	20	7.3	301	12.6	3107	44.3

In the succeeding years of study, about 56.5% of the women delivered in public health facilities in 2004 and increased to about 73.2% in 2010. In terms of education status, the majority of women who attained education up to primary school level had a postnatal care inclination. For instance, about 72.5%, 63.2% and 66.7% attained a primary school level in 2000, 2004 and 2010 respectively. However, it was observed that women who had a postnatal care service access and had secondary education or higher were very few. More illustratively, about 2.2%, 17.0% and 19.5% of these women had a postnatal care access in the year 2000, 2004 and 2010 respectively. Furthermore, about 44.0 %, 40.4% and 41.2% of these women earned their living through seasonal employment in the year 2000, 2004 and 2010 respectively.

In as far as standard of living is concerned, it was found that the majority of women were from poor households in year 2000 and year 2010. Additionally, women from the rich households denied using public health care facilities from about 49.3% in 2000, 22.8% in 2004 and 19.2% in 2010. Regarding the number of living children at household level, about 25.6 % of women with a child living in 2000, 26.2% in 2004 and 22.4% in 2010 had an experience with postnatal care service utilization. Furthermore, women from households with 5 or more living number of children represented about 27.8 % of the women with postnatal care utilization experience in 2000, 21.4% in 2004 and 23% in 2010.

It is worthy to note that about 71.1% of the women had a problem with accessing drugs in year 2000. This was corresponding to about 42.9% in 2004 and 63.4% in 2010. In as far as transport availability was concerned, about 56.6% of the women had no problem with access transport to postnatal care services in year 2000. The transport availability challenge was reduced to 42.9% in 2004 and was 63.4% barrier in 2010. This implies that less than 50% of the women did not have transport concerns which constrained them from accessing postnatal care service facilities in Malawi. In terms of distance challenges to access health facilities, the study found that about 44.0%, 56.7% and 30.5% of the women had no distance concerns to access the health care facilities from their households. On the same, it was found that 56.0 %, 49.3% and 69.5% of the women had challenges to access health facilities due to distance challenges in year 2000, 2004 and 2010 respectively. In terms of exposure to media, majority of the women were exposed to either a radio or a television at their household level. For example, about 51.7%, 63.5% and

48.4% were exposed to either a radio or a television in 2000, 2004 and 2010 across the country, respectively. Additionally, a small proportion of the women had both a radio and television at household level across the years of study.

At community level, the study found that about 90.2% of the women had adequate access to quality of care in 2000, 82.8% in 2004 and as low as 52.7% in 2010, it was observed that 62.6% and 56.2% of the women were adequately satisfied with the quality of care delivery in facilities within their communities. In term the respondents' place of residence, majority of them were predominantly from rural communities. For example, in 2000 about 90.2% of the women were rural inhabitants, 82.8 % in 2004 and 86.0% in 2010. In as far as community availability of health care services, the study found that 72.7 % of the respondents had challenges in accessing health care facilities in 2000 and 87.4% in 2004. However, in 2010, the situation was a little bit improved and consequently reduced availability of maternal health care service challenge to about 55.7%. Table 6.1 summarises the details of the background characteristics of the women in 2000, 2004 and 2010.

6.4.2 Bivariate association between explanatory variables and women's use of postnatal care service

Table 6.2, 6.3 and 6.4 show the bivariate results of the explanatory variables were insignificantly related to women's use of postnatal care services in Malawi. However, in 2000, the study found that ANC frequency, number of living children, exposure to media and availability of health care providers within the communities were found to be significant factors associated with women use of postnatal care service within 24 hours after child delivery. In 2004, it was found that maternal education, women's employment status, standard of living, number of living children, exposure to media, place of residence and availability of health care providers relate significantly with women use of postnatal care services within 24 hours after delivery. In 2010, the bivariate result indicates that only standard of living and concerns of no transport were the two significant factors associated with women use of postnatal care services in the country. Table 6.3 provides details of the results.

Table 6.2 Bivariate analysis of the women factors associated with use or non-use of postnatal care services within 24 hours after childbirth

Variables	Women use of postnatal care : less than 24 hours								
	2000			2004			2010		
	N=274		Chi-square	N =2386		Chi-square	N = 7018		Chi-square
	No (%)	Yes (%)		No (%)	Yes (%)		No (%)	Yes (%)	
Maternal age									
15—24	36.27	28.75	1.89	39.44	36.79	2.97	23.93	25	0.07
25—34	40.41	42.5		41.57	41.47		48.74	47.37	
35+	23.32	28.75		19	21.74		27.32	27.63	
ANC frequency									
<4 times	50.78	36.25	4.67**	34.8	33.38	0.47	59.67	51.32	2.02
>= 4 times	49.22	63.75		65.2	66.62		40.33	48.68	
Maternal education									
No education	25.91	23.75	0.17	20.25	17.19	13.9**	23.06	22.37	0.412
Primary	72.02	73.75		37.24	46.65		69.73	68.42	
Secondary and Higher	2.07	2.5		42.51	36.16		7.21	9.21	
Women employment									
Not employed	20.73	17.5		20.25	17.19	19.45***	22.4	28.95	1.7
All seasonal	45.08	41.25	1.27	37.24	46.65		48.52	44.74	
Seasonal	34.2	41.25		42.51	36.16		29.07	26.32	
Standard of living									
Poor	57.51	70.37	4.15	33.42	36.79	12.95**	53.11	43.42	1.07**
Middle	27.98	20.99		41.57	44.75		42.19	43.42	
Rich	14.51	8.64		25.02	18.46		4.7	13.16	
number of Living Children									
1	25.91	25		27.08	24.53		12.02	10.53	1.14
2	21.76	15	14.4**	22.95	23.51	8.64*	19.23	19.74	
3	14.51	6.25		16.93	14.54		18.69	18.42	
4	16.06	11.25		13.17	12.9		19.34	15.79	
5+	21.76	42.5		19.87	24.53		30.71	35.53	
Concerns no drugs									
Problem	72.54	67.5	0.69	44.01	40.58	2.54	63.83	57.89	12.8
Not a problem	27.46	32.5		55.99	59.42		36.17	42.11	
Concerns no Transport									
Problems	58.03	51.25		49.47	48.8		69.95	52.63	9.7**
Not a problem	41.97	48.75	1.06	50.53	51.2	0.09	30.05	47.37	
Concerns no Distance									
Problems	60.1	60		44.2	41.47	1.61	70.16	61.84	2.3
Not a problem	39.9	40	0.001	55.8	58.53		29.84	38.16	
Media exposure									
Neither radio nor television	40.93	51.25		27.71	30.47		48.2	53.95	4.01
Either radio or television	55.96	41.25	6.2**	62.82	64.85	17.14***	47.65	38.16	
Radio and television	3.11	7.5		9.47	4.68		4.15	7.89	
Quality of care									
Inadequate	43.01	41.98		37.37	41.09		2.62	1.32	1/34
Moderate	27.46	30.86	0.36	26.9	26.3	4.94	60.87	56.58	
Adequate	29.53	27.16		35.74	32.62		36.5	42.11	
Place of residence									
Urban	0.52	0		1.88	1.9	6.03**	1.09	2.63	4.7
Semi-urban	8.81	11.11	6.75	16.61	12.77		2.84	6.58	
Rural	90.67	88.89		81.5	85.34		96.07	90.79	
Availability of health care providers									
Problems	92.75	92.59	4.8**	86.4	89.4	4.1**	49.29	52.63	0.31
not a problem	7.25	7.41		13.6	10.6		50.71	47.37	

*** p < 0.001; **p < 0.05; * p < 0.1

In as far as women's use of postnatal care service facilities between 1- 6 days after childbirth, the study found very few indicators related to women use of postnatal care service facilities over the period 2000, 2004 and 2010. As a matter of fact, the study found that in 2000, ANC frequency, number of living children, and quality of care was associated with women's use of postnatal care service facilities between 1- 6 days after childbirth in Malawi. In the year 2004, it was observed that women's employment, number of living children, and availability of health care providers were statistically significant and related to women's use of postnatal care service facility between 1 – 6 days after childbirth in Malawi. In 2010, the study found that maternal age related significantly with women's use of postnatal care service after 1- 6 days after childbirth in Malawi. Table 6.3 provides more details.

In terms of women's use of postnatal care service facilities after 1 week or higher after childbirth, it was observed that in 2000, maternal age, number of living children, concerns of no drugs and quality of care relate significantly to women's use of postnatal care services between the period of 1 week or higher after childbirth in Malawi. In another aspect, it was noted that maternal education, women's employment, standard of living, number of living children, concerns regarding drugs in adequacy and unavailability, transport availability, distance challenges, women exposure to media and quality of care statistically related to women use of postnatal care service in year 2004. In 2010, the study found that maternal age, education attainment, standard of living, number of living children, concerns of distance, exposure to media, quality of care and place of residence are statistically and significantly related to utilization of postnatal care among women between 1 week and higher after childbirth in Malawi. Table 6.4 provides more details.

Table 6.3 Bivariate analysis of the women factors on non-use or use of postnatal care service facilities between 1-6 days after childbirth and corresponding Pearsons chi- square values.

Variables	Women postnatal use between 1 – 6 days after childbirth								
	N = 274			N = 2386			N = 7018		
	160 no	114 yes	Chi-square	1275 No	1111 Yes	Chi-square	5327 no	1691 Yes	Chi-square
Maternal age	%	%		%	%		%	%	
15—24	36.4	30.7		38.75	37.81	2.21	24.27	22.31	5.56*
25—34	39.6	42.98	0.98	40.85	44.21		47.27	57.69	
35+	23.9	26.32		20.4	17.98		28.46	20	
ANC frequency									
<4 times	42.1	52.63	2.93*	34.65	33.06	1.39	59.7	54.62	1.2
>= 4 times	57.8	47.37		65.35	66.94		40.3	45.38	
Maternal education									
No education	26.4	23.68	0.48	20.82	15.91	0.25	23.11	22.31	1.8
Primary	71.0	74.56		63.83	60.54		69.11	73.08	
Secondary and Higher	2.52	1.75		15.35	23.55		7.78	4.62	
Women employment									
Not employed	20.1	19.3	1.02	18.09	23.76	6.55**	22.4	28.95	1.7
All seasonal	41.5	47.37		41.69	35.12		48.52	44.74	
Seasonal	38.3	33.33		40.22	41.12		29.07	26.32	
Standard of living									
Poor	65.6	55.26	3.24	35.38	31.2	0.04	51.45	58.46	3.97
Middle	23.7	28.95		43.64	38.64		42.74	39.23	
Rich	10.6	15.79		20.98	30.17		5.81	2.31	
number of Living Children									
1	31.4	17.54	12.3**	26.55	25	9.33*	11.5	14.62	3.2
2	16.3	24.56		21.98	27.69		19.4	18.46	
3	11.3	13.16		16.19	15.91		18.23	21.54	
4	10.6	20.18		12.78	14.26		18.93	20	
5+	30.1	24.56		22.5	17.15		31.94	25.38	
Concerns no drugs									
Problem	72.9	68.42	0.66	41.85	46.9	0.012	64	59.23	1.11
Not a problem	27.0	31.58		58.15	53.1		36	40.77	
Concerns no Transport									
Problems	56.6	55.26	0.05	48.48	52.27	0.87	69.34	63.85	1.59
Not a problem	43.4	44.74		51.52	47.73		30.66	36.15	
Concerns no Distance									
Problems	62.8	56.14	1.27	42.38	46.9	0.06	69.8	67.69	0.23
Not a problem	37.1	43.86		57.62	53.1		30.2	32.31	
Media exposure									
Neither radio nor television	47.8	38.6		28.55	28.93		48.43	50	1.61
Either radio or television	47.1	57.89	3.1	64.41	59.92	3.54	46.81	47.69	
Radio and television	5.03	3.51		7.05	11.16		4.76	2.31	
Quality of care									
Inadequate	44.3	40.35		39.43	35.33		2.67	1.54	1.07
Moderate	23.1	35.96	5.9*	25.5	31.4	6.63	60.86	58.46	
Adequate	32.5	23.68		35.07	33.26		36.47	40	
Place of residence									
Urban	0-0	0.88		1.95	1.65		1.28	0.77	
Semi-urban	8.13	11.4	2.28	14.62	18.18	0.69	3.02	3.85	0.49
Rural	91.8	87.72		83.44	80.17		95.7	95.38	
Availability of health care providers									
Problems	91.8	93.86	0.38	87.49	86.98	2.93*	48.55	56.15	2.6
not a problem	8.13	6.14		12.51	13.02		51.45	43.85	

*** p<0.001; **p<0.05; * p<0.1

Table 6.4 Bivariate analysis of the women factors on non-use or use of postnatal care service facilities between 1 week or higher after childbirth and corresponding pearsons chi-square value

Variables	Women's postnatal use - 1 week or higher								
	2000		2004		2010				
	N = 274		N = 2386		N = 7018				
	194	79	1902	484	6061	957			
	No (%)	Yes (%)	No (%)	Yes (%)	No (%)	Yes (%)			
Maternal age									
15—24	23.93	25		38.75	37.81	2.28	23.3	24.2	10.1**
25—34	48.74	47.37	5.49*	40.85	44.21		53.88	47.26	
35+	27.32	27.63		20.4	17.98		22.82	28.54	
ANC frequency									
<4 times	59.67	51.32	0.112	34.65	33.06	0.43	53.4	60.51	0.22
>= 4 times	40.33	48.68		65.35	66.94		46.6	39.49	
Maternal education									
No education	23.06	22.37	0.97	20.82	15.91	20.6*	22.33	23.18	16.06***
Primary	69.73	68.42		63.83	60.54		71.36	69.17	
Secondary and Higher	7.21	9.21		15.35	23.55		6.31	7.64	
Women employment									
Not employed	22.4	28.95	0.64	18.09	23.76	10.65**	22.82	22.93	1.65
All seasonal	48.52	44.74		41.69	35.12		48.06	48.28	
Seasonal	29.07	26.32		40.22	41.12		29.13	28.79	
Standard of living									
Poor	53.11	43.42	0.05	35.38	31.2	18.5**	52.91	52.23	14.39**
Middle	42.19	43.42		43.64	38.64		40.78	42.68	
Rich	4.7	13.16		20.98	30.17		6.31	5.1	
number of Living Children									
1	12.02	10.53	14.6**	26.55	25	11.6**	11.5	14.62	10.21**
2	19.23	19.74		21.98	27.69		19.4	18.46	
3	18.69	18.42		16.19	15.91		18.23	21.54	
4	19.34	15.79		12.78	14.26		18.93	20	
5+	30.71	35.53		22.5	17.15		31.94	25.38	
Concerns no drugs									
Problem	63.83	57.89	2.98*	41.85	46.9	4.02**	58.74	64.59	0.26
Not a problem	36.17	42.11		58.15	53.1		41.26	35.41	
Concerns no Transport									
Problems	69.95	52.63	1.62	48.48	52.27	3.22*	59.71	70.96	0.46
Not a problem	30.05	47.37		51.52	47.73		40.29	29.04	
Concerns no Distance									
Problems	70.16	61.84	1.53	42.38	46.9	9.52**	58.74	64.59	2.9*
Not a problem	29.84	38.16		57.62	53.1		41.26	35.41	
Media exposure									
Neither radio nor television	48.2	53.95	0.93	28.55	28.93	13.29**	51.46	47.9	9.8**
Either radio or television	47.65	38.16		64.41	59.92		44.17	47.64	
Radio and television	4.15	7.89		7.05	11.16		4.37	4.46	
Quality of care									
Inadequate	2.62	1.32	10.7*	39.43	35.33	9.5**	1.46	2.8	135.1***
Moderate	60.87	56.58		25.5	31.4		57.77	61.27	
Adequate	36.5	42.11		35.07	33.26		40.78	35.92	
Place of residence									
Urban	1.09	2.63		1.95	1.65		1.46	1.15	9.11**
Semi-urban	2.84	6.58	3.01	14.62	18.18	3.8	4.85	2.68	
Rural	96.07	90.79		83.44	80.17		93.69	96.18	
Availability of health care providers									
Problems	49.29	52.63	0.39	87.49	86.98	0.89	54.85	48.15	0.05
not a problem	50.71	47.37		12.51	13.02		45.15	51.85	

*** P < 0.001; p < 0.05; * p < 0.1

In 2010, the study found that all women attributes were associated and significantly related to their use of postnatal care services in Malawi. Table 6.5 below summarises the details.

6.4.3 Multivariate results of factors influencing women's use of postnatal care services

In the multivariate analysis four approaches are employed depending on the nature of the outcome variable the study uses to define women's use of postnatal/postpartum care. For instance, these were defined as immediate, moderate and delayed postnatal care utilization related to 1 day, 1–6 days and 1 week or higher postnatal care utilization respectively. The study aggregated all the defined three categories to explore determinants of postnatal care service utilization in general over the years of study. The succeeding sections provide more details. Lastly, the aggregate model odds ratios are employed for decomposition in order to establish relative contribution of each variable towards women's use of postnatal care service facilities in the country.

6.4.4 Factors associated with immediate use of postnatal care in Malawi

In year 2000, the study found that women who attained primary education (OR=1.81, 95% CI = 1.04-3.17, $p < 0.05$) were associated with increased use of postnatal care service compared to women without any formal education. Still at individual level, it was found that women affiliated to Protestant religious groupings (OR = 1.77, 95% CI= 0.95-3.2, $p < 0.1$) were associated with increased likelihood of using postnatal care services relative to the women affiliated to the Catholic religion.

At household level, the study found that women's number of living children and exposure to media were found to be partly significant in influencing women's use of postnatal care services after childbirth in Malawi. For instance, women that had 1 to 4 living children were found to reduce their chance of using postnatal care service facilities. On the contrary, it was observed that women that had at least five living number of children (OR =2.27, 95% CI= 0.91 -5.67, $p < 0.01$) were more likely to use postnatal care service after childbirth compared to women with a single child. Women's exposure to either a radio or a television (OR = 0.52, 95% CI = 0.26-1.01, $p < 0.1$) was associated with reduced likelihood of using postnatal care service facilities relative to their counterpart with neither a radio nor a television.

The study found that women's immediate use of postnatal care service facility was influenced by different factors across the years of study. For instance, moderate quality of care delivery within the health facilities (OR = 0.34, 95% CI = 0.21-0.54, $p < 0.001$) compared to adequate quality of care and women resident in either semi-urban (OR = 0.03, 95% CI = 0.01-0.08, $p < 0.001$) or in rural (OR= 0.02, 95% CI = 0.01-0.06, $p < 0.001$) compared to women in urban counterpart, remained statistically significant in reducing women's use of postnatal care services immediately after childbirth.

Table 6.5 Odds Ratios for factors influencing women's use of postnatal care service immediately after childbirth for the years 2000, 2004 and 2010 in Malawi

Variables	Immediate postnatal check-up < 1 day after childbirth		
	2000	2004	2010
Maternal age			
15-24	1.00	1.00	1.00
25-34	1.46	1.06**	1.02
35+	1.01	1.13***	1.01
ANC frequency			
<3	1.00	1.00	1.00
>=4	1.39	1.17	1.12**
Public health care delivery			
No	1.00	1	1
Yes	-	1.55	2.19***
Maternal education			
No education	1.00	1.00	1.00
Primary	1.81	0.97	0.95
Secondary and higher	0.61	0.96	1.07
Women employment			
Not employed	1.00	1.00	1.00
All seasoned	1.77	1.04	1.13**
Seasonal	0.81	1.1	0.95
Occasional	1.02	0.79	1.03
Religious affiliations			
Catholics	1.00	1.00	1.00
Protestants	1.77	0.86*	0.93
Muslims	1.61	0.87	1.13*
Others	-	0.65	0.93
Standard of living			
Poor	1.00	1.00	1.00
Middle	1.01	0.98	1.09*
Rich	0.21	0.78**	1.02
Number of living children			
1	1.00	1.00	1.00
2	0.73	0.83	0.93
3	0.38	0.83	0.95
4	0.82	0.86	1.01
5+	2.27	1.05	0.92
Concern of no drugs			
Not problem	1.00	1.00	1.00
Problem	0.92	0.97	1.01
Concern of transport			
Not a problem	1.00	1.00	1.00
Problem	0.75	0.76**	0.94
Concern of distance			
Not a problem	1.00	1.00	1.00
Problem	1.05	0.94	0.93
Media exposure			
Neither radio nor television	1.00	1.00	1.00
Not a problem	0.52	0.99	1.03
Problem	1.88	0.82	0.85*
Quality of care			
Adequate	1.00	1.00	1.00

Moderate	0.34***	0.64**	0.86***
Inadequate	-	0.03**	0.01***
Place of residence			
Urban	1.00	1.00	1.00
Semi-urban	0.03***	0.37**	0.01***
Rural	0.02***	0.27**	0.59***
Availability of health services			
Not a problem	1.00	1.00	1.00
Problem	0.59	0.78**	0.99

Note: *** signifies $p < 0.001$; ** $p < 0.05$ and * $p < 0.1$

In 2004, women's use of ANC clinics for at least four times (OR = 1.17, 95% CI = 1.02 - 1.32, $p < 0.05$) were associated with increased use of immediate postnatal care services after childbirth relative to women that had less than four ANC visits. On the same aspect, the study further found that women that delivered within the public health care facilities (OR = 1.55, 95% CI = 1.36-1.75, $p < 0.001$) were increased the likelihood of using postnatal care services relative to women that did not deliver within the public health care facilities. Based on religious affiliation, it was observed that women from the Protestants grouping (OR = 0.86, 95% CI = 0.75-1.01, $p < 0.1$) were associated with reduced likelihood in using postnatal care services compared to Catholics.

At the household level, women from the rich household (OR = 0.78, 95 % CI = 0.62 - 0.97, $p < 0.05$) were associated with less likelihood in using public health care postnatal care services relative to women from the poor households after childbirth. In as far as women's concerns to transport access, the study found that those that indicated to have problem to access transport (OR = 0.77, 95% CI = 0.65 - 0.90, $p < 0.05$) were less likely to utilize postnatal care services immediately after childbirth.

At the community level, it was found that women that indicated to have accessed inadequate quality of care in public health facilities (OR = 0.03, 95% CI = 0.01-0.04, $p < 0.001$) and moderate quality of care (OR = 0.64, 95% CI = 0.56-0.72, $p < 0.001$) were associated with reduced chance of using postnatal care service facilities compared to women that indicated to have received adequate quality of care in turn. At the same level, the present study found that women in either semi-urban (OR = 0.37, 95% CI = 0.29 - 0.49, $p < 0.001$) or rural communities (OR = 0.28, 95 % CI = 0.22 - 0.34, $p < 0.001$) were associated with reduced chance of utilizing postnatal care services immediately after childbirth compared to those in urban communities.

In 2010, women's ANC utilization for at least four times (OR = 1.12, 95% CI = 1.02 - 1.32, $p < 0.05$) were associated with increased use of postnatal care among women compared to their counterpart with less than four ANC times. Likewise, the study found an increased use of

postnatal care among women who delivered their babies within the public health care service facilities (OR = 2.19, 95 % CI = 1.36 - 1.75, $p < 0.001$) relative to those that did not deliver at the public health facilities. In terms of employment, it was found that women who had all seasoned employment status (OR = 1.13, 95% CI = 1.02 - 1.25, $p < 0.05$) were associated with increased and significant likelihood of using postnatal care services as compared to those women without no employment.

At household level, women from middle income households (OR= 1.09, 95% CI= 0.99 - 0.19, $p < 0.1$) were associated with increased use of postnatal care service facilities immediately after childbirth compared to the poor counterpart. At the same level, women from households with both a radio and a television (OR = 0.85, 95% CI = 0.54-0.64, $p < 0.1$) were associated with reduced use of postnatal care services. At the community level quality of care and place of residence were associated with less likelihood of women's use of postnatal care in year 2010.

6.4.5 Women's use of Postnatal Care services between 1-6 Days after Childbirth

In 2000, based on Table 6.5, it was observed that women's use of postnatal care services between 1–6 days after childbirth was very low. The study found that only 29% of the total women attended postnatal care between 1–6 days after childbirth. On the same wave length, the study found that a lot of factors were associated with reduced likelihood of women in using postnatal care services between 1–6 days after childbirth. For instance, individual factors such as women utilization of ANC, secondary education attainment, occasional employment status of women were associated with reduced yet significant likelihood of women's use of postnatal care between 1–6 days after childbirth. At a household perspective, it was found that problem concerning drugs within the health facility (OR=0.5, 95% CI=0.31-0.79, $p < 0.05$) and distance to the health facility (OR=0.55, 95% CI=0.34-0.97, $p < 0.05$) compared with those with no problems to either accessibility of drugs and no problem with distance respectively, were statistically and significantly associated with less chance of utilizing postnatal care services between 1–6 days after childbirth. At community level, the study found that moderate delivery of care, place of residence and problems of health services availability was associated with reduced women chance of using postnatal care service facility between 1–6 days after childbirth in year 2000.

In 2004, the study found that when women have delivered through the public health care facilities (OR = 1.67, 95% CI = 1.41 - 1.98, $p < 0.001$), they were more likely to increase their

use of postnatal care services between 1–6 days after childbirth compared to those that delivered in other facilities. At community level, it was found that women with radio and television (OR = 1.43, 95% CI = 0.93 - 2.19, $p < 0.1$) were associated with increased likelihood of women's use of postnatal care services between 1–6 days after childbirth. However, factors such as standard of living at household level and community's level quality of care and place of residence was associated with reduced chance of women in using postnatal care services facilities between 1–6 days after childbirth in year 2004.

Table 6.6 Odds ratio's and factors influencing women use of postnatal care between 1-6 days after childbirth for the year 2000, 2004 and 2010

Variables	Women Postnatal Check-Up between 1–6 days after Childbirth		
	2000	2004	2010
	OR	OR	OR
Maternal age			
15–24 ®	1.00	1.00	1.00
25–34	0.98	1.09	1.01
35+	1.22	1.15	1.05
ANC frequency			
<4 ®	1.00	1.00	1.00
>=4	0.49***	0.96	0.96***
Public health care delivery			
No (R)	1.00	1.00	1.00
Yes	-	1.67***	1.49***
Maternal education			
No education ®	1.00	1.00	1.00
Primary	1.11	0.76**	0.75***
Secondary and higher	0.17**	0.95	0.84*
Women employment			
Not employed ®	1.00	1.00	1.00
All seasoned	0.86	0.84	0.91
Seasonal	1.06	0.75**	0.95
Occasional	0.45**	0.49**	0.97
Religious affiliations			
Catholics ®	1.00	1.00	1.00
Protestants	1.05	0.78**	0.8***
Muslims	1.09	0.81	0.73**
Others	0.56	0.31**	0.63
Standard of living			
Poor ®	1.00	1.00	1.00
Middle	0.96	0.83*	1.16**
Rich	1.37	0.63**	1.31**
Number of living children			
1 ®	1.00	1.00	1.00
2	1.13	0.67**	0.82**
3	0.76	0.72**	0.86
4	1.33	0.81	0.78**
5+	0.8	0.65**	0.88
Concern of no drugs			
Not a problem ®	1.00	1.00	1.00
Problem	0.50**	1.28*	0.76***
Concern of transport			
Not a problem ®	1.00	1.00	1.00
Problem	0.93	0.87	0.93
Concern of distance			
Not a problem ®	1.00	1.00	1.00
Problem	0.55**	0.94	0.93
Media exposure			
Neither radio nor television ®_)	1.00	1.00	1.00
Either radio or television	0.86	1.08	0.89*

Radio and television	0.30	1.43*	1.09
Quality of care			
Adequate ®	1.00	1.00	1.00
Moderate	0.24***	0.52***	0.76***
Inadequate	-	0.08***	0.01***
Place of residence			
Urban ®	1.00	1	1
Semi-urban	0.22***	0.31***	0.39***
Rural	0.17***	0.19***	0.25***
Availability of health services			
Not a problem ®	1.00	1.00	1.00
Problem	0.42**	1.15	0.91

Note: *** signifies $p < 0.001$; ** $p < 0.05$ and * $p < 0.1$; OR is the Odds Ratio

In 2010, the study found that women's use of ANC, women education attainment, number of living children, problems concerning drug access in health facilities, quality of care and place of residence were the significant factors that reduced women's likelihood of utilizing postnatal care services between 1–6 days period after childbirth. On the contrary, the study found that women that delivered within the public health care facilities and women from household with either middle or rich standard of living were found to be more likely to use postnatal care services between 1–6 days after childbirth.

6.4.6 Postnatal health care service utilization from 1 week or higher

Regarding the determinants associated with women utilization of postnatal care after a week and later after childbirth the study found slight difference between the years 2000, 2004 and 2010. For instance, in 2000, women from other religious affiliations (OR=3.45, 95% CI=1.08-10.9, $p < 0.05$) were more likely to use postnatal care service facilities, 1 week or later after childbirth relative to their Catholic women counterparts. On the contrary, the study found that women from households with five or higher living number of children were associated with significant as well as less prospect to use postnatal care services facilities a week or later after childbirth compared to women having a single living child. In terms of quality of care, the study found that the number of women that indicated access to moderate quality of care during prenatal care was significantly reduced in their likelihood of utilizing postnatal care services, 1 week or later after childbirth compared to women that reported access to inadequate care.

In 2004, the study found that women employment status was a significant predictor of postnatal care utilization among women after 1 week or later after childbirth. For instance, the study found that women that had all seasoned (OR = 1.25, 95% CI = 0.97 - 1.6, $p < 0.1$) and occasional employment (OR= 1.45, 95% CI = 0.97-2.1, $p < 0.1$) were associated with increased use of postnatal care, 1 week or later after childbirth. Considering factors such as religious affiliations,

either having a radio or a television, quality of care and place of residence were associated with significantly less likelihood for women to use postnatal care services for the period 1 week or later after childbirth.

In 2010, it was observed that primary school attainment among women, their employment status either in all seasoned or seasonal work, those that were affiliated to either Protestants or Muslims, number of living children, problems concerning drugs availability, media exposure, quality of care and place of residence were negative predictors of women's use of postnatal care service facilities 1 week or later after childbirth in 2010 (See 2010 Model in Table 6.7).

Table 6.7 Odds ratios of factors influencing women's use of postnatal care check-up between 1 week or higher after childbirth

Variables	Women post natal check-up 1 week or later		
	2000	2004	2010
Maternal age			
15–24 ®	1.00	1.00	1.00
25–34	1.16	1.28	1.16
35+	1.34	1.45	1.25
ANC frequency			
< 4 ®	1.00	1.00	1.00
>=4	0.73	0.97	1.03
Public health care delivery			
No	1.00	1.00	1.00
Yes		1.27	1.01
Maternal education			
No education ®	1.00	1.00	1.00
Primary	1.21	0.82*	0.84*
Secondary and higher	0.59	1.2	0.96
Women employment			
Not employed ®	1.00	1.00	1.00
All seasoned	1.51	1.25*	0.84*
Seasonal	1.16	0.83*	0.84*
Occasional	1.71	1.46*	1.12
Religious affiliations			
Catholics ®	1.00	1.00	1.00
Protestants	0.77	0.62***	0.72***
Muslims	1.32	0.45***	0.52***
Others	3.45**	0.35*	0.57

Standard of living			
Poor ®	1.00	1.00	1.00
Middle	1.07	0.91	1.13
Rich		1.09	1.19
Number of living children			
1 ®	1.00	1.00	1.00
2	0.58	0.86	0.76**
3	0.68	0.64**	0.75**
4	0.46	0.74	0.79*
5+	0.41*	0.52**	0.64**
Concern of no drugs			
Not a problem ®	1.00	1.00	1.00
Problem	0.57	0.84	0.74**
Concern of transport			
Not a problem	1.00	1.00	1.00
Problem	1.01	0.8	1.06
Concern of distance			
Not a problem ®	1.00	1	1
Problem	0.92	0.83	0.78**
Media exposure			
Neither radio nor television ®	1.00	1.00	1.00
Either radio or television	1.06	0.74***	0.82**
Radio and television		0.84	0.77*
		1.00	1.00
Quality of care			
Inadequate ®			
Moderate	1.00	0.01***	0.1***
Adequate	0.34***	0.62***	0.78***
Place of residence			
Urban ®	1.00	1.00	1.00
Semi-urban	0.03	0.28***	0.27***
Rural	0.06	0.20***	0.19***
Availability of health services			
Not a problem ®	1.00	1.00	1.00
Problem	0.54	1.02	1.13

Note: *** signifies $p < 0.001$; ** $p < 0.05$ and * $p < 0.1$

6.4.7 Factors associated with women's use of postnatal care services

This section explains the generic model that simulated to investigate determinants of postnatal care utilization from an overall perspective in the country for the years 2000, 2004 and 2010. As indicated in Table 6.1 a small percentage of about 2% of the women were found to use postnatal

care services in public health care facilities after childbirth in 2000. In subsequent years, it was found that 20% and 30% of the women's used postnatal care services in 2004 and 2010 respectively. In comparison to reports of levels of women's use of either prenatal and public health care during childbirth, these statistics are far lower with regard to the women's health care service utilization for the country concerned (NSO & Macro,2001; NSO & OCR Macro, 2004; NSO & ICF Macro, 2011). Therefore, this section highlights the determinants associated with this low service utilization.

Table 6.6 illustrates the odds ratios of the factors influencing women's use of postnatal care service utilization. In year 2000, the study found out that women utilization of antenatal care (OR = 0.71, 95% CI = 0.55-0.91, $p < 0.05$) was associated with reduced likelihood of women's use of postnatal care services in that year compared to the women that had less than four ANC visits. In terms of education, it was found that women that had secondary education (OR = 0.53. 95% CI = 0.11 - 0.68, $p < 0.05$), in year 2000, had challenges to use postnatal care services in public health facilities compared to their counterpart without formal education. At household level, it was observed that concern about drugs availability (OR=0.57, 95% CI= 0.41-0.77, $p < 0.001$) was associated with reduced chance of women's use of postnatal care services relative to the women with no challenges in accessing drugs. Similarly, problems of distance to health facility and women exposure to either a radio or a television at household level influenced towards reduced likelihood of women's use of postnatal care services in 2000. At community level, inadequate quality of car (OR = 0.27, 95% CI = 0.20 - 0.34, $p < 0.001$) was associated with decreased likelihood of women's use of postnatal care services compared to women who were adequately given quality care. Similarly women in either semi-urban or rural areas were found to have challenges in utilizing postnatal care services after childbirth compared to the women in rural communities. This was noted in reduced and significant likelihood in the year.

In 2004, the study found that maternal age, ANC visits of at least four times, childbirth in public health care facility, and women attainment of secondary education or higher was associated with significantly increased likelihood of women's use of postnatal care services, in Malawi.

Table 6.8 Odds Ratios of Factors influencing women use of postnatal care in Malawi

	Women's postnatal check-up		
	2000	2004	2010
Maternal age			
15–24 ®	1.00	1.0	1.0
25–34	1.12	1.19**	1.12**
35+	1.11	1.32**	1.19**
ANC frequency			
<4 ®	1.00	1.0	1.0
>=4	0.71**	1.22***	1.2***
Public health care delivery			
No ®	1.00	1.0	1.0
Yes	-	1.95***	2.6***
Maternal education			
No education ®	1.00	1.0	1.0
Primary	1.24	1.09	1.07
Secondary and higher	0.28**	1.48***	1.4***
Women employment			
Not employed ®	1.00	1.0	1.0
All seasoned	0.97	1.14	1.19**
Seasonal	0.99	0.99	1.04
Occasional	0.91	0.83	1.23**
Religious affiliation			
Catholics ®	1.00	1.0	1.0
Protestants	1.03	0.87**	0.93
Muslims	1.21	0.87	1.06
Others	1.34	0.52**	0.91
Standard of living			
Poor ®	1.00	1.0	1.0
Middle	1.04	0.98	0.93***
Rich	0.61	0.98	1.06***
Number of living children			
1 ®	1.00	1	1
2	0.77	0.87	0.92
3	0.59**	0.83**	0.96
4	0.84	0.92	0.97
5+	0.94	0.91	0.92
Concern of no drugs			
Not a problem ®	1.00	1.0	1.0
Problem	0.57***	1.1	0.91
Concern of transport			
Not a problem ®	1.00	1.0	1.0
Problem	0.88	0.8**	0.98
Concern of distance			
Not a problem ®	1.00	1.0	1.0
Problem	0.72**	0.95	0.89**
Media exposure			
Neither radio nor Television ®	1.00	1.0	1.0
Either radio or television	0.74*	1.05	0.97
Radio and television	0.56	1.1	0.9
Quality of care			
Adequate®	1.00	1.0	1.0
Moderate	0.27***	0.55***	0.53***
Inadequate	-	0.02***	0.01***
Place of residence			
Urban ®	1.00	1.0	1.0
Semi-urban	0.34***	0.66**	0.75**
Rural	0.32***	0.45***	0.64***
Availability of health services			
Not a problem ®	1.00	1.0	1.0
Problem	0.48**	0.96	0.96

Note: *** signifies $p < 0.001$; ** $p < 0.05$ and * $p < 0.1$

On the contrary, it was observed that women affiliated to Protestants and other religious grouping, women having three living children, challenges of transport to access health care, quality of care and women place of residence were associated with reduce chance of women's use of postnatal care services in year 2004.

In 2010, maternal age from 25 years or more was associated with significant increased likelihood of women's use of postnatal care services compared to those aged less than 25 years. At the same time, it was observed that those women that had at least four ANC visitations, those that delivered in public health facilities, had attained secondary education or higher, were seasonally and occasionally employed and were from the rich households increased their chance of using postnatal care services after childbirth in 2010. However, it was observed that women from middle income households, those with problems of distance to access postnatal care, quality of care and place of residence were associated with lowering women's chance to use postnatal care services after childbirth in the country.

6.4.8 Relative contribution of factors towards postnatal care utilization in Malawi

To determine the contribution of each factor to women's use of postnatal care service facilities, the decomposition approach, illustrated in chapter 3, was used.



Figure 6.2 percentage contributions of women factors on use of postnatal care services after childbirth in year 2000, 2004 and 2010

Therefore, based on the overall factors contribution, it was 0.53 in 2000, 0.11 in 2004 and .089 in 2010. This means that in all years the overall factors contributed a lot on women's reduced likelihood to use postnatal care services after childbirth. As such considering the contribution of other factors to the overall factors contribution, in 2000, maternal age (C = 25%), ANC frequency (17%), maternal education (8%) and maternal employment (7%) explained the most positive contribution of women's use of postnatal care service at an individual level, in year 2000. At household level, the number of living children (C=35%) contributed greatly towards the overall factor contribution. On the same argument, other factors such as concern about the drugs, transport and distance to the health facility were associated with positive yet slightly smaller contributions at that level. At community level, the study found that quality of care (C=17%) was the major contributor towards the women's reduced use of postnatal care services in year 2000. On the contrary, it was observed that women's use of public health facility during delivery (C= -6%), women place of residence (C = -4 %), standard of living (C = -2 %) and exposure to media (C = -2 %) reduced the women readiness to use postnatal care service after childbirth.

In 2004, the study found that maternal age (C = 13%), ANC frequency (C = 28%), number of living children (C = 19%), and quality of care (C = 23%) explained the positive contribution on women's use of postnatal care service facilities in 2004. On the same note, it was observed that maternal education (C = 2%), women employment (C = 3%), standard of living (C = 2%), exposure to media (C = 2%) and place of residence (3%) contributed slightly towards women's use of postnatal care service facilities.

In 2010, maternal age (C = 15%), ANC frequency (C = 17%), delivery in public health facility (C = 18%), number of living children (C = 23%), and quality of care (C = 21%) stood out to be the main factors that influenced women's use of postnatal care services after childbirth in Malawi. On the same note, it was observed that women employment statuses (C = 3%), standard of living (C = 4%), exposure to media (C = 1%) and place of residence (C = 1%) contributed slightly towards women's use of postnatal care service utilization.

Therefore, after aggregating the factors contribution by individual, household and community level, the study found that individual level factors are associated with most explained contribution on women's use of postnatal care service after childbirth across the years of study. This was seconded by the household level factors. However, community factors constitute the least explained level across the years of study. Figure 6.3 illustrates the percentage contributions associated with levels over the years 2000, 2004 and 2010.

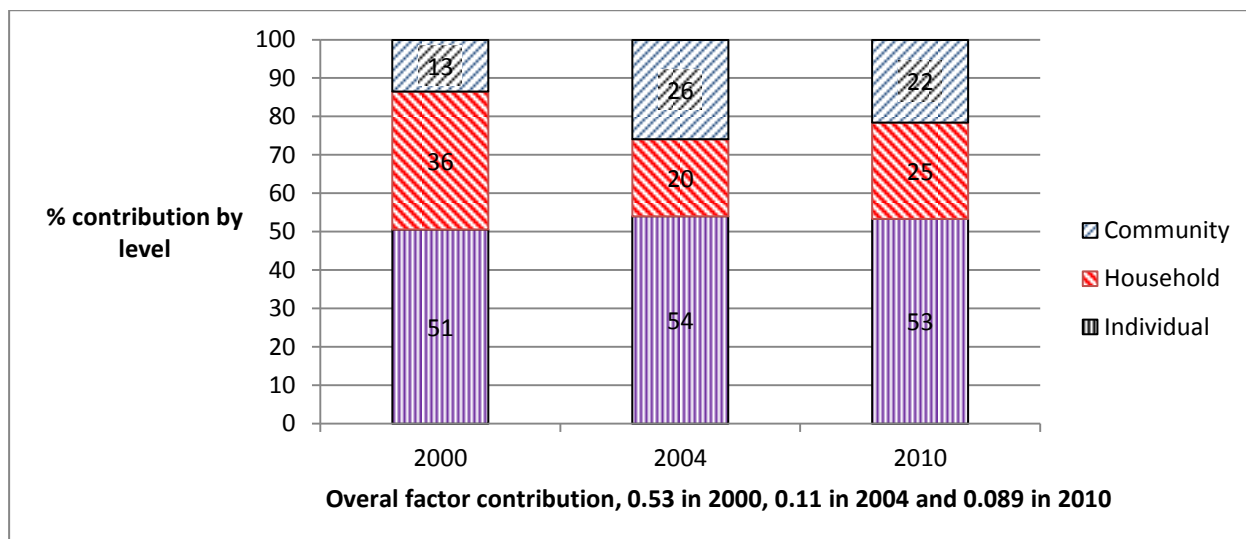


Figure 6.3 Summary of percentage contribution of individual, household and community factor on women use of postnatal care services in Malawi

6.5 Discussion

Over the years of this study, the women continued to experience an unmet need of postnatal care services in Malawi. This was despite the untiring efforts of the government of Malawi to promote health care system for women guided by maternal health promotion of integrated programmes such as “Road Map to Accelerate Reduction of Maternal Mortality and Morbidity” among others. Yet, women’s use of postnatal care service within a day, a week and longer than a week, is still influenced by numerous individual, household and community factors. Thus considering different dimensions that these factors have, the present chapter underscores the significance of understanding utilization of postnatal care service facilities among women that gave birth within 24 hours, 1–6 days, and 1 week and longer after childbirth in Malawi. Consequently, using the MDHS datasets from years 2000, 2004 and 2010, the object of the chapter is to examine maternal health and sociodemographic factors associated with postnatal care service utilization in the country, with the underlying aim of understanding critical factors causing unmet need in as far as maternal health care service utilization is concerned. Such information, if discovered, becomes paramount to redirect and direct maternal health management policy and other related health policies in general, and in addition, assist other influential key stakeholders in health care planning, budgeting and promotion, realign their strategies and focus in order to improve this fluctuation health public challenge still affecting women lives in Malawi based on the findings of this study.

For that reason, the study has pinpointed several factors that are both consistently or inconsistently significant and related to women's use of postnatal care service facilities after childbirth over time. For instance, the bivariate analysis showed in Tables 6.2, 6.3 and 6.4 found all, except maternal age and employment in year 2000 and concerns of drugs in 2004, variables that are statistically significant in influencing women's use of postnatal care utilization after childbirth.

Further to this, the multivariate results show great and inconsistent variations in the factors influencing women's use of postnatal care service over time. For instance, the aggregate model indicates that women's use of ANC, women attainment of secondary education or higher, concerns about drugs, distance to health facility and moderate quality of care, place of residence and availability of health services within the communities were associated with reduced likelihood of women's use of postnatal care services in year 2000. In the subsequent years, the study found that maternal age over 25 years, ANC frequency, child delivery in public health facility, and women attainment of secondary school education or higher are more likely to influence women's use of postnatal care service facilities after childbirth in year 2004. Yet, in the same year, the study found that women that were affiliated to Protestants and other sects of religion, concerns of transport availability, quality of health care with the communities, and place of residence remained the factors that reduced the likelihood of women's use of postnatal care services in year 2004. In year 2010, it was observed that maternal age, women's use of ANC, women's childbirth in public health facilities, women attainment of secondary school education or higher, women employed in either all seasoned or occasional work and those from rich households were more likely to increase their postpartum care utilization in that year. Contrary to this, it was found that women from the middle income households, those with challenges due to distance to access health care facilities, community quality of care and place of residence reduced the chance of women's use of postnatal care services in 2010. Further to this, the study found individual factors of women to be the most dominant positive contributors over time associated with inequality in women's use of postnatal care service facilities in Malawi. However, community level factors contributed the least towards women's use of postnatal care service facility after childbirth in the country.

The study established that maternal age was associated with increased odds of women's use of postnatal care service facilities after childbirth for the entire period of study from the perspective of the generic model. The findings support the results of several studies that confirmed that maternal age determines utilization of maternal health care services (Babalola *et al.*, 2009;

Neupane *et al.*, 2013). However, women in Malawi were found to increase their maternal health seeking behaviour with age. This finding contradicts what others found. They assert that as women grow older, their willingness to use maternal health care services declines. For instance, a study by Sardasht *et al.* (2015) noted that previous experiences that women encounter at the time they use maternal health care services affect their willingness for further use of the services hence reduced utilization by experienced mothers. Therefore, this study peculiarly found that women in Malawi rely on health care services a lot despite their maternal age as they were found to increase their odds of utilizing postnatal care services consistently across the years 2000, 2004 and 2010 different from the findings of other scholars (Ikamari *et al.*, 2004; Mpembeni *et al.*, 2007). On the other hand, increased use of postnatal care services, supported by works of earlier scholars, indicate that as women grow older they become aware of the significance of utilizing maternal health services when needed. This is because age serves as a proxy of education attainment which might influence utilization of maternal health care services of women in the long term (Chakraborty *et al.*, 2002; Doku *et al.*, 2012; Pebley *et al.*, 1996).

On the contrary, ANC utilization at least four times was associated with increasing and significant likelihood of women's use of postnatal care services after childbirth. Therefore, the year 2004 and 2010 findings concur with results of other scholars who found that as women's use of ANC service increases, their perspectives in seeking maternal health services for any subsequent maternal health needs during childbirth and postpartum care increased in India, Tanzania and Zimbabwe (Griffiths *et al.*, 2001; Mrisho *et al.*, 2009; Mathole *et al.*, 2004). This is due to the fact that at the time of ANC engagement women have the benefit of being told of the significance of safe motherhood and importance of using the modern health care facility if and only if the safe motherhood is to be attained. However, based on year 2000 model, the country ANC services had little effect in influencing women's use of subsequent maternal health care services. However, efforts that have been followed over time aimed at promoting ANC services, such as FANC services which resulted in increased use of ANC between year 2004 and 2010 (NSO & OCR Macro, 2005; NSO & ICF Macro, 2011). The present study found that the situation resulted in increased likelihood among women's use of postnatal care services after childbirth.

A recent study by Dahiru *et al.* (2015) argued that better service delivery among women during childbirth has the potential of increasing their likelihood of seeking future maternal health care more importantly, postpartum care service. Dahiru *et al.*, (2015) also observed that of the 37 women that were professionally attended during childbirth in health care facility, majority of

them managed to come for postpartum care services after being discharged. The present study concurs with this finding, in both 2004 and 2010, which women who delivered in public health care facilities were found to increase their likelihood of using postnatal care services facilities in Malawi.

The present study found that primary school education attainment status of women increased their likelihood of using postnatal care services across the entire period of study. On the same matter, it was found that, in year 2004 and 2010 studies, women who attained secondary school education level significantly increased their utilization status of postnatal care services. Therefore, based on the women's education status in Malawi, the study underscores the significance of promoting little education from primary level among women, as it has the potential of increasing women's willingness to utilize postnatal care services. This finding is consistent with the work of other previous studies which demonstrated and postulated a strong and significant relationship between maternal education and utilization of postnatal care among women in Nepal and Kenya (Dhakal *et al.*, 2007; Ochako *et al.*, 2011). On the contrary, the study found that women with secondary qualifications or higher were less likely to utilize postnatal care relative to women without formal education attainment, significantly, in year 2000. According to Onwujekwe *et al.*, (2005), they pointed out that women who attained secondary education or higher are economically enriched to support their own maternal health outside the public health care facilities hence low utilization of such services for alternative modern facilities in Pakistan (Shaikh *et al.*, 2008; Shaikh *et al.*, 2004). And so, the present study findings underscore the need to have renewed and determined effort to promote women education as from primary level and higher in Malawi if the country is to reap the dividends of maternal health through women's use of postnatal care service facilities. This is to support the effort of other countries with the importance of education on maternal health utilization, that is in tandem, with what other scholars postulated education to have a direct effect on increasing women's knowledge about maternal health and consequent reliance of maternal health services for any emergent maternal health need during or after childbirth (Neupane *et al.*, 2013; Paulus *et al.*, 2008).

Disparities among women with respect to work status have been a standing problem over the past decades in Malawi. For instance, the present study found that women over 40% of the women who indicated to have a postnatal care access, have been seasonally employed since year 2000 (NSO & Macro, 2001; NSO & OCR Macro, 2004; NSO & ICF Macro, 2011). Furthermore, multivariate result of the present study observed that women who were employed

full time were found to be more likely to use postnatal care services in year 2004 and significantly in 2010 relative to those who were not employed. Similarly, it was found that women with occasional employment were more likely and significantly to increase women's use of postnatal care services compared to those that were not employed in 2010. However, in preceding years women with either occasional or seasonal employment status were associated with low utilization of postnatal care services in 2000 and 2004, insignificantly. Such low health care utilization among women according to Bronfenbrenner's (1979) theoretical framework attributed this to interpersonal economic challenges among women as a result of that little paying employment which result in erratic availability of cash to support health care services among them maternal health care. As such, women in stable financial positions are capable of seeking and spending on their health care services compared to those experiencing financial instability (Rai *et al.*, 2012; Muldoon *et al.*, 2011). Such experiences result in delays in seeking health care services and subsequently worst maternal health outcome in the long term (Barnes-Josiah *et al.*, 1998). In Zambia, a study by Sialubanje *et al.* (2014) pointed out that economic challenge as a result of women unemployment status affect women's decision to seek maternal health services outside their home. Such delays affect quality of maternal health among them (Barnes-Josiah *et al.*, 1998).

In as far as religious affiliation is concerned, Ochako *et al.* (2011) found that religious affiliation among women increased their likelihood of using postnatal care in Kenya. Correspondingly in Bangladesh, a study by Rahman *et al.* (2011) pointed out that ethnicity and religion greatly affected women's use of postnatal care services in that country. In a similar vein, the present study found that religion has a significant effect in reducing women's use of postnatal care services in Malawi. For instance, the study found that women affiliated to Protestants beliefs are less likely to use postnatal care services compared to women of Catholic belief. Similarly, women that belong to other religious sects are associated with decreased likelihood of utilizing postnatal cares service relative to their counterparts belonging to Catholic beliefs.

A previous study has shown that improved standard of living has a positive influence on the household use of maternal health care services (Neupane *et al.*, 2012). It has also been highlighted by other studies that better standard of living positively increases women's use of postpartum care services (Rahman *et al.*, 2011; Elo, 1992). However, the present study also supports that, as women standard of living is above the average, their willingness to use postnatal care significantly increases the likelihood in year 2010 as compared to women with poor standard of living at household level.

As the number of living children per household increases, the study found that the burden that the women have in taking care of such children decreases their likelihood of utilizing postnatal care services facility after childbirth. For instance, the present study found that as the household increased their number of living children, the women's use of postnatal care services becomes less likely and insignificant except those household with three living children in years 2000 and 2004. The findings are inconsistent with what other scholars recorded that women with fewer children are more likely increase use of maternal health care services compared to those having a lot of living children (International Council on Research of Women, 2007; Raj *et al.*, 2015). This is because women with less number of children have lower burden to take care of their children and if experience any postnatal care challenges are better placed to use such maternal health facility relative to those burdened with more children (Singh *et al.*, 2012). However, as the number of living children increased per woman her experience and knowledge about previous encounter with health care systems have a bearing influencing her future and subsequent engagements with maternal health care (Singh *et al.*, 2012).

In as far as cost of drugs is concerned, the study found that women from households experiencing problems because of costs were less likely to use postnatal care service facility after childbirth compared to those women who indicated to experience no problem of accessing postnatal care due to drug costs. It was further observed that women in year 2000 were associated with a significant yet less likelihood to use postnatal care services as a result of drug costs. This implies that in Malawi, costs of drugs scares away women and affects their maternal health seeking behaviour, more specifically, postnatal health care services, as noted in this study. Yet, in early 2000, an Abuja Declaration of which Malawi is a signatory, the country made a commitment to increase health care service by investing 15% of the annual national budget in health so as to enhance service delivery, among them availability of medicine in order to minimise costs of drugs and promote quality of health care, maternal health care included, in the long term. Yet, the study findings indicated that the country is making little progress in promoting women's use of maternal health care services as a result of drug availability in health care facilities. Health care costs, be it direct or indirect, in the form of user fees costs, cost of drugs and other related costs of medical services to patients, remain the extensive barriers negatively affecting women's use of maternal health care services in six sub-Saharan African countries (Meessen *et al.*, 2011). However, control of such direct or indirect costs has the potential of increasing patronage and health seeking in facility based environment even among those living in stressful economic environment (Lara *et al.*, 2005; Masiye *et al.*, 2010;

Onwujekwe *et al.*, 2005). Levin *et al.* (2003) observed that direct subsidy on cost associated with drugs increases women's use of the services among communities.

Similarly, the study found out that women's access to transport was associated with decreased use of postnatal care across for the entire period of study in Malawi. For instance, women who indicated to have problems to access health care facilities due to transport problems were associated with reduced likelihood of using postnatal care services, significantly in the year 2004. Although insignificant in other years, a lower likelihood is reported as well. Kongnyuy *et al.*, (2008) indicated that such scenarios are often attributed to unsupported maternal health care service operations by a robust transport network within the health system, capable of meeting the transport needs of women at the time they need maternal health care services. This transport challenge influences women to seek alternative health care services other than the public health care services. Such developments consequently worsen maternal health outcome (Ratsma *et al.*, 2005). In Pakistan, availability of transport services reduced not only physical barriers and time taken for women to reach the health care facility, but also undoubtedly increased women's use of maternal health care services facilities and subsequent improvement in women health outcome (Shaikh *et al.*, 2004; Simkanda *et al.*, 2006).

Distance to the health centre was associated with reduced likelihood of women's use of postnatal care service facilities across the entire period of study, in Malawi. On the contrary, in neighbouring Zambia, a recent study found that despite women's closest proximity to maternal health service facilities, other factors apart from distance influence women not to use maternal health care services when in dire need and opted for home-based maternal services (Sialubanje *et al.*, 2014). On the same, the need to consider minimising challenge of distance in Malawi in order to promote women's use of maternal health care more specifically postnatal care cannot be overemphasized. A study by Gabrysch *et al.* (2009) and Stekelenburg (2004) highlighted that women need to be supported against distance barriers if their maternal health is to be improved as most women that stay very far from the health care facilities, are more vulnerable to worst maternal health outcome. Distance discourages women from readiness and capacity to seek health care especially where transport and other access costs and terrains are problematic.

Even though a community campaign using media was recommended to be adopted by Malawi government in its quest of improving maternal health care utilization, there has been negative developments to that effect despite recommendations to improve on community mobilization and advocacy for promoting use of the services by previous scholars (Kululanga *et al.*, 2011; Palamuleni, 2011). However, this present study found that media exposure among women still

have a predominantly lower and insignificant impact on utilization level of postnatal care services among women in the years 2000 and 2010. However, in the year 2000 the study found that women, who had a radio or a television, remained statistically significant in reducing women's use of postnatal care services. Harvey *et al.* (2007) asserted that social interaction through media exposure has a bearing to changing women health seeking behaviour due to extensive information acquired as a result of media access, a situation which appreciates maternal health outcome over time.

The availability of maternal health care services, more especially the postnatal care facilities and an understanding of the postnatal check-ups are very significant in improving usage among women. Therefore, despite availability of health care services, it is observed that quality of care challenges affect health care services utilization (Van Eijk *et al.*, 2006). Therefore, based on the study findings, it was found that quality of care was a great source of concern that significantly reduced women's use of postnatal care services, despite the nature of care administered in years 2000, 2004 and 2010. Despite improved and adequate quality of care being associated with maternal health care facility, increased patient-in-waiting to access the health care services, create an extensive case load of clientele and resultant failure of the public health facility in the long term (Libamba *et al.*, 2007). Such operational drawbacks have had a subsequent impact on quality of care which corresponds to low utilization of such services by clientele over time.

In as far as place of residence is concerned, women in semi-urban areas and rural areas are found to be consistently associated with reduced women utilization of postnatal care service in Malawi. This implies that women in urban areas are better placed and capacitated to use postnatal care service facilities relative to their counterparts from either the semi-urban or rural communities. This finding is in support of the work of other scholars who found that women resident in urban areas are in a better position to seek and acquire maternal health care services than their rural counterparts (Babalola *et al.*, 2009; Navaneetham *et al.*, 2002).

The study also found that women who indicated having problems in accessing available maternal health care services within the communities were less likely to use postnatal care service facilities relative to those indicated to have no problem. Griffiths *et al.* (2001) and Dhakal *et al.* (2007) pointed out that availability of health care services that are furnished with positive attitude health care resource personnel within the communities facilitate women's use of such services and result in successive improvement in maternal health outcome. In another study, in Gambia, Cham *et al.* (2005) pointed those extensive delays to immediate care as a result of

extensive patient-load waiting to be served by the health care service providers. This consequently results in not only in delays in provision requisite maternal health care to complicated cases by the health workers, but also result in low women utilization in the long term due to unsatisfying services in Gambia. In the present study, it was observed that availability of health services within most community's results in lower utilization of postnatal care services among women after childbirth in Malawi. This scenario of problems in women accessing available community health care resources has been there for an extensive period of time. This is noted from the less likely odds ratio over the period 2000 to 2010. This implies a call to seek an audit as to what affects available services from being defined as giving problems to the women and results in consistent reduction of women's use of postnatal care service facility for over a decade now.

6.5.1 Percentage contribution of the factors towards overall factor contribution

Further to the analysis, the study explored the extent to which each factor contributed to influencing women's use of postnatal care services in order to determined and rank them by levels. Previous studies that have tried to look at determinants of postnatal care service utilization did not qualify which factors contributed more by individual, household and community level (Navaneetham *et al.*, 2002; Van Eijk *et al.*, 2006). On the same note, other scholars who investigated beyond the individual levels (Ononokpono *et al.*, 2014; Babalola *et al.*, 2009), did not take into consideration the contribution of each factor in order to direct health policy in developing countries. This development resulted in countries fail to meet their national health care investment targets due to resource constraints (Fillipi *et al.*, 2006). Therefore, based on the study findings, it was found that in Malawi postnatal care service utilization is affected mostly by individual factors and this has been consistent over the past decades. For example, of the overall factor contribution that this study hypothesised, in 2000 the overall factor contributed about 0.53 in influencing women's use of postnatal care services. In 2004 and 2010, the overall factor contribution was as low as 0.11 and 0.089 respectively. As such within the years the study found that maternal age, women's use of ANC services are the individual factors that contributed positively on women's use of postnatal care services, overtime, in Malawi. At household level, the number of living children was the major contributor of reduced likelihood of women's use of postnatal care services. Despite having positive contributions, the odds ratios that were derived from the models denote quality of care influencing women's use of postnatal care negatively. At the community level, quality of care stood out as the consisted factor negatively affecting women's use of postnatal care service over time and this was reflected using a positive

contribution. On the contrary, some factors affecting women such as problems of transport to access health facility, distance to health facilities, drugs unavailability and unavailability of health services in communities were associated with decreased likelihood of women's use of postnatal care services.

6.6 Chapter summary

The chapter investigated factors associated with women's use of postnatal care service utilization over the years 2000, 2004 and 2010 in Malawi. Two different approaches were used to investigate these determinants. Firstly, the use of the logistic regression analysis to investigate which factors were associated with women's use of postnatal care services. Secondly, using the estimated odds ratios from the regression, a decomposition technique was used to determine the relative contribution of each factor on women's use of postnatal care and the relative contribution of an aggregate total for individual, household and community level were computed. Therefore the study found that maternal age, ANC service utilization, place of delivery, women education attainment from secondary school or higher was the most consistent positive predictors of women's use of postnatal care services in Malawi over time. On the contrary, it was found that costs of drugs, unavailability of transport, media exposure and availability of health care services within the communities, to some extent, reduced women's use of postnatal care services significantly over time. Further to this, quality of care and place of residence was associated with decrease in women's use of the maternal health care services consistently over time. From the decomposed perspective, individual level factors dominated household and community level factors contributing to women's use of postnatal care service facilities. Therefore, based on this summary, community quality of care and availability of health centres within the communities, concerns associated with drugs, transport, distance to health and women place of delivery are the health care factors still having a bearing on women's use of postnatal care services. Therefore, it is paramount to explore supply-side barriers while interviewing health workers responsible for operations of the services, if we are seeking answers to whether maternal health care service delivery could promote women's use of such services at any maternal health need in Malawi.

CHAPTER 7

Supply-side factors influencing quality of delivered maternal health care: health workers perspectives

7.1 Introduction

Maternal age, women's use of health care, education attainment from secondary level and higher were found to increase women's use of postnatal care services. On the contrary, unavailability of drugs, transport, distance to health facility, quality of care and challenges associated with health services availability at community level were the major determinants that reduced women's use of postnatal care services over time. However, there is still a prospect that if the supply-side factors that are behind maternal health care service delivery are known to the key stakeholders responsible for management of maternal care in Malawi, then proper policies can be implemented. In this context, the supply-side factors include availability of human resources to support effective delivery of quality care, timely availability of medical resources and other supplies, availability of information systems capable of supporting efficient delivery of health services, timely availability of finances from the government to assist in supporting health system operations more especially maternal health service delivery and other related organisation cultural aspects influencing delivery of maternal health care services in the country. Therefore, it is imperative to investigate the supply-side factors and identify barriers to quality of maternal care delivery in Malawi.

The implementation of maternal health programmes requires an enhancement of existing evidence based strategies in maternal health care services in two ways. Firstly, it requires an extensive implementation of routine care (WHO, 2005). Secondly, it needs an extensive improvement of both intrapartum and postpartum care routine services (Kerber *et al.*, 2007). In developed countries, such an extensive implementation of maternal health care services has resulted in about 97% of the women attending at least one ANC visit, 99% of them deliver in health care facilities and about 90% attending at least one postnatal care service facilities after childbirth regardless of postnatal complications or not (World Bank, 2016). This is contrary women utilization rate that was reported for sub-Saharan African which was attributed to a number of factors (AbouZahr *et al.*, 2003).

Studies have indicated that coverage and quality of care directly or indirectly affect maternal health care service delivery in sub-Saharan countries. For instance, Koblinsky *et al.* (2006) pointed out that most developing countries in sub-Saharan Africa including Malawi have a critical shortage of skilled health workers, a situation which significantly affects the quality of care delivery. Nevertheless, in order to scale up on the quality of care challenges, the government of Malawi signed a 2001 Abuja Declaration which advocates for all developing countries to invest, at most, 15% of its annual budget in health care. However, an Ocampo report on health funding in Africa, Malawi was among the six countries in sub-Saharan African that demonstrated to have made a tremendous improvement on health care investments to about 17.1% from less than 10% before an Abuja evaluation (Ocampo, 2013; WHO, 2001). Other countries include Rwanda (18.8%), Botswana (17.8%), Niger (17.1%), Zambia (16.4%) and Burkina Faso (15.8%). Yet, little is known as to how this relatively promoted quality of services on maternal care which subsequently influences maternal health outcome.

Furthermore, in Malawi, the country is currently implementing a *Locum*, a human resource support initiative, in which off-duty health workers volunteer their services in order to support or beef up skeletal health workers on official duty to mitigate manpower shortages in the health system. These off-duty volunteer health workers are to be paid overtime allowance at the end of the month for the services rendered (Manafa *et al.*, 2009). By definition, *Locum* is a Latin term meaning “a physician who temporarily stands up to assist in order to serve the people and minimise the impact of the other physician outage” (Morgan *et al.*, 2000). However, despite such a quest to improve on health system in order to achieve quality maternal care, the country’s maternal health care services are yet to be universally available and accessible to women in Malawi. It is sad to note that maternal health outcome still remains a public health concern in the country to date. Supporting evidence indicates that in 2010 alone, about 12% of the women had their first ANC visits in the first trimester of their pregnancy whereas 48% of the women were, on average, paid first ANC visit in the 4.5 months from the time they conceived. About 57% of the deliveries were in health care facilities in general whereas 48% of them hardly had attended any facility based postnatal care services. Yet, the advocacy for women utilization of maternal health care service has been highly recommended by government and scholars as a precondition of attaining improved maternal health well-being in the country (Government of Malawi, 2006; Koblinsky *et al.*, 2006). With this background, this chapter of the study investigates the barriers associated with quality of maternal health care service delivery from the supply-side perspectives in Malawi.

7.2 Literature Review

7.2.1 Health care resource personnel's and quality of delivered care

The quality of maternal health care service delivery depends on service providers such as medical doctors, both general and specialist doctors, nurses, general nurses, auxiliary nurses, midwives and support health staffs (Government of Malawi, 2012). In developing countries including Malawi, human resource shortages within the health system affects quality of delivered care. For instance, Muula (2006 b) indicated that due to extensive migration of health workers to other paying health care jobs within and outside Malawi (brain drain), there has been a creation of a huge gap and extensive pressure on the remaining health workers in the system who cannot manage health care demands especially of the most vulnerable groups such as women in the country. According to 2010 World Bank health database, the nurse and midwives ratio stood at 0.3 per 1000 in Malawi (World Bank, 2016). In another study, Chen *et al.* (2004) studied on Health Resources for health: overcoming health workers crisis around the world, found that in most countries quality of care is affected not only by an imbalance of the skills mix and inequality in as far as distribution of health workers between rural and urban sectors, but also other factors such as a work environment which is not conducive to support quality of care and an inadequate motivation base among health workers. Fawole *et al.*, (2008) highlighted such existent challenges as having a dire consequence among the health workers, which not only creates operational bottlenecks but also culminates in low quality of care. In 2006, Rowe *et al.* (2006) pointed out that an empowered workforce has a direct impact on high quality service delivery, a factor which improves health care utilization in public health care settings. In a contrary perspective, it has been observed that health workers subjected to other challenges have been associated with harmful practices such as providing unnecessary treatment, a factors which contributes negatively on quality (Radyowijati *et al.*, 2003; WHO, 2001). A drawback such as unnecessary drug administration must be exclusively removed and recurrence avoided, if health workers are to deliver effectively and enhance quality care (Rowe *et al.*, 2006). This can only be achieved if the health workers are not overworked or overwhelmed by extensive patient load.

7.2.2 Medical equipment and supplies in relation to quality delivery

Drugs, medical supplies and equipment have a great impact on the quality of maternal health care that can be felt by the clientele. WHO's (2005) policy framework for "health for all" advocates that health systems are mandated to make informed decisions to buy medical resources

and equipment in order to meet the emergent priority needs, while minimising pilferage of these limited medical resources and equipments. In most developing countries, the shortage of essential drugs and medical supplies always exists (Kutzin *et al.*, 2003; Afsana 2004). Nevertheless, there is scant information on the way of ensuring timely availability of the essential medical equipment and supplies which affects the delivery of quality care (Borghini *et al.*, 2006). In Uganda, it was observed that shortage of equipment has resulted in less women being monitored by pantograph in order to assist the health cadre to make contrite decisions regarding maternal health conditions (Wanyera, 2011). In Malawi, it was observed that shortage of supplies such as fuel have resulted in some District Health Offices suspending ambulatory services indefinitely due to the denial by the filling station owners to grant credits on fuel due to government failure to honour previous extended credit facilities signed with the private petroleum companies (Phiri, 2015). This situation affects quality of care delivery in referral systems existing between hospitals and health centres. This development impacts on quality of care, more importantly, among the vulnerable pregnant women (Kongnyuy *et al.*, 2009; Muula, 2005).

7.2.3 Logistics management bottlenecks and quality of care

Inefficiencies in logistics management in a clinic setting have had a significant impact on the quality of delivered care. For instance, Gupta *et al.*, (2008) pointed out that effective quality care delivery of the health system is associated with different individual systems that affect its operations which, among others, include manufacturing, transportation and logistics which can hardly provide a comprehensive health system's performance. Such logistics challenges affect the underserved poor and cause a lot of barriers for them to access and utilize not only the health care facilities, but also other related health care consumables (Kiwanuka *et al.*, 2008). It was highlighted that logistic problems in the health care systems such as late and delayed referrals, lack of knowledge of the existence of health care infrastructure such as availability of ambulatory services in rural-based facility and delays in drug supplies in the public health care systems affect effective delivery and, more importantly, was found to influence delivery of both conventional and maternal health care services in Uganda (Kyomuhendo, 2003). This situation was observed to have vertical challenges influencing differentials in health care access economically across communities in Malawi (Zere *et al.*, 2007).

In addition, the logistics of monitoring the delivery of health care facilities has been proved to be erratically performed in developing countries like Tanzania, Malawi and Nigeria. For example, it

has been observed that inadequate monitoring of institutional child delivery, failure to minimise long patient queues and unavailability of anaesthetics contributed to low quality of care which resulted in dire maternal health outcome in Katsina and Lagos states in Nigeria (Fawole *et al.*, 2012). In Tanzania, logistics challenges associated with staffing of health workers and associated bottlenecks to ensure medical supplies and equipment in a timely manner, lagged delivery of quality of maternal health care (Pembe *et al.*, 2011). In Malawi, Fenton *et al.* (2003) pointed out that logistic challenges in client management such as timely and correctly diagnosis exercises have resulted in poor quality assessment of women that, in the long term, were exposed to the worst health conditions and maternal health outcome.

7.2.4 Information systems and quality of maternal health care

Simkhada *et al.* (2006) observed that information communication systems played a significant role in improving maternal health care service delivery in Nepal. For instance, use of telephone systems, more especially in remote areas, as a result of network challenge, take a long time in providing a communication to contacting the qualified health personnel among women with access to the technology. This scenario prevents women's optimal use of the technology in order to access quality of care and professional health care advice regarding their maternal health challenge (Tang *et al.*, 2006). However, in a communication viable environment, Paulus *et al.* (2008) asserted that use of such communication infrastructure when combined with other innovative technologies supporting delivery of health care like health management information systems, improves quality of service delivery. This role of health information system provides patient-centred medical services capable of tracing them and support extra services during an after-discharge period from the hospital (Kraschnewski *et al.*, 2013). Among the services include telemedicine, web-based patient portals, electronic patient registry and related electronic health records (Meyer *et al.*, 2011; Bates *et al.*, 2010; Reed *et al.*, 2012).

7.2.5 Health care financing and quality of care

According to WHO (2000), inefficiencies and fiscal deficits create a lot of challenges in the operation of health care systems, a factor which results in sub-optimal delivery of health care services at country level perspectives (Kutzin *et al.*, 2003). A previous evaluative report by Borghi *et al.* (2006) pointed out that health care expenditure over the period was attributed to inadequate staffing, poor leverage of medical resources and equipment and performance of the

health care services. They found that these factors require extensive reform in place if the health care facility is to improve maternal and child health and perform excellently along vertical health challenges such as tuberculosis and HIV/AIDS. Borghi *et al.* (2008) pointed out that financing of excellent health care should try to balance the existent financial variations between the poor and the rich women and should often strike a promotion mechanism to ensure pro-poor attendance is attained at all level of health care investment. For example, in Burkina Faso, those women that were reported to have debts during childbirth were found to have low health seeking behaviour in subsequent maternal health care needs (Storeng *et al.*, 2008). Likewise, the hidden costs associated with the free maternal health care services such as transport costs in times when the formal health care systems operate sub-optimally to meet the demands of the communities, cost associated with acquisition of drugs when the health care systems experience low and inadequate inventory level due to constrained financial resources to meet the emergent demand affect not only quality of care delivery, but also promote utilization of home-based alternative maternal health therapy among most women in developing countries (Borghi *et al.*, 2006; Afsana, 2004; Borghi *et al.*, 2008). Deliberate health care financing with the aim of implementing performance based quality improvement has been proved to have a remarkable development in improving quality of health care in most developing countries around the world (Peabody *et al.*, 2006; Eichler *et al.*, 2001). This development can only be attained if proper monitoring and auditing mechanisms are in place to ensure a balance health system performance consistently over time (WHO, 2000).

7.2.6 Cultural barriers and health care utilization

Patients' perception on quality of care delivery has been largely ignored by health care providers in most developing countries. According to Andaleeb *et al.* (2001), such behaviour promotes the culture of stigma towards health care utilization choices among patients, more importantly the vulnerable groups; in as far as usage of available health facilities is concerned. As such, the perceived low quality of health care resulted in choice shift from public health care to either the private health care service utilization among those defined economically capable or home-based therapy among those with economic inadequacy to support improved health care needs (Pakdil *et al.*, 2005; Andaleeb, 2001).

7.2.7 Theoretical framework

This chapter uses Donabedian's (1978) framework for assessing quality of care which defines health care system using two interrelated elements, namely, structural process and outcome. Firstly, in the structural elements, the theory defines major entities that influence quality of health care delivery, namely, patients, health care providers, materials, equipment and other resources used within the health care infrastructure in order to harness quality of care. Secondly, the process elements define operations associated with care delivery, namely, treatment process, service management and other operational issues such as information technology, financial systems and other operational logistics and the outcome elements which define satisfaction levels of the patients to delivered care, ability of the patients to function with good health after interacting with the health systems (Donabedian, 1978).

It is therefore imperative to explore perceived health workers factors influencing quality of maternal health care services delivery across Malawi using this theoretical principle. As such issues associated with maternal health such as health care resource personnel, process elements such as medical equipment and supplies, logistics managements affecting quality of maternal care, financial systems and related operational barriers, as they are associated with quality of maternal health care delivered, were investigated from health workers perspectives.

7.3 Material and methods

7.3.1 Data and study design

The study used primary qualitative data which was collected using an in-depth interview. The interviews were designed to ask the respondents and understand perspectives of health care workers on the issues affecting effective delivery of maternal health care services in general in Malawi. The in depth interviews conducted at the hospitals were conveniently selected depending on the accessibility and comprehensiveness in offering maternal health care services at referral and their ability to provide referral services to health centres under the district health office. The qualitative data for the study was collected using the analytical induction technique in which the factors associated with maternal health delivery were examined.

The induction technique allows the interviewer to ask respondents questions and keenly follow their response. Based on the contents and issues that the respondent provides, the interviewer

probes more in order to get more details in line with the study grounded theory and objectives (Pope *et al.*, 2000). The approach asked health care providers to explain their shortcomings associated with the structural set up of health care institution delivery. An in-depth interview with overall officer-in-charge of the maternal health care service providers was conducted. The potential officer-in-charge subjects were selected for interviews using a snowball sampling technique, a non-probabilistic approach in which the district health officer identified a nurse or matron-in-charge that was subjected to in-depth-interview. The nurse or matron in-charge was then asked to name the health centres from which they receive a lot of referrals and the interviewer visited such health centres to interview the officer in charge of the health centre. So, an officer-in-charge in a district hospital and health care facilities were used as the targeted respondents to provide environmental factors associated with maternal health care service delivery. Health care officers-in-charge were approached and a verbal informed consent was provided to all potential respondents in addition to the provision of detailed explanation of the study purpose. In all the study conducted a total of twelve (12) KI interviews two per district. This implies that one KI interview was conducted in a district hospital and one in a health centre. The first KI interview was arranged at the district hospital and the officer-in-charge directed and connected the researcher to the health centre facility-in-charge of one health centre which had highest referral cases over the past 3 months preceding data collection process. The interview was conducted in English using a pre-designed in-depth interview guide that was pretested for pertinence and precision. The interview guide comprised multi-faceted questions covering a wide array of maternal health care service delivery at the health facility (See Appendix 3 for detail of questions guide used).

The KI interviews were designed to capture health practitioner's insight by giving an in-depth understanding of maternal health services in all the selected districts. It is through this methodology that health practitioner's perceptions, attitudes and behavioural practices could be examined. The interviewer collected the information using a tape-recorder throughout the interview period. An interview guide was used and all questions were open ended (See appendix 3). The questions focused on challenges encountered in the provision of maternal health services. The interviews were in private offices without the presence of any other person. The recorded data were transcribed into text formats using Microsoft word.

Preliminary analysis was conducted at the time of the data collection process that guided the researcher in the generation of the themes at the preamble stage of the study. A verbatim manuscript was produced using Microsoft word and subsequently analysed thematically using

Atlas-ti software. The manuscripts were read several times in order to understand the contents being delivered and thereafter coded, condensed and categorized into meaningful broad themes, namely, reproductive health, human resources, health care financing and operational barriers associated with the delivery of maternal health services. A unique key was used to identify each interview that was conducted and conceptual codes were developed and entered in Atlas-ti to ease with data analysis process regarding supply-side barriers and factors associated with maternal health delivery in Malawi.

7.4 Results

The analysis is based on information generated from KI interviews of health workers in the selected government health facilities. Table 7.1 describes the themes used in applying Donabedian framework in order to explore the supply-side barriers and factors associated with maternal health care service delivery in Malawi.

Table 7.1 Themes and sub-themes designed from the narratives from the health workers at health centres

Theme	Sub theme
Personnel issues	Human resource adequacy Specialist availability
Medical equipment and supplies	Drugs and other supplies
Logistics managements	Referral systems linkages Ambulatory systems
Information systems	Storage of patient information Manual systems management Drugs inventory management
Financing	Operational financing Resource financing
Operational barriers and quality of care	Human resource bottlenecks Financing bottlenecks Linkages barriers Patient-cultural beliefs

7.4.1 Factors associated with supply of maternal health care service delivery

7.4.1.1 Personnel issues within maternal health facilities

A number of women were reported attending the maternal health care services, namely, ANC service facilities, delivering in modern health care facilities and very few had a postnatal care utilization status. On the supply-side of the maternal health care services, human workers reported to experience a lot of challenges with regards to delivery of maternal health services in Malawi. Among the challenges that were observed and investigated was shortage of staff and long queues within the hospital environment that hampered effective delivery of maternal health care services. In addition, there have been shortages of specialists at the disposal of the medical health facilities to support maternal needs in the health facilities and this is what most respondents mentioned in in-depth interviews:

“In this hospital we do not have enough human resources to manage our daily rosters without problems, as we have a number of patients that come to seek maternal health care services. That is why we rely on Locum, a local arrangement which pays each nurse for the extra day or night in service.... So this Locum is very important to cover existent gaps in nursing staff within the hospital.”(IDI –Hospital, Northern Region)

“I am the lone Clinic officer working in this health centre doing all other open dispensary services and assisting the nurses in maternity ward when the needs arise. But most of the times, it is the nurse that is responsible for all antenatal and postnatal services. You see, we don’t get time to rest in our work as the catchment area for this health centre has a lot of people”. (IDI-Health Centre, Northern Region).

“There is a shortage of staff in this health centre. We have one clinic officer, and that is me, and a nurse who has just been assigned from Namitambo Health Centre to assist this health centre. It is because last year, the facility experienced a number of maternal deaths, some of which occurred within the facility...The District Health Office has reshuffled the staff members just to enrich the facility with an experienced nurse who can assist in handling maternal health care issues.” (IDI- Health Centre, Southern Region).

“The issue of health workers is a problem. The few health workers do offer voluntary services as overtime. In the meantime, we are able to contain the shortage of the staff problems. Our other main challenge is the increased number of maternal health patient per day. This situation creates a lot of fatigue on the side of health workers as they don’t get adequate time to rest. The main issue is that the hospital serves people from neighbouring country, thus, results in congestion. This causes work related stress on our side and thus, some patients are not given enough attention.” (IDI-Hospital, Central Region).

The study further investigated effectiveness of the Locum programme in meeting the shortage of health care personnel with the health facilities. The study found that the majority of the health workers were not impressed with the management of the Locum programme in visited health facilities. Below, is what the health workers highlighted in relation to the Locum Programme.

“The Locum is a very good programme as it motivates health workers. However, the great challenge to Locum rollover at this health centre is delay on the side of government to remit the payment. This delay results in a lot of health workers being owed and consequently demoralized. It is a great concern.” (IDI-Health Centre-Northern Region).

“In the entire district, Locum payments have not been remitted due to the fact that the hospital which is the central point managing the operation of health centres has not received money to support the payment. This situation has been going on since July. This is September and people are still working for a period of three months now without pay. That is the major demoralizing factor indeed. It’s like your sacrifice after working a straight shift is not appreciated.” (IDI-hospital, Central Region).

“This Locum payment as an overtime pay assists us very much to supplement our monthly income. It is a motivation on our side. The main challenge associated with the programme is that of late payment. People are not happy with that. I don’t know how the Ministry of Health views this. In addition, unsolicited statements claim that the government wants to remove Locum. Imagine! How are we going to handle the workload? Besides, the government stopped recruiting newly graduated nurses and health workers from college for

a year now yet health care service demands are on the increase every day.”
(IDI- Hospital, Southern Region).

Despite the shortage of health workers, nurses/clinic officers are often invited to attend some administrative meetings either at district health office or to attend a short course offshore. In that situation, the health facility is left with skeletal staff to manage both conventional Out Patient Department (OPD) and maternal health care. This development affects quality of service and demoralizes patients who end up seeking alternative home-based therapy, and more importantly, maternal health therapy.

Concerning availability of specialised maternal health care services, the respondents stated that most of the health cadres that are working in the maternal health care services have done obstetrics and gynaecology as a course when they were studying either nursing or clinical medicine, as one of the prerequisite courses and they graduated with a nursing science or clinical medicine qualification. As such, most of them did not specialise and qualify as a professional gynaecologist. This is what they said:

“We do not have a Gynaecologist in this hospital. The work requiring Gynaecologist is performed either by a Clinical Officer or a general practitioner and it works so far so good. But, if you talk of having a professional gynaecologist, per se, the facility does not have one. For instance, if we have a dire need for a gynaecologist, we call the District Health Officer, who is a general medical practitioner to assist and cover us up” (IDI-hospital, Central Region).

“Yes, we do not have any specialist in Gynaecology. So, the nurses use their knowledge and experience acquired in one of the elementary courses learnt in colleges/universities in Gynaecology, to serve the situation. Therefore, based on that course and their practical experience, they are entrusted to handle any obstetrics and gynaecology related cases. What can we do if we don't have the required specialist obstetrics and gynaecology professionals at the hospital? Life must go on and services must continue. Some of the issues, it's just by the Grace of God!” (IDI- Hospital, Northern Region).

“We do not have Gynaecologists. Yet in a health facility like this, we need to have such professional cadres. For example, clinical psychologists, to assist on issues related to some psychological challenges both to patients and health cadres in general. You see, every one of us has problems. If you can count, we have very few clinical psychologists in the entire country as of now that is very worrisome. For example, last month, one woman was psychologically affected and was not willing to talk to anyone. This was immediately after childbirth. Such a case required the services of a psychologist to provide some counselling sessions in order to enhance women’s psychological position and that of other patients in the health facility and recommends best anti-depressant medication.” (IDI-Hospital, Southern Region).

7.4.1.2 Medical equipment and supplies in maternal health service delivery

With regard to availability of medical equipment and supplies required to ensure effective delivery of maternal health care services, the sampled health facilities reported a common problem related to that medical resource and supplies availability. For instance, most of the health facilities lacked capacity in as far as resource and supplies mix to effectively and efficiently service maternal health care cases during pregnancy, childbirth and after childbirth. After a cross country interview with the health care responsible personnel across the country, this is what they had to say in view of medical resource and supplies challenge:

“Sometimes we order medical resources and other generic equipment to assist not only in maternal health care service delivery, but other generic health services needs. The Stores Department told us that they have submitted a requisition at the Central Medical Stores Trust (CMST). At the CMST either they reply after months of waiting that the requested consignment is not unavailable yet on the demand side, patients continue to be prescribed of that medicine or that the CMST do not have enough funds to procure such medical resources from the recognised local suppliers or outside the country”(IDI-Hospital, Southern Region).

“When the facility experiences stock outage of medical resources, the Stores Department entrusted with reordering of stock from relevant government parastatals submits a requisition. Most of the time, we experience delays in

acquiring the requested batch quantity either due to shortage of drugs quantity to meet the country's demands at the CMST (IDI-Health Centre, Northern Region).

"In one instance, I encountered a situation where I prescribed a drug for a patient, a Tocolytic drug medication such as Magnesium Sulfate or related Brethine drugs in order to contain the woman's placenta previa challenge. The facility's in-house pharmacy did not have the drug in stock. The patient was in a very critical condition and was economically challenged as she was from the rural community and too poor to afford the drugs from private pharmacies. I just gave her Paracetamol just to ease her pain. Luckily, the woman recovered. All this is because we are, often, under stocked with medicine or do operate the facility without government supplied medical resources." (IDI-Health Centre, Northern Region).

"Sometimes, we get reports from the local store/pharmacy that they don't have drugs of certain type and recommendation that we prescribe the alterative drugs that are always listed. Some of the drugs cause allergies in some patients and that results in challenges providing exact prescription in order to improve patients situation." (IDI-Health Centre, Southern Region).

"You, see I don't have problems with the medical supplies at this health centre because all that I request from the District Health Office, if they have, they have always been supportive." (IDI-Health Centre 2, Southern Region).

In addition, the participants were asked to explain the state of equipment that they use to perform scanning of any maternal health care challenges during antepartum, intrapartum and postpartum periods.

"As of now we don't have the scanning machine; it's almost a year now. Yet a scanning machine is very helpful for pregnant women... it assists in identifying high risk pregnancies, if the woman has twins or not, the position of the baby and determine the position of the baby whether is normal or not. Due to this challenge, women do go and pay K 2000 to have scanning services at private hospitals and those that don't have money just depend on our discretions and

encouragements. Yet, at the referral hospital they have the facility but you see issues of fuel affects the maternity section to take these women for scanning in Mzuzu. We use to do scanning services every Thursday but now due to the present situation, we are not.” (IDI-Hospital, Northern Region).

Regarding the availability of oxygen to assist when a patient is transported from one hospital to a referral hospital, distance problems affect effective management of the maternal patient which often results in worse maternal health outcome in the Central Region.

“The hospital has a small oxygen concentrator and our ambulances don’t have in-house oxygen generator. So we had a case where a patient did not make it because our oxygen concentrator can only keep oxygen for a few minutes. So most of the times when we leave Ntcheu we hope to get an oxygen concentrator from Dedza district hospital to assist us manage the patient to Lilongwe Central Hospital, our main tertiary hospital in the region. By the time we arrive in Lilongwe, the patient is already in a gasping state. They, then criticise us by saying that we always give them already critical patients in order to increase the number of maternal deaths at the tertiary hospital.” (IDI-Hospital, Central Region).

7.4.1.3 Logistics barriers to maternal health service delivery

Analysis of the narratives indicates that the logistic of the health systems in Malawi has a lot of barriers in the form of transport services due to unavailability of fuel within the health systems to assist in moving patients from either health facilities to secondary district hospitals or secondary district hospitals to tertiary referral centres. Asked if they do reserve fuel to assist in emergency cases, the responses were as follows:

“We don’t have fuel and there is no fuel for emergency. You see every fuel that we receive is already for emergency and we often prioritize maternity. So when we have the fuel, we perform better whenever there are referral demands.” (IDI-Hospital, Northern Region).

In Nkhatabay, in the northern part of Malawi, the respondent indicated that the issue of fuel is a national problem so the best way is for the women to come to hospital much earlier in order to be diagnosed earlier and be referred when the situation is not yet critical.

In the Southern and Central regions, shortage of fuel supply within the health system was regarded as a major barrier towards effective delivery and coordination of maternal referral health care system from the health facility and district hospital level's perspective.

“Most of the time, we fail to coordinate with the health centres at district level due to shortage of fuel.” (IDI- Hospital Central Region).

“Often the issue of fuel does not only affect the coordination between the health centres and the hospitals when a referral case exists, but also we have the generator set that requires constant fuel to operate as the electricity not reliable at this hospital. So we rely on the generator as an alternative power source, as we have some drugs and vaccines that require refrigeration at all times. You can also imagine, a mortuary operating in an environment of constant power outage” (IDI-Hospital, Southern Region).

“In terms of the ambulatory services, I, in person, called the Transport Officer. It was around 8 pm and that time I had a critical delivery case that required a referral. I waited and waited to no avail. I struggled with the client up to 2 am, which was the time she delivered her child. As such, around 8 pm during reporting, I called the matron in-charge at the district hospital to find out the reasons the transport was not released as requested. The Transport Officer casually said that he had forgotten due to overwhelming health care tasks that were experienced that night.”

“...lack of reliable transport to be used to collect supply, when the CMST has transport logistics challenge. Sometimes, we use private vehicles but it is discouraged because it promotes drug theft cases and the entire process becomes so expensive.” (IDI-Health Centre, Northern Region).

7.4.1.4 Information system-maternal patient data management

Respondents were asked to assess whether they have information regarding data management about the clients that they assist as they come at the hospitals. Most health care facilities indicated that for antepartum and intrapartum care, the health care facilities had up to date repository of patient information. However, the challenge was to trace women after being discharged from the maternity wards due to lack of a comprehensive postnatal care register:

“You see, we had no register for the women in as far as postnatal care is concerned. Currently, the Ministry of Health has just offered a directive that we should have a register to keep track of the mothers after being discharged from the hospitals.” (IDI-Hospital, Central Region).

“We keep the patients information in our records, but where can we find money to finance calling the patients after they have been discharged from the health facility after childbirth. We just hope that once they are out of the hospital and they are in their homes they visit either the community clinics that we set up or other health centres closest to them.” (IDI- Hospital, Northern Region).

“We have a repository for antenatal care and about women who deliver within the health care facilities. But as you see, the issues of postnatal repository are neglected issues here. Once the woman is discharged that’s it. If the women decide to come for postnatal care service or not, it is not recognised” (IDI-Hospital, Southern Region).

In an attempt to understand the performance of the newly launched hospital Management Information System at Ntcheu District Hospital, with an exclusion of the internet point of presence challenge, the system was able to produce queries related to ANC service facilities such as the number of women that completed the recommended four ANC visits, the number of women that were assisted with skilled delivery at childbirth within the hospital, but it has some empty tuples regarding the women postnatal history with a lot of null values. However, even though the system was found to be very commendable source of patient information repository that the Ministry of Health developed for the country’s health system, the issues of access privileges within the system remain a significant authentication challenge among end-users. For instance, one was able to enter data for a particular health facility if one logged-in as an in-

charge/administrator and have the capacity to modify and update records easily. This result in quality concern in as far as the data repository is concerned. This is what they said:

“You see the system is very good, but as I have entered here with authenticity of the health cadre, such as a matron, I can change these figures and the whole country can wonder what is happening in Ntcheu. If only the system can be sorted out on issues of privileges and again make sure that its well-populated with maternal health care services, I know the system is in its beta version, then the problem of data scarcity can be supported by this system.” (IDI-Hospital, Central Region).

On the same issue, it was found that the lack of comprehensive information for the health care system is creating a lot of bottlenecks and pilferage of medical resources due to manual storage of information related to drugs and reorder levels. Such developments affect medical resource balancing with the health care system.

“Even on issues of drugs that could not be a problem because the system can assist in tracking the most frequently prescribed drugs that might assist the central medical stores to order the right drug consignment than we hear stories in the newspaper that the drugs have expired in a resource restrained country like Malawi where we can use the money into proper medical use.” (IDI-Hospital, Southern Region).

7.4.1.5 Health care financing

The study explored the perspectives of health workers with regards to challenge that they experience in getting finances from the government and other supporting partners to coordinate and operate health care facilities including maternal health care services in the country. Therefore, based on the selected health facilities that the study considered, there were common tenets noted as practices that the health system experienced due to delays in acquiring the budgeted health care support. The practices include completely collapsing of the ambulatory services due to unavailability of operations budgets, shortage in essential pharmaceuticals, radiography, human resources, cafeteria, maternity homes and other sundry items to support effective delivery of health care services including maternal health.

More specifically, in the transport sector, it became so apparent that the District Health Officers, in some districts grounded the services of ambulances because of lack of basic operational requirements such as tyres and fuel. Services not being done on schedule resulted in some District Health Offices operating without ambulances for months. However all these challenges were attributed to delay in getting finances from Ministry of Finance's treasury department to support effective operations, which is often insufficiently allocated to finance all targeted operational activities related to both conventional and specific health care services per month. These were some of the selected issues pointed out:

“Not at all, we are not adequately funded to manage the ambulance for maternal health care services.” (IDI-Hospital, Northern Region).

“Yes, Serious! We are waiting for subversion to be remitted in our health facility accounts in order to buy fuel for the ambulance and generator. Currently, the ambulances mobility is limited due to fuel challenges, especially to support in remote far health centres within the district. Like last week, we received a call demanding an ambulance to carry a woman in need of referral services here at the hospital; we failed to support them just because we did not have enough fuel for the service.” (IDI-Hospital, Northern Region, KI).

On the other hand in the Southern region, it was reported that the time at which the treasury fund the health care operation is not fixed and sometimes not certain which becomes difficult for the District Health Office to plan its activities properly:

“As for me, I can say, there is no specific time when to get the funding from the government. The Treasury remit the funds into health facilities account using their own time frame. There are no fixed dates. We just know its mid-month, but often that is not achieved.”

“The other challenge within is that if the funds are remitted, for our management team to convene a fund allocation meeting, it take a week or so and in some cases up to early week of the next month. Such delays imply that a lot of pending activities waiting to be financed miss their operational time frame.”

“... a lot of internal inconsistencies from within the health facility as well.”

“.... to the extent that in some months we under spend and the treasury request refund of such overage or sometimes they under fund to say use the last month budget that you had not spend. You see, it’s like within the hospital we are not consistent with our budgeting and management. Yet, at the same time the health centres are lacking basics to support them in their daily operations (IDI-Hospital, Southern Region).

“You see delay in getting funding do affect our operation very much not only in transport sectors, but paying for other incentives to the health workers such as Locum allowances. For instance due to underfunding we haven’t been able to pay for the Locum for months now and this is a source of demotivation among the nurses to volunteer for overtime duties to cover up for the shortage of health care workers with the hospital and again the health centres served by this hospital.”(IDI-Hospital, Central Region).

“The issue at hand is the delay in timely getting the funds. Most of the time whatever we put in our budget, we get insufficient funds from Treasury, as we are told the budget has been revisited due to cash flow problems.”

“As such, as the health facility, we struggle in settling our creditors in lieu of the services that they rendered to the health facility.” (IDI-Hospital, Southern Region).

“You see, the amount that we receive from the Treasury and that is allocated to Locum is very insufficient. Imagine it amounts up to K 2000 (USD 3.64) per all night hours worked. Additionally, it’s not even flexible and open that one can extensively. The management have set that each person should not exceed a threshold of K 12,000 per month (USD 21.8), as a way of avoiding to blot up the health facility monthly operational budget.”

“...that is so little an amount earned per month. As a matter of fact, such amount of money despite it being so insufficient, there is months delay before it is paid into our account. It is a source of concern on our side as health workers managers because people work grudgingly, a situation which compromises of

quality of care delivery. But, Malawians are hardworking and dedicated to render their service, it should be like that.” (IDI-Health Centre, Southern Region, KI).

“In terms of drug acquisition, we place the order and we see at the end of the month, a report shows that we have our funds meant for medicine is remitted to suppliers. Yet the suppliers do indicate that they are waiting for the consignment of the indicated set of drugs which in the long term we see that the drugs never are given. And due to such delays we cannot even go and buy our self the medicine from the private vendors, its prohibited according to Malawi Procurement Act. So often we recommend the drugs to the patients to buy for themselves at the private pharmacies.” (IDI-Hospital, Southern Region).

However, some health workers indicated that even though the government of Malawi, through the Ministry of Health, had allocated funds in the budget to support overtime payments to make up for the shortage of health care workers within the hospital.

In terms of the effect of low funding and availability of food provided to the patient within the hospital, the respondent indicated that women are given beans and pap (Nsima) every day. Sometimes if the shortage is too much, the hospital management gives the admitted patients only one kind of meal per day, as long as the admitted patients have had something to eat on that day.

“Due to shortage of funds, our cafeteria provides food to the patients only and we go for the volume food stuffs such as beans and “Nsima” (Pap), nothing else. We cannot afford beef and chicken in the patients’ meals because that would be costly to feed the entire patient base within the hospital.” (IDI-Hospital, Southern Region).

At the same time, there is shortage of maintenance funds to buy some of the resources such as beddings and other properties such as beds and other materials. It was found that the hospital did not have the mandate to purchase the furniture, but the process has to be facilitated by the procurement department in the Ministry of Health and is directed by the Public Procurement Act (PPA) of 2003. As such, a lot of things are left unattended when they are not in good functioning conditions due to irreconcilable nature of reality and dictation of PPA. This results in a lot of medical equipments remains absolute in function. Therefore, it is because of this maintenance

and procurement challenge that resulted in shortage of essential materials to support maternal health care services such as beds, beddings and serving utensils such as spoons, cups and plates among others and in some cases kitchen equipment.

“We have got no beddings for each bed and we cannot buy more we just ask the clients to bring their own. Sometimes, due to constant electricity outage, at the ANC we have resorted in asking women to bring her own candles, basins, a pail, 6 pieces of “Chitenjes” (pieces of cloths of size 1 by 2 metres), a razor blade and warm clothes for expected new born to be used during and after birth of the babies and must often be accompanied by a guardian responsible for cooking for the expectant woman as the health facility does not provide food.” (IDI-Health Centre, Southern Region).

In terms of financing other resources within the maternal health system, while there is good intention to support the operation of the health care facilities, the government was found to have challenges in supporting other services. This situation creates a lot of operational barriers within maternal health care delivery across the country. For example, while other hospitals had a provision for nurses and doctors houses within the perimeters of the hospital, it was found that in Southern Region the houses are not enough to meet the housing demands of all categories of health care cadres at the hospital.

“You see most of the nurses and clinic officers and laboratory technicians stay in Blantyre and the District Health Officers in the past were capable of delegating us with the transport that was taking us from Limbe to the hospital. But you know they have stopped the staff transportation management due to alleged cash flow problems at the hospital.” (IDI-Hospital, Southern Region).

However, there was an outcry from the health cadres that are operating from Blantyre city to Chiradzulu district hospital due to cost and challenges associated with public transport to and from the hospital. A development which results in erratic delays in time of starting services per day and time gaps due to partial absence of health care cadre, a situation which affect effective delivery of health care services.

“You see, the removal of transport to assist medical workers within this hospital from Blantyre city to this place is a challenge now. This is because most of the staff members that are resident in Blantyre do not have their own transport and so they use public transport. These public transport upset the time health workers report for duties (7:30 am) and they knock off very early by 4:00 pm for them to get back to their places of residence.” (IDI-Hospital, Southern Region)

7.4.1.6 Cultural barriers

The health care management in Malawi is confounded in cultural barriers that affect efficient delivery of maternal health care services in the country. These challenges often result in putting the health care at a risk of administering safe motherhood initiatives in order to enhance better maternal outcome. Analysis of the narrative that the health cadres gave, it shows that as much as the maternal health care services have some barriers that affect its effective and efficient operation, cultural norms associated with communities around Malawi have a contribution towards ineffectiveness of maternal health systems.

“You see, we always provide reproductive health education promoting women’s use of maternal health care services in the country. Women diligently attend ANC services, but when it comes to institutional delivery choices some women still prefer to deliver at homes or self-delivery to health facility delivery, only to come to the health facility when something wrong has happened.” (IDI-Health Centre, Northern Region).

In the Southern Region, it was observed that women did not prefer nearest health centre during childbirth process due to societal beliefs pertaining to wrong conduct by the health care personnel at the hospital. Most women reported to have a negative attitude towards patronising the health centre, a situation which resulted in congestion in other health care facilities.

“You see we have the congestion at this health centre because most of these women are coming from the Mwandama health centre in Zomba. Since we are within the boundary they come here. They allege that at Mwandama one health care service provider was shooting some video of one woman who was giving birth and that the clip was released to the public and people were discussing about it. That alleged story has caused women in Mwandama not to trust the

health care facility delivery near their homes, but come to this facility whenever time of delivery approaches causing congestion in the facility.” (IDI-Health Facility, Southern Region).

However, considering at the ethical gravity of the matter, the respondent was probed further to furnish response to what the Ministry of Health did to explore that unethical allegation in the health care facilities.

“The District Health Office was consulted to investigate the issue and it was discovered that it was just an alleged story. Yet, it is still the belief of the community around the Mwandama Health Centre that the incident happened at the health centre.” (IDI-Health Facility, Southern Region).

Another cultural barrier associated with women’s under-utilization of maternal health care services is viewed as confidential and secret phenomena across societies in Malawi. Such a belief contributes a lot to the response rate in as far as utilization of health care services during childbirth period. Women prefer home-based delivery due to the belief that at the nurses at the hospital have bad attitudes towards them becoming pregnant. Utilization of the Traditional Birth Attendant is banned, but there are those who are still conducting their duties in secret. Women only need to go to the formal health care facility when the Traditional Birth Attendant fails to handle some complications.

“Some women still believe in the Traditional Birth Attendant regardless of their extensive advocacy and government ban on their services.”(IDI-Hospital, Central Region).

Asked if the traditional birth attendants are still conducting their duties in the villages, the respondents had this to say:

“You see government banned the Traditional Birth Attendant and did not provide a quick and immediate replacement of these parallel health providers. Instead, the community health nurses that were trained by the government are still operating at the District Health Hospitals because there are no infrastructures in the rural areas wherein these community nurses can operate from. As such women have got no choice but to resort to these secret Traditional Birth Attendants in issues related to childbirth. You see, when we ask these

women they say they could not come to the hospital at night so the best alternative is to use the traditional one.” (IDI-Hospital, Central Region).

On the same aspect, one health care service provider indicated that most of the time, it is not the traditional birth attendant per se, sometimes are the mothers of these adolescent young mothers assist them at home for fear of the attitude and mockery of the health care personnel at the health centre or hospital.

“Most of the times, the traditional birth attendants are not the ones who deliver per se, but elderly women who used to deliver themselves assist their young children to give birth in their homes because they have a bad attitude towards the way care is delivered within the formal health care facilities and encouraged by the feeling of self-satisfaction after assisting their daughters in childbirth” (IDI-Health Centre, Northern Region).

However, when further probed on the way forward, the health care service providers did not promote the practice exercised by elderly women, but use of the health care facilities instead.

“You see we have implemented a programme with the chiefs to charge any woman who happen to give birth at home. But most of the times these women hide the occurrence of birth and if anything goes as unexpected they report to the Chief/Village head man that they were going to the hospital for their daughter to give birth but the woman ended up giving birth along the way and that the child died. These cultural practices remain major barriers that hinder women’s utilization of maternal health care services.” (IDI-Hospital, Central Region).

7.5 Discussion

This chapter suggests important supply-side factors influencing delivery of quality of maternal health care in Malawi. Overall, the study findings illustrate that numerous supply-side factors exist that negatively influence quality of delivered maternal health care services in the country. The findings show that the health care system in Malawi has insights into delivery of maternal health care services which have a bearing in effective delivery of the service. For instance, shortage of health care resource personnel to provide the requisite quality of maternal health

care services provide not only delays in the provision of care among women, but also results in sub-optimal services being delivered to that effect. Consistent with other studies, Malawi is confounded in a situation of inadequate health workers, which results in negative effect on the quality of maternal health care that is being delivered within the health systems (Chen *et al.*, 2004). Furthermore, the study observed that the few health workers on ground do have far-reaching workload as one health cadre at a health care facility is responsible to administer both generic Out Patient Dispensary services and maternal health care services. Therefore, this lack of segregation of duties catalysed due to shortage of resource personnel's, negatively affect quality of care in the country. Anand *et al.* (2004) and Chen *et al.* (2004) asserted that such erratic availability of skill mix of the health care resources in developing countries have had a tremendous detrimental effect in the operation of most public health care services in most developing countries of sub-Saharan Africa. Furthermore, the findings indicate that some of the service delivery that the health workers provide have a dire maternal health outcome due to lack of requisite knowledge to understand emergent problem that women have as a result of pregnancy and the best practice to be conducted in order to serve the maternal live. This finding concurred with an earlier study by Dolvo (2003); Martineau *et al.* (2004) who attributed to in adequacy in skills among health workers to lack of mentorship by the skilled and experienced health workers due to migration of the skilled health workers specialist to other well-paying countries thus creating a health care vacuum in developing countries including Malawi.

The study findings underscore the government understanding of the health care workers within the health systems and suggested best practice to utilize the existing health care providers to ensure leverage of the health workers bottlenecks within the system through Locum initiative programmes. As indicated earlier, this Locum is an initiative aimed at allowing the health workers that have service their mandatory straight shifts report back for part time working, which pays daily allowances, for these hours of service worked. As much as the initiatives were considered perfect, financial bottlenecks affect quality of care delivery in Malawi. This development concurs with the general practice suggested by Chen *et al.* (2004) that as the government manages the health workers; the core principle of such initiatives should be aimed at improving performance in order to achieve three core factors, namely, motivation, balanced coverage and competence. As such in terms of coverage, it entails ensuring adequacy of quality of services targeting both vulnerable and marginalized communities. On the same page, in term of motivation, it aimed at harnessing financial adequacy in order to ensure a supportive health care system is in place. Additionally, in terms of competence, ensure continuous professional development among health workers through advancement of skills acquisition in order to

promote efficient and effective delivery. Yet, the current health care work environment experiences an imbalance in scaling-up motivation, coverage and competence challenges, which directly or indirectly affect quality of delivered maternal care.

Skill acquisition among maternal health care personnel was found to be inadequate with specialists such as obstetrics, gynaecologists and clinic physiologists found to be the scarce skills among the practising health cadres. However, in order to achieve a balance delivery of maternal health care services, there is need to scale-up skills within the health systems, if professional maternal health care is to be delivered (Koblinsky *et al.*, 2006). As such, it is important to note that in the process of ensuring that professionalism among the health workers is achieved, there is need to enhance provider competence assessment in order to match their theory and practice as continuous professional development, in order to achieve a high quality of maternal health care encapsulated in the health system (Harvey *et al.*, 2004). In this aspect a structural element as suggested by Donabedian (1978) in as far as health workers participation within the health care system is concerned.

The study found that medical equipment and supplies within the health care system are not adequate to meet the operational demands. Often times this is the case due to supply logistics challenges which jeopardize health system performance thereby affecting negatively quality of care in the country. Boller *et al.* (2003) asserted that repeated assessment of medical supplies within the health systems is paramount if quality of care is to be ascertained. Mrisho *et al.* (2009) indicated that meeting the equipment and medical resources challenges within the health care system is the only remedy to ensure availability and effectiveness of maternal health care services and associated quality care delivery. In order to achieve this development, Borghi *et al.* (2006) supported the desire for frequent assessment of medical equipment to ensure that they are operating within the required standard in order to improve the quality of health care delivery. Such assessments go a long way in addressing some of problems noted in some health care facilities in Malawi. For example, issues of capacity challenge to having a health duty and oxygen concentrator able to operate over long period of time in addition to dilapidated and malfunctioning medical equipment such as scanners among others, to assist in effective diagnosis of women pregnancy condition in order to ensure better maternal health outcome.

Additionally, timely availability of supplies to support health care delivery remains a challenge in Malawi. For instance, there is need to have a shortage of blood in the facilities blood banks to support women in dire need, have been associated with low quality of expected care. This

result concurs with findings of Cham *et al.* (2005) who found that adequate availability of blood in the bank supplies of the health care facility have a potential of reducing maternal deaths to causes related haemorrhage and anaemia and among 6.4% of the women that have undergone caesarean section. Further to this, haemorrhage and anaemia are regarded as the main direct cause of maternal deaths due to low quality of care as a result of shortage blood within the health care facilities (Kongnyuy *et al.*, 2009). This results in total substandard care in the delivery of maternal health care services translating into increased worst maternal health outcome (Ratsma *et al.*, 2005).

Regarding transport availability in facilitating referral services either between primary and secondary health care facilities or between secondary and tertiary facility care facilities, the unreliable transport service system within the health care facility pose a challenge to quality of care delivery. For instance, across the country, issues of shortage of fuel and its direct effect on effective operation of the health care facilities. Such phenomena became a common practice that is experienced by most health care facilities in the country and situation has had a dire consequence on maternal health outcomes (Chisamba 2015; Mpaka 2013). This development affects women use of health care facility for alternative non-institutional health care services (Simkanda *et al.*, 2008). As such, women who preferred to deliver at the health care facilities, remain with no option but walking too far in order to access maternal health care (Thaddeus *et al.* (1994). This increases the level of vulnerability among women and they thus get motivated for non-institutional maternal health care services (Palamuleni, 2011).

On the same aspect, regarding issues of affordability and accessibility, the study found that the responsibility of providing the transport services to support health care services remain an obligation of the government. On the contrary, a robust public-private partnership in the transport sector resulted in the private sector supporting government initiatives providing transport services to women (Jeong, 2005). This situation resulted in increasing women use of the facilities and subsequent improved health outcome. It is therefore important to note that such equity in accessing health care facilities support everyone in the community despite socioeconomic differences (Wagstaff *et al.*, 2003). This, according to Donabedian theory, creates a challenge in meeting the process structural needs that is targeted to enhance quality of health care through a ready transport system within the process of health care delivery as a catalyst of quality attainment.

The study also found out that as much as the women are more interested in visiting maternal health care services, the current transport network from either the private or public sectors is not coherent and substantive enough to provide a seamless service to meet the needs in the maternal health care services. This observation confirms the findings of Sialubanje *et al.* (2014) in Zambia, those exogenous factors such as long distances to health care facilities, poor network of roads and cost in relation to transport service created an impetus and barrier affecting both supply and demand of maternal health care services. Campbell *et al.* (2006) pointed out that access challenges which oftentimes affect women use of the maternal health care services can be best solved by providing mobile clinics targeting those challenged.

Regarding existence of modern information systems capable of ensuring that every patient is tracked for any maternal health care services acquired from the health care facilities, the study found that all health facilities in Malawi do not have a robust patient registry system with the capacity of tracking the patients. Furthermore, it was observed that the current system does not have even the manual register with all the necessary fields in which to keep information about the patients such as telephone numbers, home addresses and other related details. As such, once the patient is discharged from the maternity ward there is no comprehensive register to track them. On the contrary, a study by Kraschnewski *et al.* (2013) pointed out that the use of information technology as a tool to facilitate health care management on patient provide a computerised patient system with the functions such as patient information tracking, patient prescription systems among others. such system are significant in making hard to reach and remote based people access electronically medical advice and thereby acquire improved health well-being (Tang *et al.*, 2006; Tang *et al.*, 2005). On the same note, Reed *et al.* (2012) pointed out that such system even advantages the patients in that they can have flexibility in terms of the timing they can decide to access skilled health care or further referrals. Such electronic health records system is paramount if and only if the patients can minimise missing medical appointments and reduce increased level of non-utilization of any services including maternal health (WHO, 2012). This consistently maintains collaboration between the patients and the health care facilities, which in the long term have significance in improving quality of health care delivered. Therefore, the low utilization of health care services at postnatal care can be traced when moderate patient record can be put in place that is capable of balancing up the current operation challenge.

In view of this development, the study discovered that in the Central Region of Malawi, government have initiative and started creating an electronic repository for patient information

with an aim of keeping track of prepartum, intrapartum and postpartum events associated with women. Despite such a remarkable stride in development the first of its patient information system which is at an alpha stage, a structured walk-through of the system revealed some security challenge towards patient data. For instance, a senior health officer once logs in, have administrator privileges that enable him to manipulate any patient records within the system without authenticity checks. This compromises data credibility and quality concerns associated with the populated data (Kraschnewski *et al.*, 2013; WHO 2012). Berhan *et al.* (2014) pointed out that a secure, obligated and coordinated health care system has the advantage of not only increasing availability of information regarding the patients, but also ensuring that the information that is being delivered is up to standard and authentic for any secondary use. These results in promoting patient-centred care capable of providing a well linked up system between the patients on one side and the health care facility on the other (Snyder *et al.*, 2011). In the present study, the current patient tracking system is partly implemented at prepartum and intrapartum care but the structure is not well augmented at the postpartum care. According to Donabedian (1978), such un-augmented process structure has a bearing on the quality of care due to the uncoordinated processes that result in incoherence of operations. On the same topic, one respondent highlighted the significance of extending the usage of a modern information system not only to support patient information tracking but also be applicable in keeping drug records such as frequently prescribed drugs per hospital. The system components add-ins can assist in removing distribution challenges affecting the current system where drugs are not needed, thus common practice is to remove drugs by expiration date due to time usage lapse because of the drug being under-prescribed and under-utilized by the health care facilities. In a similar manner, Tang *et al.* (2006) found reliance of modern technology to deliver health care services has a significant impact of reducing operational bottlenecks, and improve patient-medical personnel communication linkages (Liederman *et al.*, 2003).

In as far as health care financing is concerned; it is observed that delays in financing of health care services to have a negative effect not only on the delivery of conventional health care services facilities, but more importantly maternal health care services in Malawi. For instance, the study found that delays in health financing affects availability of essential medical resources such as the drugs magnesium sulfate which assist in treating eclampsia and prophylaxis of pre-eclampsia among pregnant women which is aggravated as a result of pregnancy (Lule *et al.*, 2000). Financial delays also affect availability of some significant equipment, such as scanning devices, and operational resources, such as petty cash for incidentals and fuel within the health care facilities. In a similar study, it was observed that

stalled health care expenditure contributed greatly to low quality of care among public health care facilities in China (Hu *et al.*, 2008). However, in order to assist in solving the problems associated with health care financing challenges in India, Ranson *et al.*, (2002) observed that community intervention in health care financing support assisted greatly in ensuring a little stability in health care service delivery to causes related to inadequate finance in Gujarat.

It has been observed that most of the overtime pays that the health workers signed to do in the Locum programmes are not honoured in a timely manner. One respondent in the Central Region pointed out that such a delay in health care financing from the treasury is becoming a routine and such incidences affect optimal operations of the health care facilities across the entire country. The respondent further pointed out that to some extent they request the patients to bring with them materials such as clothing and other utensils to be used during childbirth, while attending to skilled birth at the hospital. However, such incidences have caused those women from poor economic background not to utilize health care services due to their failure to bring such materials to the health care facility prior to childbirth delivery. This maternal health care inability to provide women with linen and other materials to support them during childbirth is due to shortage of finances that the hospitals get from the treasury to meet all maternal health needs of women in Malawi. In neighbouring Zambia, women with economic challenge to accessing basic commodities of life were found not to go and deliver at the hospital inspite of the residents walking distance to the health care facilities due to challenges in acquiring linen and clothes for the baby as is the requisite to institutional childbirth (Sialubanje *et al.*, 2014; Stekelenburg, 2004). However, from the look of things, despite this the country was observed to have taken and achieved a significant improvement in health care financing from as low as less than 10% before year 2005 to about 17% in 2011 and thus being among one of the countries to have achieved Abuja 2001 health care investment to at most 15% of the national budget (Ocampo, 2013), general operational bottlenecks related to financial constraints still persist (Phiri *et al.*, 2015). Therefore, this financial unavailability not only affects effectiveness of structural element alone, but also processes elements within the health care system which in the long term impacts greatly on the quality of health care that is being delivered across the country (Donabedian, 1978). Hence, the country is among one of the sub-Saharan nations experiencing slowed progress in reducing deaths to causes related to childbirth in the region (WHO, 2014; Hogan *et al.*, 2010).

Regarding the cultural barriers, it was observed that maternal health care services are not wholly delivered partly due to experiences and unsolicited beliefs of wrong doing by the health

workers in the country. These beliefs affect women utilization preference of delivered health care services as an important entity in the process. The study findings suggest that this low utilization due to cultural influence among women is associated with lack of comprehensive understanding of the maternal health care operations and low understanding of the perceived benefits associated with maternal health care service utilization. Therefore, the study suggests that although knowledge among women to understand the cultural dimensions of their societies is a pre-requisite determinants associated with women interaction to modern health care service utilization, extensive educative programmes are paramount to behavioural change as a result of culture, thus supporting preventive check programmes aimed at improving health care service delivery (Fishbein *et al.*, 2010; Glanz *et al.*, 2008).

In addition, the study found that women were culturally still dependent on the services of the traditional birth attendants despite them not allowed to offer maternal health care services in Malawi. For instance, one respondent in Central Region indicated that as much as the services of the traditional birth attendants were banned, the exercise was fast tracked. The reason being slow progress by the government to substitute all existing traditional birth attendants, who are still being viewed as supreme traditional maternal health care providers despite the ban imposed on them, with a handful of trained community nurse midwives, who are not yet assigned to rural communities to start delivering maternal health care services, to fill in the gap that was left by the traditional birth attendants, due to lack of infrastructure in the rural areas. Onah *et al.* (2006) pointed out that such in-bound logistic challenge in the process of leveraging and improving rural access to skilled birth attendants contributed to low quality of delivery care over anticipated quantity of care. As such, the shortage among skilled health workers in the rural areas promotes cultural patronage of traditional alternative care other than the modern health care services in most developing countries of sub-Saharan African including Malawi (Gerein *et al.*, 2006).

Regarding community participation in promoting women's use of maternal health care service facilities, the study found that the country's health system adopted a facility-based community programmes in which chiefs and village headmen are given the championship to promote women's use of maternal health care services after childbirth. Conversely, as much as most communal members are aware of the punishment they can suffer should they be charged by the chief with regard to their attempt to deliver their child at home or using the traditional birth attendants, little is emphasised on the role of the chief in promoting postnatal care services immediate after childbirth in the country. In addition, whenever women had a worst experience

with regards to childbirth at home or traditional birth attendants, they go back to the hospital and report the incidence as delivery that happened while they were on their way to deliver at the health centre. As such lack of comprehensive auditing of community maternal health experiences create a gap to understand activities of women during delivery time and guide on proper community based intervention to complete support institutional reliance among women during childbirth in the country. Rosato *et al.* (2008) pointed out that a maternal health care delivery system that relies exclusively on government to support its operation must be stretched out to include potential community based channels in a setting and strong community established approaches. Nonetheless, practical evidence in Kenya pointed out that improved community engagement on issues associated with health, their utilization rate in times of needs correlate positively (Rosato *et al.*, 2006)

7.6 Chapter summary

This chapter explored supply-side factors associated with quality of delivery of maternal health services in Malawi based on perspective of the health workers. The study used qualitative design from three administrative Region of the country, namely Southern, Central and Southern Region. Out of these regions, two districts were conveniently chosen and a hospital and a health centre were targeted within each district. A total of 12 key informant interviews were conducted which targeted interviewing health cadre responsible for maternal health services at each health facility. As a data collection technique, each interviewed was recorded which were translated verbatim and narrative codes based on the study themes in Atlas-ti 7.0. Therefore the results clearly articulate that quality of care associated with maternal health experience encounters a number of operational barriers. For instance, the health care services are often supported by inadequate resource personnel who often work under stressful environment due to large number of patients in the system a factor which results in quality of care compromise. Additionally, such health workers are not adequately motivated as the little money that is meant to be received as overtime pay (Locum) is often time received very late. These result in extensive frustration on the side of health workers and consequent lowering quality of services rendered.

The health system has inadequate resources and equipment to meet emergent maternal health needs such as scanning instruments not functioning as expected, health facilities operating without a robust ambulatory services and insufficient medical resources. As a matter of fact, this situation was found to be aggravated by delay in health care financing which often provides insufficient funds to support health care operations more importantly maternal health care.

Additionally, the majority of the women culturally believe that being pregnant is a secretive thing and some of them still rely on the services of traditional birth attendants despite the government ban imposed on these traditional health practitioners and delay on the part of government to fill the gap that was created the exit of the traditional birth attendants through enactment of community health workers across the country.

Therefore, based on the supply-side factors that are affecting health care services in Malawi as is defined from the perspective of health care personnel as one key stakeholder, the understanding of the women's perspective is necessary in order to curb the demand side factors that women anticipate on the nature and quality of maternal health care services required during pregnancy, childbirth and after childbirth if that can assist in setting the goals needed to enhance maternal health service utilization and subsequent increase in uptake of services in Malawi.

CHAPTER 8

Demand-side factors maternal health care services: women's perspectives

8.1 Introduction

This study has established that delays in providing health care services and insufficient financial support are drawbacks preventing effective delivery of quality maternal health care in Malawi. Health care managers responsible for management of maternal health in Malawi identified major factors influencing the supply of quality maternal care. These factors are related to factors of health care financing challenges which have a ripple effect on other health operating function like logistics on availing medical resources and supplies within the system, supporting significant services such as transport services during referral calls, delays ensuring that financial incentives of health workers payments on those working for Locum overtime shifts. Therefore, as the maternal health care services is not a matter of supply alone, but a matter that can be understood holistically if the perspectives of the service consumers is considered in order to establish what their views are pertaining to anticipated quality of maternal health care based on the previous experiences encountered in the country's health system.

Total fertility in Malawi remains as high as 5.6 children, based on the recent World Bank statistics (World Bank, 2016). This implies that the lifetime risk of women dying from causes related to pregnancy still remains a major public health challenge (WHO, 2014). This further implies that women's demand for better quality maternal care require serious attention if maternal health outcome is to improve through maternal health care facilities in Malawi.

Based on this background, the study investigates women's perspectives in Malawi with regards to quality of maternal health care they receive during pregnancy, childbirth and after childbirth. More specifically, the study explores the perspective of women on the nature of support given immediately upon arrival at a maternal health facility, perceived quality of care administered while in the health facility, perceived barriers preventing them from accessing maternal health care when in need, their perceived need for improvements required to scale-up quality of maternal health care and enhance utilization of maternal health care services in the country.

Over the past decades, much has been advocated for regarding improvement of maternal health care services. Sight should not be lost of the fact that the health care service provision is entrenched in the constitution of Malawi and that every government pledged its commitment to ensure that health demands are wholly supported and provided for to the Malawian society. Section 13(c) under chapter 3 of the Republican Constitution, every government is mandated constitutionally “To provide adequate health care, commensurate with the health needs of Malawian society and international standards of health care”. Further to this, as the constitution is the supreme law of the country and mandates expedite conduct and action by any organs of the state, including the health sector to deliver services in order to meet the Constitutional rights of the people regardless of gender and economic differentials (Government of Malawi, 1995). Maternal health care services are not adequately delivered to guarantee a universal access among deserved women of reproductive ages to support their antenatal, intranatal and postnatal health needs (NSO & Macro, 2001; NSO & OCR Macro, 2005; NSO & ICF macro, 2011).

Additionally, as the country is involved in becoming a signatory of many international and regional policies, protocols and declarations aimed at improving health care systems at primary secondary and tertiary levels with the aim of meeting the health needs of the people among them women (See Chapter 1, section 1.0), the country is still confounded in deficiency in its emerging demand to expedite a health system including maternal health care needs, a factor which affect quality of delivered care (Government of Malawi, 2012). As such this chapter seeks to understand the perception that the women have with regards the delivery of antepartum, intrapartum and postpartum care services in the country and understand the anticipated direction regarding delivery of maternal health care services in order to moderate preventive checks affecting universal utilization in the country.

8.2 Literature review

8.2.1 Perspective of prenatal care service delivery

Numerous arguments have been advanced regarding how effective and efficient the prenatal care services to improve maternal health outcome across the globe. For example, studies over time found that early use of antenatal care service utilization among women has a direct influence in improving maternal health outcome (Say *et al.*, 2007; Fillipi *et al.*, 2006; Leigh *et al.*, 2008). However, even though the association has been contested to have had a positive effect, the question as to whether the relationship is causal or not still hangs in balance (Griffiths *et al.*,

2001). Other scholars asserted that ANC service provision alone is not a precondition towards improved delivery of maternal care, but ensuring that capacity to provide continuum of care to every woman regardless of socioeconomic differentials is a major paramount catalyst (Kerber *et al.*, 2007; WHO, 2003).

Various researchers have also shown that perception of women with regards to continuum of care that they receive at the prenatal care service facility affect their willingness to patronise the services for the betterment of their improved health outcome. For instance, Nisar *et al.* (2003) pointed out that women do have high level of dissatisfaction regarding ANC service delivery as a result of bottlenecks within the system. Some of these bottlenecks include long waiting queues, inadequate supply of medicines and failure of women to complete mandated services such as tetanus toxoids vaccination dosage due to stock outage of drugs and other supplies. In Nigeria, Oladapo *et al.* (2009) observed that the challenge that women acquire due to sociodemographic status limitation, impacts on the perceived quality of ANC services that they can choose to patronise. In a similar study, as much as women perspective towards ANC service utilization was viewed highly to increase their preference of utilizing the services, challenges of service availability and readiness to meet their maternal needs do retard their continued use of subsequent maternal health care services (Fawole, 2008; Langer *et al.*, 2002; Van Eijk *et al.*, 2006). In view of this, framework to underscore the knowledge about user's perspective in relation to maternal health care service delivery had been lowly and partly assessed to understand the heated role of the user as a prominent key player in the equation of prenatal care service delivery (Al qutob *et al.*, 1996; Munjanja *et al.*, 1996). For instance, studies that evaluated worse maternal health outcome in Malawi, not only evaluated the factors underscoring maternal deaths from an institutional perspective, but also did not either consider to investigate prenatal care factors from the women perspective as to what factors contribute towards high maternal deaths in Southern and Central Region of the country or include an understanding of perceived factors across the entire country (Lema *et al.*, 2005; Kongnyuy *et al.*, 2008). Thus, it is imperative that the view of women with regards to quality of antenatal care service delivery should highly be respected and adhered to by policy makers when strategies aimed at universally improving on maternal health care services is to be adhered to sustainably.

However, technical health care indicators such as competence of the health care workers in delivering of services and timely availability of medical services and supply often determine the perceived quality of care among women (Baltussen *et al.*, 2002). Additionally, understanding the women perspective with regard to health care delivery remain imbalanced due to their

differences in socio-demographics and early scholars have accounted such perspective ranging from small to significant (Oladapo *et al.*, 2008; Griffiths *et al.*, 2001).

8.2.2 Women's perspectives of institutional delivery

Over time, Sitzia *et al.*, (1997) identified three determinations to be considered in measurement of patient level of satisfaction in as far as maternal health care service delivery is concerned. In their study, patient perspective regarding health care services, an assessment of processes of care implementation which focuses on identifying the gaps and associated interventions and evaluation of care delivery, were recommended as particular artefacts to be considered in the process of measuring satisfaction levels of the patients regarding delivered health care services. Hildingsson's (2007) study on women's perspective on maternity services in Sweden asserted that process of care in the form of providing a supportive, friendly, attentive, respectful and non-judgemental maternal care services, was found to increase the level of women satisfaction regarding services delivery. This woman centred maternal health care service was seen to increase satisfaction levels among women using maternal health care services in the long-run. In the same way, Hodnett (2002) observed that women involvement in deciding the nature of services that they can be given while attending maternal health care services motivates them to be satisfied of the services. Additionally, some years later, on the same matter, Hodnett *et al.* (2005) indicated that better delivery environment among women advantages them to patronize maternal health care services due to the positive attitude contributed thereof.

On the issues of accessibility of the health care facility corresponding to maternal health care utilization during childbirth, a lot has been debated over time in literature. For instance, not only lack of unmet expectation toward the delivered health care, but also poor communication between the patient and the doctor with regards to care delivery contributed to low health care utilization (Jackson *et al.*, 2001). Additionally, physical distance, quality of infrastructure, and unavailability of transport service to access the health care facility predicted positively to home delivery among women (Awoyemi *et al.*, 2011; Ensor *et al.*, 2004). Additionally, Ensor *et al.*, (2004) echoed that if communication between the doctors and the patient improves, home-based maternal health care services could be at a minimal threshold. With regards to perception of men in encouraging women's use of institutional delivery, Kwambai *et al.* (2013) qualitatively observed that in Kenya men positively supported and encouraged women's use of institutional childbirth delivery. Similarly in Nigeria, it was observed that men involvement in emergency

obstetric care promoted women's use of institutional maternal health care services in Nigeria (Odimegwu *et al.*, 2005).

In Malawi, there has been dearth of studies investigating the perspective of women as custodian of institutional based childbirth delivery over the past years. Study that tried to understand different perspective regarding health care services was conducted using men as a unit of analysis (Kululanga *et al.*, 2011). As such the study postulated that involvement of men at the household level in a timely manner, they have potential of support women at any stage of reproductive process and this minimises level of stress that the women suffer alone in the absence of spousal support. On the same, others concentrated on other maternal health care services such as prenatal care only forgoing the significance on the women's perspective in as far as institutional childbirth delivery was concerned (Sakala *et al.*, 2011). Therefore, based on this study, it is important to understand perspective of women on delivered institutional health care services in order to redirect, either directly or indirectly, policies still having a bearing in affecting women's choice of institutional childbirth services in Malawi.

8.2.3 Women perspective on postnatal care utilization

Numerous scholars have highlighted that there exists different factors affecting perspective of maternal health service delivery which influences their usage rate of postnatal care services around the world. For instance, while issues of culture, unavailability of supportive infrastructure, and low socioeconomic status among women affects their perspective of utilizing postnatal care services in Bangladesh, cost of health care , scant availability of better maternal health care services, poor road network infrastructure and lack of extensive community awareness programmes were found to increase women negativity in ensuring that their postnatal care services are utilized as advised by the health workers upon discharge.

In sub-Saharan Africa, a number of women face a challenge in utilizing postnatal care services as expected, a factor which affects their maternal health outcome within the region. In Tanzania, barriers of distance and fear of wild animals constitute to low preference in utilizing further delivered maternal health care services (Mrisho *et al.*, 2009). Regassa (2011) found that high level of literacy and communication with regards to significance of attending postnatal care services among women has a positive impact on perspective on women in using postnatal care delivered services in Ethiopia.

Janssen *et al.*, (2006) asserted that a high level of courtesy and professional competence that the midwives demonstrate to the women during institutional childbirth period; greatly contribute towards positive or negative attitude among women in utilization any subsequent maternal health care services after being discharged. On the same topic, Foster *et al.* (2010) augmented that inadequate staffing of professional health cadre mix affect availability of quality services. It is also viewed to influence quality of continuum of care, a situation which retards women willingness to seek modern care (Titaley *et al.*, 2010).

Furthermore, if a health cadre (a midwife) exercises high level of women motivation at the time they are within the institutional based childbirth environment, MacArthur *et al.* (2002) observed that the set-up patient- health cadre bond at the time directly increases perspective among women and a subsequent future commitment to any postpartum care calls. In the same way, inconsistency in reproductive health education engagements, low level interaction that the health worker demonstrates to the patients while in labour and unscheduled information dissemination regarding significance of maternal health care services at levels predict negatively on women maternal health seeking behaviour (Beake *et al.*, 2011).

Socio-demographically, it has been found that women's parity, method of birth and nature of maternal complication following childbirth predict women's use of postnatal care services (Brown, *et al.*, 2005). A study revealed that lack of requisite postnatal care advice from skilled health personnel such as nurses/midwives, inadequate awareness of timing and schedules of postnatal care services delivery and low education among women regarding use postnatal care services has had an impact on women's use of such maternal health services (Sakala *et al.*, 2011). However, such findings of Sakala *et al.*, (2011) cannot be generalized as it was an analysis based on a single health facility and considered only women attending under-five clinic services excluding those still in the health facility for other services such as childbirth and prenatal care.

Therefore, with this background, the understanding of the perspective of women with regards to the maternal health care service delivery and an anticipation that women have on quality on postnatal care is important to direct policies aimed at fostering women's use of maternal health care services at the level of care namely prenatal, intranatal and postnatal care.

8.3 Materials and methods

Data was collected from two districts in each region of Malawi, namely Mzimba and Nkhatabay in the Northern Region, Salima and Ntcheu in the Central Region and Chiradzulu and Zomba in the Southern Region. The researcher purposely selected Mzimba, Ntcheu and Chiradzulu districts since they had health centres with the most referrals of maternal cases in their respective regions. These health centres were Manyamula health centre in Mzimba, Northern Region; Tsangano health centres in Ntcheu, Central Region; and Namadzi health centre in Chiradzulu district, Southern Region. Therefore, in each district hospital and selected health centres, the researcher requested the health care management team to conveniently allocate at most two women that were accessing antenatal intrapartum and postnatal care services. These health facilities are feasible places to have a representation of all women's accessing antenatal, intranatal and postnatal care services suitable to participate in the FGD.

As such, for each FGD, a minimum of 6 to a maximum of 10 women were targeted and requested at each health facility to participate in FGD. This was the feasible range taking into consideration the complications that the women experience at this time. A total of about 54 women participated in the FGD and were spatially distributed as follows: 16 women in the Northern Region, 10 women from the Central Region and 18 were from the Southern Region. The FGDs were intended to capture information related to perspective of women on the quality of maternal health care service delivery among those that were visiting the health facility for antenatal, childbirth delivery and postnatal care, their perception regarding the services that they acquire at the health facilities and barriers that affect timely use the health facilities when in need of maternal health care services. Lastly, all were asked to suggest ways that can be followed or implemented to enhance quality of care and their subsequent maternal health care service utilization. The interview guides are presented in appendix 3.

The FGD was conducted within the health care facility in a room that was allocated by the hospital management in order to avoid any type of interruptions and provide high level of independence and freedom for the participants. Prior to the FGD, women were told about the purpose of the discussion and they were asked to be free to participate or not. Luckily, no woman indicated unwillingness to participate in the FGD. The FGDs were recorded using voice recorder and those discussions that were in vernacular were translated by two different people in order to ensure that quality of verbatim was achieved. The typed transcripts were exported to Atlas-ti version 7 which the qualitative data analysis was conducted. We triangulated responses from

women attending antenatal, postnatal care and intranatal care and the study found that the information was almost uniformly corresponding in all cases.

8.3.1. Themes and sub-themes drawn from the narratives obtained from the respondents

Table 8.1 provides themes drawn from the FGD regarding quality of maternal health care services in Malawi. The interview guide questions are outlined in the appendix 2.

Table 8.1 Themes from focus group discussion on quality of maternal health services in Malawi

Theme	Sub-theme captured
Predisposing Factors <ul style="list-style-type: none"> • Service quality satisfaction 	Time taken to be served Health cadre responsible for serving
Household factors <ul style="list-style-type: none"> • Challenges/barriers 	Attitude of service workers Household and community challenge Household/Spouse support Ready finances to access health facility
Community Factors	Distance to health centre Transport availability Maternity home facility Quality of care Resources availability to support maternal health Condition of health facility Information about postnatal

8.3.2 Ethical consideration

The study sought ethical clearance from two ethical boards. Firstly, the North West University ethical clearance number: NWU- 00394-15-A9 and the other was requested at the district health office after presenting the research intent letter from Lilongwe University of Agriculture and Natural Resources to which the principal investigator is affiliated. The District Health Office upon reading and vetting the content of the submitted proposal and interview guides, gave authorisation to meet relevant officers, either within the hospital or requested health centre within the district which had on average frequent number of referral cases in the year 2015.

8.4 Results

From the qualitative analysis, four themes came up: (i) perceived support that women get immediately they arrive at the health care facility; (ii) perception about the services that are delivered at during their time for antenatal, intranatal and postnatal care; (iii) barriers that affected them when they made decision to come for maternal health services; and (iv) suggestions on anticipated areas to improve maternal health care services at the health centre/hospital that they patronized.

8.4.1 Perceived support at arrival to the health care facility

The respondents communicated different perceived support that they receive at the ANC facility, intranatal facility and postnatal care facility. However, the quality of care that the women receive during ANC and postnatal care services were found to be correspondingly similar. For instance, a lot of women positively appreciated the nature of support and assistance they receive from the health cadres during ANC care and postnatal care service acquirement. This is what the women said in support of immediate care acquired at during antenatal and postnatal care visits:

“When I first came for antenatal care services, I was very much encouraged by the reception and quality of lessons the health worker gave us. For instance, we were trained on topics such as importance of getting tested for HIV/AIDS during pregnancy and how that can be an advantage in minimising infection to the expected baby, education about birth preparedness as this is my first pregnancy, grilled on self-pregnancy assessment in order to know any complications and immediately seek medical attention” (FGD, Mother of First Parity, Health Centre, Southern Region).

“I am quite satisfied with the quality of reproductive health education that the nurses are giving us. The lessons are very clear and they use nice posters for us to understand the lesson clearly. For example, last week I learnt about how to take care of the child immediately after birth and this week they are teaching us about the importance of discussing our maternal health problems with our husbands so that we get support when time to come and deliver comes. This is very inspiring as this was not being taught like this over the past years” (FGD, Mother of Parity 3, Health Centre, Northern Region).

“We don’t have a problem with the reproductive health educative programmes. They are quite clear. You saw inside [special room] the nurses were very busy collecting our urine, measuring our blood pressure and others so that they [the hospital] can have a good history of my pregnancy. Even though we are many the doctors [meaning nurses] are working very fast in order to assist each one of us and by 12:00 mid-day they would have attended to all of us” (FGD, Mother First Parity, Hospital, Central Region).

The study found that despite the congestion in as far as delivery of antenatal care and postnatal care services are concerned, nurses were working hard and within three and a half hours from the start the service till the last woman was served, the quality of care delivery was very impressive. The major reason that was reported by the majority women was that most nurses that administer educative sessions about safe reproductive health programmes and conducted further tests regarding proteins level, sugar level, blood pressure and height had a vast experience in their job and were not only friendly, but also motivated the women on the importance of recurring hospital visitation during pregnancy.

However, in an isolated case, one woman indicated that she started prenatal care service very late due to the fact that she was not aware that she was pregnant due to the fact that she was on contraceptive. This is what she had to say:

“I started very late in coming for these lessons because I was not convinced that I was pregnant. Up to five months I did not know that I was pregnant yet I was on a Depo Provera. So, when I came to the health centre to ask why my legs were ever swelling, that is when I learnt that I was pregnant” (FGD, Mother of Second Parity, Hospital Northern Region).

In addition, the women were asked about the quality of care that they receive at the health care facility on arrival in terms of timeliness, what the medical personnel did to receive them at the health centre. There were dissenting feedbacks in response to this question.

“Immediately I arrived I was received very well and I was directed to the place where ANC lessons will be conducted” (FGD, Mother, Health Centre, Central Region).

“There were other women having similar problems like mine and were more critical. So the doctor was attending to that patient first and I waited for 45 minutes before the doctor finally came to assist me” (FGD, Mother First Parity, Health Centre, Southern Region).

“The problem here is not the ANC service delivery. The same doctors (meaning nurse, as the word can be used interchangeably) started shouting at us and called us all names as I come for this pregnancy I am expecting here” (FGD, Mother Parity Three, Health Centre, Southern Region).

“Sometimes when you are in pain, you call the doctor for assistance. In one incidence the doctor pinched me and told me not to cry. She said a lot of things. I was quite and I could not cry. I was scared that once I cried she would harm me. I don’t know what the doctor meant by that statement” (FGD, Mother Pregnant, Health Centre, Southern Region).

“The issue here is not the ANC clinic services, but the way we are handled when we are waiting for child delivery. That is the time we always have problems with these people [health workers]. They become more emotional and treat us badly” (FGD, Mother, Hospital Central Region).

“I had a cramp in the legs at home and I was had problems walking on my own. I have been lifted to come to the health centre and there was no wheel chair to take me to the health facility for diagnosis. It was a challenge and painful experience for me. At the time, some workers were shouting while they were assisting me. I was in agony and it was very bad to see the one who is employed to assist us in such a state. She exhibited bad attitude towards me indeed” (FGD, Mother Second Parity, Health Centre, Northern Region).

8.4.2 Perceptions on quality of care delivery in prenatal, public health care during childbirth and postnatal care facilities

Women's perceptions on maternal health care services at prenatal, postnatal and during delivery were found to be different by the type of the service that they were seeking. As such women indicated that they were treated differently.

8.4.2.1 Prenatal care services

With regards to prenatal care services, majority of women reported to be satisfied of the quality of care delivery at the health care facilities. In addition, most of the women rated the level of communication from the health care providers as above average and encouraging. This is what they had to say:

"I don't have any problems with the way ANC services are delivered to us, all is very well and the nurses are very friendly to us. Even those that are on training are able to handle us with good care. So far so good, I cannot complain at all. Like now I am waiting to be tested before I go home. But you can see, this friend of mine has already finished and she is just waiting for me. I just delayed a little bit because I was getting tested for HIV/AIDS so the doctor was giving me some counselling about it. So if it was not for that reason, we would have been gone by now" (FGD, Pregnant Woman, Hospital, Northern Region).

"All is very fine... even during the prenatal care education, they [health worker educator] were asking us of the problems that we experience during the pregnancy and suggested possible solutions about them. For example we got a lot of elaboration about the state of our legs swelling, persistent headaches, vomiting, lack of appetite on some favourite food I used to like before I fell pregnant and constant abdominal pains due to the pregnancy and the situation is to improve when the pregnancy advances in a month or two" (FGD, Pregnant Woman, Hospital, Central Region).

"At the prenatal, they talk to us very nicely. So I don't have problems. They are very kind with positive attitude towards us. For instance, they joke with us,

encouraging us to bring our husbands and those women that have brought their husbands are served first. This was an encouraged development.” (FGD, Pregnant Woman, Hospital, Southern Region).

Therefore, based on these narratives, it appeared that most of the women that have visited the antenatal care services were found to be appreciative of the services that they acquired at the health facilities in as far as antenatal care services were concerned. However, when women were asked to indicate the time that they took to start ANC clinic visitation, the majority of the women reported to have started late after 4 months and above. Further probations indicated that women were unaware of the pregnancy, others indicated that they wanted to be sure that they were pregnant because it has happened before that they missed menstrual period for 3 months only to restart the period in the fourth month. Others indicated that they hardly knew that they could be pregnant because of using modern contraceptives.

“I started ANC clinic visitation after 5 months because I did not know I was pregnant. I thought it’s the normal menstrual cycle breaks that we sometimes experience due to the contraceptive use...I started the ANC very late in the sixth month after conception because I wanted to start going to the hospital when my pains stopped. You see the hospital is very far and with my challenge of having no transport money, as my husband works far from my village and he always come once in a month. The issue of starting very late is associated with money. You see I should find money to support ANC visits, another sum of money to support my other children. That is very difficult for me. As a result I just trusted that everything is okay. I can delay the ANC visitation because that is another way of saving money meant for other maternity needs in the future” (FGD, Women Pending Labour, Health Centre, Southern Region).

8.4.2.2 Public health facilities during childbirth

The majority of the women indicated that during the time that they have been hospitalised awaiting childbirth, they experienced a number of challenges that made them remain very stressful and this was partly due to tiredness in general because of the pregnancy condition and partly due to low quality of care delivery.

“I was very dizzy when I just came last week after I started feeling the labour pains. After getting blood test, I was told that I needed one and a half pints of blood because I am anaemic. They told me that the hospital does not have blood in its bank. I called home to ask for well-wishers. They came three days after the call. I suffered from that dizziness until I got blood transfusion.” (FGD, Women Waiting For Child Delivery, Hospital, Northern Region).

“I was told that I am anaemic, but there was no blood supply at the health facility to assist me. So, my guardian sought assistance from a person whom we paid K2000 (USD 3.3) for a pint and the man donated two pints which we paid secretly” (FGD, Women Pending Delivery, Hospital, Central Region).

“I got blood I bought from a vendor outside.....You see, at the entrance of the hospital there are some men lingering around and chilling. Some of them sell their blood to get money for a living even though the market is not known by the district health officers. When they come in for donation, they act as merciful people, when in actual fact; they have pocketed some money for the donation” (FGD, Women Pending Labour, Hospital, Southern Region).

On the same issue, in the Southern region there was some mixed reaction to the testimonies that the women gave with regards to the services delivered when they were waiting for the time of delivery.

“The treatment at the maternity ward is not good at all. There are very few beds and because the women that are expectant are more, we sleep two women per bed. Some times when a lot of deliveries happen, we are taken off the beds and told to go and sleep in the kitchen and that place is not pleasant at all for someone who is pregnant and tired as we are. In the kitchen there are no mattresses to sleep on and so we sleep on the floor and on cartons that they [health workers] give us, and that is a big challenge. Sometimes when you call them for assistance of a strange feeling that you have, they [health worker] come and start shouting at you. In some isolated incident, they even pinch you very hard and tell you not to cry” (FGD, women waiting for labour, health centre, Southern Region).

In the Central region, women complain that the health care providers more importantly working for night duty had a negative attitude to address the women complaints. This consequently resulted in one woman delivering herself while in the hospital environment.

“When I reported to the nurse that I was not feeling well, the nurse ignored me and shouted at me claiming that I was just imagining things I was feeling. She spoke at the top of her voice that we [women in the ward] should give her a break. If anyone feels genuine labour pains and she is ready for delivery then they should call her. Every one of us gets frustrated by that attitude and conduct. The only thing that these people [health workers] forget is that they are there because of us. If we can stop coming here for childbirth then they can be declared redundant, (she lamented). I am telling you their behaviour is different from the way we were treated during the time we were attending antenatal care clinic services. Given a chance I can go and deliver at home. These people [health workers] are disrespectful and they hardly know how to respect patients’ rights. This is very unethical. I am saying this so that you can assist us in making the world know of the problems that are existent in this hospital. I think even in other hospitals or health centres we suffer a lot of humiliation in the hands of these health workers” (FDG, women waiting for labour, hospital, Central Region).

One woman had higher parity and had indicated to have delivered one of her children with the traditional health assistance pointed out that even though the traditional birth attendants were banned, their services were accommodative and supportive to the woman pregnancy course yet this traditional health assistance was not formally trained on reproductive health management and all was done relying on her experience. This is a narrative of what one woman:

“I delivered my third child with the traditional birth attendant’s assistance. The environment was good. I was being massaged at night and I remember the time I was weak to wake up and take a bath. She bathed me with warm water. That experience that I had then cannot happen here in these formal hospitals. If its bathing then you must know it’s the guardian that is to do that and if you do not have a guardian then it’s a problem. You stay without a bath and that is unhygienic living in a place that is meant to be hygienic” (FGD, Woman Pending Labour, Hospital, Central Region).

In another health centre in Southern Region of the country, there was a lot of congestion in the health centre. When respondents were asked the reasons why they preferred to come to this health centre in Chiradzulu other than their own closest health centre in Zomba. It came to light that women to have some challenge with the conduct of some health workers at the health centre that prompted them to come and deliver in Chiradzulu health centre. In another one health centre in Southern Region of the country, there was a lot of congestion. Respondents at this center were asked the reasons why they preferred to come to this health centre in Chiradzulu other the health centre in Zomba which was closest to them. In the process it came to light that women tend to have some challenges with the conduct of some health workers at the health centre in Zomba.

“It did not happen to me, but my neighbour in our village. She indicated that the trainee nurse that was assisting her to deliver was shooting a video of her without her consent. Later, she heard that the health workers were showing that video to his friends at the drinking spree. Imagine that thing happened. The problem at the health centre is that the workers are protected and are not disciplined at all. For example, when that rumour reached the District Health Office, we were expected maternal health auditors to come and investigate this serious matter and stop that unethical behaviour. Alas! Nothing happened. When that situation became known among the communities, women started shunning away that closest health centre and came to this one in Chiradzulu. For your information, this health facility is not even up to standard but its better here than have your maternal privacy shown to the public. It was very shameful.” (FGD, Women Pending Labour, Health Centre, Southern Region).

“We (Me and my guardian) arrived at the health centre in time and the doctor informed me that I must go to the district hospital and when he called the transport officer at the district health office, we found that there was no fuel in the ambulance. It was just by grace of God that my conditions just changed for the better and up to this day the ambulance has not come for the same reason” (FGD, Woman pending Labour, health centre, Northern Region).

8.4.2.3 Postnatal care service

In as far as the postnatal care service is concerned; women were very much appreciative of the services that they were rendered when they came for postnatal care services. Those that indicated having challenges, they claimed to see no need to come for the postnatal check-up after 6 weeks after all they reported to have no experience with any physiological bodily challenges warranting them for postnatal care check-ups immediately after getting discharged from the hospital. However, with regards to the information awareness and reminder about the postnatal check-up some who came with their children for postnatal clinics indicated that they had some talk from the nurses briefly 30 minutes prior to being discharged.

“I remember, the nurse told me about the significance of coming to the health centre for postnatal care check-ups. But, the emphasis was for me to finish the tetanus toxoids vaccination and check-up of the child’s umbilical stump to see if it was closing properly” (FGD Women Postnatal Services, Hospital Northern Region).

“I was advised to come and start postnatal care check-up in two days and 6 weeks after getting discharged from the health centre. But after two days I did not come due to lack of transport money” (FGD, women postnatal care, health centre, Central Region).

“I stayed at home for the postnatal care services because I had another boy who was very sick. So I did not have someone to nurse him as my sister’s daughter who was my guardian at the health facility had gone to her home just for some other family business. So, I decided not to go for the postnatal care facility after 2 days to take care of these two children. After that it was my sister’s daughter who always took my children to the hospital for under-five clinic services. I have come here to relieve my sister’s daughter because I felt like consulting a doctor. I am always feeling too cold every day at dusk (FGD, women postnatal care, health centre, Southern Region).

The patients were asked to narrate their experience with postnatal care service delivery with regards to attitude, work ethics regarding the expected services that they expected doctors and nurses to give to mothers, availability of medical resources such as vaccination therapy and other supportive related maternal child health medicines, perception of the equipment used to assist

both the child and the mother. Based on the findings, it is apparent that women perceive medical doctors and nurses as very busy and moderately attentive on postnatal care services. In as far as availability of vaccination was concerned; in the northern part of the country vaccination was readily available.

“Yes, on vaccinations there are no problems. Everything is very fine. Thanks to the government for coming up with the vaccination at the appointed time that they promised us and right to our community” (FGD, Women Postnatal Care, Health Care, Northern Region).

In the Southern Region, it was observed that lack of refrigeration equipment at the health centre affected storage of the medicines and vaccines that require specific temperature. As such when women were asked to explain the postnatal care experience with regards to vaccination administration management, the women were not happy with the logistics associated with the treatments.

“I came here early in the morning and I am waiting for vaccination. The nurse had just told us to wait a little while because of the problem of transport delays from the hospital to the health centre. They don’t have working fridges to store the vaccines.” (FGD, Women Postnatal Care, Health Centre, Southern Region).

“You see the challenge of availability of some drugs still persists in this health centre. A doctor has just told us to come next week because he has not yet received the medicine from the district health office. So he is hoping to receive the medicine by tomorrow so he cannot conduct postnatal care services where such vaccinations are administered. So we have all been advised to come on Friday which is the scheduled day for postnatal clinics” (FGD, Women postnatal, Health Centre, Central Region).

“You see, other women send their husbands for postnatal care. These men are served first before us who came without our husbands. Look at that Man, he has just come and he is already served. That is very encouraging. I came here with my husband and I was served quickly. I did not wait in the queues. The doctor gave us priority as a way of motivating us. You know most men don’t like to be associated with maternal health care of their wives even though they give us

money for transport and other expenses to access the health care services” (FGD, Women Postnatal, Health Centre, Southern Region).

8.4.3 Determinant factors in uptake of maternal health services

The study took a step to understand some of the challenges that women face in maternal health care services in general. However, there were common factors that were pointed out as barriers that influenced their preference to utilize health care facilities.

“The major challenge to me is the distance to access the health care facility. It is not far but because of the state that I am in, I take long time to walk to the health centre and that affects me greatly” (FGD, Women pending labour, Health Centre, Northern Region).

“It takes a lot of time to come to this health centre. I used the boat to come here as I live in the Likoma Islands. So the boat took even sometime to reach this place because the one that was guiding it lost direction and we ended up going far south of the hospital. In addition, the boat was highly congested with other business people and it was not comfortable for a woman in my condition. But all the same, my aim was to come here and deliver in the health care facility that why I took such a risk. Secondly the boat owners charged us double because I requested for a comfortable seat in the boat and that stopped another customer from embarking. Lastly, from the boat to this hospital I paid transport fare again. Such topography of the place like here [Nkhatabay] poses great challenges among women who are heavily pregnant like me” (FDG, Women in Labour, Hospital, Northern Region).

“The cost associated with accessing the health centre has changed a lot. Like when I was having my first child I used to pay K 100 (about USD 0.16) but now due to increase in pump price of fuel, the bus fares have reached K 250 (about USD 0.42). That is quite a lot of money to spend on transport alone before considering buying other materials that we are mandated to bring at the health centre such clothes, candles, razor blade or new scissors, children clothes, linen clothes 6 of them and basins (FDG, Women Pending Labour, Health Centre, Southern Region).

However, considering the household factors that prevented them to use maternal health care services much faster than anticipated, it was observed that the family and other relatives with the community did have an impact in influencing women delays in patronizing maternal health care services timely.

“My husband works in Blantyre and when I am pregnant like, this we agreed that I come to the village so that I get more support from my mother. So, life is very hard in the village because my husband has not yet sent money to support this development. My husband is not formally employed, we rely on agriculture. Unfortunately we did not harvest much last year due to draught. So we are struggling financially. So the money that I have used to come to the hospital was a loan from the village bank. So immediately after being discharged I find ways of repaying my debts otherwise they will take my garden and rent it out to someone so that they recoup their money. I don't want to experience that again” (FGD, Women Pending Labour, Health Facility, Southern Region).

Some women stated the ways the communities affected them regarding health care utilization in the country.

“The ministry (Health Ministry) empowered the chiefs to be charging the women who deliver at home. In the same way, at the health centre if you come and say I delivered at home they charge you K 7000 (about USD 11.67). You see this financial burden affected us quite a lot and we are forced to pay as punishment that we should never give birth at home or using traditional birth attendants. Most of the times, we end up suffering a long term financial problem due to this payment of debts. If you are not paying the village head disowns you as part of the village and that is very bad. So in one case, a woman failed to pay and the village head man was came to the woman's house every day claiming a lot of things that if the child dies, she must find her own graveyard to bury the child. Hahahahah! It has now become a criminal activity in the village (Zalowa kuba kwenikwenitu m'midzimu) as the headmen were taking advantage of that mandate given to them by the health ministry” (FDG, Women Pending Labour, Health Centre, Southern Region).

“I have just delivered now and I have a baby boy. I came here three days ago and I will be discharged today. I came late because I did not have much food to bring to the health centre to support me. As a serving mechanism I came late. It’s just that I deliver normally and this is my third child so I was confident things will be well (FGD, Women after Delivery, Health Centre, Northern Region).

“The issue of women requested to bring linen, candles, children clothes, and food stuff is becoming a common situation. But you see the issue of money and unemployment is distressing a lot of women and this affects us in making timely decision to use modern health care services because we want to be financially stable before we make a decision to come for these public health care services” (FGD, Women After Delivery, Health Centre, Southern Region).

8.4.4 Women perspective on scaling-up of maternal health services

During FGDs in the health care facilities, different suggestions were made in order to motivate them to scale-up on maternal health care services in Malawi. For example, the issue of improving the conditions in the health care facilities such as having more beds supplied to ensure that the current congestion which is common to almost if not all hospital environments must be addressed. They pointed out the issue of shortage of health care providers, especially at the health centres. Women suggested that the government must be obligated to ensure that the rural health centres are well capacitated with reasonable number of health care workers to minimise the current work stress in the health centres which on average have a nurse and a clinic officer to handle all health care needs of the people including critical maternal health care services.

“You see, the structures are there. If for example we have all the necessary resources and good number of health workers, we cannot go to district health facilities or elsewhere to access health services. We do that because the current system does not assist us at all” (FGD, Woman Pending Child Delivery, Hospital, Northern Region).

“We are not pleased at all to seek health from very far places and when we go there are very few people there. If the government could assist us to capacitate these rural and remote health care facilities with nurses and clinic officers that

are adequate to meet our health needs then we are sorted” (FGD, Woman Postnatal Care, Health Centre, Central Region).

“You see, I have travelled a long distance to come here and seek antenatal care service. There are a lot of my colleagues in our village who failed to come because of lack transport money. If government can revive the use of mobile clinics on specific days of the week where a nurse and clinic officers can come and offer maternal child health care services in the communities around us, we can really be help. Instead us travelling to the health centres which we are not sure of the availability of medicine based on what you are suffering from, let them come to us and provide the services close to us. I can dare you my brother, the government cannot implement that because it knows how little is spending on medicine and medical staff to support such pro-poor rural centred community health care services. Such services will alleviate many challenges that we face that prevent us from visiting the health care facilities in time. In that way, there is a referral to the health centre or district hospital, the booking can be made there and details of the woman taken and in that way as government they can make a system of checking on us (women) a day prior to that to ensure that we are attending the booking the next day. Such developments can improve maternal health outcomes in this country.” (FGD, Woman Postnatal, Hospital, Southern Region).

The other challenge that was encountered is the shortage of equipment and relevant medical resources aimed at promoting quality of health care services in the country. A lot of community based initiatives were suggested by the women in order to make sure the current problems experienced in health systems such as shortage of drugs, scanning equipment, linen, beds and inadequate health care facilities such as small rooms used as maternity wards in some health centres in the country.

“The problem of shortage of equipment can be solved once and for all if everyone in the community takes a deliberate effort to improve the quality of health care in our societies. For example, you remember during single party rule we used to have a youth week during which time a house of a teacher or a block of school could be built by the communities without any pay. If we continued with that Malawian help your community spirit, some of the issues

that are a challenge today would have been solved by the community. We can contribute some little for our drugs bills, mould our brick to increase the size of our health care facilities or houses of the health care personnel, we can even make an agreement that all women who are pregnant be given a concession to ride transport along the roads of Malawi without pay. The government should try to subsidize or charge less tax to private pharmaceutical companies in order for them to have a wide array of drugs at an affordable rate so that people can be referred to access such drugs. Otherwise the current health system lacks a lot of monitoring. That's why we hear of drug-gates (drugs being stolen from public health care pharmacies' to private health care facilities). This is very serious” (FGD, women postnatal, hospital, Central Region).

“When I am coming for any maternal health care services, I always have better expectations but to my dismay such expectation are not met. You see the attitude of the health care workers very unbecoming and you tend to wonder whether these people employed by the government to ill-treat women when they are giving birth or what. The government must do something to improve quality of health care instead of just mentioning plans of health services development in political campaigns just to buy votes” (FGD, Woman Pending Labour, Hospital, Southern Region).

8.5 Discussion

This chapter examined perception of women about maternal health care services in Malawi. The FGD was the only principle qualitative tool that was used to understand the different perspective from women.

According to previous international protocols, 1978 Alma Ata declaration number VIII;

All governments should formulate national policies, strategies and plans of action to launch and sustain primary health care as part of a comprehensive national health system and in coordination with other sectors. To this end, it will be necessary to exercise political will, to mobilize the country's resources and to use available external resources rationally²

² Declaration VIII: 1978 Ama Alta Declaration, International Conference on Primary Health Care, Alma-Ata, USSR, 6-12 September 1978

This was complemented by declaration number VII, sub section (7) which reads:

...relies, at local and referral levels, on health workers, including physicians, nurses, midwives, auxiliaries and community workers as applicable, as well as traditional practitioners as needed, suitably trained socially and technically to work as a health team and to respond to the expressed health needs of the community...³

This was reinforced by subsequent international and regional conferences including the 1994 ICPD which stated that:

"...to promote women health and safe motherhood: to achieve a rapid and substantial reduction in maternal mortality and morbidity.....To improve the health and nutritional status of women, especially pregnant women and nursing women..."

However, despite Malawi being a signatory to Alma Ata and ICPD declarations, and having responsibility to implements these declarations, the country's women's utilization of maternal health services which is meant to support all women speaks volumes about the quality of services delivered or perceived challenges negatively influencing women and compelling them not to rely on facility based maternal health services.

One implication of this shortfall is that Malawi will have challenges to "ensure healthy lives and promote well-being for all at all ages" as stipulated in Sustainable Development Goal number three (United Nations, 2015).

- By 2030, reduce the global maternal mortality ratio to less than 70 per 100,000 live births
- By 2030, end preventable deaths of newly borns and children under 5 years of age, with all countries aiming to reduce neonatal mortality to at least as low as 12 per 1,000 live births and under-5 mortality to at least as low as 25 per 1,000 live births
- By 2030, reduce by one third premature mortality from non-communicable diseases through prevention and treatment and promote mental health and well-being
- By 2030, ensure universal access to sexual and reproductive health-care services, including for family planning, information and education, and the integration of reproductive health into national strategies and programmes
- Achieve universal health coverage, including financial risk protection, access to quality essential health-care services and access to safe, effective, quality and affordable essential medicines and vaccines for all

³ Declaration VII, subsection (7). Refer 1 above.

8.5.1 Prenatal care utilization

The findings reiterate that although women were found to be very pleased with prenatal care services as related to operations conduct at both the health centre and hospital level, some disappointment existed with regards to accessibility, indirect costs associated related to transport and other non-health care factors such as community belief negatively influence women's use of health care services. This finding, in part, concurs with what Lule *et al.* (2000) pointed out that positive attitude and better communication that the health workers render to women at the time they are within the health care environment, promoted women use of maternal health care services in the country. On the same note, other previous studies highlighted that good service delivery with positive attitude from the health care provider perspective have had a remarkable on usage preference of maternal health care services (Brown *et al.*, 2005; Staniszevska *et al.*, 2005).

In this present study, women in Malawi generally describe prenatal care services as the best delivered so far in terms of conduct of the services, educative programmes associated with maternal health care services and even positive attitude of the health care service providers to that status quo, although in some minor instances, issues of congestion was discussed as the factor contributing to prenatal care service challenge. However, other women indicated that the health workers were so efficient in their work and were capable of releasing the women in a timely manner regardless of women congestion levels. There is also evidence that higher level of satisfaction of health care service delivery is often attributed mostly to acceptability pattern of the delivered services in the form of easy access, quick patient-doctor throughput, longer and flexible delivery and better attitude (Shaikh *et al.*, 2004; Bhattia *et al.*, 2001).

On the same issue, United Nations draft on human right and health care pointed out that access to primary health care is regarded as a basic individual social right (Grad, 2002). In this study, majority of the women complain that congestion in health care service facilities at each and every prenatal health care facility, a development which could result in other women losing confidence in the quality of care, thus, being denied their social right to acquire health care from the public health care facilities. Other scholars pointed out that congested primary health care facility in which prenatal care services belong, result in high level of dissatisfaction of the services delivered and seek alternative services to either health care shops or go directly to higher level of care seeking primary care (Atkinson *et al.*, 1999), leading to high levels of inefficiencies and loss of control over efficacy and quality of care (Adamu *et al.*, 2002).

Issues of distance were pointed out to be the barrier to utilization of prenatal care services in the country among women from their villages to health care facilities. Studies over the past year found that in most developing countries women in rural areas do have disincentive to use the health care facilities due to either distance which gets adhered to some other factor such as transport or need the services of government run ambulatory services for them to access the health care services in time of critical need (Shaikh *et al.*, 2004; Fatimi, 2002). Therefore the issue of distance, availability of transport and financial experienced by majority of the women have been a core disincentive towards women's use of prenatal care services in the entire country. As such, factors these need to be dealt with by either the government or communities if women are to be motivated to seek prenatal care services without such barriers.

8.5.2 Public health care childbirth

The study found that most women perceive challenges to services delivery at the time they come for childbirth which are contrary to the type of services they were having during their prenatal care services. For example, shortage of blood in the blood banks of the health care facilities was among the factors that were felt to be a challenge for the hospital to fail to provide the fundamental support in blood transfusion from its blood banks. In some instances women reported to have resorted to paying some people some money in order to get pints of blood to substantiate their anaemic challenge due to the f shortage or no supply within the government facility bank. In Gambia and Bangladesh, similar studies observed that such indirect cost associated with blood transfusion, due to shortage of blood in the blood bank and access challenge to some medical supplies such as Magnesium Sulfate are some of the drawbacks causing non-public health facility birth choices among women (Cham *et al.*, 2005; Afsana, 2004). This trend of shortage of essential medical supplies such as medicine, blood and other equipment's aimed at supporting maternal health care services do affect quality of delivered care which if prolonged cause unmerited maternal health outcome.

Additionally, the level of congestion exists in the maternity wards and maternity homes which leave a lot of women experiencing challenges to the quality of accommodations that the health care facilities provide, and were found to be a common phenomenon in the country. Such degree of congestion demean women in their social right that the primary health care is failing to deliver in order support both health and physiological well-being of the people (United Nation, 2015; WHO, 2000).

The study found that attitude that some health workers displayed to women pending labour with the health care facility contradicts with what Lule *et al.* (2000) earlier found that sincerity and good communication skills increased positive perception of women's use of maternal health care service in Malawi. In the present study, it was further observed that majority of the patient clients questioned the integrity and unethical behaviour demonstrated by some health care providers in the way they emotionally handled their patients. A study by Attree (2001) asserted that such service delivery in an inhumane manner was perceived as not good quality of care. Additionally, the study found that the majority of the women were dissatisfied of the quality of care they get from health centres, a factor which subsequently affect their decision to utilize health care in their future need. On the same, previous study found that quality of health care services delivery have had a significant effect on patient satisfaction and subsequent use of the health care facility in the long term (Andaleeb, 2001).

In the study, women indicated that the referral system was not comprehensively working due to intermittent shortage of fuel which created a barrier to efficient operations of health care facilities ambulatory services. For instance, it was observed that lack of fuel disintegrated ambulatory services and caused worse health outcome in the country's health systems. This was the case because the challenge created delinkage in maternal service coordination and correspondence between either the primary to secondary referral system or between the secondary and tertiary referral system. Previous studies, Murray *et al.* (2006) and Kaye *et al.* (2004) asserted that poor quality referral system resulted in subsequent worse maternal health outcome in Zambia and Uganda. This implies that lack of coherent and robust referral systems due to other indirect factors such as inefficiency in healthcare system delivery which consequently worsen maternal health outcome.

In trying to access health care services amidst transport challenge, the study found that women incurred other indirect cost in the form of transport to access the health care services in Malawi. Other scholars observed that this indirect cost women paid to access health care service extends to other unforeseeable factors. For instance, in a neighbouring Tanzania, Kowalewski *et al.* (2002) observed that unofficial cost associated with access to health care services among women, remain the a common preventive barrier utilize maternal health care services including choice of place of childbirth. Similarly, in Indonesia, a study indicated that indirect cost such as cost of food, living in the hospital, caretaking and extensive transport cost constitute a large cost associated with access to health care (Behrman *et al.*, 1987), a factor which contribute negatively to women choice of facility based childbirth (Cham *et al.*, 2005).

8.5.3 Postnatal care delivery

With regards to the postnatal care service delivery, women that delivered normally were found not willing to stay in the hospital much longer and most of them opted for discharge from the health centre and go home. The majority of women were of that view due to economic challenges, being fed-up with the attitude of some health workers before they deliver and inadequate bed space where they could stay with their new baby due to congestion within the wards. This study's findings contradict those of Foster *et al.* (2008) who found that women opted to stay on within the health care facilities after childbirth despite the challenges experienced at the time they were in the hospital.

Furthermore, for many women, it was found that even though they were told during their postnatal care services that the service has been cancelled due to logistics challenges to accessing the vaccination in time, the majority of them pointed out that they came back the other week without any problem as they understand the significant impact of vaccination towards their maternal health well-being. This finding concurs with what Lule *et al.* (2006) found that when women are well communicated in a modest way about service delivery challenges and strengths, they are more willing to positively comply with any call that might appear advantageous to their health well-being.

In as far as women's perception regarding their spouse involvement in supporting postnatal care services, it was observed that the majority of women were happy to get assistance from men. For example, women that were asked to give their perspective, the majority of them indicated that they would not have problem if a man came to the hospital with the child as doctors give him priority. The women says that if all Malawian men could understand that maternal health care problem experienced by the women is their problem again and take up a step to support the women to improve the current status quo, then women status can really be improved. In a different study, Odimegwu *et al.* (2005) and Kwambai *et al.* (2013) pointed out that even in Nigeria and Kenya men were more likely to assist women of any maternal health care services and accompanying them regardless of the challenges. However, the practice demonstrated by men in Nigeria and Kenya were far much positive in supportive women when it comes to maternal health care services and not consistent with Malawian men that were found to have successes or failure in supporting women on their maternal health care services (Kululanga, *et al.*, 2011). Therefore, the need to call for male championship on maternal health care support in the country cannot be an overambitious gender balanced health promotion strategy.

8.5.4 Women's suggestions to improve maternal health care delivery

There is a need to increase the number of health workers by adopting a bottom up approach in order to make the number of health workers in health centres can assist in a number of ways. This can lead to reduced cost of referral services which the country is consistently experiencing due fuel availability problem; reduce the number congestion at the secondary and tertiary health care facilities as majority of the women are to be assisted at the primary health care facilities. According to Murray *et al.*, (2006), a referral system is viewed as a system capable of solving all referred cases as it is characterised by the following: adequate resources, effective and efficient coordination with lower levels such either secondary or primary health care, feasible transport system, operational protocols between the receiver of the services and the sender (referrer), knowledgeable logistics and accountable human resource; services that are affordable, effective and all these underpinned by robust and flexible policy. Koblinsky *et al.*, (2003) pointed out that such an effective and efficient referral system that was implemented by countries such as Sri-Lanka and Malaysia improved maternal health outcome tremendously in Asia, amidst the country having lower health care budgets relative to other countries around the world (Kruk *et al.*, 2007; Borghi *et al.*, 2006).

In view of the distance challenges to access the health care facilities, the government should make a deliberate effort to support mobile clinics initiatives and bring health care services to the people in their place of residence than is presently the case. MacArthur *et al.* (2002) pointed out that redesigning of the health care services to meet the demand-side challenges related to maternal health care service delivery, has an impetus to increase maternal health care service utilization in West Midland Region of United Kingdom. On the same issues, a similar study observed that use of mobile-health technologies have a significance in reducing the distance that women's used to access the health care facilities (Free, *et al.*, 2013), this scaling up process of health care advantages women in as far as acquisition of improved health care is concerned at a lower price (Tomlinson *et al.*, 2013; Gurol-Urganci *et al.*, 2013). As such countries such as Malawi that are still experiencing problems with distance can seek to find a lasting solution to health care by implementing a mobile health system using the mobile gadget that the country is reported to have about 30% of its total population as active subscribers using mobile-phone for communication (World Bank, 2015), which could be easy on average to communicate health care treatments than is presently the case.

Design mechanism that will enhance male involvement to support their spouse's utilization of maternal health services at prenatal, intranatal and postnatal health care facilities. This is to assist couples to make joint decision making with regards to family planning and maternal health and thereby promote maternal health outcome as is the case in some part of Kenyans and Nepalese Communities (Kwambai *et al.*, 2013; Mullany *et al.*, 2007). Ensure a robust private-public partnership programme in which the government inter-act with the private sectors in order to improve health systems in general at a macro-level in Malawi. On the same, from a micro-perspective, the need to have encouraged community participation in supporting health care service delivery in some minor auxiliary services such as providing free transport to expectant women. According to Skelcher (2005), a well-coordinated public-private partnership in a designated sector has the potential not only to increase the sectoral growth, but also benefits the communities at a micro-level in their socio-economic well-being. On the same, Widdus (2001) and Nishtar (2004) echoed that public-private partnership have the possibility and remove all the barriers affecting currently defining the health care service's as unavailable, inaccessible and unaffordable particularly among the economically challenged and marginalised societies around the world.

The government should make a deliberate effort to liberalize pharmaceuticals industries in the country by awarding licences to a lot of private sectors in order to promote quantity and quality of medicines and other medical equipment and make sure that these companies are heavily supported by government through soft and flexible loans, tax holidays and numerous pharmaceutical trainings in order to improve availability, accessibility and affordability of any pharmaceuticals products to people without any political, economic and social differences. In Denmark, Herborg *et al.* (2007) asserted that even though community pharmacies are privately owned the government has control in liberalization of the prices of medicine to improve access and affordability of the medicine among people without economic differences. Lubbock *et al.* (2008) pointed out that universal subsidy of health care service delivery have not only increased equity in access to health care services including drugs among the people, but also increased protection in financial risk associated with health care access. In England, heavy subsidy to pharmaceuticals by the state not only made an increase in a wide array of drugs to meet the diverse health needs of the people, but also increase equity to access of affordable drugs among most English. This implies that if government of Malawi can learn from other nations in relation to pharmaceutical management, the persistent drug challenge the country experience every year might be lessened.

8.6 Chapter summary

This chapter investigated the perspective of women with regards to the on demand side factors that influence quality of maternal health delivery in Malawi. More specifically, the study examined the perspective of women in areas of quality of care that they received immediately after arrival at the health care facility, the perspective associated with services that was administered to them, barriers affecting them in acquiring maternal health care services when needed and their perspective in terms of how the maternal health care services can be scaled up in order to promote not only quality of care, but also increased utilization of the maternal health care services in Malawi. Therefore using qualitative approach, the study conducted about 12 FGD's which comprised at least six women per group. In total, about 54 women who created a sample size, were interviewed to give their views on the topical matter of which there responses were transcribe verbatim and code generated and analysed.

The study found that in Malawi, based on antenatal and post natal care service delivery, the majority of the women were satisfied with the way health cadres received them and assisted them. Despite, congestion of women awaiting service delivery remained a barrier that delayed the efficient service delivery. Similarly, most women complained of the distance barrier for them to access the health facility. In terms of institutional delivery, the issue of inoperable ambulatory services in the entire country stood as the major drawback that affected women access the referral services and subsequent low quality of care at the initiation health care facility. At the same time, women pointed out that health workers demonstrated unethical attitude totally different from what they received during the care. As such, most the women regrettably pointed out that the situation is very unbecoming and worrissom in view of the state of their health. Additionally, there were insufficient beds in the health facility in that women were told to share a bed with another woman just to balance up the situation and ensure that each woman has a safe place with the new born.

Consequently, some recommendations were made on how to improve the situation. These include among others, developing a private-public partnership in order to ensure that fuel is always available to support health care ambulatory services operate effectively. Some women pointed to the need to invest in mobile maternal health care clinic to meet women in their place of residence in order to ensure increased uptake of maternal health care services. Liberalise some of the health care service through subsidising pharmaceutical services and ensure that drugs are available, affordable and the batches have the required mix in order to meet medical needs of any

emergent need. Therefore, with this background, there is need to integrate qualitative and quantitative issues identified throughout the series of the analysis in order to understand the condition of maternal health care services in Malawi.

CHAPTER 9

Summary, conclusions and recommendations

9.1 Introduction

This chapter presents the summary of the findings, conclusions, recommendations, policy implications and further suggestion of research based on the study findings.

9.2 Summary of the findings

The study answered the general research question as to what factors are associated with maternal health service utilization in terms of prenatal, public health facility childbirth and postnatal care services in Malawi. During the period under review maternal mortality rate declined slightly from 750 per 100 000 live birth in 2000 to about 510 deaths per 100,000 live birth in 2013, the country continues to a reasonable number of women to causes related to pregnancy. Despite the observed decline, the available statistics indicate that maternal mortality is still high and continues to be major public health concern in Malawi.

The levels and trends in maternal mortality ratio are partly due to use and non-use of maternal health care services not only in Malawi but also other developing countries at large. Using quantitative and qualitative data sources, the study has contributed to the body of knowledge by unearthing and highlighting factors associated with women's use of maternal health care services in the country using both quantitative and qualitative approach as follows: Firstly, it identifies factors associated with prenatal, public health care childbirth delivery and women postnatal care service utilization after using regression analysis while considering individual, household and community perspective. As such, in understanding the complexities involved singling out the factors that had the most contributions on women's use of maternal health care services. The study used the decomposition technique, an approach which uses a multivariate outcome associated with prenatal, childbirth in public health care facilities and postnatal care to investigate which factors contributed most to women's use of maternal health care service facilities. Secondly, the study complemented this quantitative findings by identifying the gaps associated with the perspective of key stakeholders (health workers and women) in order to

identify the barriers and their perspectives in as far as quality of maternal health care service delivery is concerned in Malawi. In coming up with the critical determinants influencing women's use of maternal health care services, such results are important in redirecting policies and programme interventions suitable for the country to forge ahead in its quest of improving quality of public health care services, maternal healthcare services included. This has been the basis for the study.

Therefore, this chapter is organised to firstly, provide an integrated highlight of quantitative and qualitative findings drawn from the study aims as presented in the previous chapters. Secondly, the chapter provides the conclusions and recommendation to assist in directing policies and programme initiatives in order to improve maternal health care service utilization and address maternal public health challenges associated with the country. It also highlights the areas requiring future research in relation to the subject matter in addition to similar health care inquiry. The following sections provide the summary of the study findings.

9.2.1 Factors influencing women's use of prenatal care services

The study discovered that maternal age, birth order and maternal education are the predictors of prenatal care service utilization among women at individual level in Malawi. It was noted that maternal age was associated with increased use of prenatal care services over the entire period in which older women were associated with increased likelihood of using prenatal care services compared to the younger women. This concurs with what other scholars found that this is due to low social economic status and younger women being in an environment where they are not supported attributed to underutilization (Ochako *et al.*, 2011; Magadi *et al.*, 2007). This implies that as older women are using prenatal care service much more than the younger women, they are less vulnerable to the risk of dying as compared to the younger women due to the low utilization status of prenatal care service. The study found that birth order of the women decreased the likelihood of women's use of prenatal care services. This means that the women burden of child nurturing after birth order of at least two children does affect them to be more conformed and support the healthier maternal health compared to those with birth order of 1. This argument is in support with an earlier assertion that the higher the women's birth orders, the lower the likelihood of women's use of ANC service in India (Navaneetham *et al.*, 2002). On another aspect, this study found that as women attain education up to primary education, they acquire much understanding of advantage of seeking maternal health care services as compared

to women without formal education. This is in support of what Findley *et al.* (2013) pointed out that women's education if and only if improved maternal health status is to be achieved.

In another context, the present study discovered that women belonging to middle income (standard of living) or higher were associated with increased likelihood to seek prenatal care services in the country. This implies that women from the poor households were experiencing a lot of challenge to improve their maternal health through ANC facilities. Such a situation results in worse maternal health outcome because women from such families are economically disadvantaged to use extra income to support their health well-being (Simkanda *et al.*, 2008; Ochako *et al.*, 2011).

For that reason, the study revealed that if women are uplifted socio-economically, their likelihood to seek maternal health care increases beyond access or cost barriers. This is because the women are able to have disposable income which can be used to invest not only in their health, but also in other household appliances such as radio and television through which they will be able to access information regarding safe-motherhood which can improve their knowledge about maternal health and subsequent health care utilization. The present study on Malawi supports an earlier argument that better socioeconomic status is the key to attain improved maternal health outcome (Celik *et al.*, 2000; Ochako *et al.*, 2011; Magadi *et al.*, 2007). The study found that use of media greatly influence women's use of prenatal care services entirely over time. This concurs with what other scholars found out that media access among women have a multiplier effect of improving not only utilization of health facilities, but also reduces worse health outcome in Bangladesh (Baqui *et al.*, 2008). Furthermore, it is through media that women can access reproductive health campaigns which significant benefit them greatly (Agha *et al.*, 2011).

At community level, quality of care delivery was established to be the source affecting women's use of prenatal care services significantly, in general, over the entire period of study. The study further found out that even those women that rated the quality of care as adequate, they were not willing to use the same health services. This is a very worrisome situation if the use of maternal health care facility could be included in the programme interventions equation aimed at improving the country's worse maternal health outcome. In another study, it is argued that such poor quality of care has resulted in lower utilization of maternal health care services among women (Griffiths *et al.*, 2007). In this present study, the contrary position have been found that despite level of quality of care, challenges affecting women use of prenatal care services exist. This Malawi

situation, contradicts what other scholars found out that adequate delivery of quality of care has direct impact on women utilization of the services and subsequent improvement of their health status (Simkhada *et al.*, 2008; Griffith *et al.*, 2001).

Based on the relative contribution of the factors on women's use of prenatal care services, individual factors of women and community factors are found to contribute a lot to influencing women's use of prenatal care services relative to women household factors. More specifically, at an individual level, maternal age contributed positively in increasing women's use of the maternal services whereas birth order positive contribution was associated with reducing women's use of prenatal care services. At community level, quality of care remains the major contributor causing women lower utilization of prenatal care services in the country.

9.2.2 Childbirth in public health care facilities

The study explored different factors associated with childbirth in public health facilities in Malawi. It was observed that women's individual factors influenced them on the use of public health facility during childbirth in the country. For instance, the study underscores that women's use of ANC services did not have a positive influence in motivating women a lot to seek childbirth in public health facilities. Similarly, it is significant to point it out that in Malawi, a lot of women delay in seeking maternal health. This type of delay is noted to have influenced women's choice of delivering their babies in public health care facilities (Barnes-Josiah *et al.*, 1998). However, this low influence from ANC usage and timing of using ANC towards women's use of public health facility for childbirth, can be reversed if extensive education is in place to promote awareness in the significant of seeking maternal health timely and subsequent advantage toward their maternal health outcome, if the country is to improve its current maternal public health challenge. Studies have highlighted that intensity in using ANC services have an advantage of increasing women deliver in health care facilities (Victoria, *et al.*, 2011; Brown *et al.*, 2011; Dhakal *et al.*, 2011). In the present study, it was found that women education attainment, exposure to media where issues of reproductive health matters are discussed, and community awareness on information related to reproductive health, are at insufficient level to significantly increase women's use of public health facility at the time of childbirth in Malawi.

It worthy to note that those women who visited the health facilities were adequately pleased with the quality of care at prenatal care, henceforth the increased likelihood of using public health facilities during childbirth. However, the study found some that some women reported to have

challenges fully utilize prenatal care services despite other reported being satisfied with the prenatal service quality and following institutional based childbirth and after birth health care use. This development explain why there are great variations in the levels of utilization of maternal health services between women at prenatal, childbirth and postnatal in the country.

Therefore, based on quantitative results, quality of care was an outstanding major contributor and remained outstanding as a positive contributor influencing women use of maternal health services over a period of study. Likewise, based on qualitative results, both health workers and women indicated quality of care not up to standard in the country due to challenges of finance to meet operational needs of the health facilities. For instance, where the health workers pointed out that insufficient funds and lack of commitment on the side of government to avail resource that would improve on the quality of care, on the other hand, women complained of having to share a bed with another mother and her baby, being requested to bring their own items such as razor blade, clothes to assist during delivery and sometimes their own food, the situation is been defined to lower quality and expected quality of maternal services. Scholars over the past period pointed out that economic stress that most developing countries including Malawi experience is affecting quality of care delivery and subsequent use of health care facilities among women when in need (Campbell *et al*, 2009; Kongnyuy *et al.*, 2009; Fillipi *et al.*, 2006). Such situation worsens health outcome among the impoverished and underserved communities (Palamuleni, 2011; McNamee *et al.*, 2009; Gage, 2007).

9.2.3 Postnatal care health facilities

In Malawi, the study established that of the three maternal health care services studied so far, postnatal care services remain the least services being utilized by women in the country. This is the case world over that studies indicate that majority of the women certify themselves during postpartum period to be better and see no need of having postpartum check-up from skilled health care professional of any maternal health complications or physiological conditions in order to ascertain their maternal health position. Such phenomena resulted in increased risk of dying to after childbirth maternal condition which might not be recognised by the woman. This situation would have been prevented if and only if women were subjected to mandatory comprehensive postnatal care check-ups up to until they are certified clinically perfect.

In this current study, a number of predictors were found to influence women's use of postnatal care. For instance, maternal age, ANC service utilization, the place where the women's used to

give birth and education attainment above secondary school were among some of the factors. In addition, health care factors such as unavailability of drugs, transport among women to seek health care, and quality of care were the isolated institutional factors affecting women's use of postnatal care facilities. Such quantitative findings concurred with what health workers indicated that most of the determinant affecting quality of delivery of maternal health care in the country is inadequate resources such as finances, human resources and other equipments and supplies to enhance delivery of quality of care. Over time, improvement in challenges associated with health care resourcing have the potential of increasing women use of maternal health services and subsequent health outcomes (Fournier *et al.*, 2009; Perry *et al.*, 2000). In the present study, it was found that while majority of the women are not utilizing postnatal care service and have low postnatal care health seeking behaviour. On the same, it worthy to note women exposure to media significantly is not doing much to promote women's use of postnatal care service facilities. Yet, media exposure has the potential of creating better understanding among women in order for them to improve their uptake of health products (Simkanda *et al.*, 2008). However, it is because of these that women in rural communities hardly see the need of going to the health facility because to most of them most of them media is not doing a lot to motivate them positively to use maternal health services for any emergent maternal health need in the country.

9.2.4 Health workers perspectives on quality of maternal health care delivery

The study highlights major barriers associated with maternal health care service delivery in Malawi from the health care perspectives. The study found that financial challenge, health personnel shortage, poor record keeping of patient data more importantly at postpartum care service level, irregular ambulatory services, unavailability of a comprehensive medical equipment and supplies logistic system do cripple effective delivery of maternal health care services in selected district of Malawi. Previous study indicated that Malawi's insufficient medical operational challenges not only affect quality of care, but also results in increased migration of health workers to other sectors within or outside the country (Muula, 2006). Looking at the time lapse between Muula (2006b) findings to the present time, there is slow progress in as far as scaling-up on resources in order to enhance quality of care, more specifically maternal health care in the country. It is imperative to note that majority of the health worker attributed the country's challenge to assumed robust quality of care system to financial challenges often retarding effective delivery of quality of care. For instance, it was observed as a common practice for government to delay in remitting monthly budgeted finances meant to support health care operations at district levels. It is worthy to mention that some health workers

lamented of budget cuts on the amount proposed to government under the pretext of cash-flow problem. Such delays and insufficient health care financing consequently cause shortage of essential resources (Campbell *et al.*, 2007). Based on the study findings, such essentials resources include: fuels shortage to run ambulatory services, inadequate funds to support maintenance of equipment and insufficient or no funds to pay health workers overtime claims (Locum). Previous studies observed that such barriers in mobilising finances to meet the health care needs, account for worse maternal health outcome in sub-Saharan Africa countries Malawi included (Fillipi *et al.* 2006; Borghi *et al.*, 2006). Such a scenario is still existent and continues to replicate over years and continues to affect service delivery which include maternal health care. Therefore, to ensure standard quality of care is achieved, Campbell *et al.* (2007) suggested that adequate financing is fundamental to achieve improved health. As such failure of most sub-Saharan countries, Malawi included, to meet the Abuja Declaration pledge of investment about 15% of their national budget to support health care operations, lowers the quality of care delivery and subsequent worse health outcome of which maternal health service facility is the least affected facility (WHO, 2002).

9.2.5 Women perspectives on quality of maternal health care services

Based on the qualitative findings from the perspective of women on quality of maternal health care, several issues were highlighted as barriers affecting quality of care in Malawi. For instance, in terms of quality of care at prenatal, postnatal and intranatal service delivery, women highlighted variations in the way these facilities are operated. It was noted that health workers were more professional and ethical in the delivery of prenatal and postnatal care compared to intranatal care. The majority of the women complained of the unethical behaviour on the part of service providers which was reflected in attitude and shouting at the patients while in the facility. This unethical behaviour has been attributed to influencing women to prefer home-based delivery over institutional based care in some developing countries (Azimu *et al.*, 2015 Palamuleni, 2011; Dhakal *et al.*, 2007; Okafor *et al.*, 1994). Further to this, women's pointed out lack of basic medical resources such as medicinal resources, supplies and equipment, shortage of bed space to accommodate them with their newly-born and being requested to bring their own bedding, clothing for the expected child, and other sheets to be used at the time of delivery, defeat the whole quest of government need to improve quality of care in the health facilities. The situation discourages women from coming for childbirth in health facility due to their socio-economic challenges to support their maternal needs. Consequently, all this results in under-

utilization of maternal health care services, a factor which is attributed to worse maternal health outcome (Kutzin *et al.*, 2003; Acharya *et al.*, 2000).

As a universal problem, respondents across the country demeaned the state of operations of some basic services such as ambulatory services, scanning services and other supplies such as drugs to influence quality of care in the country. It is a general outcry that the country's ambulatory system collapsed due to lack of fuel and basic service requirements for the vehicles to meet the standard operations. On the same note, some respondents that the facility lack of operational scanning device, caused her pay a lot of money at the private health provider while other women that did not have money to pay for the services hardly accessed the services. As medicine availability, women highlighted that the local pharmacy did not have prescribed drugs at the health facility. A situation which either strain them to access the drugs in alternative private pharmacies whereas other suffer the challenge of ill-health due to their economic disability, and denied their right to access full health care services as required. Previous studies health care challenges not only affect women at the time they are accessing care but also contributes on their future willingness to use the services (Gouws *et al.*, 2005; Radyowijati *et al.*, 2003; WHO, 2003). In as far as the right of women in terms of access to information, health care, and right to be heard and life among them is significant if women to achieve acquire improved maternal health right. This is based on the background of the present study that some women were complaining of on unethical practice by the health workers without being given opportunities, so that they should feel confident that they have some recourse.

9.3 Conclusion

The study had five research objectives, namely, exploration of factors associated with women's use of prenatal care service utilization among women; establishment of the determinants influencing women's use of public health facilities during childbirth; an examination of which factors influence women's use of postnatal care facilities, using a quantitative approach; an investigation of the supply-side factors associated with delivery of quality of maternal health care services from the health workers perspectives and an exploration of the barriers affecting women's use of maternal health care service utilization in Malawi, using qualitative approach. Therefore, these objectives were addressed using two different datasets, namely, MDHS, to meet the quantitative approach and data collected from selected districts across the country to meet the qualitative part of the study. In summary, the study pointed out various findings and contributions to the body of knowledge:

- 1) In Malawi, women aged above 25 years are more prone to use maternal health care services compared to their younger counterparts.
- 2) ANC utilization for as high as 4, has increased women's use of public health care facility for childbirth and postnatal service in year 2004 and 2010.
- 3) Women education attainment of primary school and higher increases use of maternal health care services at prenatal, postnatal care and childbirth in public health facility.
- 4) Women employment status is associated with increased use of prenatal care service facility and reduced women's use of public health care facility for childbirth and insignificantly associated with women choice of use of postnatal care service facilities in Malawi.
- 5) Variations in the influence of religion on women's use of maternal health care services exist in Malawi. Women who are affiliated to Muslims faith significantly do not prefer using prenatal care compared to Catholic women. On women's use of public health care during childbirth, their religious affiliation was associated with consistent and significant influence in causing high level of unwillingness of childbirth in public health facility compared to catholic women. This is similar in as far as use of postnatal care service facility was concerned.
- 6) Standard of living is largely associated with increased and significant women's use of maternal health care services in general.
- 7) At a prenatal care, women exposure to a radio and a television increased their use of the services. On the contrary, women exposure to both radios and televisions hardly impacted on women's use of public health care facilities during childbirth. At postnatal care utilization, women exposed either to radio or television reduced women's use of the services in year 2000. This implies that women media exposure has varied impact on women's use of maternal health care services in Malawi.
- 8) Distance to health care facilities was found to be a problem in women's use of public health care facility during childbirth significantly in year 2004. However, in year 2010, distance had no influence to women's use of public health care facility during childbirth.
- 9) At prenatal care service facility, quality of care delivery consistently and significantly reduced women likelihood of use of prenatal care services in Malawi. However, women who indicated to have received adequate quality of care, they significantly increased their willingness to deliver their babies in public health facilities. At postnatal care facility, quality of care influenced not to go for postnatal care services significantly.

- 10) Women that are predominantly rural are statistically significant to reduce their willingness to either use public health care facility during childbirth or postnatal care service facilities relative to their counterpart in urban sectors.
- 11) From the workers' perspectives, insufficient and delayed health care financing affects quality of maternal health care delivery in the country.
- 12) Quality of care maternal health care delivery, more importantly at the time women go to the public health facility during childbirth, remains a major barrier contribution to low utilization of the facility during childbirth contrary to prenatal care services in Malawi.
- 13) Women's use of maternal health care service facility in Malawi has been associated with their individual and community factors.
- 14) Women's rights to health are not well adhered to by most health care facilities in Malawi, more importantly, across public health care services during childbirth. For example, the right to health is not recognised in the constitution, but with the context of the right to development.

9.4 Recommendations

There is need for policy makers to understand the maternal health care system operational behaviours focussing their efforts from the health centre level, district hospitals in order to give much credence and promote quality of care and improve women's use of maternal health care services at health centre level. The following recommendations are suggested:

- 1) In view of older women being more positioned to use prenatal care services as compared to the younger women, there is need to create a community based mentorship programme where older women are to be attached to younger women on issues related to reproductive health in order for the younger women to learn from the older women's experiences. This will, in the long term, create a community of women that will be supporting each other on issues related to childbirth and increase not only utilization of health care services but also maternal health status in general.
- 2) There is need to promote women's use of family planning methods in order to minimise high birth order in the country which has been found to be associated to reduced likelihood of women's use of prenatal care services.

- 3) There is need for government to legislate mandatory education for the women so that 100% of the women in any cohort are in school. This is because this present study found that any level of education attained, women's increase health seeking behaviour. This could be rendered as the last resort to the challenge of maternal health the country is facing can be solved through the suggested compulsory education system. In addition, in order to make education a paramount empowerment indicator promoting women health, government should refocus on introducing elementary subject in demography where issues associated with fertility, mortality, sexual and reproductive health and women and health in general are going to be discussed so that they become knowledgeable and make informed choices regarding use of health care services as a way of improving their maternal health outcome.
- 4) Government is has to subsidize the prices of media devices such as radios, televisions among others as they have been proved to increase prenatal care service utilization in the country. As a result of such a universal media exposure among women which is to be supported by extensive reproductive health programmes through initiatives of radio listening clubs at community level, the country maternal health care utilization is going to improve tremendously and promote quality of maternal lifestyle in the long term.
- 5) There is need for more in-depth research in order to understand the health workers challenges that frustrate them and fail to provide pro-patient centred services with an anticipation of promoting and motivating utilization of facility-based services among women at prenatal, intranatal and postnatal care services regardless of challenges experienced with supply of health care services in the country.
- 6) There is need to have an appropriated pro-maternal health care financing to deal with issues affecting delivery of quality of care presently. Such financing should target solving operational challenges such as shortage of fuels, Locum dues, and training of medical engineers who will be responsible to design, develop and maintain medical equipments and instruments in order for the devices to aid in accurate diagnosis and improve quality of care in general term. As is noted in the current study, issues of resource insufficiency is the source of low quality of care which is discouraging women's use of maternal service in country health facility(s) and increased worsening of maternal health outcome.
- 7) The qualitative study partly hinted on the continued existence of traditional health attendants across the country secretly despite their operation being banned. As currently is the case, it is perceived as though the government of Malawi did not have a change-over strategy as to what immediately happens after the banning of traditional birth attendants in order to make them completely absolute in service delivery. Therefore,

there is need for government to do a comprehensive audit towards such claims and ensure that these traditional birth attendants are formalised and capacitated to operate freely. Once they have been institutionalised they will support and minimise pressure existing in the mainstream health facilities.

- 8) In order to deal with the problem of quality of care in across communities in Malawi, there is need for government and other health supporting stakeholders to develop and implement a Maternal Operations Service charter which is to define explicitly the Standard Operating Procedures (SOPs) the health facilities to adopted as a guide to consolidate standard practice regarding maternal health care services delivery either in urban or rural settings in order to rationalise on quality of care delivery. As such, the SOPs must be constantly monitored and evaluated in order to ensure that the health workers operating and following the standard operating practice. In addition, deliberate efforts must be made to ensure that resources are timely available to support SOPs implementation if an effective quality of maternal care are to be provided that could motivate women's use of maternal health care service in general terms if an only if quality of care could be a precursor for the country to leap maternal health dividend. These standard operating procedures must be implemented across the entire maternal health care services namely antenatal, maternity wards and postnatal care facilities. Therefore, such a threshold is going to rationalise delivery of quality care and provides an easier evaluation framework to identify pros and cons affecting maternal health delivery. These anticipated set-ups are to create robust maternal health facilities from a problem-based approach and this will assist in resolving some of the recurring issues instigating maternal public health challenge in the country.
- 9) In order to ensure that the health facility is supported with adequate resources such as medical, financial, supplies and human resources, there is need for government to introduce maternal health improvement levy to be appropriated in fuel price. So that every K50 (USD 0.08) on the price of fuel, should be directed towards resourcing and financing maternal health programme interventions across the country from the primary health care upward. Such development should target the rural and underserved communities that are often marginalised in order to completely have an efficient maternal health system capable of attracting women's utilization.
- 10) In order to facilitate availability of health workers at all levels of health systems, there is need for the government of Malawi, through the Ministry of Health, to support the training of many community nurses and clinical officers across the entire country using both public and private health science colleges. After these people are supported,

government should bond them to work for some years at the facility that they are allocated for a considerable period and support the community. This is going to create availability of health workers in areas where it is affected by shortage of the same, solve the problem of illegally operating traditional birth attendants and support the rural communities with skilled health personnel that will be within reach of the communities and thereby improve their health statuses of the vulnerable which include women.

- 11) There is need to introduce capacitated health posts in all districts of Malawi in order to support women's maternal health needs close to their place of residences in order to improve on utilization. That is setting up a patients-centred maternal health facilities to support women in their place of residences across all districts.
- 12) In order to deal with challenge of shortage of human resources resulting in continued use of Traditional Birth Attendants, government should reconsider reinstating them and be capacitated so that they can work with the rural and existent primary health care facilities. This is against a background following TBA operational ban by government amidst growing increase of health workers shortages more especially at primary health care facilities.
- 13) There is need to advocate and campaign for women's rights to maternal health so that they (women) should understand their position in order for them to stand out if they happened to be abused at the time they receive maternal health care.
- 14) Women's right to maternal health must be put as a stand alone right in order for it to be constitutionally justifiable and ensure that they are well protected to minimise any form of malpractice within maternal health facilities and protect women and expected new born.
- 15) The need to have an electronic register of each and every citizen and develop an *Integrated Patient Management Information System* that will support the following functions:
 - a) Keep on record bio-data of any citizen and next of kin information including all communication details such as emails, phone numbers and other electronic media
 - b) Keep on record of any patients' health history. For example, in case of women, birth history, child records, health utilization records, medicine prescription history among others. This information must be linked to the Centralised Database Management Systems capable of supporting a distributed database facility and provide access to any ad hoc patient data at any time.
 - c) Capable of communication to any registered patient using toll free instant messaging facility. This will assist in synchronous communication of any health

related information to patients and thereby promote utilization of service even remote and hard to reach places as the networking structure remove geographical barriers. This virtual communication might assist to promote access to skilled care facility and improve on health outcomes in general.

9.5 Policy directions

Numerous findings from the study have significant policy implications from both the quantitative and qualitative results. For instance, Malawi has a standing National Population Policy which has the principle aim of reducing the rate of population growth in the country. This implies that in trying to reduce the population growth one aspect is to make women understand their right to have children by choice and not by chance which can be advocated by health care infrastructure which include maternal health facilities. In a quest to support policy effort, numerous policies have mushroomed in order to ensure target measure to improve health status of the populous are in place. Among them, there is Malawi Growth and Development Strategy (MGDS) II which is being rolled-over currently for the year 2011–2016. As both National Population Policy and Malawi Growth Development Strategy are set for revision in 2017, there is need to take this window of opportunity to devise and develop mechanisms that will assist in creating deliberate effort in the country to improve maternal health care services and make it a fundamental medium to improve the state of maternal health.

Based on the study's findings, firstly, women older than 25 years or higher are associated with increased use of maternal health care services in the country. Therefore, there is need in the next 2017–2021 MGDS to focus on increasing women education from primary school and above. This is going to make women delay in childbearing due to opportunity costs of doing school and become of age and responsible to make informed decision regarding their health thus ensure improvement of maternal health outcome in the long term. For this to be enforced, there is need to put in action an education policy that will make every girl or women attend education for free and be made mandatory to every female for a period of time (say 15 years) in order for the country to reap from the multiplier effect resulting from such women empowerment programmes, either socioeconomically or physiologically in Malawi.

Secondly, the study finds that women in some instances are not adequately influenced by media in order for them to improve their maternal health care utilization. Therefore, in order to solve this worrisome situations at once, there is need for government through MGDS III include a

domestic policy action plan which will direct introducing elementary demography course in primary and secondary school curriculum that will make people understand issues related to mortality, fertility, gender and development and health care systems in general. This will assist in promoting and empowering women to understand the significance of them becoming healthier in socioeconomic development of the country and thereby promote their health seeking behaviour to the universal level.

Thirdly, the study findings consistently pointed out that community's quality of care remain a major barrier affecting women's use of maternal health services, a factor which directly or indirectly affect quality of maternal life being realised among them. Therefore, in the MGDS III, there is need for government to have a domestic action plan to ensure that maternal health services are adequately and timely financed. It is therefore suggested that finances to be used should be collected through fuel levy in which MK 50 (USD 0.07) per every litre being sold of the fuel be directed towards improving maternal health care services. This account should be closely monitored and used from primary health care upwards. For instance, the issues to be considered in order to improving quality of maternal health should include training and recruiting more health workers to make sure that that community gaps and decades on end health workers shortages, are completely filled by ensuring availability of basic medical resources, supplies and equipments at each health facilities.

Fourthly, the study decomposition approach consistently found that women individual and community factors contribute relatively higher on women decision to seek maternal health care services. With this development, there is need in the 2017/2021 MGDS III social development theme consider setting up domestic action plan aimed at using the communities in Malawi assist women, more importantly those that are pregnant. The Government of Malawi can initiate the process taking an advantage of the national holiday "*Mother's Day*" which always come on the second week of the month of October every year, to push social development agendas aimed at improving maternal health care in the country. Among the issues should include sensitizing communities to assists every pregnant women who have problems with transport to ensure that they access maternal health against all odds. The government should make a deliberate effort to give and lure companies to invest in health care using their yearly notches related to corporate social responsibilities. As such, there is need to institute a secretariat that will coordinate, facilitate and police the entire process to ensure that eminent result in improving maternal health care delivery and outcome are noted.

There is need for government to initiate a comprehensive private-public partnership with stakeholders such as Telecommunication companies and tertiary academic institutions in order for these stakeholders assist in developing information technology infrastructure aimed at improving health care data and information system development in order for the health care facilities effectively and efficiently improve communication base. In this case the telecommunication is responsible to supporting the hardware and other network devices connecting the health care facilities across the country. On the other hand, the academic institutions are able to provide human resource to both manage and development the be-spoke software programmes that would meet the requirement capture of the health care facilities in the country. For that reason, in order to motivate the interest of these key stakeholders involved in improving health care infrastructure, Government must give them a tax holiday and directive on how they can invest that tax directly to support developments aimed at enhancing health information infrastructure in the country.

9.6 Future research directions

The study investigated the determinants of maternal health care service utilization in Malawi using two sources of data. The MDHS datasets followed by a qualitative complimentary data collected from selected health facilities in Malawi. Therefore based on this study, the following areas of research are suggested.

There are various areas which require further explorationresearch based on this study. They the following;

- Further research on the determinants of maternal health care among the women buy focusing areas such as urban/rural differentials, regional differences and considering including all the health centres around the country sung a qualitative approach. This is going to create a better balance to understand the strength, weakness, opportunities and threats associate with maternal health care services in general in order to improve women health. Given that fitting separate regression models for each year does not tell us much there is need for future studies to use pooled data across the years. This will ensure that the “year” is a control variable. In addition, there could also be interaction terms of the year variable and other key variables to assess whether the dependent variable changes with the level of the interacting variable over the years.

- Further comprehensive research to understand how maternal health care is financed is required. More specifically, understanding how much of the health care investment is allocated to support maternal health operations. This will assist to better understand the reason of health care financing that the study has found and using such result recommend on the best financial management model that will support maternal health care operation thus improve women health in general.
- There is need to conduct more research to understand why health workers serving in public health care facilities, more specifically, the maternity section demonstrate different attitude and work ethics compared to their counterparts assigned to service other maternal health care service facilities as antenatal or postnatal care in the country. Thus, based on qualitative study, the issues of attitude that this current study found health workers servicing facilities responsible for childbirth is going to be understood and from the findings mechanism are suggested to make childbirth health facilities psychologically supportive among women.
- The study pointed out that individual and community factors were the major factors, so there is need to do more qualitative studies to understand the determinants affecting women's use of maternal health care putting a more focused aspect on both individual and community level factors so that at the end an individual and community based model can be developed that will enhance future programme interventions in order to have a lasting individual and community solutions contributing to low utilization of maternal health services in the country. This will assist in improving individual and community health status of women.
- Maternal health policies in the country do not include sufficient attention to complications arising as a result of women giving birth, there is need therefore to further explore related complications in order to establish which factors can be controlled through efficient operation of the health care system in order to ensure moderate quality care.
- Researching on how the Information, Communication and Technology can be used to enhance delivery of health care services and promote people utilisation of the services in the long term targeting the underserved communities in Malawi.

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Appendices

Appendix 1 : Qualitative Data Logistics-Informed Consent

Informed Consent.

Determinants of maternal child health utilization in Malawi.

Address : Population Training and Research Unit, Private Bag , X2035 Mmabatho 2753,North West University –

Mafikeng, South Africa.

Principal Investigator: Kennedy Machira.

My name isI am a PhD student from Population Studies Department of North West University, South Africa. I am conducting a research on “Determinants of Maternal Child Health Care Utilization in Malawi”. The purpose of the study is to understand issues affecting maternal child health care in Malawi. I will ask the questions about your background information and your experiences pertaining to the use of prenatal services, experience you had about previous period of delivery among those who delivered using a hospital and your experience on postnatal care services.

Your participation is voluntary and if you agree to take part in the deliberation, we might take about an hour. In the course of deliberation, you are free to ask any question and even stop the interview altogether. If you decide to quite, then your responses will be deleted and not considered for further analysis. Therefore, if you consent to the interview, all information given will be treated as confidential and be used for the purpose related to this study.

After the interview, if you have any question or concerns regarding the study, do not hesitate to contact the Principal investigator.

This research has been reviewed and approved by the North West University Institutional Review Board (IRB).An IRB is a committee that reviews research studies in order to help protect participants. If you have any questions about rights as a researcher participants, you may contact.....

CONSENT TO PARTICIPATE IN SURVEY

Please sign/thumb print below if you agree to participate in the study.

The above document describing the benefits, risks and procedures on the determinants of maternal child health utilization in Malawi has been read and explained to me .I have been given an opportunity to ask questions about the study and they have been answered/not answered to my best satisfaction. I agree to participate as a volunteer.

Respondents

Signature/thumbprint:

Date:.....

Interviewer Signature:.....

Date:.....

Appendix 2: Focus Group Discussion

Predisposing Factors

Are you satisfied with the level of services that you are getting here at the hospital?

Are you served instantly when you arrive at the health centre?

Who attended to you when you just arrived: Doctor/clinician, nurse/mid-wives, patient attendance?

Is the attitude of the services providers motivated you to use this hospital services again?

Household factors

What challenges are there within your household that sometimes prevents you from accessing the health services?

Is your partner or household member support you to visit the health care facility in view of your present situation?

Do you have ready financial position that could make you visit the health care facilities instantly when the need be?

Community factors

Is the health centre far from your village/house?

Is health centre has a place where you and your guardian can wait before you deliver?

What is the condition of the maternity homes if available at this health centre?

Are you given food and other materials things like blankets, soaps and pails at the maternity homes by the health facility at during child delivery?

Can you recommend to another woman to use the maternity homes if she wants to deliver using this hospital?

Does the doctors/clinician, nurses/midwives/patients attendance tells you come for prenatal clinic sessions (“Sikelo”) during the prenatal or visits, delivery time?

Appendix 3: In-depth Interviews

On average how many pregnant women do you receive in a month?

Do you have enough human resources to assist you with handling these women?

What is the highest qualification of the medical personnel that are responsible to handle: prenatal care services, delivery services and postpartum care services?

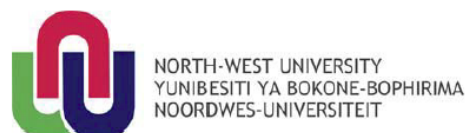
How many health personnel do they assist during the night period?

Are you adequately financed to manage the maternal child health centre operations?

Is anyone responsible to handle issues of maternal child health education?

What is the qualification of that person?

Appendix 4 : Ethical Clearance



Private Bag X6001, Potchefstroom
South Africa 2520

Tel: (018) 299-4900
Faks: (018) 299-4910
Web: <http://www.nwu.ac.za>

Institutional Research Ethics Regulatory Committee

Tel +27 18 299 4849
Email Ethics@nwu.ac.za

ETHICS APPROVAL CERTIFICATE OF PROJECT

Based on approval by the **Human Resource Research Ethics Committee, Mafikeng Campus**, the North-West University Institutional Research Ethics Regulatory Committee (NWU-IRERC) hereby approves your project as indicated below. This implies that the NWU-IRERC grants its permission that, provided the special conditions specified below are met and pending any other authorisation that may be necessary, the project may be initiated, using the ethics number below.

Project title: Determinants of maternal Health Care services utilization in Malawi.																															
Project Leader:	Prof M Palamuleni																														
Student:	K Machira																														
Ethics number:	<table border="1"><tr><td>N</td><td>W</td><td>U</td><td>-</td><td>0</td><td>0</td><td>3</td><td>9</td><td>4</td><td>-</td><td>1</td><td>5</td><td>-</td><td>A</td><td>9</td></tr><tr><td colspan="3">Institution</td><td colspan="6">Project Number</td><td colspan="2">Year</td><td colspan="4">Status</td></tr></table> <small>Status: S = Submission; R = Re-Submission; P = Provisional Authorisation; A = Authorisation</small>	N	W	U	-	0	0	3	9	4	-	1	5	-	A	9	Institution			Project Number						Year		Status			
N	W	U	-	0	0	3	9	4	-	1	5	-	A	9																	
Institution			Project Number						Year		Status																				
Approval date:	2015-08-20																														
Expiry date:	2018-08-20																														
Category	N/A																														

Special conditions of the approval (if any): None

General conditions:

While this ethics approval is subject to all declarations, undertakings and agreements incorporated and signed in the application form, please note the following:

- The project leader (principle investigator) must report in the prescribed format to the NWU-IRERC:
 - annually (or as otherwise requested) on the progress of the project,
 - without any delay in case of any adverse event (or any matter that interrupts sound ethical principles) during the course of the project.
- The approval applies strictly to the protocol as stipulated in the application form. Would any changes to the protocol be deemed necessary during the course of the project, the project leader must apply for approval of these changes at the NWU-IRERC. Would there be deviated from the project protocol without the necessary approval of such changes, the ethics approval is immediately and automatically forfeited.
- The date of approval indicates the first date that the project may be started. Would the project have to continue after the expiry date, a new application must be made to the NWU-IRERC and new approval received before or on the expiry date.
- In the interest of ethical responsibility the NWU-IRERC retains the right to:
 - request access to any information or data at any time during the course or after completion of the project;
 - withdraw or postpone approval if:
 - any unethical principles or practices of the project are revealed or suspected,
 - it becomes apparent that any relevant information was withheld from the NWU-IRERC or that information has been false or misrepresented,
 - the required annual report and reporting of adverse events was not done timely and accurately,
 - new institutional rules, national legislation or international conventions deem it necessary.

The IRERC would like to remain at your service as scientist and researcher, and wishes you well with your project. Please do not hesitate to contact the IRERC for any further enquiries or requests for assistance.

Yours sincerely

Linda du Plessis
Digitally signed by Linda du Plessis
DN: cn=Linda du Plessis, o=NWU,
ou=Vaal Triangle Campus,
email=linda.duplessis@nwu.ac.za,
c=ZA
Date: 2015.10.26 18:52:08 +02'00'

Prof Linda du Plessis

Chair NWU Institutional Research Ethics Regulatory Committee (IRERC)

VICE CHANCELLOR
Prof. G Y Kahyama-Phiri, Dip, BSc, MS, Ph.D.



BUNDA COLLEGE OF AGRICULTURE
P.O. BOX 219, LILONGWE, MALAWI.

Telephone: (265) 277 222
Fax: (265) 277 364
Telex: 43622 BUNDA MI
Telegrams: "BUNDAGRIC"

Our Ref: BC/km/478

TO WHOM IT MAY CONCERN

I write to inform you that Mr Kennedy Machira is a lecturer of Lilongwe University of Agriculture and Natural Resources. Currently, he is doing a PhD studies at North West University in Republic of South Africa. His topic is "Determinants of Maternal health care service utilization in Malawi" and now doing a home research.

Any assistance and authorisation that might be rendered to him in order to allow him to collect data within the health facilities in your district is highly appreciated. The information collected might be used for academic purposes only and will assist Mr Machira to complete his doctoral studies within the record time.

Your assistance is greatly appreciated.

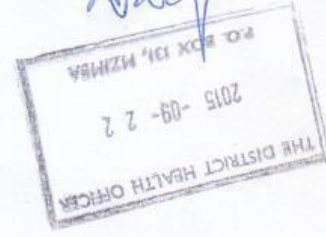
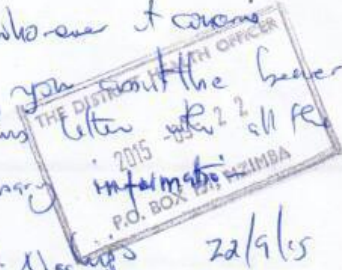
Regards,

BB Maonga PhD

Dean Faculty of Development Studies

*To whom it concerns
Can you assist the leader
of this letter with 22/9/15
necessary information*

*D. P. Nachingo 22/9/15
Dno*



VICE CHANCELLOR

Prof. G. Y. Kanyama-Phiri, Dip, BSc, MS, Ph D



BUNDA COLLEGE OF AGRICULTURE
P.O. BOX 219, LILONGWE, MALAWI.

Telephone: (265) 277 222
Fax: (265) 277 364
Telex: 43622 BUNDA MI
Telegrams: "BUNDAGRIC"

Our Ref: BC/km/478

*DNSB
Incharge
Namadzi* You may proceed

TO WHOM IT MAY CONCERN

Ministry of Health & Population
The District Health Officer
2015 -09- 2 5
Chiradzulu District Health Office
P.O. Box 21, Chiradzulu

I write to inform you that Mr Kennedy Machira is a lecturer of Lilongwe University of Agriculture and Natural Resources. Currently, he is doing a PhD studies at North West University in Republic of South Africa. His topic is "Determinants of Maternal health care service utilization in Malawi" and now doing a home research.

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Regards,

BB Maonga PhD

Dean Faculty of Development Studies

*- DNSO assist
Also to visit Namadzi
A/c*

Ministry of Health & Population
The District Health Officer
2015 -09- 2 5
Chiradzulu District Health Office
P.O. Box 21, Chiradzulu

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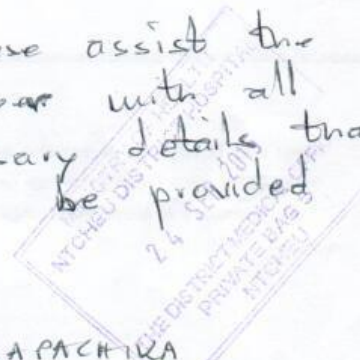
BB Maonga PhD

Dean Faculty of Development Studies

Please assist the
bearer with all
necessary details that
may be provided

DR KAPACHIKA

MO



archive@measuredhs.com

25/11/2014

to me

****See Attached.****

You have been authorized to download data from the Demographic and Health Surveys (DHS) Program. This authorization is for unrestricted countries requested on your application.

The data should only be used for the purpose of the registered research or study. To use the same or different data for another purpose, a new research project request should be submitted. This can be done from the "Create A New Project" link in your user account.

All DHS data should be treated as confidential, and no effort should be made to identify any household or individual respondent interviewed in the survey.

The data sets must not be passed on to other researchers without the written consent of DHS. Users are requested to submit a copy of any reports/publications resulting from using the DHS data files. These reports should be sent to: archive@dhsprogram.com.

To begin downloading datasets, please login at: http://www.dhsprogram.com/data/dataset_admin/login_main.cfm

Once you are logged in, you may also edit your contact information, change your email/password, request additional countries or Edit/Modify an existing Description of Project.

If you are a first time user of DHS Data, please view the following videos on downloading and opening DHS data: http://www.dhsprogram.com/data/Using-DataSets-for-Analysis.cfm#CP_JUMP_14039

Additional resources to help you analyze DHS data efficiently include: <http://dhsprogram.com/data/Using-Datasets-for-Analysis.cfm>, a video on Introduction to DHS Sampling Procedures - found at: <http://youtu.be/DD5npeIwh80> and a video on Introduction to Principles of DHSSampling Weights - found at: <http://youtu.be/SJRVxvdlc8s>

The files you will download are in zipped format and must be unzipped before analysis. Following are some guidelines:

After unzipping, print the file with the .DOC extension (found in the Individual/Male Recode Zips). This file contains useful information on country specific variables and differences in the Standard Recode definition.

Please download the DHS Recode Manual: <http://dhsprogram.com/publications/publication-dhsq4-dhs-questionnaires-and-manuals.cfm>

The DHS Recode Manual contains the documentation and map for use with the data. The Documentation file contains a general description of the recode file, including the rationale for recoding; coding standards; description of variables etc. The Map file contains a listing of the standard dictionary with basic information relating to each variable.

It is essential that you consult the questionnaire for a country, when using the data files. Questionnaires are in the appendices of each survey's final report: <http://dhsprogram.com/publications/publications-by-type.cfm>

We also recommend that you make use of the Data Tools and Manuals: http://www.dhsprogram.com/accesssurveys/technical_assistance.cfm

DHS statistics can also be obtained using the STATcompiler tool: <http://www.statcompiler.com>

This tool allows users to select countries and indicators to create customized tables. It accesses nearly all of the indicators that are published in the final reports. Authorization is not needed to use the STATcompiler.

For problems with your user account, please email archive@dhsprogram.com.

For data questions, we recommend that users register to participate in the DHSProgram User Forum at: <http://userforum.dhsprogram.com>

The User Forum is an online community of DHS data users and contains discussions about many DHS analysis and dataset topics. Please search the contents of the forum, and if you do not see your question addressed, consider posting a new question for users to discuss.

The Demographic and Health Surveys (DHS) Program
ICF INTERNATIONAL
530 Gaither Road
Suite 500
Rockville, MD 20850
USA

LOGIN INFORMATION:

Login Email: kmachila30@gmail.com

Password: (use the password you entered when you registered)

Appendix 6: Dissemination of the study findings

The findings of the study were presented at three conferences and three manuscripts are going to be published in accredited journals as follows:

Conferences

1. **Machira K and Palamuleni ME 2016.** Maternal healthcare, socioeconomic status and use of modern family planning methods in rural Malawi. Paper to be presented at the International Conference on Family Planning: Research and Best Practices, Bali, Indonesia, January 24-28, 2016.
2. **Machira K and Palamuleni ME 2015.** Decomposing sociodemographic and economic factors associated with utilization of prenatal health care services in Malawi. Paper Presented at Union of African Population conference. 30th Nov- 4th Dec, **2015.**
3. **Machira K and Palamuleni ME 2015.** Sociodemographic and economic determinants of women use of public health care services during child birth in Malawi: a decomposition approach. Paper presented at the Public Health Association of South Africa (PHASA) Conference, Durban South Africa. 7-9 October **2015.**

Journals

1. Machira K and Palamuleni ME 2017 “Perceived Barriers Associated with Maternal Health Care Service Delivery in Malawi: Health Personnel Perspectives” *Studies on Ethno-Medicine (S-EM) Sciences Studies on Ethno Medicine*, **11(1): 49-54.**
2. Machira K and Palamuleni ME 2017 “Perspectives of women on quality of delivered maternal health care services in Malawi” *African Health Sciences (accepted, forthcoming)*
3. Machira K and Palamuleni ME 2017 Rural-urban Differences in women use of postpartum care services in Malawi *Journal of the Egyptian Public Health Association (JEPHA) (accepted, forthcoming)*
4. Machira K and Palamuleni ME “Women perspectives on quality of maternal health care services in Malawi” *Health care perspectives (Submitted, under review)*