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FACTORS INFLUENCING LONG ACTING REVERSIBLE CONTRACTIVE USE IN MALAWI

A RESEARCH REPORT SUBMITTED TO THE SCHOOL OF SOCIAL SCIENCE, UNIVERSITY OF THE WITWATERSRAND, JOHANNESBURG, IN PARTIAL FULFILMENT OF THE REQUIREMENTS FOR THE DEGREE OF MASTER OF ARTS IN THE FIELD OF DEMOGRAPHY AND POPULATION STUDIES FOR THE YEAR 2013.

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February 2013

UNIVERSITY OF THE WITWATERSRAND, JOHANNESBURG
FACULTY OF HUMANITIES
SCHOOL OF SOCIAL SCIENCES

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Declaration:

I, Violet Nyambo, hereby declare that this research report is my own original work. It is being submitted to the Faculty of Humanities and Social Sciences, University of the Witwatersrand, Johannesburg in partial fulfillment of the requirement for the Master of Arts degree in the field of Demography and Population Studies. I declare, to the best of my knowledge, that it has not been submitted before, in part or in full, for any degree or examination at this or any other university.

…….. day of ……. 2013

Dedication:

This work is dedicated to the LORD God, the Almighty who has provided me with the grace to complete my postgraduate studies.

Acknowledgements:

I would like to give thanks to the following:

- My brother, Peter for the support and selflessness you have shown through my postgraduate studies. May the Almighty God continue to bless you immensely.

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Abbreviations

ADB	African Development Bank
CI	Confidence Interval
GDP	Gross Domestic Product
HIV	Human Immunodeficiency Virus
ICPD	International Conference on Population and Development
IUD	Intra-uterine Device
LARC	Long Acting Reversible Contraceptive
MDHS	Malawi Demographic and Health Survey
MOH	Malawi Ministry of Health
NICE	National Institute for Health and Clinical Excellence
NSO	National Statistical Office
OR	Odds Ratio
RC	Reference Category
UNFPA	United Nations Population Fund
WHO	World Health Organization

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Abstract

Background: Unintended pregnancy is a major problem among sexually active women and occurs due to a number of reasons, such as inconsistent use of short term contraceptive methods or non-use of modern contraception. Recent scientific findings indicate that long acting reversible contraceptives (LARC) methods, which are cost effective and highly effective in pregnancy prevention, are a possible solution to the problem of unintended pregnancies. Therefore, the aim of the study is to identify the demographic, socio-economic and reproductive health factors associated with the use of long acting reversible contraceptive methods among sexually active women aged 15-49 in Malawi.

Methods: The study used the Malawi Demographic and Health Survey 2010 data. The sample comprised of 17 744 sexually active women aged 15-49 years. LARC methods were defined as Norplant, Intra-uterine device (IUD) and Depo-Provera. Descriptive analysis was done to describe the study sample, while binomial logistic regression modeling was done to identify demographic, socio-economic and reproductive health factors that influence LARC method use. Data analysis was done using Stata 12.

Results: The results suggest that prevalence of LARC methods is 26%. At multivariate level, the results indicate that younger women (15-24) are more likely to use LARC methods than older women (35+). There is distinct regional variation of LARC use, with women in the Southern region being more likely to use the methods. Additionally, being married, with a secondary education or higher, having been visited by a family planning worker, staying in urban areas and wanting children after 2 years, increased the odds of using the LARC methods among the women.

Conclusion: Increasing the prevalence of LARC methods is very crucial as a solution to the challenge of unintended pregnancy. Measures need to be put in place to ensure that there is no distinct variation in LARC use in women found in the three regions of the country. Formal education and mobile family planning workers are crucial in increasing LARC methods use.

CHAPTER 1

INTRODUCTION

1.1 Background

Family planning is defined as the use of contraceptive methods to control the number, timing and spacing of births (NSO & ICF Macro 2011). The use of modern contraception is of great importance in public health, as its advent has resulted in the decline of fertility, the improvement of economic productivity, as well as the health of mother and child (Cleland, 2012).

The use of modern contraceptive methods prevents unintended pregnancy, which is associated with many negative health consequences (Cleland, 2012; White, 2007). According to a report released by the Guttmacher Institute and UNFPA, in 2012 approximately 54 million unintended pregnancies resulted in 26 million abortions (of which 16 million would have been unsafe); 79,000 maternal deaths and 1.1 million infant deaths which would have been prevented if women of reproductive age used modern contraception. Furthermore, modern contraception reduces unwanted pregnancy among HIV positive women, which in turn reduces the number of infants born with HIV (White, 2007). Thus, most countries in Sub Saharan Africa are engaged in family planning interventions to ensure that women of reproductive age, namely 15 to 49 years, have access to modern contraceptive methods as a health and development strategy (White, 2007).

In Malawi, a country in Sub-Saharan Africa, modern contraceptive use has been one of the dramatic social transformations of the 21st Century (Gakidou 2007). Despite a challenging socio-economic environment, family planning interventions have led to significant improvements in modern contraceptive use in the country (NSO & ICF Macro 2011; Solo 2005). The challenges

include limited financial and human resources and the serious opposition that the Ministry of Health faced from the government, when it introduced family planning services in the country as a strategy to stop the negatives consequences of rapid population growth (Cohen 2000; Solo 2005). Family planning services were banned from 1964 to 1994 (Solo, 1995). Eventually, the government realized that rapid population growth stifled the economic growth and development of the country as well as negatively affected the health status of, especially women (Cohen 2000; Solo 2005). Since then, there has been a remarkable increase in modern contraceptive use among married women of reproductive age (15 to 49 years) from 7.4% in 1992 to 26.1% in 2000; 28.1% in 2004 and 42.2% in 2010 (NSO & ICF Macro 2011). Despite this remarkable improvement in modern contraceptive use, it is still very low when compared to countries like Zimbabwe and South Africa, with contraceptive prevalence of 57% and 60.3%, respectively (MOH 2010, Sharan 2010).

The desire to limit and postpone childbearing in many women has increased their risk of unintended pregnancy in settings like Malawi where the use of modern contraceptive methods is considered relatively low (Kavanaugh 2011). Additionally, incorrect or inconsistent use of short term modern contraceptive methods (pills or condoms) also increases the risk of unintended pregnancy (Secura, 2010; Frost, 2008). Thus, family planning programs in Malawi are advocating for the availability and use of highly effective contraceptives such as long acting reversible contraceptives (LARC) methods, in order to limit the occurrence of unintended pregnancy (Hubacher 2008). This is highlighted by a cohort study which reported that the risk of pregnancy was 0.27 and 4.55 pregnancies among LARC methods and short term users respectively (Winner 2012). LARC methods namely Intra-uterine devices (IUD), injectables and implants, are commended as the best strategy for reducing unintended pregnancy (Hubacher

2008, Jacobstein 2007, Solo, 2005). The Ministry of Health in Malawi has authorized the Copper IUD, Depo-Provera (injectable) and the Norplant (implants) as the three LARC methods available in the country (Solo 2005).

Despite the record of efficacy, safety, cost effectiveness and user friendliness, there is very low usage of long acting reversible methods (Blumenthal, 2011; Kluge, 2008 and Whitaker, 2010). The growing evidence in the literature of the appropriateness of these methods evokes the need for research into factors influencing their use among sexually active women of reproductive age. Thus, the study seeks to identify determinants of long acting reversible contraceptive methods among women of reproductive age in Malawi.

1.2 Problem Statement

There is low use of LARC methods in developing countries like Malawi (Hubacher 2008). According to the Malawi Demographic and Health Survey of 2010, 20.5% of sexually active women are using LARC methods (NSO & ICF Macro 2011). About 0.2%, 19.2% and 1.1% use the Copper IUD, Depo-Provera (injectables) and Norplant (implants), (NSO & ICF Macro 2011). Inability to access these highly effective family planning methods by the majority of sexually active women in reproductive age has tremendous negative consequences. Challenges which culminate from low use of LARC methods in Malawi include rapid population growth which results from the high birth rate of 5.7 children per women (NSO & ICF Macro 2011). The government is unable to meet the demands for the social services of its people like education, housing, health and employment with the ever increasing population (Government of Malawi 2012). Additionally, rapid population growth has increased food insecurity (Government of

Malawi 2012). If the country continues to have a high fertility rate, it is predicted that Malawi will not attain economic growth and development (Government of Malawi 2012).

Malawi is characterized by a high rate of unintended pregnancy, which is a result of contraceptive failure, poor use of short term methods (pills, condoms) and non-use of modern contraception (Black 2010; Bradley 2011; Blumenthal 2011; Hubacher 2008). The 2004 Malawi Demographic and Health Survey indicates that 39% of pregnancies were unintended (Bradley, 2011). These unintended pregnancies have negative consequences on the health and wellbeing of women and their families (Bradley, 2011). Studies indicate that children born from unintended pregnancies are less likely to be breastfed, more likely to be stunted and have a higher risk of child mortality than children from wanted pregnancies (Gipson, Koenig, and Hindin, 2008). The quickest way to eliminate these negative health outcomes is through an increase in the use of LARC methods (Mavranezouli, 2008). A comparison of maternal and child health indices from Malawi and developed nations indicates the need for the promotion of long acting reversible contraceptives (Jacobstein, 2007). For instance, maternal mortality is rare in Sweden, with two deaths per 100 000 live births (Jacobsetin 2007), whereas in Malawi maternal mortality is high, at 675 deaths per 100 000 live births (NSO & ICF Macro 2011).

Therefore, it is imperative to focus of solving the challenge of low LARC use in Malawi for the country to enjoy better socio economic conditions.

1.3 Research Objectives

1.3.1 Research Question

- What factors are associated with the use of long acting reversible contraceptive (LARC) methods among sexually active women between the ages of 15 and 49 in Malawi?

1.3.2 General Objective

- To identify factors associated with the use of long acting reversible contraceptive (LARC) methods among sexually active women between the ages of 15 and 49 in Malawi.

1.3.3 Specific Objectives

- To describe prevalence of LARC use
- To describe characteristics of women in the sample by selected demographic, socioeconomic and reproductive health characteristics.
- To examine association between LARC use and each selected independent variable
- To identify factors associated with LARC use

1.4 Justification

Despite the availability of much literature defining long acting reversible methods, there is limited literature relating to factors which influence the use of LARC methods (IUDs, injectables and implants) among sexually active women of reproductive age especially in Malawi. Of the limited studies, the majority of the studies have been carried out in developed nations such as the United States of America (Finer 2012; Frost 2008; Kavanaugh 2011; Tranfer 2000; Whitaker

2012). It is imperative to study the factors influencing LARC methods using quantitative methodology to come up with family planning policies which can be generalised to sexually active women in Malawi.

Recent scientific findings strongly encourage the use of LARC methods, because they are the most efficient and cost effective family planning methods for pregnancy prevention (Jacobstein 2007). Long acting reversible methods are cost effective, because of the reduced cost that a couple incurs in a year of protection when compared to short term methods (Hubacher, 2008). In Malawi, the Norplant, which is the type of implant currently available, offers up to five years of protection from pregnancy, whereas the Copper IUD offers up to ten years of protection (MOH 2010). The Depo-Provera injectables offer 3 months of protection from pregnancy. This long acting protection offers an economical way of pregnancy prevention, which is advantageous to women in Malawi, the majority of whom stay in rural areas and do not have the resources to constantly go to health care facilities for contraception (Solo, 2005). Additionally, for those women interested in postponing childbearing, a woman can become pregnant immediately after stopping use of LARC methods (Secura, 2010). Thus, LARC methods can cater for the need of those women who want to postpone or limit childbirths.

Malawi is faced with a sexual reproductive health burden as a result of pregnancies which are "too early, too many, too late, and too frequent", which puts pressure on the country's limited financial resources (MOH, 2010; Solo, 2005). Increased use of LARC methods would help reduce government expenditure on maternal and infant health through the reduction of mortality and morbidities. The savings can be channeled to mitigate other socio-economic challenges in the country. According to a study by Bradley (2011), more than a quarter of unintended

pregnancies and about 44% of induced abortions would be prevented if LARC non-users switched to LARC methods. This translates not only to more money being saved but also improved health of women in the country leading to improved economic productivity. Thus, it is important to study those factors that may promote the use of LARC methods, so that the health and development goals of the country can be more speedily realized.

Furthermore, family planning is still a priority in virtually all developing countries like Malawi which are concerned with the rapid population growth (Government of Malawi). Thus there is a continual need to update literature on the risk factors associated with the usage of modern contraceptive methods (Magadi 2003). Malawi needs to reach a contraceptive prevalence rate of 62% by 2015 in order to fulfil the 5th Millennium Development Goal (The Respond Project, 2009). Without the increased use of LARC methods, Malawi faces an uphill battle to meet this goal (Bradley 2011). Thus, this study seeks to extend the understanding on modern contraception by looking specifically at long-acting reversible methods, which are a highly effective form of modern contraception.

Additionally, it is estimated that by 2015, approximately 723 000 women would have entered reproductive age (The Respond Project, 2009). To accommodate the family planning needs of an ever-increasing number of women, the Government of Malawi has to strongly encourage the use of long acting reversible methods in order to meet the Millennium Development Goal (The Respond Project, 2009). Thus, this study will inform policy on measures which can help increase LARC use, which in turn reduces many sexually reproductive health and economic challenges associated high fertility.

1.5 Definition of Long Acting Reversible Contraceptive methods

In Malawi, long-acting reversible methods are defined as modern "methods that require administering less than once per cycle or month" (NICE, 2005). These are injectables (Depo-Provera), implants (Norplant) and Copper IUDs (Blumenthal 2011; NICE, 2005). Injectables offer protection from pregnancy for up to 3 months. The Copper IUD offers protection for up to 10 years, whereas implants last up to 5 years (MOH, 2010). "Implants and IUDs are inserted and removed by a trained healthcare provider and are completely independent of adherence for efficacy" (NICE, 2005). The chance of pregnancy over a year of use is significantly lower than short term methods such as pills and condoms (Blumenthal, 2011).

1.6 Background of Study Area

Malawi is located in Sub-Saharan Africa (South Eastern Africa) between the borders of Tanzania, Mozambique and Zambia (NSO & ICF Macro 2011). It is one of the 10 poorest countries in the world, with a population of approximately 15.38 million in 2011 (The World Bank 2012). About 49% of this population is under the age of 15 (NSO & ICF Macro 2011). It is one of the most densely populated countries in the world (Government of Malawi, 2012; WHO, 2011).

Malawi is divided into three regions. The Northern region, with about 13% of the total population, is argued to have the best socio-economic indicators when compared to other regions (Makoka, 2009; NSO & ICF Macro 2011). The Central region, where approximately 42% of the country's population resides, has the second best socio-economic indicators. The Southern region has the majority of the population (45%) and is considered the least developed of the three regions (Malawi Government, 2010). The socio-economic conditions in these regions are

relatively low when compared to neighbouring countries in the region, such as Zimbabwe and South Africa.



Figure 1: Map of Malawi

The rapidly growing population has worsened the socio-economic problems in the country (Government of Malawi, 2012). The population growth rate is estimated to be 2.8% annually in 2012 (Government of Malawi, 2012). The rapid growth rate is due to the high fertility rate (5.7 children per woman) and a decline in the mortality rate (Malawi Government, 2010). Some of the consequences of the rapid population growth are high unemployment rate amongst the youth, food insecurity, poor infrastructure and depletion of natural resources (Government of Malawi,

2012). Increasing family planning has been adopted as one of the solutions to addressing population related problems troubling the country (Cohen 2000, Government of Malawi 2012).

The country heavily relies on an agrarian economy (WHO, 2011). About 37% of the Gross Domestic product (GDP) is from agriculture (ADB, 2011). Tobacco is the main export for the country. Tea, sugarcane and coffee are the other major crops exported to the world markets (ADB, 2011). The heavy reliance on agriculture makes Malawi highly vulnerable to external financial shocks, such as a decline in trade, as well as drought (ADB 2011). As a result, poverty (52%) is widespread in the country, with the financial wealth in the hands of the minority (ADB, 2011). About 81% of the population stays in rural areas, where subsistence farming is the main livelihood (Government of Malawi, 2012). Women make up approximately three quarters of the population of subsistence farmers (Government of Malawi, 2012).

Malawi is characterised by a high infant and maternal mortality rate, which reflects the impact and extent of poverty and poor socio-economic conditions ((NSO & ICF Macro 2011). Maternal mortality nearly doubled between 1992 (620 per 100 000) and 2000 (1120 per 100 000) (NSO & ICF Macro 2011). It has seen relative decline to 675 maternal deaths per 100 000 live births in 2010 (NSO & ICF Macro 2011). Infant mortality is 66 per 1000 live births. These indicators are a reflection of poor nutrition, lack of access, and poor coverage of maternal health services (NSO & ICF Macro 2011)

There are rural-urban and regional differences in educational attainment in Malawi. The urban areas and the Northern region see the most widespread educational achievement of both women and men (Government of Malawi, 2012). Only 8% and 2% of the population has attained secondary and tertiary education, respectively (Government of Malawi, 2012). With such low

levels of education, the country suffers from a dearth of skilled labour (Government of Malawi, 2012). This is exacerbated by the migration of skilled labour to other countries (Government of Malawi 2012).

In terms of health, the country has been heavily affected by HIV/AIDS, which has resulted in a depletion of financial and human resources (Solo, 2005). The HIV infection rate has declined and so has HIV/AIDS related mortality (Solo, 2005). According to the 2010 estimates, approximately 11% of adults aged between 15 and 49 are living with HIV/AIDS in the country, with women having the highest prevalence rate of the disease (NSO & ICF Macro 2011).

The Malawian population constitutes of different religions and ethnic groups. The majority of the population is Christian. Other religions include both Muslim and traditional African beliefs. There are approximately 12 different ethnic tribes (NSO & ICF Macro 2011).

CHAPTER 2

LITERATURE REVIEW AND THEORETICAL FRAMEWORK

2.1 Introduction

This chapter presents an overview of literature related to long-acting reversible contraception (LARC) methods. Studies that discuss reasons for non-use of LARC methods as well as the level, trends and predictors of LARC methods use, will be examined. A theoretical framework related to the study will also be examined.

2.2 Literature Review

Qualitative studies (Spies, 2010; Glaiser, 2012 and Rose, 2012) have laid the groundwork in explaining why LARC methods, which have been available in most developing countries for more than 40 years, have not been used widely, despite the high rate of unmet needs for highly effective modern contraception (Blumenthal, 2012). The most prominent reasons for low uptake of LARC methods among women include: myths and misconceptions about safety and efficacy; provider bias towards short-term methods; lack of trained providers; and lack of knowledge on the part of potential users (Blumenthal, 2012; Finer, 2012; Neukom, 2011; Secura, 2010). A study by Spies (2010) among women aged between 18 to 30 revealed that the respondents believed that LARC methods were for older women, who had reached their desired family size. The respondents said they could not afford the expense of these methods, particularly when it came to the implant and IUD.

Glaiser (2012) added that the women in her qualitative study indicated that they did not choose any of the three LARC methods (injectables, IUD and implants) because they did not have any prior knowledge about the methods. After using thematic content analysis to investigate reasons of non-use of the LARC method among young women aged between 16 and 25 seeking abortion services, Rose (2012) reported the fear of side effects as well as a concern over whether the method contained hormones or not, as some of the reasons cited for non-use, in addition to those mentioned already. Scholars such as Dempsey (2012) and Haimovich (2009) have stressed the continual need to educate providers on the appropriateness of LARC methods for their clients, since the providers have been identified as one of the main reasons why women do not know about or use LARC methods.

Though very important in the study of LARC methods, qualitative studies fail to bring out the socio-economic and demographic factors associated with LARC use. Rather, the qualitative studies highlight knowledge and attitude towards LARC use. Additionally, they lack generalization to all women of reproductive age in the country of study. Generally, qualitative studies have small sample sizes. For example, Rose (2012) studied 30 participants aged between 16 and 25 years old who had experienced an abortion, while Spies (2010) interviewed 649 participants.

According to Blumenthal (2012), many attempts have been made to address the myths and misconceptions women have about LARC methods that are known to result in their infrequent use. He argued that one of these attempts in literature has been the use of clinical studies to inform policy on family planning about the appropriateness of LARC methods. Clinical studies have emphasized the effectiveness and safety of LARC methods in the prevention of unintended

pregnancy, when compared to short-term contraceptive methods (Winner, 2012; Lipetz, 2009; Varney, 2004). The results of these studies have helped dispel the misconceptions and fears women have expressed about LARC methods in qualitative studies.

Clinical studies indicate that LARC methods are safe for use in women immediately after child birth, abortion, in young women who have never given birth, and in HIV positive women (Blumenthal, 2011; Frost, 2008; Whitaker, 2008). In a systematic review of clinical studies, Tolaymat (2007) concluded that LARC methods are safe to use in adolescents. Lipetz (2009) and Varney (2004) demonstrated the cost effectiveness of the implant, as compared to the oral contraceptive pill. Additionally, Mavranezouli (2008) used a decision analytic model, which estimates the cost of the Copper IUD, Depo-Provera (injectable) and implants. These methods are most cost effective over one year of use, when compared to short-term methods, such as the pill (Hubacher 2008, Mavranezouli 2008). Thus, a woman increasingly enjoys the cost effectiveness of the IUD and implants in particular, with each year of use (Mavranezouli, 2008).

It is also important to note that though these clinical studies are very important, they fail to explore fully the socio-economic and demographic determinants of LARC method use. They are only concerned with proving efficacy scientifically, along with establishing the cost effectiveness of these methods. Thus this current study will fill that gap by focusing on factors influencing the use of LARC methods in Malawi.

There are also studies that report on the level and trend of LARC methods use. Generally, the use of LARC methods is low in developed and developing countries, though it is lower in developing countries (Blumenthal, 2012). Kavanaugh (2011) reported a dramatic increase in the use of LARC methods by young women in the United States between 2006 and 2008. A recent study

based on women aged between 15 and 29 who were at risk of unintended pregnancy, reported a 2% increase in the use of LARC methods from 2000 to 2010 (Moreau, 2013). Only 6.6% of the young women in the study were using LARC methods (Moreau, 2013).

Another study in the United States among women aged between 15 and 44 found a significant increase in LARC methods among women of all ages, race, educational level and income group: from 2.4% in 2002 to 3.7% in 2007, and 8.5% in 2009 (Finer, 2012). The study found that women with one child or two and under the age of 30 had the largest increment in LARC use in the country, which he attributed to provider bias. Providers were more likely to encourage LARC use among these women, who would have reached their desired fertility intentions. This supports the argument raised in qualitative studies, that providers with little information on LARC are more likely to discourage their use amongst all women, regardless of their demographic or health status (Dempsey 2012).

In the Sub-Saharan region, the level of long-acting reversible contraceptive method use is low among sexually active women of reproductive age (Hubacher 2008). Takele (2012), in a study of married women in the South East region of Ethiopia, found that about 8.7% of the women used implants and IUD. In Cape Town, South Africa, Crede (2012) also reported very low levels of long-acting contraceptive method use. Only 6.4% of the HIV negative and positive women in the study in Crede's (2012) study used implants as a method of contraception. In Kenya, Magadi (2003) found an increasing trend in the use of long-acting reversible methods. Injectables were the method that had the highest increments, especially among rural women, the uneducated, and those with partners who disapprove of family planning. According to the Malawi Demographic

and Health Survey 2010, there has been a drastic increase in the use of injectables in Malawi, with a slight increment in the use of implants (NSO & Macro 2011).

There are quantitative studies that discuss determinants associated with LARC use. However, the majority of these studies found in the literature have not been carried out in Sub-Saharan African countries. Most of the studies were carried out in the United States (Finer 2012; Frost 2008; Kavanaugh 2011; Tranfer 2000; Whitaker 2012) Tang (2012) found that "not trying for pregnancy at time of conception" and no desire for another pregnancy within 2 years to be factors associated with LARC use among postpartum women in the United States. The sample size for the clinical randomized trial was 800. A study by Bharadwaj (2012) with a sample of 194 adolescent and young women reported that fear of pain and needles made these women less likely to use LARC methods, despite knowledge of their reliability, long duration and effectiveness in preventing unintended pregnancy. These studies have explored risk factors of LARC among diverse populations of women at risk of unintended pregnancy. This study however, will identify the demographic and socio-economic predictors of LARC on a wider range of sexually active women who fall within the reproductive age, who are also at risk of unintended pregnancy in Malawi. Bharadwaj (2012) and Tang's (2012) studies had relatively small sample sizes. Though studies with small sample sizes can be adequate for drawing conclusions, it can be argued that a study with a relatively large sample is ideal to yield results, which can be more representative of the total population of women in the area of study (Galpin 2011).

It is established that education influences the uptake of modern contraception among women in Sub-Saharan Africa (Ainsworth, 1996; Adanu, 2009; Benefo, 2006; Saleem & Babok, 2005;

Thomas, 1996). The main argument being that each addition in year of primary schooling has the greatest positive influence on modern contraception use (Ainsworth, 1996). A nationally representative cross sectional study by Frost (2008), of women aged between 18 and 44, yielded an interesting result. Frost (2008) found that women with no college education were more likely to use long-acting methods than women with a college education. This is not in line with findings from scholars like Kavanaugh (2011) and Finer (2012), who indicated that women with a college education were more likely to use LARC methods due to their increased knowledge on modern contraceptives. Frost (2008) speculated that women with no college education were more likely to use the long acting methods, because they were cheaply available at public funded health institutions. Kossler (2011) and Creanga (2011) found that LARC methods were used by women of higher socio-economic status, who were more likely to be educated, particularly up to tertiary level.

There are studies which examined factors influencing the LARC methods separately. Tranfer (2000) studied reasons and determinants associated with the intention to use the injectable and implant among women aged between 20 and 37 in the United States, using data collected from the 1993 and 1995 National Surveys of Women. It was found that marital status, education, parity and fertility intention were factors that predicted the use of the injectable. Never married women were two times more likely to use the injectable than married women. Women who wanted to have a child in the next two years were more likely to use the injectable than women who did not desire a child. The analysis was based on a very small sample size and the results indicated that none of the selected factors were significantly associated with the intention to use the implants. Tranfer (2000) argued that the results obtained from an analysis of factors influencing intention to use both the implants and injectables use, were influenced by the pattern

of intention to use the injectable. The author argues that most studies on predictors of implants are hampered by the small sample sizes or sample design issues which he experienced, even after selecting his sample from two rounds of the National Surveys of Women.

A study by Whitaker (2010) identified the predictors of Depo-Provera and implant use separately, which Tranfer (2000) failed to do in his study, due to methodological issues. Whitaker (2010) used cross-sectional data from the National Survey of Family Growth in the United States among young women aged 15-24. Age, education, socio-economic status and income were not observed to determine the use of either the Depo-Provera or of implants. Number of living children is the only variable that was found to be significantly associated with use of the Depo-Provera and implant. Whitaker (2010) observed that the Depo-Provera and the implant had different factors which had underlying influence from a healthcare provider. For example, married women were 5 times more likely to use the implants when compared to those women who had never married. Never married women who had contracted a sexually transmitted disease at some point in their life were almost 2 times more likely to use the Depo-Provera.

Literature recommends the study of men and their influence on family planning. It is a strength in Dempsey's (2012) study that he identified predictors of LARC use among young men, as well as among young women. Men, especially in Sub-Saharan countries, influence women's reproductive health choices as they might take supreme or partial control in the choice of modern contraception (Biddlecom, 1998; Do, 2012). Dempsey (2012) found that knowledge of IUD had the strongest association with LARC use, especially among young men. Age and early sexual activity were the other factors that promoted use. Young people aged between 25 and 29 were

more likely to use LARC methods than those aged between 19 and 18. However, Dempsey (2012) did not include injectables in his analysis, as he focused on other LARC methods, namely the IUD and the implants.

Place of residence was found to be significantly associated with use of injectables in a study by Magadi (2003). Women in the rural areas were less likely to use the long acting reversible methods when compared to women in urban areas.

Religion has been found to generate mixed influence on modern contraception. Caldwell & Caldwell (1987) argued that religion encourages high fertility and low use of modern contraception, due to the strict influence of the Roman Catholic Church and African traditional religion, which were considered as conservative. A more recent study from Yeatman & Trinitapoli (2008) indicated that it is the attitude of particular congregations towards family planning and sexual morality that influence modern contraception use. However, Takele (2012) reported that religion was not significantly associated with the use of implants and the IUD in South East Ethiopia.

Despite the well-established advantages of modern contraception, the literature indicates that modern contraception, and particularly LARC methods, are still not well utilized in most Sub-Saharan countries (Hubacher, 2008; Jacobstein, 2009; Stephenson, 2007). However, most studies in Sub-Saharan African countries concentrate on examining factors that influence all modern contraception (Do, 2012; Kaggwa, 2008; Magadi, 2003; Stephenson, 2007). These studies do not differentiate between modern contraceptives, which are known to give 'short term' protection from pregnancy, and those methods which give longer term protection, which are known as long-acting reversible methods. For this reason, the present study emphasizes determinants of LARC

methods, since they are appropriate for developing countries like Malawi, which sees high rates of unintended pregnancy amongst sexually active women. Additionally, there are no studies which have been carried out that explore the determinants of LARC methods among sexually active women aged 15-49 in Malawi.

The various types of studies highlighted in this review serve to summarise the research done on LARC methods as well as give an indication of variables which have been used in the studies. The studies highlight the research gap that there are limited studies on determinants of LARC in Southern Africa especially in Malawi. Definitions of LARC methods have varied among the studies, as some studies were limited to analysing one or two of these methods. However, this study intends to identify the factors associated with the use of the three methods (IUD, implants and injectables), which have been defined as being long-acting in pregnancy prevention, and reversible.

2.3 Theoretical Framework

This study will employ The Proximate Determinants of Fertility Framework by Bongaarts (1978). The framework indicates that socio-economic, cultural and environmental factors (background factors) act through a set of four proximate determinants in influencing fertility (Bongaarts, 1978). The four sets of proximate determinants are contraception use, marriage patterns, induced abortion and lactation (Bongaarts, 1978). Instead of focusing on the four proximate determinants of fertility, this report focuses on contraception use since it is the main discussion in the report.

Contraception use is defined as any deliberate parity dependent practice, which includes abstention and sterilization, done to reduce the risk of pregnancy (Bongaarts 1978). The framework also explains that a change in the background factors such as socio-cultural factors results in a change in the prevalence of contraception use (Bongaarts 1978). For example an increase in education (a background factor) in an individual will result in the individual changing her reproductive health behaviour, namely, higher contraception use. As a result, higher contraception use decreases fertility.

This study employs a modified version of the Proximate Determinants of Fertility framework. The framework is used to explain how demographic, socio-economic factors and reproductive health factors have a direct influence on the reproductive health behaviour of a woman, namely contraception use. Contraception use is limited to three types of LARC methods, namely the Injectable, Norplant and IUD. As illustrated by Figure 2, it is hypothesized that background factors have a direct influence on LARC use.

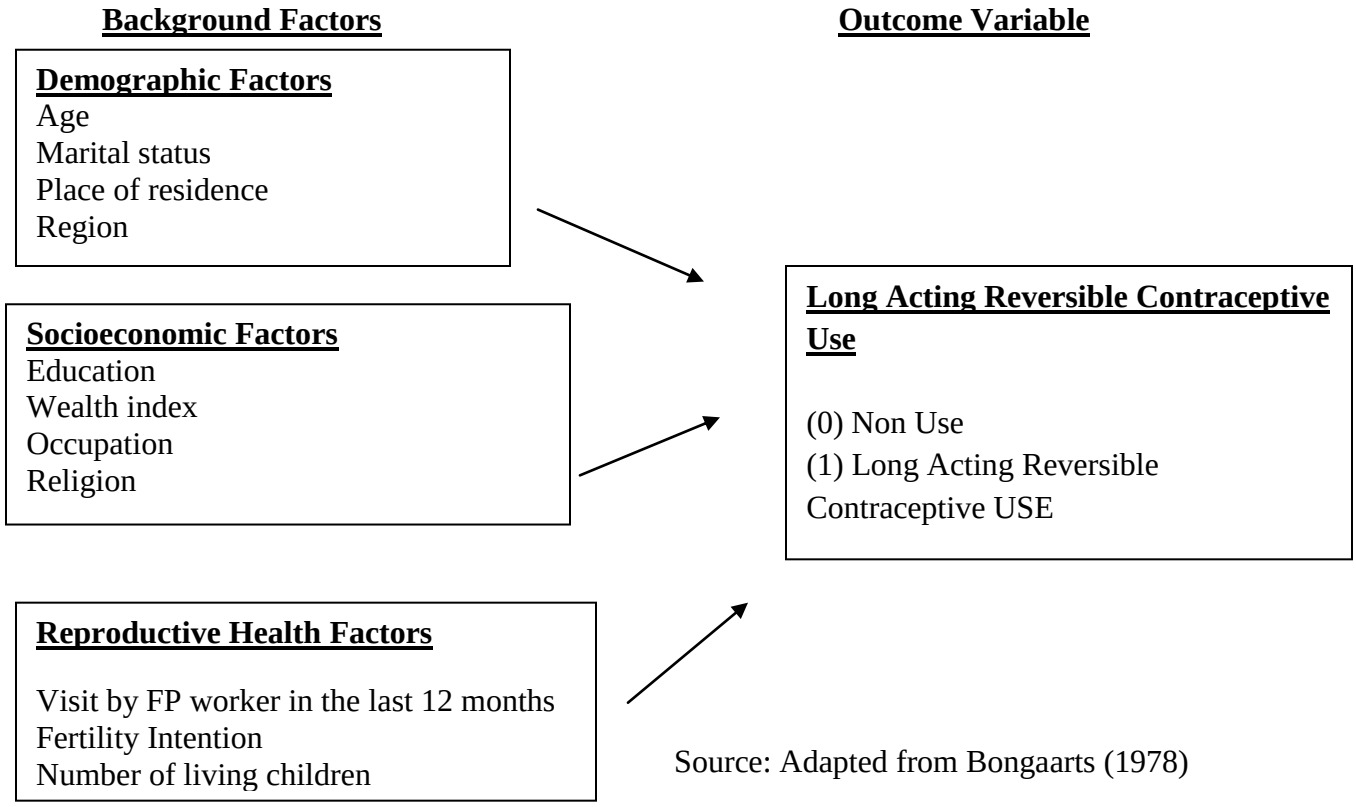


Figure 2: Adapted Theoretical Framework for studying factors associated with long-acting reversible methods in Malawi

2.4 Hypotheses

The following hypotheses are being tested in this study:

- It is hypothesized that respondents aged between 15 and 24 are less likely to use LARC methods compared to older women. Older women who would have reached or are close to the end of their reproductive life are more likely to use these highly effectively methods to limit births.

- The second hypothesis for the study is that the higher the number of living children a woman has, the more likely she is to use LARC methods for limiting and spacing the birth of children. Women with no children, especially those who are married, who may still have to provide proof of their fertility, are less likely to use any LARC method.

- It is also hypothesized that respondents with secondary and higher education are more likely to use LARC methods than respondents with no education and those with primary education.

- There is regional variation is the use of LARC in Malawi, due to unequal distribution of wealth in the country. Thus, it is expected that the Northern region, which has the best socio-economic indicators of the three regions in Malawi, is more likely to use LARC methods.

CHAPTER 3

METHODOLOGY

3.1 Introduction

This chapter outlines the methodology used to fulfill the general objective of the study. Data source, sampling design, study population, variables definition, data management and analysis are aspects discussed in this chapter. The limitations of the study are also stated.

3.2 Source of Data

Data used in this analysis are derived from the Malawi Demographic and Health Survey of 2010, which is a nationally representative cross sectional survey (NSO & ICF Macro 2011). The Malawi Demographic and Health Survey (MDHS) for 2010 provides secondary data on population and health indicator estimates at the national, regional, and district levels (NSO & ICF Macro 2011). The data is quantitative in nature.

3.3 Study Population

The study focuses on sexually active women aged between the ages of 15 and 49 years. A total of 23 020 women were interviewed in the Women's questionnaire. The final sample used in the analysis included 17,744 sexually active women of reproductive age. These are the women who responded to the question on the method of contraception they were using at the time of interview. The following women were excluded from analysis:

- Women who have never had sexual intercourse

- Infecund women. These are defined as women who have never been pregnant despite being married for more than 5 years and not using contraception. Women experiencing menopause or have had a hysterectomy, never menstruated, or have been postpartum amenorrheic for 5 years or longer are also considered infecund

- Sterilized women or with a male partner who is sterilized.

A sexually active woman is defined as any woman who has had sexual intercourse. Therefore, women who have had sex before, but had not had sex in the four weeks preceding the survey due to postpartum amenorrhea, as well as those who had not had sex in the four week preceding the survey but were not experiencing postpartum amenorrhea, were considered sexually active.

3.4 Sampling Design

The sampling frame of 2008 Malawi Population and Housing Census (PHC) was used in the Malawi Demographic and Health Survey of 2010. According to the MDHS 2010 report, a stratified, two stage cluster design was conducted. Firstly, the sample was stratified according to 28 districts, which were further divided into 849 enumeration areas or clusters (NSO & ICF Macro 2011). Out of the 849 clusters, 158 were urban and 691 were rural ((NSO & ICF Macro 2011). More than 90% of the population lived in rural areas in most of the districts in the country. As a result, urban areas were oversampled (NSO & ICF Macro 2011).

In the second stage of sampling, households were sampled to yield a selection of a nationally representative sample of 27,345 households (NSO & ICF Macro 2011). One third of these households were selected for the subsample, in which eligible women aged between 15 and 49

were tested for HIV (NSO & ICF Macro 2011). Three questionnaires were administered, namely the Household Questionnaire; the Woman's Questionnaire; and the Men's Questionnaire, in the Malawi Demographic and Health Survey of 2010. Data for analysis in this study comes from the Woman's Questionnaire, which focuses on sexual reproductive health of women aged between 15 and 49, among other issues (NSO & ICF Macro 2011). The MDHS 2010 has a response rate of 98%. The Women's Questionnaire meanwhile had a 97% response rate (NSO & ICF Macro 2011).

3.5 Variable Definition and Measurement

This section gives the definition and measurements of the selected independent variables and dependent variable in the study.

3.5.1 Dependent Variable

The primary outcome of interest in the study is long acting reversible contraceptive (LARC) use. This variable is measured as a dichotomous variable categorized into 'Non-use of LARC' and 'LARC use'. This variable was formed from a variable called current contraceptive use, in the data that asked all women of reproductive age in the survey to specify the method of contraception they were using at the time of the interview. Women who were using short-term modern contraceptive methods (the pill, or female and male condoms), those who used traditional methods, and those who did not use any method of contraception, were categorized under 'Non use of LARC' and were coded as '0'. Women who were using IUD, Norplant and injectables were categorized under 'LARC use' and coded as '1'.

3.5.2 Independent Variables

Since the aim of the research is to identify factors influencing long-acting reversible contraceptive (LARC) use in Malawi, the researcher used a number of variables as covariates. Variables which were selected were age; marital status; number of living children; fertility intentions; region; education; wealth index; place of residence; occupation; visit by family planning worker in the last 12 months; and religion. All these variables relate to the female respondent at the time of the interview. The measurements are detailed in Table 3.1.

3.6 Data management

Some independent variables were re-categorized in order to facilitate meaningful interpretation. Age was categorized into 3 age groups of youth (15-24), young adults (25-34) and adult women (35+). This will help highlight the variability of use in the sample population.

Religion and marital status were used as proxies of societal and cultural influence to which a woman is exposed. According to Durkheim, religion is defined as an institution of social control which may shape the reproductive norms of members through behavioural regulations (Gyimah 2011). For the marital status variable, the categories of ‘divorced’ and ‘widowed’ were defined as ‘formerly married’, whilst ‘living together’ and ‘married’ were combined in the category of ‘married’.

Occupation and education were used as proxies for women’s empowerment. Women in the ‘tertiary’ category were combined with those in the ‘secondary’ category, due to the very small number of women educated at tertiary level to form a category called ‘higher education’. Under the ‘occupation’ variable, ‘professional’, ‘technical’ and ‘managerial’ categories were combined to form the ‘professional’ category. ‘Clerical’, ‘sales’ and ‘skilled’ workers were combined to

form the ‘skilled’ category. The ‘unskilled’ category was meanwhile defined as those women working for example in domestic work. Other variables which could have been used as a proxy of women’s empowerment, such as ‘decision-making power in contraceptive use and in household decisions’ were dropped from the analysis because they were highly correlated to marital status. Wealth status was also taken as a proxy for women’s empowerment. It likewise serves to indicate the social class from which a woman comes.

Table 3.1 Measurements and Definitions of Independent Variables

Variables	Definition used in the Study	Original Classification
Age of Woman	0=15-24 1= 25-34 2=35+	15-19; 20-24; 25-29; 30-34; 35-39; 40-44; 45-49
Marital Status	0=Never Married 1=Married 2=Formerly Married	Never Married; Married; Living Together; Widowed; Divorced; Not Living Together
Number of Living Children	1-14	1-14
Region	0=Northern 1= Central 2= Southern	Northern; Central; Southern
Education of woman	0=No Education 1= Primary 2= Higher Education	No Education; Primary; Secondary; Higher
Wealth Index	0=Poor 1=Middle 2= Rich	Poorest; Poor; Middle; Rich; Richest
Place of Residence	0= Rural 1=Urban	Rural; Urban
Occupation	0=Not working 1=Professional 2=Agricultural 3=Skilled 4=Unskilled	Not Working; Professional, Technical & Managerial; Clerical; Sales; Agric Employed; Agric Employee; Domestic related Work Skilled Manual; Unskilled Manual
Visited by FP worker in the last 12 months	0= No 1=Yes	No; Yes

Fertility Intention	0= No more children 1= wants in the next 2 years/ after 2 years 3=Unsure of timing 4=Undecided	Wants in 2 years; wants after 2 years; wants but unsure of timing; no more; undecided
Religion	0=Catholic 1=Other Christian denominations 2= Muslim 3=No religion	Catholic; CCAP; Anglican; Seventh Day; Other Christian; Muslim; No religion

The influence of the family planning programme in Malawi is of great importance. Thus, the variable, 'visit by family planning worker in the last 12 months' was used as a proxy for the family planning programme in Malawi.

Number of living children a woman has was included for analysis in order to reflect the societal and individual dynamics that might influence a woman to use contraception. For ease of interpretation, number of living children was treated as a continuous variable in the binomial logistic regression.

'Place of residence and region' were used to assess differentials of LARC use according to location. Place of residence was also used as a measure of accessibility and availability of modern contraceptive methods since women in urban areas have more access to health care facilities. The Northern region was used as a reference category, under the variable 'region' because it is argued to have the best socio-economic conditions in the country (Government of Malawi, 2012).

3.7 Data Analysis

The analysis was done in three parts. Firstly, descriptive analysis was done in order to present the background characteristics of the women in the sample, which included general characteristics and LARC use. Cross tabulation was also used to give the pattern on method use according to the characteristics of women.

The second part of the analysis involved examining the association between each selected independent variable and the dependent variable. This means that each independent variable was examined for its association with LARC use. Binomial logistic regression was employed since the dependent variable, LARC use, dichotomous.

Multivariate analysis was used in the third part of the analysis. Binomial Logistic Regression was also used because LARC use was maintained as binary dependent variable. Since all independent variables were critical in the analysis, they were all included in the multivariate model, despite their significance at bivariate analysis level. Through multivariate logistic regression, the researcher was able to identify the risk factors associated with LARC use. Results from the binomial logistic regression are reported as odds ratios (ORs), with a 95% confidence interval (CI). The log odd ratio was used because it explains the likelihood of each independent variable influencing LARC use, holding other factors constant. It is also possible to control for confounding effects. All statistical analysis was done using Stata 12.

The formula used in the multivariate analysis to estimate the probability of a woman's use of LARC methods is as follows:

$$\mathbf{Ln\ (p_i / 1\text{-}p_i) = \beta_0 + \beta_1 x_{i1} + \beta_2 x_{i\,2} + \beta_3 x_{i\,3} + \beta_4 x_{i\,4} + \beta_5 x_{i\,5} + \beta_6 x_{i\,6} + \beta_7 x_{i\,7} + \beta_8 x_{i\,8} + \beta_9 x_{i\,9} + \beta_{10} x_{i\,10} + \beta_{11} x_{i\,11}}$$

whereby:

Ln (p_i / 1-p_i) is the log-odds ratio. It estimates the probability of LARC use where

β_0 is a constant

β_1 is the coefficient

and **$x_{i1} \ldots x_{i\,11}$** represents the 11 predictor variables

3.8 Limitations

Since this study is cross sectional in nature, it cannot infer that the selected independent variables cause women to use LARC methods. Rather, the study can only infer that the selected independent variables are associated with a higher incidence of LARC method use in the study sample, which is exposed to the independent variables. In a nutshell, the study cannot infer causality.

Healthcare provider's prescribing practice is regarded as one of the main factors which influence women's use of long-acting reversible contraceptives (Blumenthal, 2011, Rose, 2012). However, this variable is not available in the Demographic and Health Survey data set.

It would have been interesting to note and compare the factors influencing each LARC method. This was hindered by the small sample, which makes up respondents using Copper IUD and Norplant.

CHAPTER 4

RESULTS

4.1 Introduction

This chapter is divided into three sections. The first section presents the univariate analysis results of the background characteristics of the respondents. The second section, bivariate analysis, presents the association between the each selected independent variable and long acting reversible contraceptive (LARC) use. Finally, the multivariate analysis results are presented in the third section, which outlines the factors that are significantly associated with LARC use among the study population.

4.2 Univariate Analysis Results

The objective addressed in this section is to describe prevalence of LARC use.

4.2.1 Prevalence of Long Acting Reversible Contraceptive Methods Use

Just over a quarter (26%) of the women are using a LARC method, as illustrated in Figure 4.1. Of the three LARC methods, the injectable called Depo-Provera is the most commonly used method (24%) (Figure 4.2). A mere 1.4% of the respondents use the Norplant, as the second most used method. The IUD has the lowest percentage of usage among the LARC methods.

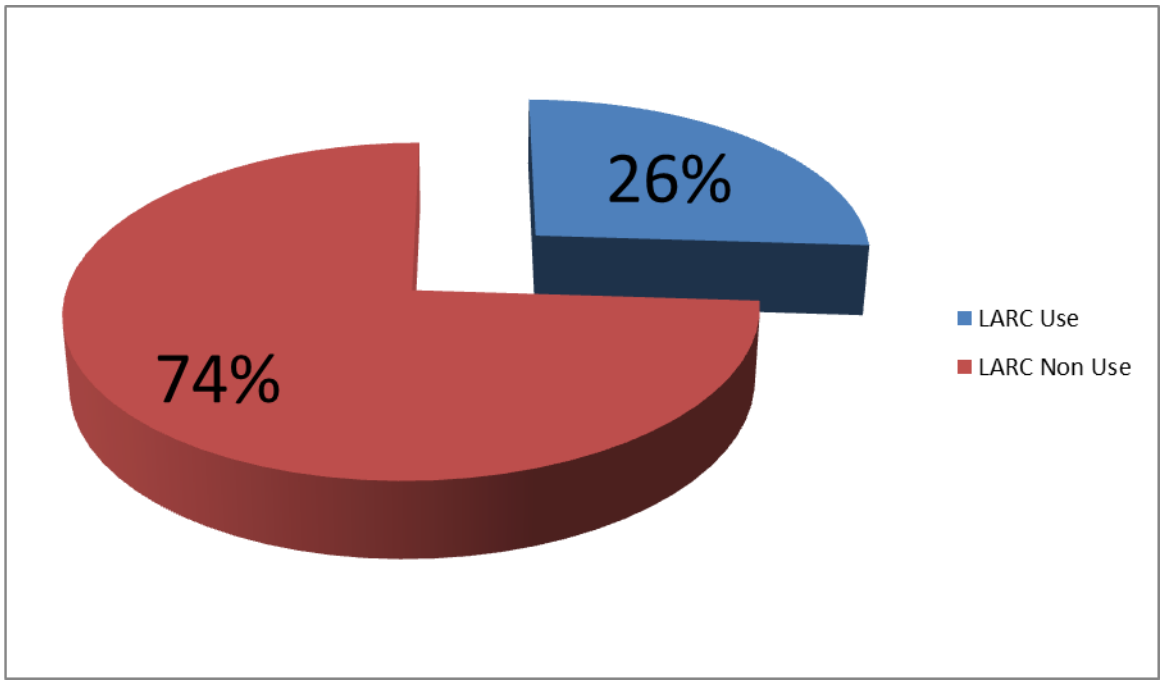


Figure 4.1 Percentage Distribution of Respondents using Long Acting Reversible Contraceptive methods

4.2.2 General Characteristics of the sample population

The characteristics of sample are summarized in Table 4.1. The population is predominantly made up of women above the age of 25. The majority of the women (40%) are in the 25-34 age group, with women older than 35 comprising only 25% of the study sample. Reflective of a traditional patriarchal society that upholds marriage, 77% of the women are married and only 10% and 13% are formerly married and never married, respectively. A high fertility rate is implied by the high proportion of women with children in the sample. Indeed, only 12% of the population does not have children. About 21% of the respondents have more than 5 children, whereas about 37% of the women have one or two children.

Slightly over two thirds (67%) of the women had primary education. About 18% of the respondents have higher education. This is not surprising considering that the majority (87%) of

the women stay in rural areas. It is also not surprising that only about 1% of the women are engaged in professional work and the majority (46%), earn a living through agricultural work with 26% being unemployed. The population is divided into two extremes in relation to wealth status, with the poor being the majority. About 41% of the population is poor, whereas 38% is considered rich.

The majority of the women (49%) stay in the Southern region, with the Central and Northern region being the least populous respectively. The smallest proportion of the respondents (18%), stay in the Northern region. A large proportion of the respondents want to limit or postpone childbirth. About 43% of the respondents do not want to have more children, whereas 39% want a child after 2 years. It is also intriguing to note that nearly 84% of the respondents have not been visited by a family planning worker in the year leading up to the survey. The main religion is Christianity, with 22% of the women being Roman Catholic, and 65% being from other Christian denominations. Muslims make up 11% of the population.

Table 4.1 Percentage Distribution of Respondents using Long Acting Reversible Contraceptives Methods

Characteristics	LARC Users %	Sample %
Age		
15-24	33	35
25-34	50	40
35+	17	25
Total Number	**4 607**	**17 744**
Marital Status		
Never Married	5	13
Married	90	77
Formerly Married	5	10
Total Number	**4 607**	**17 744**

Number of Living Children		
0	0.4	12
1-2	40	37
3-4	39	30
≥5	20.6	21
Total Number	**4 607**	**17 744**
Education		
None	14	16
Primary	68	67
Higher	18	17
Total Number	**4 576**	**17 500**
Place of Residence		
Urban	13	13
Rural	87	87
Total Number	**4 607**	**17 744**
Region		
Northern	13	18
Central	34	33
Southern	53	49
Total Number	**4 607**	**17 744**
Visited by FP worker (last 12 months)		
No	81	84
Yes	19	16
Total Number	**4604**	**17 736**
Occupation		
Not working	22	24
Professional	1	1
Skilled	25	23
Agricultural	46	46
Unskilled	6	6
Total Number	**4 607**	**17 744**
Fertility intention		
Does not want any more	44	43
Wants in 2 years	5	12
Wants after 2 years	48	39
Wants, but unsure of timing	1	3
Undecided	2	2
Total Number	**4 604**	**17 744**
Wealth Index		
Poor	39	41
Middle	22	21
Rich	39	38
Total Number	**4 607**	**17 744**

Religion		
Roman Catholic	23	23
Other Christian denominations	66	65
Muslim	10	11
Other	1	1
Total Number	**4 596**	**17 691**

4.2.3 Characteristics of women using Long Acting Reversible Methods

The general characteristics of LARC methods users are as follows. About two thirds of the women (66%) who used LARC methods are from 'other Christian denominations', with 23% Roman Catholic and 10% Muslim. Poor and rich respondents make up 39% of the users, respectively. The majority of the respondents using LARC methods want to limit (44%) and postpone (48%) child bearing. In terms of occupation, women engaged in agricultural work are the majority (46%) amongst LARC users. Professional women are a mere 1%, whereas 22% of the LARC users are unemployed. About 81% of the women using LARC methods have not been visited by a family planning worker in the 12 months prior the survey.

More than half of LARC users reside in the Southern region of the country, and only 13% stay in the Northern region. Rural residence is also a dominant characteristic with 87% of the women using LARC methods. In terms of education, the majority (68%) of the women are educated up to primary level, whereas 14% are not educated and 18% of the respondents are in the higher education category. Women with 1-2 and 3-4 children are also the main users of LARC methods. Usage of LARC methods is extremely low (0.4%) among women who do not have children. LARC method use is high among the married women, at 90%. About 5% of the never married and also 5% of formerly married women are using LARC methods. Women aged between 25

and 34 make up half of the LARC users, and women considered youth between the ages of 15 and 24 are 17% of the users.

In a nutshell, the respondents who have the highest percentage in LARC method use are women who are aged between 25 and 34, are married with 1 to 4 children, having attained primary education, and staying in the rural areas and the Southern region of Malawi. Additionally, they work in the agricultural sector, attend a non-Catholic Christian denomination, want to postpone having children for the next 2 years, and have not been visited by a family planning worker in the year preceding the survey. These women are more likely to be in the rich and poor social classes.

4.3 Bivariate and Multivariate Results

4.3.1 Bivariate Results

This section displays results of the examination of association between LARC use and each independent variable.

Age of respondent is significantly associated with LARC use. The pattern of LARC use according to age illustrates that women older than 35 years are less likely to use the methods than women younger than 35 years. Women aged between 25 and 34 years old are 1.53 times more likely to use LARC methods than women aged 18-24, whereas those older than 35 years have decreased odds of using LARC by 30% when compared to women aged 18-24.

Married women are 3.86 times more likely to use LARC methods than never married women.

Table 4.2 Unadjusted and Adjusted Odds Ratios of Long Acting Reversible Contraceptive Use among sexually active women (15-49 years) in Malawi

Variable	Unadjusted OR	CI (95%)	Adjusted OR	CI (95%)
Age				
15-24(RC)	1.00		1.00	
25-34	**1.53***	**1.42-1.65**	**0.94***	**0.80-1.00**
35+	**0.70***	**0.64-0.78**	**0.28***	**0.28-0.38**
Marital Status				
Never Married (RC)	1.00		1.00	
Married	**3.86***	**3.36-4.44**	**3.33***	**2.87-3.87**
Formerly Married	1.19	0.97-1.44	**1.17***	**1.00-1.44**
Number of living children	**1.10**	**1.09-1.12**	**1.24***	**1.20-1.27**
Education				
None (RC)	1.00		1.00	
Primary	**1.28***	**1.16-1.42**	**1.27***	**1.14-1.42**
Higher	**1.32***	**1.17-1.48**	**1.50***	**1.30-1.75**
Place of Residence				
Urban (RC)	1.00		1.00	
Rural	**0.86***	**0.78 – 0.95**	**0.83***	**0.73 – 0.93**
Region				
Northern (RC)	1.00		1.00	
Central	**1.54***	**1.38 – 1.71**	**1.83***	**1.63-2.05**
Southern	**1.65***	**1.50 – 1.83**	**2.16***	**1.93-2.41**
Visited by FP workers in the last 12 months				
No(RC)	1.00		1.00	
Yes	**1.35***	**1.23 – 1.47**	**1.20***	**1.09-1.32**
Occupation				
Not working (RC)	1.00		1.00	
Professional	0.81	0.58-1.16	0.90	0.63-1.27
Agricultural	**1.12***	**1.03-1.22**	1.05	**0.96-1.16**
Skilled	**1.30***	**1.18-1.43**	1.31	1.18-1.46
Unskilled	1.16	0.99-1.35	**1.27***	**1.07-1.50**
Fertility intention				
No more children(RC)	1.00		1.00	
Wants more in 2 years	**0.38***	**0.33-0.43**	**0.42***	**0.36-0.49**
Wants after 2 years	**1.25***	**1.17-1.35**	**1.26***	**1.15-1.38**
Wants but unsure of timing	**0.18***	**0.13-0.26**	**0.42***	**0.30-0.59**
Undecided	**0.64***	**0.50-0.82**	**0.71***	**0.55-0.92**

Wealth Index				
Poor(RC)	1.00		1.00	
Middle	**1.16***	**1.06-1.27**	**1.11***	**1.01-1.27**
Rich	**1.13***	**1.04-1.22**	**1.34***	**1.04-1.25**
Religion				
Roman Catholic (RC)	1.00		1.00	
Other Christian Denominations	1.00	0.92-1.08	**1.00**	0.91-1.09
Muslim	**0.74***	**0.66- 0.85**	**0.67***	**0.57-0.74**
No religion	0.63	0.39-1.01	**0.58***	**0.35-0.96**

* Significant at 5% level; *RC* Reference Category

The more educated a woman is, the more likely she is to use LARC methods. Primary educated women are 1.28 times more likely to use LARC methods when compared to uneducated women. As expected, women with secondary and higher education have higher odds (1.32) of LARC use when compared to uneducated women and women with primary education.

There are rural-urban differentials in the use of LARC methods. Being a woman from the rural area reduces the odds of using LARC methods by 14%. Additionally, the variation in LARC method use is also evident according to region of residence. Women in the Central and Southern regions are 1.54 times and 1.65 times, respectively, more likely to use LARC methods than women in the Northern region. Women in the Southern region have the highest odds of using LARC methods among the three country regions.

Agricultural women are 1.12 times more likely to use LARC methods than unemployed women. Women in the Skilled occupations are 1.30 times more likely to use LARC methods, when compared to unemployed women.

Women who were visited by family planning workers in the last 12 months are 1.35 times more likely to use LARC methods than those who did not receive such as visit.

Fertility intention is also significantly associated with LARC use. Women who want to have children within 2 years of the survey, who are undecided about their fertility intention, and those women who want more children, are less likely to use LARC methods when compared to those who do not have any future intention to bear children. Women who are postponing child bearing are 1.25 times more likely to use LARC methods when compared to those who are limiting.

Women in the middle and upper income classes are more likely to use LARC methods than poor women. However, women from the middle class have higher odds (1.15) of using LARC method, when compared to respondents from the upper classes (1.13).

4.3.2 Multivariate Results

The results for the multivariate analysis are presented in Table 4.2.

Having controlled for selected factors, age is negatively associated with LARC use. The results indicate that as the age increases, the likelihood of LARC method use decreases. Being a young adult aged between 25 and 34 years old decreases the odds of using LARC methods by 6%. . Also being older than 35 years decreases the odds of using LARC by 72%.

Women who want to limit or postpone having a child are more likely to use LARC methods than women who want a child in 2 years, or those who are undecided on when to have a child. Women who wanted to postpone having a child to after 2 years, were 1.26 times more likely to use LARC methods than women who did not want any more children.

Another expected result is that women with a higher level of education are more likely to use LARC methods. Women with a primary level of education are 1.27 times more likely to use

LARC methods than the uneducated respondents, whereas those with a higher education where 1.50 times more likely to use LARC methods than the uneducated respondents.

Women who are in professional occupation who are most likely to be educated to tertiary level have decreased odds of using LARC methods by 10%, though it is not statistically significant. However, statistically significant results are for respondents who work in the skilled sector, who are 1.31 times more likely to use LARC methods, whereas those with unskilled labour are 1.27 times more likely to use LARC methods than unemployed women.

There is regional variation in the use of LARC methods after controlling for other socio-economic and demographic factors. The results indicate that women in the Southern region have the highest odds of using LARC methods. Central and Southern regions are 1.83 and 2.16 times more likely, respectively, to use LARC methods than women in the Northern regions. This is a surprising result, since the Northern region is believed to fare better socio-economically than the Southern and Central regions.

The association between place of residence and LARC use is significant. Being a woman from the rural areas decreases the odds of LARC use by 17%.

The variable ‘visit by family planning worker in the last 12 months’ is also significantly associated with LARC use. Respondents who were visited by the family planning worker are 1.20 more likely to use LARC methods than women who were not visited.

Being a Muslims decreases the odds of using LARC methods by 33% when compared to Roman Catholics.

Wealth status, a proxy for social class, is significantly associated with the use of LARC methods. The results implies differential in LARC use according to wealth, with rich respondents being more likely to use the methods than poor respondents. Rich respondents are 1.34 times more likely to use these methods, whereas those of the middle classes are 1.11 times likely to use LARC methods when compared to women who are poor.

CHAPTER 5

DISCUSSION

5.1 Introduction

This study investigated the factors that influence the use of LARC methods (Norplant, IUD and Depo-Provera contraceptive injectable) among sexually active women aged between 15 and 49 in Malawi. There are limited studies in Southern region which explore determinants of LARC methods which can be used for policy formulation. Recent scientific findings on the economic and health benefits from using LARC methods make it necessary to study the determinants in a bid to promote their use in Malawi, a country that has challenges such as unplanned pregnancy. Additionally, family planning is still very important and there is a need for continual updating of existing literature.

The argument in the literature is that the more educated a woman is, the more likely she is to use modern contraception (Ainsworth, 1996; Adanu, 2009; Benefo, 2006; Saleem & Babok, 2005). Women of higher education are more likely to use LARC methods because educated women are more likely to be aware of the disadvantages attached to unplanned pregnancies and are more likely to choose LARC methods, which are highly effective in pregnancy prevention. A similar result was found in a study by Wellings (2007) in the United Kingdom. However, Frost's (2008) who carried the study in the United States of America had different results from the current study as he reported that uneducated women were more likely to use long acting reversible methods than educated women. Frost (2008) argues that this is due to the fact that disadvantaged women in the study had access to the IUD and or the implants at cheaper prices from those made

available at publicly-funded institutions. Thus the hypothesis that educated women are more likely to use LARC methods is proven by the results of the study.

Age is a demographic factor whose influence on modern contraception is well-established in literature (Stephenson, 2007). However, studies have had differing explanations on how and why certain age groups are more likely to use any method of modern contraception. Findings from the study indicate that having controlled for selected factors, women older than 24 years were less likely to use LARC methods when compared to young women aged between 15 and 24 years old. Similarly, Tang (2012) observes that younger women aged between 14 and 17, were more likely to use LARC methods than older women between 35 and 43. The reason for this finding in the current study and Tang's (2012) study is due to the high proportion of older women using permanent methods like sterilization. In Malawi, sterilization is very common among women who would have reached their desired reproductive goals. Malawi is one of the countries in the Sub-Saharan region with a high rate of sterilization use among older women who are sexually active (Jabostein 2013, NSO & Macro 2011). According to Jacobstein (2013), the country has 10% of currently married women aged 15-49 using female sterilization as a contraception. The sterilization prevalence rate is higher than that of some developed countries (Jacobstein 2013). This finding can be indicative of provider bias of certain contraceptive methods for certain age groups (Dempsey 2012, Haimovich 2009). It can be argued then that in Malawi, providers are more likely to prescribe long-acting reversible contraceptives to younger women who want to postpone or limit births, and to prescribe permanent methods to older women who want to limit births. Another possible reason for younger women using a given LARC method more than older women could be, as found in a study by Whitaker (2010), that young women aged between 15

and 24 are at higher risk of unintended pregnancy, thus are more likely to use the methods to space out and/or limit births.

Bledsoe (1998) had different results in his study of women in rural Gambia from those results of the current study. Bledsoe (1998) found that younger women favored short-term methods such as pills, and older women above the age of 30 were more likely to use LARC methods such as the Depo-Provera. Bledsoe (1998) argued that older women realized their vulnerability to the health risk associated with pregnancy, such as painful and long labour, hemorrhage and death. Therefore, older women used long-acting reversible methods to create and maintain longer intervals between births. Younger women who still have the strength and health which allows them to recuperate quickly from each birth, were not afraid to have more closely spaced births. As a result, the young women used short acting methods, or no method of modern contraception. Kavanaugh (2011) also found that older women between the ages of 35 and 44 years, were more likely to use LARC methods than the younger age groups. Therefore, the proposed hypothesis that young women in the study are less likely to use LARC methods not proven.

The study results support the hypothesis of the study that the greater the number of living children a woman has, the more likely she is to use LARC methods. A similar result was found in a study by Thomas (1996) and Whitaker (2010). This could be because since Malawi has a traditional society which promotes high fertility, women are less likely to use LARC methods before their first child in order to demonstrate fertility. Women with more than 5 children are especially more likely to use the highly effective methods, since they would have reached the end of their reproductive life. The current study result is different to the results noted in Khan's study (1996), who compares the influence of the number of living children a woman has on the

use of long acting methods and short-term methods. He concludes that women with low parity tend to adopt more effective and long-acting methods for child spacing, whereas older women with higher parity tended to favour permanent methods, such as sterilization.

The study findings do not support the hypothesis that the women in the Northern region are more likely to use LARC methods because the region has the best socioeconomic conditions in the country. The reason why women in the Southern region, which is considered to have the worst socio economic conditions in the country, are more likely to use LARC methods could be because conscious efforts being made by the government to provide services such as family planning to disadvantaged areas. Though the Northern and the Central regions have better socioeconomic factors, the influence of socio-cultural factors at community levels such as cultural norms which promote high birth rates can influence women not to adopt LARC methods despite being educated (Clements 2004). Clements' (2004) finding that regions of low socio-economic status are more likely to have low use of contraceptives is in contrast to what the current study finds. However, the results of the study are similar to the findings of Lawrence (2000), who reports that in the Malawi Demographic and Health Survey of 2000, women in the Southern region were more likely to use modern contraception. The perpetuation of the trend that the Southern region has highest use of modern contraceptive methods implies that there are regional differentials in the availability and accessibility of LARC methods among other modern methods in the country.

The results of the study indicate that women in rural areas are less likely to use LARC methods than women in urban areas. Malawi is predominantly rural, which makes it very challenging for women to access health services (Solo, 2005). These results are consistent with findings in most

developing countries. Vaaler (2011) asserts that the main reason for rural and urban differentials is because of accessibility, limited availability of the methods and lack of trained providers to insert particularly the implants and Copper IUD in the rural areas. This also explains why the commonly used LARC method among all the respondents is the Depo-Provera injectable. It does not require the same level of clinical expertise required by the other methods (Copper IUD and Norplant), thus it is most convenient for poorly resourced rural areas of Malawi. Haimovich (2009) also shows that providers in European countries tend to be biased in the prescription of LARC methods, and are also influenced by the availability of the LARC method. The Levonorgestrel-releasing intra-uterine device was the most commonly used LARC method. Magadi (2003) also finds that in Kenya, urban women were more likely to use long-term methods than the women in rural areas.

The results indicate that married women in Malawi are more likely to use LARC methods than women who are not married (never married and formerly married women). This finding is similar to finding by Magadi (2003) and Frost (2008). A possible reason for unmarried women being less likely to use LARC methods is that these women usually have less frequent sexual encounters, thus are more likely to use independent methods such as the condoms. Additionally, since marriage and high fertility is so important in Malawi, married women might be aware that child spacing using highly efficient methods not only promotes their own health and that of their children, but also enables them to have as many children as possible safely. Magadi (2003) also adds that those never married, who are usually in unstable relationships, are less likely to use LARC methods, because they prefer condoms which provides protection from sexually-transmitted diseases.

As expected, women who were visited by a family planning worker in the 12 months preceding the survey were more likely to use LARC methods. This could be because women become aware of the range of effective methods available to them. Family planning workers are more likely to dispel any myths and misconceptions that usually come from friends or community, who would have had negative experiences with the contraceptive methods, thus promoting the use of LARC methods. Rose (2011) found that a lack of knowledge about LARC methods, especially the IUD and implants, is one of the main reasons for their low use among women at risk of unintended pregnancy (Rose, 2011).

CHAPTER 6

CONCLUSION AND RECOMMENDATIONS

6.1 Conclusion and Recommendations

The aim of the study was to investigate factors that influenced the use of long acting reversible contraceptive (LARC) methods among sexually active women aged between 15 and 49 in Malawi.

The prevalence of LARC use is 26% which suggests a great need to strengthen the family planning interventions in Malawi in order to increase LARC methods use among sexually active women. Increasing the prevalence of LARC methods is very important since it will directly reduce the rate of unintended pregnancy in the country.

From the results, it can be recommended that;

- The government should continue to promote education of women since formal education especially significantly increases uptake of LARC methods.
- There is need for strategies to be put in place to eliminate the regional variation in LARC method use in the country.
- There is need to promote the use of the LARC methods especially among women older than 24 years. This can be done through increasing awareness and knowledge of the methods
- The use of mobile family planning workers is also crucial to increase awareness and knowledge about LARC methods which promotes use.

There is need for research on the LARC-prescribing practices of healthcare providers in the country. The results can be used to inform policy on how much of a barrier to LARC method use the providers might be, as well as to map strategies to improve healthcare providers' knowledge and confidence in LARC methods.

Additionally, there is need for research into factors which are promoting regional variation of LARC use in the country.

References

Adanu, R., Seffah, J., Hill, A.G, Darko, R., Duda, R. & Anarfi, J.K. (2009). Contraceptive Use by Women in Accra, Ghana: Results from the 2003 Accra Women's Health survey. *African Journal of Reproductive Health, 13*(1); 123-133

African Development Bank. (2011). *Interim Country Strategy Paper 2011-2012*. African Development Bank.

Ainsworth, M., Beegle, K & Nyamete, A. (1996). The Impact of Women's Schooling on Fertility and Contraceptive Use: A Study of Fourteen Sub Saharan Countries. *The World Bank.* 18(1); 85-122

Benefo, K. (2006). The Community Level Effects of Women's Education on Reproductive Behaviour in Rural Ghana. *Demographic Research, 14*(20); 485-506.

Bledsoe, C., Banja, F. & Hill, A. (1998). Reproductive Mishaps and Western Contraception: AN African Challenge to Fertility Theory. *Population and Development Review, 24*(1); 15-51

Blumenthal, P. Shah, N., Jain, K., Saunders, A., Clements, c. Luca, B., Jafa, K. & Eber, M. (2012). Revitalizing long-acting reversible contraceptives in settings with high unmet need: a multicounty experience matching demand creation and service delivery. *Contraception,* 87(2):170-5. doi: 10.1016/j.contraception.2012.10.002

Blumenthal, P., Voedisch, A. & Gemzell-Danielsson. K. (2011). Strategies to Prevent Unintended Pregnancy: Increasing use of Long Acting Reversible Contraception. *Human Reproduction Update, 17* (1): 121–137.

Bongaarts, J. (1978). A framework for analyzing for the proximate determinants of fertility. *Population and Development Review, 4*: 105-132.

Bradley, S., Croft, T. & Rustein, O. (2011). The Impact of Contraceptive Failure on Unintended Births and Induced Abortions: Estimates and Strategies for Reduction. *DHS Analytical Studies No.22*. Calverton, Maryland, USA: ICF Macro.

Caldwell, J. & Caldwell, P. (1987). The Cultural Context of High Fertility in Sub Saharan Africa. *Population and Development Review, 13*(3):409-437.

Clements, S., Baschieri, A., Hennink, M., Madise, N. & Stephenson, R. (2004). *Explaining Areal Variations in contraceptive use in East Africa. S3RI Applications & Policy Working Paper*

Cohen, B. (2000). Family Planning Programs, Socioeconomic Characteristics and Contraceptive Use in Malawi. *World Development*, *28*(5): 843-860.

Creanga, A., Gillespie, P., Karklins, S. & Tsui, A., (2011). Low Use of Contraception Among Poor Women in Africa: An Equity issue. *Bulletin World Health Organisation, 89*:258-266.

Dempsey, A., Billingsley, C., Savage, A. & Korte, J. (2012). Predictors of long-acting reversible contraception use among unmarried young adults. *American Journal of Obstetrics and Gynecology, 206*(6):

Do, M. & Kurimoto, N. (2012). Women's Empowerment and Choice of Contraceptive Methods in Selected African Countries. *International Perspectives on Sexual and Reproductive Health, 38*(1): 23 – 33.

Finer, L., Jerman, J. & Kavanaugh, M. (2012). Changes in the use of long-acting contraceptive methods in the United States, 2007-2009. *Fertility and Sterility, 98*(4):893-897.

Frost, J. & Darroch, J. (2008). Factors associated with contraceptive choice and inconsistent method use. *Perspectives on Sexual and Reproductive Health, 40*(2):94-104.

Gakidou, E & Vayena, F. (2007). Use of Contraception by the Poor is Falling Behind. *PLos Medicine. 4*(2).

Galpin. J. (2011). Statistical Research Design and Analysis [Course notes]. Johannesburg, South Africa: University of the Witwatersrand

Gipson, J., Koenig, M. & Hindin, M. (2008). The effects of unintended pregnancy on infant, child, parental health: A review of the literature. *Studies in Family Planning, 39*(1):18-38.

Government of Malawi. (2012). *Why Population Matters to Malawi's Development: Managing Population Growth for Sustainable Development*. Author.

Gyimah, S., Adjei, J. & Takyi, B. (2011). Religion, Contraception, and Method Choice of Married Women in Ghana. *Journal of Religion and Health,* 51(4):1359-74. doi: 10.1007/s10943-011-9478-4

Haimovich, S. (2009). Profile of LARC users in Europe. *The European Journal of Contraception and Reproductive Health Care, 14*(3): 187-195.

Hubacher, D., Mavranezouli, I. & McGinn, E. (2008). Unintended Pregnancy in Sub-Saharan Africa: Magnitude of the problem and Potential Role of Contraceptive Implants to alleviate it. *Contraception, 78:* 73-78.

Jacobstein R. (2013). Lessons from the recent rise in use of female sterilization in Malawi. *Studies on Family Planning,* 44(1): 85-95

Jacobstein, R. (2007). Long Acting and Permanent Contraception: An International Development, Service Delivery Perspective. *Journal of Midwifery and Women's Health, 54*(2).

Jacobstein, R., Bakamjian, L., Pile, J.M. & Wickstrom, J. (2009). Fragile, Threatened and Still Urgently Needed: Family Planning Programs in Sub-Saharan Africa. *Studies in Family Planning,* 40(2): 147-154

Kaggwa, E. B., Diop, N. & Storey, J.D. (2008). The Role of Individual and Community Normative factors: A Multilevel Analysis of Contraceptive Use among Women in Union in Mali. *International Family Planning Perspective, 34*(2):79-88.

Khan, M. & Raham, M. (1996). *Determinants of Contraceptive Method Choice in Bangladesh. MCH-FP Extension Project (Rural) Working Paper No. 117.* ICDDR, B Working Paper No. 54.

Kavanaugh, M.L, Jerman, J., Hubacher, D., Kosk, K. & Finer, L. (2011). Characteristics of women in the United States who use Long acting Reversible Contraceptives. *Obstetrics and Gynecology*. *117*(6): 1349-57

Lawrence, R. (2000). Who is using modern contraception in Malawi? Evidence from the Malawi Demographic Health Survey 2000. *Evaluation of Reproductive Health Services.*

Lipetz, C., Phillips, C, Flemings, C. (2009). The Cost effectiveness of a long-acting reversible contraceptive (Implanon) relative to oral contraception in a community setting. *Contraception, 79*(4):304-9.

Madagi, M. & Curtis, S. (2003). Trends and Determinants of Contraceptive use in Kenya. *Studies in Family Planning, 34*(3): 149-159

Malawi Ministry of Health (MOH) & IntraHealth International. (2010). Preservice Education Family Planning Reference Guide. Lilongwe, Malawi: MOH.

Mavranezouli, I. (2008). The cost-effectiveness of long-acting reversible contraceptive methods in the UK: analysis based on a decision-analytic model developed for the National Institute for Health and Clinical Excellence (NICE) clinical practice guideline. *Human Reproduction*, *23*(6):1338-1345.

National Statistical Office (NSO) and ICF Macro. (2011). *Malawi Demographic and Health Survey 2010.* Zomba, Malawi, and Calverton, Maryland, USA: NSO and ICF Macro.

NICE. (2005). *Long Acting Reversible Contraception: The Effective and Appropriate Use of Long Acting Reversible Contraception.* National Collaborating Centre for Women's and Children's Health.

Moreau, C., Bohet, A., Le Guen, M., Bajos, N. & The FECOND Working Group. (2013). *Trends and barriers of use of long acting reversible contraception in France: Results from a population based survey*. http://paa2013.princeton.edu/papers/131764.

Richardson, F., M. Chirwa, M. Fahnestock, M. Bishop, P. Emmart, and B. McHenry. (2009). *Community-based Distribution of Injectable Contraceptives in Malawi*. Washington, DC: Futures Group International, Health Policy Initiative, Task Order 1.

Rose, S.B., Cooper, A.J, et al. (2011). Attitudes Towards Long Acting Reversible Contraceptive Among Young Women Seeking Abortion. *Journal of Women's Health, 20*(11): 1729-35

Secura, G., Allsworth, J., Madden, T., Mullersman, J. & Peipert, J. (2010). Contraceptive CHOICE Project: Reducing Barriers to Long-Acting Reversible Contraception. *American Journal of Obstetrics Gynecology, 203*(2):115e.1-7

Sharan, M., Ahmed, S., May, J. & Soucat, A. (2010). *Family Planning Trends in Sub-Saharan Africa: Progress, Prospects, and Lessons Learned.* Baltimore, Maryland, USA: Johns Hopkins Bloomberg School of Public Health.

Solo, J., Jacobstein, R., & Malema, D. (2005). *Malawi Case Study: Choice not Chance. A Repositioning Family Planning Case Study.* New York: The ACQUIRE Project/EngenderHealth.

Spies, E., Askelson, N., Gelman, E. & Losch, M. (2010) Young women's knowledge, attitudes, and behaviours related to long-acting reversible contraceptives. *Women's Health Issues, 20*(6):394-399.

Stephenson, R., Baschieri, A., Clements, S., Hennink, M & Madise, N. (2007). Contextual Influences on Modern Contraceptive Use in Sub-Saharan Africa. *American Journal of Public Health, 97*(7).

Takele, A., Degu, G. & Yitayal, M. (2012). Demand for long acting and permanent methods of contraceptives and factors for non-use among married women of Goba Town, Bale Zone, South Ethiopia. *Reproductive Health, 9* (26):26

Tranfer, K. Wierzbicki, S. & Payn, B. (2000). Why are U.S Women Using Long-Acting Contraceptives? *Family Planning Perspectives, 32*(4): 176-183.

The Respond Project. (2

009). Malawi: Meeting National Goals and People's Need with LA/PM's

Thomas, D. & Maluccio, J., (1996). Fertility, Contraceptive Choice, and Public Policy in Zimbabwe. RAND

Tolaymat, L., Kaunitz, A. (2007). Long-acting contraceptives in adolescents. *Adolescent and Pediatric Gynecology*, *19*(5):453-460.

Varney, S & Guest J. (2004).Relative cost effectiveness of Depo-Provera, Implanon and Mirena in reversible long-term hormonal contraception in the UK. *Pharmacoenomics, 22*(17):1141-51

Wellings, K., Zhihong, Z., Krentel, A., Barrett, G.& Glaiser, A. (2007). Attitudes towards long-acting reversible methods of contraception in general practice in the UK. *Contraception, 76*(3): 208-214.

Whitaker, A., Dude, A., Neustadt, Gilliam, M. (2010). Correlates of use of long-acting reversible methods of contraception among adolescents and young adult women. *Contraception, 81*(4):299-303.

Whitaker, A., Johnson, L., Harwood, B., Chiappetta, L., Crenin, M. & Gold, M. (2008). Adolescent and young adult women's knowledge of and attitudes toward the intrauterine device. *Contraception,78*:211–7.

White, J. & Speizer, I. (2007). Can Family Planning outreach bridge the urban-rural divide in Zambia. *BMC Health Services Research, 7*:143.

WHO. (2011). *Malawi: Cooperation at a glance*. World Health Organization

Yeatman, S. & Trinitapoli, J. (2008). Beyond Denomination: The Relationship between Religion and Family Planning in Rural Malawi. *Demographic Research, 19(*55).

Winner, B., Peipert, J., Zhao, Q., Buckel, C., Madden, T., Allsworth, J., Secura, G. (2012). Effectiveness of long acting reversible contraception