

Socio-economic related inequalities in the utilization of family planning services among women of childbearing age in Zambia: a Cross-sectional study

By

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DECLARATION

I, **Ndhlovu Simang’aliso** declare that this research document being presented for the Degree of Masters of Public Health (Health Policy and Management) has not been previously submitted either wholly or in part for other Degree at this or any other University nor is being currently submitted for any other Degree. I bear full responsibility for the views, defects and errors of omission which might be found in this work.

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CERTIFICATE OF APPROVAL

This dissertation of Ndhlovu Simang'aliso is approved as fulfilling the requirement for the award of the Degree of Masters of Public Health (Health Policy and Management) by the University of Zambia.

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LIST OF ACRONYMS

CBDs	Community Based Distributors
CPR	Contraceptive Prevalence Rate
CSA	Census Supervisory Area
CSO	Central Statistics Office
MoH	Ministry of Health
SSA	sub-Sahara Africa
USAID	United States Agency for International Development
UN	United Nations
UNFPA	United Nations Population Fund
UNICEF	United Nations Children’s Fund
UNZABREC	University of Zambia Biomedical Research Ethics Committee
WB	World Bank
WHO	World Health Organization
ZDHS	Zambia Demographic and Health Survey

DEFINITION OF KEY TERMS

Unmet need - refers to a situation where a couple is not using any family planning method but does not want to have another child or they would want to space the next birth.

Family Planning – refers to working out a plan by a couple on when and how many children to have and how to prevent unwanted pregnancies.

Use of family planning – the ability and practice of an individual man or woman to use family planning services and contraceptives.

Socio-economic – examines social and economic factors to better understand how the combination of both influences the utilization of family planning services.

Inequality – the condition of being unequal; lack of equality. In the study, it implies unequal or lack of equality in accessing and utilization of family planning services.

Spouse / Partner – men or women who are either married, living together or who are sexually involved and have children together

Women of childbearing age – women at their reproductive age (15 – 49 years)

Quintile - The wealth index is a categorical variable with five categories of quintiles which included: highest wealth quintile (richest), secondary (rich), middle (middle), fourth (poor) and lowest wealth quintile (poorest).

Educational attainment - the level of education attainment was analysed as a categorical variable. Classification of education is by primary (seven years of schooling and below); secondary (up to 12 years of schooling) and tertiary (more than secondary level of education).

Age - This is in years but analyzed as a categorical variable classified in 5 year age groups (15-19, 20-24, 25-29, 30-34, 35-39, 40-44 and 45-49). The age in years gives the rate of probability of family planning utilization as age increases thus capturing the non-linearity of the age effect.

Province - this is the respondent's provincial residence (Central, Copperbelt, Eastern, Luapula, Lusaka, Muchinga, Northern, North Western, Southern and Western provinces). It is expected that there are provincial variations in family planning utilization due different types of people

found in the different provinces.

Marital status: this was constructed as a binary variable; married and not married.

ABSTRACT

Background: There is a large literature that has documented inequalities in utilization of healthcare in Zambia, and the rest of sub-Saharan Africa. However, there is little or no literature that is focussing on inequalities in utilization of family planning services and decomposition of the factors driving differences in family planning use. Zambia is particularly interesting because there has been documented increase in healthcare utilization in many dimension but also increases in inequality. Although utilization of family planning services has increased from 15% in 1992 to 48% in 2018, it is not clear if this progress is benefiting everyone or only restricted to the well-off. This paper examines socio-economic related inequalities in the utilization of family planning services among women of childbearing age in Zambia.

Methods: Using secondary data from the 2013-2014 Zambia Demographic and Health Survey, Concentration curves and indices are applied to the 12,498 women of childbearing age to examine how pro-poor and pro-rich the distribution of family planning is. A Blinder-Oaxaca decomposition analysis is conducted to decompose the rural-urban differences in use of family planning services among women of reproductive age.

Results: Of the 12,498 participants, 5,662 (45%) used family planning and 6,836 (55%) did not. Among these participants, 8,173 (65.39%) were married and 4,325 (34.61%) were not married with an average of two children. Although the resulting concentration curves and index show that there is inequality in family planning utilization in Zambia (CI=0.590, P=0.055) and rural areas (CI=0.4009, P=0.0730), there is equality in utilization of family planning services in urban areas (CI=0.049, P=0.159). Utilization of this service among urban women is 5.16 percentage points higher than rural areas. Some of the factors driving this gap with positive contribution are the richest group (54.79%), women with 1-3 children (30.36%), tertiary education (79.46%) and age group of 45-49 years (53.68%) while those with negative contribution were women with 7 and more children (-48.22%), with 4-6 children (-16.96%), being married (-43.45%), primary education (-33.93%), middle wealth group (-43.75%) and poorer (-22.34%).

Conclusion: Despite progress in use of family planning services, it is imperative to note that socioeconomic inequalities in use have persisted. Based on the findings, the study suggests that interventions to increase family planning use should aim at addressing rural socioeconomic disadvantage, with programs targeting poor women and those with low levels of education.

CHAPTER ONE: INTRODUCTION 1.1 Background

Family planning saves lives of both the woman and the new born and preserves their health by preventing unwanted pregnancies as well as maternal and newborn deaths. Therefore, family planning is a requirement and a human right central to gender equality and women's empowerment, and a key factor in reducing poverty (Newman & Feldman-Jacobs, 2015). In addition, family planning improves the health and economic well-being of families and communities, and ensures women's planned childbearing in order to achieve education and career goals which could raise family income thereby reducing poverty (Population Reference Bureau, 2012).

Globally, the world's total fertility rate has dropped dramatically, from 5 children per woman in the early 1970s to 2.6 children per woman in 2011 largely owing to more widespread use of contraceptives especially in the developing world (WHO, 2011). Additionally, the prevalence rate of developed world's family planning utilization is at 62% while in less developed countries, modern contraceptive method is about 43% (WHO, 2011). According to Cahill et al., (2018), the use of modern contraceptive has increased globally from 48% in 1990 to 57% in 2015. This report reviewed that contraceptive use was much higher in the developed countries than in underdeveloped countries. In addition, low use of family planning services in less developed countries have contributed to high population growth leading to negative environmental and economic outcomes such as impacts of over-farming, deforestation, water pollution to eutrophication and global warming (Leblanc, 2018).

In Africa, one in 26 women of childbearing age die from maternal causes, as opposed to one in 9400 in Europe which implies that between the poor and the wealthy countries, there exist parallel disparities in fertility and in family planning utilization (Creanga et al., 2011). Further, in developing countries, Africa inclusive, attempts have been directed towards advances in promoting and provision of effective family planning utilization, but success has been limited (Agadjanian et al., 2015). For instance, according to Nair & Navaneetham (2015), the unmet need for modern contraceptive among women of childbearing age in Africa who wish to avoid pregnancy and were not using any family planning methods was high at about 53%. In sub-

Sahara region some 214 million women who want to avoid pregnancy are not using safe and effective family planning methods (UNFPA, 2016). As a result, most of the countries with the lowest rates of contraceptive use have the highest maternal, infant, and child mortality rates. In addition, according to UNFPA (2017), 7.1 million unintended pregnancies, 20,000 maternal deaths, 126 000 child deaths and 2.2 million unsafe abortions occur in developing countries especially in the rural areas. Rural and poor women use family planning services less compared to their urban and richer counterparts which could promote poverty by slowing economic growth (USAID, 2007). Further, these differences have disadvantaged the rural and poor. Therefore, reducing inequalities in family planning use could improve the health outcomes by reducing poverty and improving the quality of life of women (Aslam et al., 2016).

Education level, population distribution, and cultural expectations and its determinacy could lead to increase in demand for family planning services among women of childbearing age. Education level could be a determinant of demand for family planning services among women of childbearing age (Ortayli & Malarcher, 2010). In addition, education increases demand for family planning utilization services as better educated individuals have a higher efficiency in the production of health, educated women would prefer to have a reasonable number of children that they can manage (MoH, 2012).

Resistance of family planning services due to cultural expectation has contributed greatly to the unmet need for family planning utilization, example, some traditions expect a woman to have a lot of children, hence likely not to use family planning services until the required number of children is met. In some cultures, especially in the sub-Saharan region where women are viewed as child bearing objects, utilization of family planning services is lowest (Bongaarts, 2013).

In Zambia, according to Collins & Gilmartin (2016), the contraceptive prevalence rate (CPR) was at 45% for modern family planning methods for the married or in union couples and 48% in 2018 (CSO, 2018). Further a wide gap in the utilization is seen between the rural and urban areas, and the gap between the rich and poor in family planning utilization has persisted despite improvements in socio-economic status and the expansion of family planning services in Zambia (Population Council, 2016). These disparities have disadvantaged the rural and poor women of childbearing age. Therefore, contraceptive use disparities between the rural and urban women, the

rich and poor remain an obstinate challenge which needs to be solved to achieve rapid growth in family planning use by the whole population (Zakus et al., 2015).

Zambia is among countries that aim to move towards universal health coverage through access to adequate and satisfying family planning services which are of acceptable quality (WHO, 2012). However, previous studies have revealed inequities in health care utilization in the favour of the urban rich based individuals. Furthermore, those with the greatest need for family planning services, i.e. the rural based individuals, are not getting a fair share because progress has lagged far behind (White & Speizer, 2007). According to Mwikisa & Hjortsberg (2002), though equity in access in all health services utilization is inscribed in the Zambian government documents, there is evidence suggesting that the rural-based populations who need the health services such as family planning services are not receiving their reasonable share. In order to reach the women, family planning services are integrated in reproductive health services specifically Maternal and Child Health services and safe motherhood because it affects motherhood. These programs are more on women because women have been viewed as their primary clients as they are the women who become pregnant and most family planning methods are designed for them (UNFPA, 2004).

The distribution and utilization of family planning services between the rural and urban population of Zambia is an important aspect for public policies aimed at reducing poverty through ensuring that families have reasonable number of children that they can manage to take care of (MoH, 2012). In addition, the distribution of family planning services helps in fostering development especially in the non-developed areas of the country because investing in family planning enables women and young people to complete their educations, it saves governments money, and it helps entire communities and nations thrive (Longwe & Smits, 2012). A woman is considered to have met her need for contraceptives for spacing births when she is on family planning method and indicates that she does not want to conceive now but sometime in the future, usually after 2 years of her last birth (UNFPA et al., 2016). A woman can also be considered to have met her contraceptive need to limit births when on family planning method and decides that she wants to have no more children in the future (Cleland et al., 2011).

Various strategies and policies have been put in place to facilitate the use of family planning services as a step towards reducing the fertility rates, increasing CPR and reducing the unmet

family planning needs in Zambia. The Zambian Government through the Ministry of Health in 2012 developed policy measures which included strengthening the integrated Reproductive Health services including male involvement, strengthen maternal and child health programs, strengthen community involvement in maternal and child health including the roles of traditional birth attendants and Safe Motherhood Action Groups (SMAGs), Advocate for public policies that support and promote health and strengthen health education and promotion (MoH, 2012).

These policy measures were introduced to ensure a nation of healthy and productive people through provision of a continuum of quality effective health care services as close to the family as possible in a competent, clean and caring manner (MoH, 2012). Despite these policy measures, fertility rate is still high at about 5.3 births per woman, and only 49% of married or in union use family planning (CSO, 2015). According to CSO (2015), the high fertility rate together with low contraceptive use and unmet needs for family planning services could be contributing towards the high population growth which could hinder economic growth and equality of resource distribution.

Further, studies have shown that on average, urban women use more family planning services than their rural counterparts (CSO, 2015). In addition, the economy, income generating activities, property and household income could have possible different effects on family planning services uptake. It was predicted to have a positive impact on family planning utilization, because higher income leads to an increase in demand for the resources involved in acquiring the services. Contraceptive use was found higher among employed women than that of unemployed women because the employed has the capacity to purchase. Employment status can be correlated with the utilization of family planning services because employed women with a reasonable income are likely to have a higher uptake of family planning services (Hindin et al., 2014). This paper examines the socio-economic related inequalities of family planning service utilization amongst women of reproductive age (15 - 49 years) in Zambia and the factors that explain the gap in utilization between rural and urban populations.

1.2 Statement of the Problem

Zambia's population growth rate was at 3.0% with fertility rate of about 6.2 births per woman (World Bank, 2018). Further, according to CSO, (2018) only 48% of married couples or in union

use modern method of family planning while unmet need for family planning was at 20%. Unplanned births and unwanted pregnancies were at 40% and 16%, respectively (CSO, 2015).

Low use of family planning services in Zambia has contributed to high population growth and high fertility rate which could have lead to negative environmental and economic outcomes such as impacts of over-farming, deforestation, water pollution to eutrophication and global warming (Leblanc, 2018). High fertility rate has also contributed to slow economic growth and distracts from human capital investment in Zambia. In other words, there is low use of contraceptives in Zambia which have lead to high population growth and posed health risks for children and their mothers. This overpopulation has put pressure on the environment, on the Zambian economy and on services such as education, health and water and sanitation services (Banda, 2018). Therefore, there is need to examine socio-economic related inequalities in family planning service utilization amongst women of reproductive age (15 - 49 years) in Zambia.

Further, even though family planning utilization in Zambia has increased in the past years, from 15% in 1992 to 48% in 2018 CSO, (2018), there is uncertainty if this progress is occurring in only a small portion of the population, excluding the poor, or unclear if the increase in utilization is cross cutting or only specific to certain socio-economic groups.

Although access to safe and voluntary family planning counseling and services significantly reduces unwanted pregnancies and abortion and saves women's lives, accessing and utilizing family planning services is still a challenge in Zambia (Belohlav & Karra, 2013). White and Speizer (2007) observed that the CPR was higher in urban areas compared to rural areas by about 25% even after the introduction of Community Based Distributors (CBDs) who visited rural households to promote and offer the family planning services. This means that there is lower utilization of family planning among the rural populations, but it is unclear what factors explain the rural-urban gap. Additionally, we do not know if the inequalities are higher in urban areas compared to rural areas. Therefore, understanding the drivers of rural-urban differentials in family planning utilization is important in addressing the inequalities (Ortayli & Malarcher, 2010). Lower use of contraceptives by the rural population may imply that they bare a disproportionate larger share of the negative consequences of lack of family planning services.

This situation prompts that actions should be taken to improve accessibility and utilization of family planning services. Delaying of pregnancies among women could significantly lower or reduce the population growth rate, generate broad economic and social benefits, in addition to improving and promoting the health of the women (WHO, 2018). The use of any form of family planning method in the prevention of pregnancy reinforces people's rights to determine their family size and helps prevent death of mothers and children by preventing unintended pregnancies (WHO, 2018). This study therefore, seeks to examine socio-economic related inequalities of family planning service utilization amongst women of reproductive age (15 - 49 years) in Zambia.

1.3 Justification of the study

The study will help in understanding the drivers of socio-economic inequalities in family planning utilization among women of childbearing age as general inequality in Zambia has persisted. Additionally, the study results will be used to provide points of intervention to address the various forms of inequality as well as key information that can aid policy makers and other stakeholders craft interventions correctly to address this particular type of inequality.

This study also being among the few studies conducted in Zambia to assess socio-economic related inequalities in utilization of family planning services, it will not only generate important empirical evidence but will also broaden the academic knowledge surrounding inequalities in use of family planning services.

Further, the study will help the government of the Republic of Zambia through the Ministry of Health to come up with deliberate policies to monitor the delivery of family planning services such as monitoring and evaluation strategies and measures for all health facilities as a supervisory tool for improving access and utilization of family planning services.

1.4 Research questions

1.4.1 What is the level of socio-economic related inequalities in the utilization of family planning in Zambia?

1.4.2. Where are the socio-economic related inequalities in family planning service utilization higher or lower, rural or urban areas?

1.4.3. What factors explain the rural-urban gap in the utilization of family planning services?

1.5 Objectives

1.5.1 General objective

To examine the distribution and factors associated with socio-economic related inequalities of family planning service utilization amongst women of reproductive age (15 - 49 years) in Zambia.

1.5.2 Specific objectives

1.5.2.1 To determine the magnitude of socio-economic related inequalities in family planning utilization in Zambia

1.5.2.2 To quantify the level and distribution of socio-economic related inequalities in family planning utilization between the rural and urban population

1.5.2.3 To examine the socio-economic factors that explain the rural-urban gap in the level of family planning utilization between the rural and urban population

1.6 Conceptual Framework

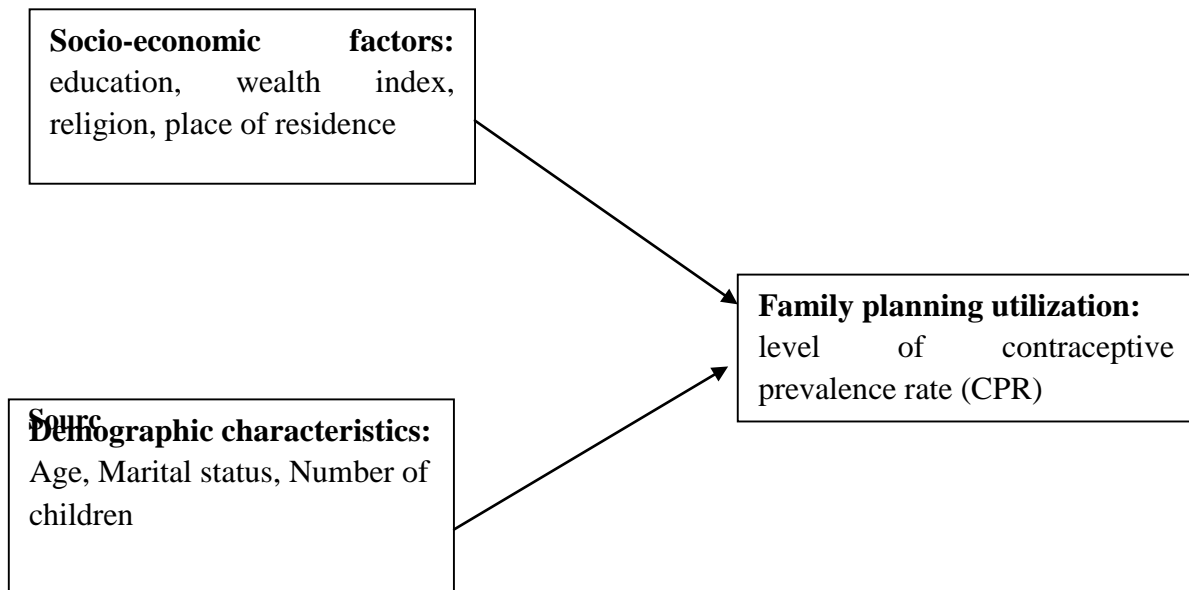
This study centered on a conceptual framework that showed the relationship between the independent and the dependent variables and how they determined demand for family planning utilization services among women of childbearing age in Zambia. The increase in family planning use is as a result of demand and supply intervention programs. This could imply that women accept family planning utilization either because they need contraceptives (demand side) or because family planning services are easily accessible and available (supply side). This framework was based on a human capital approach which is a theory that focuses on the centrality of human beings in the production and provision of family planning services and consumption or demand for this service.

The framework demonstrated factors determining demand for family planning services among women of reproductive age. This is because once there is demand, whatever services are provided, more women will adopt. The framework demonstrated how demand for family planning services among women was influenced. It encompassed variables and how their patterns affected women's

demand for these services. For example, Hindin et al., (2014) found that educational level and higher income lead to an increase in demand for the resources involved in acquiring contraceptives. While Mukasa et al., (2017) argues that supply policies have a major role in increasing family planning utilization. This is because when the services are supplied, more women would use the family planning services for example by overcoming the cultural beliefs or norms that subordinate women. This is so because on the supply side, programs improve access to family planning services through availability of different family planning methods, services and multiple service-delivery channels Hasselback et al., (2017).

Further, the supply side centres on improving quality of care and reduction on direct costs related to family planning utilization. This ensures that women are able to practice family planning effectively. Other studies argue that both demand approach and supply policies are complementary (Amalba et al., 2014). This is because without an increase in demand, the impact of supply program is limited. In addition, without family planning programmes and services, demand may not result in actual utilization of family planning services. For example, Kamal et al., (2010) found that the contraceptive prevalence was highly associated with socio-economic factors, but also that the association was much stronger when family planning programs are well organized. Literature has shown that using a variety of approaches - mixing those that improve the quality of services with those that address socio-economic barriers and those that focus on engaging community and social support promotes increase in utilization of family planning services.

This study therefore, intended to measure the socio-economic related inequalities in the utilization of family planning services among women of childbearing age in Zambia. It answered the question in relation to what may have been the key factors that explain the recent increase in contraceptive use in Zambia. To a certain extent, whether we choose the demand or supply side, utilization of family planning services would increase. Nevertheless, information regarding supply side factors is very inadequate in our dataset. Therefore, the framework below is presented though mainly restricted to the demand side, as it consist both socio-economic factors and factors related to utilization of family planning services.



CHAPTER TWO: LITERATURE REVIEW

The studies that have been reviewed provide a premise to the understanding of socio-economic related inequalities in the utilization of family planning services among women of childbearing age in Zambia. In addition many scholars have discussed family planning in terms of its impact on women's physical health because it promotes women's right to safe motherhood (Joshi & Schultz, 2013). WHO defined family planning as the decision on whether to have children or not, when to have children and how many children to have. Therefore, family planning goes beyond birth control and contraception.

2.1 Socio-economic related inequalities in the utilization of family planning services.

Women's use of family planning services could be impacted by a scope of social and economic components. On the role of social and economic development in fertility decline, there is less utilization of contraceptives in Uganda, Wakiso district due to negative circumstances that block access to information. Negative circumstances included stereotyping and denial of information available on contraceptive provided on the market. The literature further revealed that women don't utilize contraceptives because of side effects experienced and non-availability of essential contraceptive methods. With this, it is thus expected that socio-economic differentials in contraceptive use has widened the gap (Nakirijja & Kayiso, 2018).

An analysis of inequalities in the use of family planning services in 47 developing countries to better understand how to improve the effectiveness of reproductive health policies and programs was conducted by United States Agency for International Development (USAID). It was found that the different countries' degree of inequality at any given level of family planning use varied greatly and further added that inequalities in family planning use were high in countries with low contraceptive prevalence. The results also showed that wealthier and better educated women were more likely to utilize family planning services compared to the poor. There is need to effectively implement pro-poor policies and programs to reduce inequalities in service use (USAID, 2007). Further, literature has shown that there is low utilization of family planning services and this could be attributed to low education levels which could influence the ability of individuals to judge when care should be sought (Ashraf et al., 2009). There is need therefore to examine the socio-economic related inequalities in the utilization of family planning services.

A study by Groot et al., (2018) compared three Demographic and Health Surveys from Ghana and Nigeria in order to analyse the magnitude and trends in wealth-related inequalities in the use of family planning services. They report shows that inequalities in family planning use had persisted in both countries because family planning information and services were more often used by the urban women and wealthier households. This is so because the countries being reviewed are in the same settings. It further revealed that rural women and women in poorer households in Nigeria experienced changes that were inequitable. There was need to look at other socio-economic factors which could have lead to low use of family planning like levels of education, employment and marital status.

In Spain, Ruiz-Muñoz & Pérez (2013) found that age, religiousness, educational level and country of origin coupled with poor contraceptive counseling contributed to high socio-economic related inequalities in the use of contraception. In Pakistan, Aslam et al., (2016) found that the socio-economic inequalities in use of family planning methods persistently exist among the less privileged Pakistan women due to low economic status. Thus, the lower the economic status of a household, the higher the number of non-family planning users. In other words, wealth and education related absolute inequalities among women could have contributed to socio-economic inequalities. Other socio-economic factors like employment, marital status and religion could have been assessed as well.

Inequalities in the percent of demand satisfied among individual women from developing countries with data drawn from 64 Demographic and Health Surveys were due to varying economic status, education and area of residence (Ortayli, 2010). Thus utilization of family planning services were dependent on different socio-economic inequalities. In addition, Amentie (2015) assessed family planning services utilization among women in Assosa District, Benishangul Gumuz Regional State, in western Ethiopia. Results from binary logistic regression showed that privileged women were more likely to utilize family planning compared to the disadvantaged ones. Availability of family planning services, education status, women's attitude towards family planning services and knowledge of family planning were some of the contributors to the inequality of service utilization which also needed to be examined.

Inequalities in family planning utilization existed between the married and the unmarried. When knowledge, attitudes, contraceptive practices and factors related to contraceptive use in Jimma zone, Ethiopia were examined, the results showed that the unmarried were using family planning services more compared to the married (Tilahun et al., 2013). There was need to examine other socio-economic related inequalities like education, number of children, religion and income or wealth levels.

In Chilonga, Mpika district, Muchinga Province, Zambia, it was found that more women in the urban areas were using contraception compared to rural women (Kabonga et al., (2010). The report further cited an example of the urban women from the Copperbelt (19.32%) and Lusaka (21.18%) provinces that used more contraception compared to those women from North-western (4.17%) and Western (6.08%) Provinces who used less than 10 percent contraception. The findings were that most people in the rural areas had little income and were not very knowledgeable about the family planning utilization compared to urban areas and this meant that fertility was high in the rural areas compared to urban areas. She further found that religious affiliations lead to lack of family planning use in the rural areas. There was need to explore other socio-economic related inequalities like education, marital status and cultural beliefs. Furthermore, Mubita-Ngoma & Kadantu (2010) found that there was low contraceptive use among women of reproductive age in Siavonga District, Southern Province, Zambia due to religious beliefs, side effects and partner disapproval. The findings showed a relationship between educational level and use of contraceptives which could imply that educated women used family planning more compared to those women who had less or no education at all. The study didn't examine other socio-economic related variables such as employment, religion, marital status and wealth.

There was a wide gap between knowledge and use of contraceptives among Kazungula women of Southern province, Zambia even though they had vast knowledge about family planning methods (Lemba et al., 2014). This gap was due to the cultural beliefs that men are more superior to women, and women had no freedom of expression on any issues in a home including matters relating to their sexuality. Thus, most women lacked a voice to confront their husbands and convince them to allow them to take up family planning services which could have lead to low contraceptive use. In addition, due to status in society the men appreciated having a lot of children despite their economic status. This contributed to lack of family planning utilization in

Kazungula district among the married women. Health workers' attitudes towards clients in Kazungula district also contributed to low family planning utilization. Apart from knowledge, marital status, cultural beliefs and health workers' attitudes towards clients, there was need to examine other socio-economic related inequalities in family planning use like levels of education, employment, religion and wealth

The low family planning use in Zambia could also be as a result of lack of physical access to reliable contraception offering facilities which could be as a result of long distances (Belohlav & Karra, 2013). Additionally, where family planning services were available and accessible, the decision to use involved two persons, husband and wife who might have conflicting ideas and fertility preferences and misconceptions of contraceptive side effects (Blackstone et al., 2017).

2.2 Quantification of the level and distribution of socio-economic related inequalities in family planning utilization between the rural and urban population

Estimates and presented trends in contraceptive use and demand for family planning at global, regional and country levels revealed that married or in-union women were the majority that used contraceptives in almost all regions of the world, Africa inclusive (United Nations, 2017). This is in line with Cahill et al., (2018), who reported that in the underdeveloped countries, among the rural population, family planning utilization was much lower than the urban populations. There was need to explore why family planning use was lower. A systematic review on family planning and human rights conducted by Newman & Feldman-Jacobs (2015) found that there were disparities in contraceptive use between the rural and urban areas, and within urban areas where the gaps between the poor and the rich existed. The urban poor were marginalized and may fare no better than rural dwellers. Modern contraceptive use was higher in economically advanced countries and lower in most low and middle income countries especially in sub-Saharan Africa. There is need to ensure that policies and programs embrace the well-established benefits of enabling women to choose whether and when to have children (Newman & Feldman-Jacobs, 2015).

A systematic review conducted by Williamson et al., (2009) of qualitative research in examining the limits to modern contraceptive use realized that contraceptive use was low among the rural populations compared to the urban population in sub-Saharan Africa because of lack of knowledge,

limited access and concern over side effects which could lead to infertility. The study did not look at some of the socio-economic related inequalities like education, income and employment. In the same vein, Cleland et al., (2011) systematically reviewed the progress towards the modern contraceptive utilization and found that unless a large and growing number of couples were ready, willing and able to use modern contraception, fertility was not likely to decline at a fast sustained pace in sub-Saharan Africa as the use of family planning was also influenced by status and location. There was need also to look at the socio-economic related inequalities in the use of family planning services.

A study conducted by Tsui et al., (2011) compared two Demographic and Health Surveys in 13 sub-Saharan African countries where they reported both a decrease and an increase in wealth related inequalities in the utilization of family planning services. They found that wealthier countries utilized family planning services more than the non-wealthier countries because they were developed and therefore, contraceptive use was influenced by location. Apart from wealth, there was need to also look at other socio-economic related inequalities in family planning use. Further, Larsson & Stanfors (2014) revealed that fertility rates were still high in sub-Saharan Africa and contraceptive levels were substantially lower than elsewhere in the world because of low education levels among women of reproductive age while empowerment less important in determining family planning utilization. Therefore, there was need to provide basic education to all women on family planning utilization and shifting of gender roles. From their findings, it can be concluded that education is an important component in the improvement of family planning utilization.

A study conducted by Mehata et al., (2014) explored inequalities in the use of modern family planning methods among married women of reproductive age in rural Nepal where they found that only four out of every ten rural women of reproductive age were using a modern family planning method. Further, they found that usage of family planning services was lower among rural younger women than urban ones because of less family planning services offered in the rural areas. There was need to look at accessibility, levels of education and employment levels as well. In California, Yarger et al., (2017) found that utilization of family planning services was lower among the rural adolescent women than among the urban because rural adolescent women faced a lot of barriers in the right to use family planning services which included distance from the facility, lack of sexual

health education and information, less or no sexual and reproductive health services available in rural areas compared to urban. The above barriers contributed to the socio-economic inequalities in family planning use in California. Further, there was need to also look at levels of education and employment among the adolescents.

Contraceptive Prevalence Rate (CPR) was higher in urban areas compared to rural areas in Zambia by about 25% even after the introduction of Community Based Distributors (CBDs) who visited rural households to promote and offer the family planning services (White and Speizer, 2007). This means that there is lower utilization of family planning services among the rural populations, but it is unclear what factors explain the rural-urban gap. Understanding the drivers of rural-urban differentials in family planning utilization is important in addressing the inequalities because lower use of contraceptives by the rural population may imply that they bare a disproportionate larger share of the negative consequences of lack of family planning services (Ortayli & Malarcher, 2010).

Documentation on inequalities in utilization of healthcare in Zambia have been done with increases in healthcare utilization in many dimension but also increases in inequality, for example a study by Phiri & Ataguba (2014) on measures of the socio-economic inequalities in the public health care where they applied concentration curves and indices, their results showed that there was pro-poor inequality in public primary health care utilization and a pro-rich inequality in hospital visits. This study was added to the literature reviewed because no literature was found on specifically socio-economic related inequalities in the use of family planning services in Zambia. Therefore, there is need to examine the socio-economic related inequalities in the utilization of family planning services amongst women of reproductive age in Zambia.

2.3 Decomposition of factors that explain the rural-urban gap in the level of family planning utilization between the rural and urban population

A study by Beguy et al., (2017) decomposed the extent of change in use of family planning services in Nairobi Slums and how much of the change in use could be attributed to change in the population composition with regard to socioeconomic characteristics like education. In addition, they decomposed the change that resulted from changes in family planning use among women with given characteristics. They found that the disadvantaged groups of women had less right to use

family planning services even though generally the use of family planning services had considerably increased which could have been as a result of positive effect of net compositional change and net behavioural change. There was need to decompose other socioeconomic related inequalities like wealth, marital status, number of children and employment levels.

Using the Blinder-Oaxaca technique, Muhoza et al., (2013) decomposed the contributions of women's characteristics and their effect in measuring the success of family planning initiatives in Rwanda. Their results showed that women's education and place of resident contributed significantly in effects of women's characteristics in use of family planning services. There is need to look at other socio-economic variables like marital status of the study participants, religious opposition, income levels and cultural barriers in contraceptive use.

Using the 2013 DHS Oyenubi & Babalola (2018) decomposed factors that explain the NorthSouth differentials in contraceptive use in Nigeria and Senegal where they found that there was a wider gap in family planning use due to low educational levels and lack of wealth in the North which implies that education and wealth plays a part in the use of family planning services. Among the Ghanaian women, there was a reduction in rural-urban residence gap in the use of family planning services even though they was no change in education and income related inequalities. This could mean that education and income had no effect on rural-urban inequalities in family planning use (Asamoah et al., 2013). Decomposition of other factors like employment, marital status and discrepancy between equality in use of contraceptives and equality in fertility was important.

In Zambia, a growing number of health care programs and providers are realizing that ruralurban differences in health care utilization especially in family planning services still existed even though they had been given the necessary knowledge about its benefit (Ezeh et al., 2010). In addition, there are significant inequalities in contraceptive use which could be as a result of uneducated and rural women facing challenges in accessing contraceptives compared to the urban and educated women. The challenges included long distances to health facilities, traditional barriers like spouses deciding on the women's contraceptive use and men's desire to have a lot of children as a part of status in society (Population Council et al., 2017).

CHAPTER THREE: METHODOLOGY 3.1 Study Design

The study was a quantitative research method that employed a cross-sectional study design using data from the 2013 - 2014 Zambia Demographic and Health Survey (ZDHS).

3.2 Study Site and Population

The study population was defined as women of child bearing age (15 -49 years) in Zambia. The study setting was Zambia and data was sourced from the Central Statistics Office (CSO), Lusaka. The survey focused on information related to family planning utilization among women of the reproductive age in Zambia.

3.3 Sampling Methods and Sample size

The study extracted only data related to family planning utilization by the women of reproductive health. The 2013 - 2014 ZDHS was designed to provide national and provincial estimates by households as well as utilization patterns of health care services. The CSO sampling frame, Zambia was divided into 10 provinces which were in turn sub divided into 74 districts, 722 clusters, 800 households and 2 regions thus urban and rural. This same strategy was used in this study. In addition, this study used a complete enumeration which meant that opted to use all women of childbearing age as data was readily available and the sample size was 12, 498.

3.4 Data Analysis Plan

Data analysis was done with the help of STATA software version 13.0. Average Marginal Effect, concentration indices and Oaxaca-blinder decomposition are the main methods used in this analysis. The Average Marginal Effect, concentration indices and curves, and OaxacaBlinder decomposition methods were estimated in STATA software version 13.0. The concentration curves and indices were used to address objective one, and two while in addressing objective three, the Oaxaca-Blinder decomposition analysis was applied.

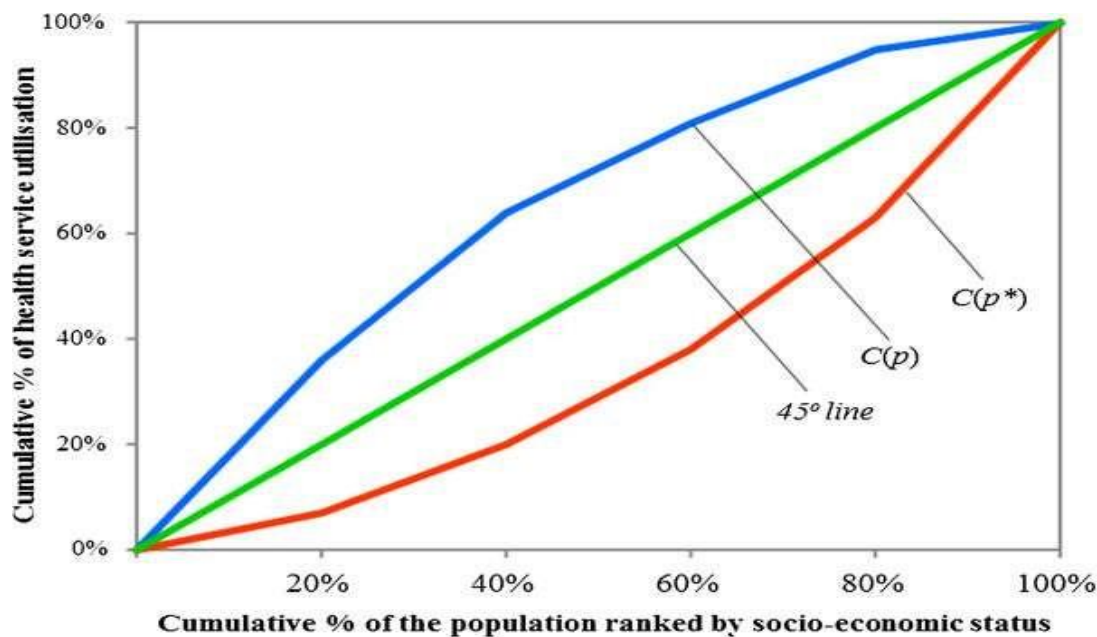
3.4.1 Concentration indices

The concentration index is defined as twice the area between the concentration curve and the line of equality (the 45 degree line) that measures wealth-related inequity in the health variable (Howe et al., 2010). In figure 2 below, it is twice the area between $C(p)$ and 45° line, $C(p^*)$ and 45° line.

In the case in which there is no socio-economic-related inequality the concentration index is zero (0) which indicates a lack of income inequality, while the more the index deviates from zero, the greater the magnitude of wealth related inequality (Erreygers, 2009). Figure 2 below shows two key variables underlying the concentration curve which are family planning utilization the subject of interest and a variable, population ranked by socio-economic status against which the distribution was assessed. In this study, a concentration curve plotted the cumulative share of family planning utilization against the cumulative shares of wealth in the population ranked from poorest to richest.

In this study, the concentration curve and concentration index were used to examine how propoor (above the 45° line) or pro-rich (below the 45° line) the distribution of family planning utilization is, and the distribution of family planning utilization between rural and urban women of reproductive age.

Figure 2: Concentration curve



Source: Phiri & Ataguba (2014)

3.4.2 Oaxaca-Blinder decomposition

After examining the inequalities, Oaxaca-blinder decomposition method was used to account for the rural-urban gap. The Oaxaca – blinder decomposition explained the gap in the means of family

planning utilization between the two groups, rural and urban. The gap was decomposed into that part that was due to group differences in the magnitudes of the determinants of utilization in family planning services and the group differences in the effects of these determinants.

Further, the decomposition output reviewed the mean predictions by groups and their differences. In the decomposition output, family planning utilization was divided into three parts. The first part, is the endowment effect which claimed the gap due to differences in the distribution of factors between the rural and urban women. This would highlight the increase in family planning utilization among the rural populations when there are similar characteristics as compared to those in the urban populations. The second part is the coefficient effect that claimed due to the differences in the effect of factors between the two groups. It quantified the change in family planning utilization among the rural populations when applying the family planning utilization among the urban populations' coefficients to the rural populations' characteristics.

Thus the coefficient answered the questions of how different the groups were. Lastly the interaction term measured the simultaneous effect of differences in the endowments and coefficients. For compositional effect, a positive coefficient suggested that the change in the percentage with that characteristic between rural and urban women of childbearing age was associated with an increase in the difference in utilization of family planning services. On the other hand, a negative coefficient indicated that family planning use in rural women of reproductive age would have been better if their characteristics had been the same as their urban counterparts.

In summary, the first and second objectives determined the magnitude of socio-economic inequality in family planning utilization in Zambia, quantified the level and distribution of family planning utilization between the rural and urban population and were analyzed using the concentration curve and concentration index. This explained the distribution of family planning use between the rural and urban populations. Lastly, the third objective examined the factors that explained the rural-urban gap in the level of family planning utilization between the rural and urban population and was analyzed using Oaxaca-blinder decomposition that decomposed or explained the gap in the means or averages of family planning utilization between the two (2) groups.

3.5 Study Variables

The data on the following variables was extracted from the 2013 - 2014 ZDHS dataset.

Table 1: Selected covariates for family planning utilization

Variable	Definition	State of variable
Family planning utilization	Current use of family planning	Binary No = 0 Yes = 1
Age	Age group	Continuous 1 = 15 – 19 2 = 20 – 24 3 = 25 – 29 4 = 30 – 34 5 = 35 – 39 6 = 40 – 44 7 = 45 – 49
Level of Education	Respondent's school attainment	Categorical 1 = No education 2 = primary 3 = secondary 4 = tertiary
Marital status	Marital status of respondent	Binary 1 = Not married 2 = Married
Religion	Denomination of the respondent	Categorical 1 = Roman Catholic 2 = Protestants 3 = Muslim 4 = Others

Children	Number of children	Categorical 1 = 0 children 2 = 1-3 children 3 = 4-6 children 4 = 7 & more children
Wealth index	Quintile of respondents	Categorical 1 = Poorest 2 = Poorer 3 = Middle 4 = Richer 5 = Richest
Province	Respondent's province	Categorical 1 = Central 2 = Copperbelt 3 = Eastern 4 = Luapula 5 = Lusaka 6 = Muchinga 7 = Northern 8 = North Western 9 = Southern 10 = Western
Region	Respondent's region of residence	Binary 1 = Rural 2 = Urban

3.6 Ethical Considerations

The study obtained ethical approval from University of Zambia Biomedical Research Ethics Committee (UNZABREC, Ref: 013-08-18) and permission was sought from the Central Statistics Office, Lusaka.

The clients did not accrue any direct benefit from this study. However, the results of their responses would be used to come up with recommendations to guide resource allocation decisions for health planners, administrators and policy makers, and offer insights on the need to ensure the provision of effective family planning services through developing appropriate structures and instituting enduring management capabilities as a platform for effective utilization. Further, no anticipated risks, discomforts, injuries or accidents happened during this study. All information obtained was strictly confidential. Data that was obtained, analyzed and reported on did not include any name and therefore could not be traced by anyone. Data was anonymous and was kept safe from unauthorized access, accidental loss or destruction. Lastly, the dataset was kept as encrypted files in the computer.

CHAPTER FOUR: RESULTS

4.1 Social Demographic Characteristics of the Study Participants

This survey captured 12,498 women of childbearing age out of which 8,173 (65.39%) were married and 5,662 (45%) reported using family planning. By province, utilization of family planning services is highest in Eastern province (12.55%) and lowest in Muchinga province (8.35%). There were 5,852 (46.82%) and 6,646 (53.18%) women of childbearing age from urban and rural regions respectively. About 36.32% of the study participants had at least attained secondary school. Details are in table 2 below.

Table 2: Demographic Characteristics of Study Participants

Variable	Category	Proportion (%)
Age	Age range (years)	
	15 – 19 years	1, 577 (12.62%)
	20 – 24 years	2, 319 (18.55%)
	25 – 29 years	2, 353 (18.83%)
	30 – 34 years	2, 089 (16.71%)
	35 – 39 years	1, 795 (14.36%)
	40 – 44 years	1, 380 (11.04%)
Level of Education	45 – 49 years	985 (7.88%)
	No education	1, 152 (9.22%)
	Primary	6, 120 (48.97%)
	Secondary	4, 539 (36.32%)
Marital status	Tertiary	687 (5.50%)
	Not married	4, 325 (34.61%)
Religion	Married	8, 173 (65.39%)
	Roman Catholic	2, 182 (17.46%)
	Protestants	10, 172 (81.39%)

	Muslim	62 (0.50%)
	Others	82 (0.66%)
Number of children	0 children	1, 496 (11.97%)
	1-3 children	5, 466 (43.73%)
	4-6 children	3, 516 (28.13%)
	7 & more children	2, 020 (16.17%)
Wealth index	Poorest	2, 272 (18.18%)
	Poorer	2, 368 (18.95%)
	Middle	2, 753 (22.03%)
	Richer	2, 634 (21.08%)
	Richest	2, 471 (19.77%)
Provinces	Central	1, 064 (8.51%)
	Copperbelt	1, 266 (10.13%)
	Eastern	1, 569 (12.55%)
	Luapula	1, 222 (9.78%)
	Lusaka	1, 400 (11.20%)
	Muchinga	1, 043 (8.35%)
	Northern	1, 171 (9.37%)
	North Western	1, 270 (10.16%)
	Southern	1, 345 (10.76%)
	Western	1, 148 (9.19%)
Region	Rural	6, 646 (53.18%)
	Urban	5, 852 (46.82%)

4.2 Average Marginal Effect Estimations

In addressing objective one, the Average Marginal Effects were estimated. Average marginal effects were estimated in STATA software version 13.0. When average marginal effects were estimated for different age groups, it was observed that the effect of family planning utilization differs greatly by age. For instance as shown in table 3 below, it was about 4% ($P < 0.05$ CI 0.0089, 0.0737) for age groups of 20-24 years, 25-29 years and about 1% ($P < 0.05$ CI 0.0017, 0.0706) for age range of 30-34 years when compared to women in the age group of 15-19 years. In addition, there was a 26% ($P < 0.0001$ CI -0.2925, -0.2202) lower in use for those in the age group 45-49 years compared to those women in the age group of 15-19 years. The results also showed that if there were two otherwise average women of childbearing age, one not married, one married, the married woman was more likely to use family planning services by about 24% ($P < 0.0001$ CI 0.2208, 0.2595). It was also observed that the effect of family planning utilization differs by the levels of education, it was about 7% ($P < 0.0001$ CI 0.0456, 0.1029) for those with primary education, 14% ($P < 0.0001$ CI 0.108, 0.1713) for those with secondary education and about 18% ($P < 0.0001$ CI 0.1327, 0.2262) for those with tertiary education compared with those without education and all were significant at 5% level of significance.

The results also shows that the likelihood of using family planning among the women with 1-3 children is 30% ($P < 0.0001$ CI 0.2719, 0.3229), 37% ($P < 0.0001$ CI 0.3432, 0.3992) for those with 4-6 children and 39% ($P < 0.0001$ CI 0.3636, 0.4177) for those women with 7 and more children in comparison with those women without children. Further, the likelihood of utilizing family planning services among those women in the richest wealth group is about 9% ($P < 0.0001$ CI 0.0473, 0.1245) while those in the richer, middle and poorer in comparison with the poorest wealth group is 7% ($P < 0.0001$ CI 0.0405, 0.1058), 8% ($P < 0.0001$ CI 0.0538, 0.1089) and 4% ($P < 0.05$ CI 0.0143, 0.0672) respectively. Additionally, the likelihood of using family planning services among those women from the urban areas is about 5% ($P < 0.0001$ CI 0.0225, 0.0668) compared to the rural women. On the other hand, there was negative average marginal effect on all different religions when compared to the Catholics which indicates a decrease in the likelihood of using family planning services. Details are in table 3 below.

Table 3: Average Marginal Effect Estimates

n = 12,498	coef	P-Value	95% CI
Age Groups			
15-19 yrs	Ref		
20-24 yrs	0.0413	0.012	(0.0089, 0.0737)
25-29 yrs	0.0362	0.04	(0.0017, 0.0706)
30-34 yrs	0.0058	0.761	(-0.0313, 0.0428)
35-39 yrs	-0.0524	0.007	(-0.0907, -0.0141)
40-44 yrs	-0.089	<0.0001	(-0.1292, -0.0489)
45-49 yrs	-0.2564	<0.0001	(-0.2925, -0.2202)
Marital Status			
Not married	Ref		
married	0.2401	<0.0001	(0.2208, 0.2595)
Religion			
Catholics	Ref		
Protestants	-0.0054	0.624	(-0.0268, 0.0161)
Muslims	-0.1016	0.065	(-0.2097, 0.0065)
Others	-0.1367	0.005	(-0.2321, -0.0412)
Level of Education			
No education	Ref		
Primary	0.0743	<0.0001	(0.0456, 0.1029)
Secondary	0.1397	<0.0001	(0.108, 0.1713)
Tertiary	0.1794	<0.0001	(0.1327, 0.2262)

No. of Children

No children	Ref			
1-3 children	0.2974	<0.0001	(0.2719,	0.3229)
4-6 children	0.3712	<0.0001	(0.3432,	0.3992)
7 & more children	0.3906	<0.0001	(0.3636,	0.4177)

Wealth Groups

Poorest	Ref			
Poorer	0.0408	0.003	(0.0143,	0.0672)
Middle	0.0814	<0.0001	(0.0538,	0.1089)
Richer	0.0731	<0.0001	(0.0405,	0.1058)
Richest	0.0859	<0.0001	(0.0473,	0.1245)

Provinces

Central	Ref			
Copperbelt	0.0477	0.013	(0.0101,	0.0852)
Eastern	0.1378	<0.0001	(0.1029,	0.1726)
Luapula	-0.031	0.107	(-0.0686,	0.0067)
Lusaka	0.1038	<0.0001	(0.0668,	0.1407)
Muchinga	0.0523	0.009	(0.0133,	0.0913)
Northern	0.0585	0.003	(0.0201,	0.0969)
North Western	0.014	0.464	(-0.0235,	0.0515)
Southern	0.0937	<0.0001	(0.0573,	0.13)
Western	0.0475	0.016	(0.009,	0.0861)

Regions

Rural	Ref			
Urban	0.0447	<0.0001	(0.0225,	0.0668)

Note: Ref on the above table refers to Reference category

4.3 Concentration Curves

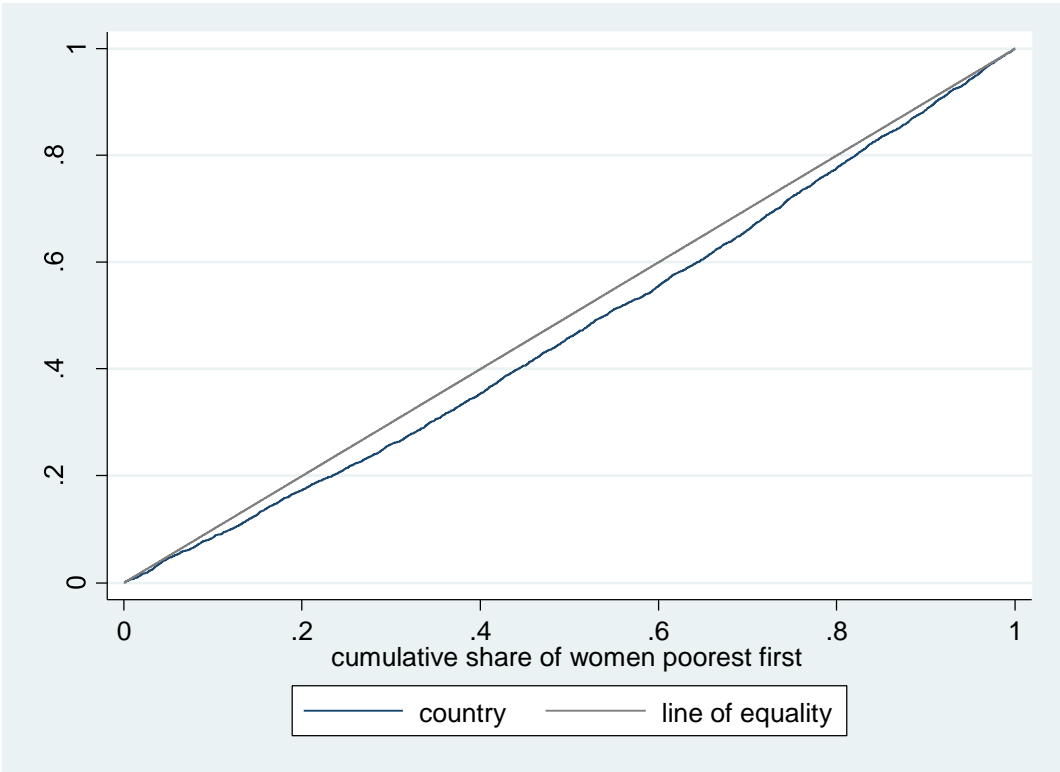
The concentration curves and indices were used to address objective one, and two. Figure 3 below shows the concentration curve for family planning utilization among women of childbearing age in Zambia. The resulting concentration index shows that there is socioeconomic related inequality among women of childbearing age in Zambia due to the deviation of the curve from the line of equality. The concentration index took a positive value (CI=0.590, P=0.055) as the curve lies below the line of equality, indicating disproportionate concentration of family planning utilization among women who are relatively better off.

Figure 4 below shows the concentration curves for family planning utilization among women of childbearing age for rural and urban regions. The rural population curve lies everywhere below that of the urban population (that is the urban population curve dominates the rural population curve). In other words, the rural population curve lie further away and below the line of equality compared to the urban curve suggesting that family planning services are to the disadvantage of the poorest women in rural areas much more than is the case in urban areas. The curve of urban family planning utilization lie relatively closer to the line of equality indicating that urban women irrespective of their socioeconomic status have almost equal access and use of family planning services, i.e. there is less inequality among them.

The resulting concentration index (CI=0.049) shows that there is no socioeconomic related inequality among urban women of childbearing age in family planning utilization because the concentration index is not significantly different from zero ($p=0.1593$). On the other hand, there is socioeconomic related inequality in utilization of contraceptives among the rural women due to the deviation of the index from zero. The concentration index took a positive value (CI=0.4009, $p=0.0730$) as the curve lie below the line of equality, indicating disproportionate concentration of family planning utilization among the relatively better off women in the rural area.

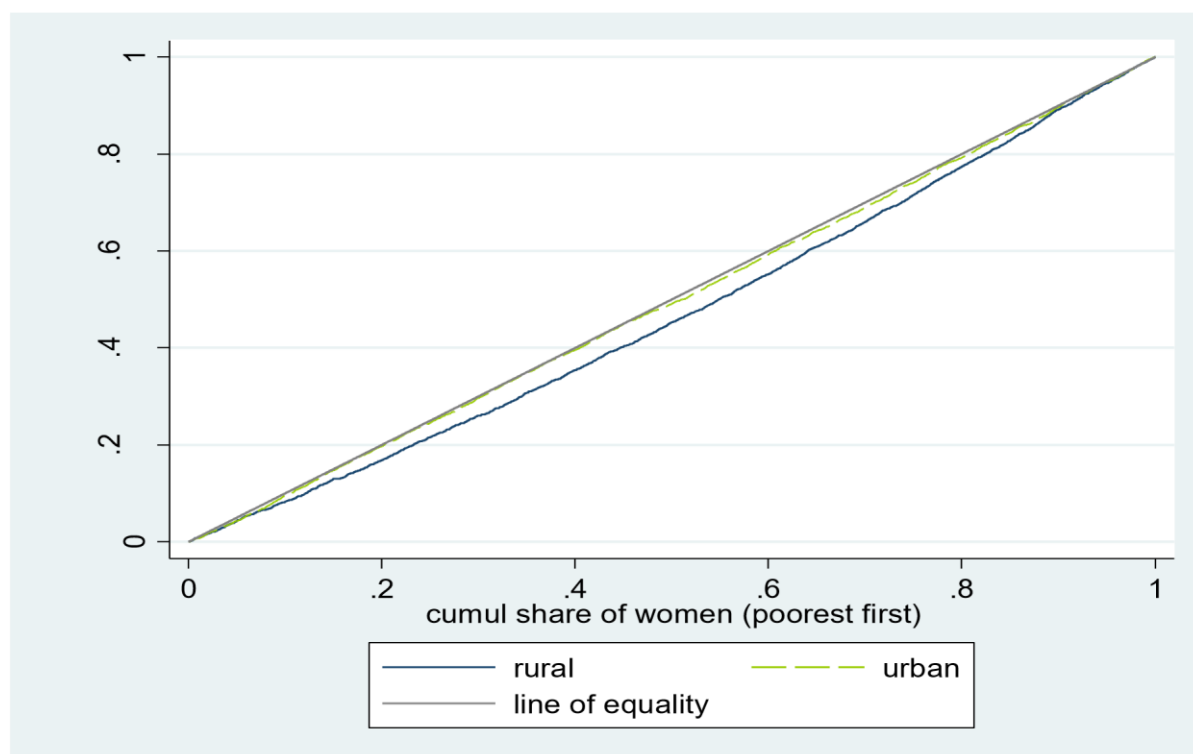
Figure 3 and 4 below shows that generally, family planning use is disproportionately distributed among the better off overall, with no socioeconomic related inequality among urban women while inequalities in favour of the better off in rural women.

Figure 3: Concentration Curve for Women of Childbearing Age in Zambia



Source: Authors

Figure 4: Concentration Curve for Rural and Urban Women of Childbearing Age



Source: Authors

Note: Fampu on the figure above stands for family planning utilization

4.4 Oaxaca – Blinder decomposition

In addressing objective three, the Oaxaca-Blinder decomposition analysis was applied. The Oaxaca-Blinder decomposition used the linear probability model. Table 4 below shows the contribution of the age, marital status, religion, level of education, number of children, wealth index, region and province to the component of change in the utilization of family planning services. The mean of family planning utilization was 0.418 for rural and 0.4696 for urban, yielding family planning utilization gap of 5.16 percentage points, which was significant (<0.0001). The endowment effect accounted for 34.50% and coefficient effect accounted for 40.12% of the average gap in the utilization of family planning services and the contribution of the interaction effect is 25.39% (Table 4)

Table 4 shows how differences in the distribution of each factor contributed separately to the first part of the gap (endowment effect). All the categories of these independent variables make

significant contribution to explaining the rural-urban inequality gap. In the endowment effect, some factors have positive contribution to the gap, thus increasing the gap while others have negative contributions thus reducing the gap, with total percentage contributions adding up to 100 percent. The factors that contributed positively to the gap were the richest wealth group (54.79%), richer wealth group (26.79%) and women with 1–3 children (30.36%). Secondary and Tertiary levels of education contributed about 19.64% and 79.46% respectively, and being 40-44 and 45-49 years contributed about 29.46% and 53.68% respectively. Substantively, if the rural women had wealth similar to those of urban women, the gap would have been smaller by 5.3 percentage points. On the other hand, being married and having seven (7) and more children helped to reduce the gap in family planning utilization by -33.45% and -48.22% respectively. Other factors that also appeared to minimize the gap in the utilization of family planning services between the rural and urban population were belonging to the poorer wealth group (-22.34%), middle wealth group (-43.75), primary level of education (-33.93%) and having 4-6 children (16.96%). Being married maybe associated with higher family planning utilization and there could also be more married women in the rural areas.

Table 4 also shows the part of the gap that is accounted by different effect of the factors (Coefficient effect) between the rural and urban women of childbearing age. It demonstrated that being married and having more children were offsetting factors in the use of family planning services which could mean that being married and having more children contributed in the reduction of inequalities in utilization of family planning services. The negative contribution of being married and having more children indicates that being married and having more children have a great effect on the reduction of inequalities on use of family planning services among the rural women.

Table 4: Oaxaca – Blinder decomposition

Blinder-Oaxaca decomposition

Number of obs = 12498

Model = linear

Group 1: Rural = 0

Number of obs = 6646

Group 2: Urban = 1

Number of obs = 5852

Family planning	Coef.	P-Value	95% CI	
overall				
rural	0.418	<0.0001	(0.4061,	0.4299)
urban	0.4696	<0.0001	(0.4568,	0.4824)
difference	-0.0516	<0.0001	(-0.0691,	-0.0341)
 endowments	-0.0112	0.234	(-0.0539,	0.0184)
coefficients	0.0004	0.095	(-0.052,	0.0106)
interaction	-0.0108	0.569	(-0.0576,	0.0313)

Characteristics	Endowments		coefficients		Interaction	
	Coef.	P-Value	Coef.	P-Value	Coef.	P-Value
Age Groups						
15-19 yrs	Ref					
20-24 yrs	-0.0006	0.321	0.0028	0.661	-0.0004	0.663
25-29 yrs	-0.0004	0.458	0.0026	0.707	-0.0002	0.709
30-34 yrs	0.0004	0.454	0.0083	0.197	-0.0004	0.386
35-39 yrs	-0.0001	0.789	0.0045	0.01	0.0001	0.900
40-44 yrs	-0.0033	0.002	0.0012	0.015	0.0022	0.038
45-49 yrs	-0.0059	<0.0001	0.0037	0.247	0.001	0.266
Marital Status						
Not married	Ref					
Married	0.0038	<0.0001	-0.0048	<0.0001	-0.0011	<0.0001
Religion						
Catholics	Ref					
Protestants	0.0001	0.766	-0.0011	0.054	0.0001	0.587

Muslims	0.0004	0.387	-0.0003	0.088	0.0002	0.883
Others	-0.0003	0.264	-0.0002	0.734	-0.0001	0.789
Educational level						
No education	Ref					
Primary	0.0038	0.064	0.0024	0.055	0.0019	0.055
Secondary	-0.0022	0.008	0.0026	0.215	-0.0013	0.236
Tertiary	-0.0089	0.005	0.0078	0.235	-0.0066	0.225
No. of Children						
No children	Ref					
1-3 children	-0.0034	<0.0001	-0.0054	0.708	0.0013	0.728
4-6 children	0.0019	<0.0001	-0.0082	0.405	-0.0016	0.419
7 & more children	0.0054	<0.0001	-0.0026	0.53	-0.0039	0.532
Wealth Groups						
Poorest	Ref					
Poorer	0.0025	0.066	-0.0041	0.231	-0.0018	0.23
Middle	0.0049	0.026	-0.0011	0.331	-0.0017	0.343
Richer	-0.0030	0.017	0.0009	0.096	-0.0007	0.963
Richest	-0.0058	0.003	-0.0023	0.039	0.0022	0.393
Constant	0.0000	0.000	-0.0065	0.924	0.0000	0.000
Total	-0.0112		0.0004		-0.0108	

CHAPTER FIVE: DISCUSSION

5.1 Summary of findings

Family planning use declined beyond age 30 and continues to decline until menopause at age 49 years which could be because of satisfied parity and onset of menopause. There is to some extent inverse U-shaped association between age and family planning utilization with the probability of use attaining a maximum in the age range 20-29 years and gradually decline at older ages. These results are anticipated as it reflects a decreasing need for family planning services among older women probably because older women entering menopause have little for family planning.

The married women were more likely to use family planning services because they were more sexually active while the not married women were less likely to use family planning services because of fear of stigmatization in society as they were not married and bias from healthcare providers. Further, having an education increases the probability of women utilizing family planning services. Thus those women with higher education were more likely to use family planning services because of their ability to make rational decision on reproductive health issues.

Additionally, it was found that as a woman's ideal number of children is met, the probability of women utilizing family planning services increases. Thus the more children a woman has, the more likely they are to use family planning services because of their achieved satisfied parity. The richer women used family planning more because they were more likely to have a huge role and an enhanced ability to make decisions regarding their fertility due to their enhanced economic status in society and their ability to make rational decision on reproductive health issues. Notably on the other part of this study, religion of the woman had no significant effect on family planning utilization, which could imply that belonging to a religious organization had no effect on family planning use.

The findings also show that urban women were more likely to utilize family planning services compared to their rural counterparts which could be due to high literacy levels, availability and accessibility of family planning services as the health facilities were within reach. The findings

further revealed that underutilization of family planning combined with lack of wealth and lack of education are some of the key factors that determine the rural-urban gap.

5.2 Contextualizing findings in the literature

Family planning use declined beyond age 30 and continued to decline until menopause at age 49 years which could be because of satisfied parity and onset of menopause. There is to some extent inverse U-shaped association between age and family planning utilization with the probability of use attaining a maximum in the age range 20-29 years and gradually decline at older ages. These results are anticipated as it reflects an increasing need for family planning services in the age groups of 20-24 and 25-29 years because they wanted to delay pregnancy as they could be in colleges, and a decreasing need for family planning services among older women probably because older women entering menopause have little for family planning. As shown further by the negative signs of average marginal effects in the age range 35-49 years, at older ages there is 25.64% lower in family planning utilization. Thus moving from age 15-19 years to the age range 30-34 years. The likelihood of utilizing family planning services is more, holding all other factors constant (Allen et al., 2013; Ashraf et al., 2009).

The study found that there was less likelihood use of family planning services by women of child bearing age range of 15-19 years which could be due to stereotyping, stigmatization as they were not yet married and were still in school. This finding is in agreement with Mehata et al., (2014) and Yarger et al., (2017) who reported that usage of family planning services was lower among younger women because of less family planning services offered to them due to stigmatization and lower family planning awareness due to lack of sexual health education accessibility in rural areas compared to urban and if accessible, lack of privacy and confidentiality hinders adolescents from accessing family planning services.

The Average Marginal effect also showed that married women were more likely to use family planning services because they were more sexually active. The not married women were less likely to use family planning services because of fear of stigmatization in society as they were not married, fear of side effects as they had no children, limited choices and bias from healthcare providers (Tilahun et al., 2013). The positive average marginal effect reinforces this conclusion that moving from not married to married, a woman's likelihood of family planning utilization is

increased. This finding does not support the previous studies that showed that married women used less family planning compared to the unmarried because they had a childbearing obligation. In addition, men had continued to appreciate having a lot of children despite their economic status and having a lot of children was a part of status in the society (Lemba et al., 2014; Tilahun et al., 2013).

Women's education has statistical significant effect on family planning utilization. For all these levels of education 7% ($P < 0.0001$ CI 0.0456, 0.1029) for those with primary education, 14% ($P < 0.0001$ CI 0.108, 0.1713) for those with secondary education and about 18% ($P < 0.0001$ CI 0.1327, 0.2262) for those with tertiary education compared with those without education, the likelihood was statistically significant at 5% level of significance. Additionally, the average marginal effect for all educational categories shows that having an education increases the probability of women utilizing family planning services. Thus the higher one is in education, the more likely they are to use family planning services because of their ability to make rational decision on reproductive health issues. In addition, the more literate one is the more likely they are to be engaged in other economic activities that may disrupt their reproduction. The findings of this study are similar to that of the previous studies that revealed that education is important in utilization and improvement of family planning services (Larsson & Stanfors, 2014; Amentie, 2015).

As expected, the higher the number of children a woman has, the higher the likelihood of family planning utilization. The likelihood of using family planning among the women with 1-3 children is 30% ($P < 0.0001$ CI 0.2719, 0.3229), 37% ($P < 0.0001$ CI 0.3432, 0.3992) for those with 4-6 children and 39% ($P < 0.0001$ CI 0.3636, 0.4177) for those women with 7 and more children in comparison with those women without children. This relationship is statistically significant at 5% level of significant and is supported by the positive average marginal effect. Additionally, the average marginal effect for all number of children categories shows that as a woman's ideal number of children is met, the probability of women utilizing family planning services increases because the use of family planning services increases with increase with parity. Thus the more children a woman has, the more likely they are to use family planning services because of their achieved satisfied parity. In other words, those without children were not likely to use family planning services as they needed to conceive compared to those with children. This is in agreement

with Blackstone et al., (2017), who found that men in the rural areas for instance, despite their economic status, appreciate having a lot of children which to them is a status in society and would only use family planning services when there is parity satisfaction.

Women's wealth status has a statistical significant effect on family planning utilization. The likelihood of utilizing family planning services among those women in the richest wealth group is about 9% ($P < 0.0001$ CI 0.0473, 0.1245) while those in the richer, middle and poorer in comparison with the poorest wealth group is 7% ($P < 0.0001$ CI 0.0405, 0.1058), 8% ($P < 0.0001$ CI 0.0538, 0.1089) and 4% ($P < 0.05$ CI 0.0143, 0.0672) respectively. For all these levels of wealth index in this study, the likelihood was statistically significant at 5% level of significance. The average marginal effect for all wealth index categories shows that richer women used family planning more because they were more likely to have a huge role and an enhanced ability to make decisions regarding their fertility due to their enhanced economic status in society and their ability to make rational decision on reproductive health issues (Aslam et al., 2016) .

Further, the richer women had the ability to purchase family planning services in times of stock outs in public health facilities. The argument here is that the poor have less income compared to the richest leading to the parallel disparities that exists between the poor and the richest in family planning utilization. This finding supports the previous study that showed that socio-economic gap or differences in family planning utilization exists and had persisted among women and this had disadvantaged the poor (Aslam et al., 2016).

As expected for a least developing country like Zambia with health facilities concentrated more in the urban areas, urban women were more likely to utilize family planning services compared to their rural counterparts which could be due to high literacy levels, availability and accessibility of family planning services as the health facilities were within reach. This finding supports the previous study that showed that urban women were more likely to utilize family planning compared to the rural women because of its accessibility, availability, women's education status, women's attitude towards family planning services and their knowledge of family planning services (Amentie, 2015). Further, urban women of childbearing age were engaged in economic activities that could give them the ability and power to purchase the family planning commodity. Some urban women would utilize family planning services as they could be in employment and

due to career development. The likelihood of using family planning services among urban women was about 5% ($P < 0.0001$ CI 0.0225, 0.0668) compared to the rural women. The results are statistically significant at 5% level of significant with the average marginal effect showing a positive sign indicating that moving from rural areas to urban areas increases the probability of family planning utilization. This finding of this study is similar to Kabonga et al., (2010) who found that rural women had little or no income compared to their urban counterparts and this meant that fertility was high in the rural compared to urban areas.

In general, there is not much provincial variation in explaining family planning utilization in Zambia. Nevertheless, it was remarkably clear that compared to Central province, Eastern and Lusaka provinces have the highest likelihood of family planning utilization where as Luapula and North Western provinces have the lowest likelihood of utilization of family planning services. This could imply that compared to Central province, belonging to Eastern and Lusaka provinces increases the likelihood of family planning utilization among women of childbearing age while belonging to Luapula and North Western provinces reduces the probability of utilizing family planning services. Luapula and North western provinces were less likely to use family planning which could be as a result of low literacy levels, long distances to the health facilities, myths and traditional beliefs. For all other than for Luapula and North western provinces the p-values are not significant which could mean that these two provinces have no significant effects on family planning utilization decision compared to those women residing in Eastern province.

Further, for all other than Luapula province, the average marginal effects are positive. Thus reinforcing the findings explained above on the rural urban differential in family planning utilization. The argument here is that urban provinces have more health facilities compared to rural provinces. This finding supports the previous studies that showed that women from the urban areas were more likely to utilize family planning compared to their rural counterparts; (Amentie, 2015; Kabonga et al., 2010).

The concentration curve and indices results show that the use of family planning services is inequitably distributed and that there are differences in the size of inequality within socioeconomic groups of women. The utilization of family planning services are in favour or advantaging wealthier women and urban women as these women considerably use the service more. This is not

surprising since wealth is correlated with education which facilitates the right to use (Ortayli & Malarcher, 2010). This finding supports previous studies that showed that higher socioeconomic status improves the use of family planning services (Aslam et. al, 2016). This study suggests that there is high need for family planning services among rural women of childbearing age. Studies show that economically self-sufficient women are more likely to utilize contraception as it enhances their ability to make rational decisions on reproductive health issues (Ortayli, 2010). Regarding the right to use family planning services, while economic status does prevent women from making sole decision about their reproductive health, it could, however, initiate a demand for contraception (Hindin et al., 2014; Amalba et al., 2014).

Furthermore, the results showed that the index deviated from zero which implied that the magnitude of wealth related inequality was there in the rural population of women of childbearing age compared to the urban population. This could imply that the rural women of childbearing age were not receiving much of their share of family planning services. Additionally, this could mean that family planning utilization was not found among the poor because it indicated a positive concentration index while there was an indication of utilization of family planning services among the urban women of childbearing age because the urban concentration index was on the line of equality and is positive meaning family planning utilization was found more among the urban women and among the rich. This is in agreement with Townsend et al., (2010) and Howe et al., (2010), found that there was wealth-related inequity in family planning utilization between rural and urban populations and between the rich and poor.

Oaxaca – Blinder decomposition results shows that more urban women had tertiary education (75%) compared to their rural counterparts. Thus education has a bigger effect in urban than in rural which could imply that the urban population is much better off than their rural counterparts as the disparity in education is in favour of the urban women. It is worth noting here that the socio-economic inequalities in use of family planning services among women of childbearing age in Zambia persistently exist than in most African countries (Larsson & Stanfors, 2014). The socio-economic inequalities in use of family planning services is more among the rural women of childbearing age and contraceptive levels were substantially lower among rural women of reproductive age which could be because of low secondary and tertiary education. In addition, Zambia urban women are better served than their rural counter parts and this is because urban areas

have a concentration of family planning and related services. The findings of this study are similar to that of the previous studies that revealed massive socioeconomic gap in health and health care utilization among women of reproductive age due to lower secondary and tertiary levels of education (Aslam et al., 2016; Groot et al., 2018; Phiri & Ataguba, 2014).

The analysis reveals that the key factors that determine the rural-urban gap of rural women is the underutilization of family planning services. Inadequate utilization of family planning services, combined with lack of wealth and limited information or low secondary and tertiary education levels on importance of family planning services may render many unidentified high-risk women of reproductive age prone to unwanted pregnancies which could lead to abortions leading to maternal deaths (Mubita-Ngoma & Kadantu, 2010). Similarly, the desire of having a large number of children could cause poverty or lack of wealth and poor education which could lead to lack of family planning use. The lower use of family planning services among the rural women of reproductive age may be due to several barriers ranging from cost of care, cost of transportation due to long distances from the health facilities, and low awareness of healthpromoting behaviour. Furthermore, family planning services in rural areas in Zambia suffer from skewed spatial distribution, shortage of health workers, poor infrastructure and a weak referral system (Belohlav and Karra, 2013). The lack of motivation among health providers and poor communication between health care providers and clients is also among important obstacles in utilization of family planning services by the rural women in Zambia (Chanda et al., 2017).

Notably on the other part in this study, religion of the woman had no significant effect on family planning utilization. In comparison with Catholics, Protestants, Muslims and other religions had -0.54% ($P=0.624$ CI -0.0268, 0.0161), -10.16% ($P=0.065$ CI -0.2097, 0.0065) and -13.67% ($P=0.005$ CI -0.2321, -0.0412). The average marginal effect for all religion categories shows that belonging to a religious group or denomination reduces the probability of women utilizing family planning services though it was not significant at 5% level of significance. Thus religion has no effect on family planning use. This could imply that belonging to a particular religion or denomination did not have an influence on family planning use. This result is not in support of the preceding studies that demonstrated that there was low uptake of family planning which was due

to poor acceptance because of religious influences despite high knowledge and awareness among women of reproductive age (Atuahene et al., 2016).

5.3 Implications for policy and practice

There was In Zambia, the government is dedicated to improving sustainable access to family planning and achieving the goals it set in 2012 which is to increase the modern contraceptive prevalent rate among women of childbearing age to 58% by 2020 (MoH, 2012). Despite this dedication, family planning utilization was still low at about 48% (CSO, 2018). However, an integrated family planning scale-up plan 2013 – 2020 was developed to address the needs of family planning service provision in the country (MoH, 2012). This policy has met the requirements of the 2012 London Summit on family planning, but not the needs of the people as it was done without consultation from users of the family planning services (Mutombo & Bakibinga, 2014).

In Zambia, family planning services are integrated in reproductive health services specifically Maternal and Child Health services (MCH) and safe motherhood because it affects motherhood. This integration has helped to increase the uptake of modern contraceptive from 9% in 1992 to 48% in 2018 though at a slow pace. Further, at policy level, there are inadequate perennial drug shortages and limitation of physical access to reliable contraception and where contraceptive resources are available, decision to contraceptive use often involves two individuals who may have conflicting fertility preferences (Field & Ashraf, 2010).

The policy to integrate family planning services into MCH is inadequate to increase family planning service utilization to about 58% by 2020 in the country. Therefore, there is need for the government to integrate family planning services into every stage of service delivery at Primary Health Care. Additionally, there is need by the government to intensify on interventions such as awareness about importance of utilization of family planning services in the community.

In terms of practice, there is need to integrate family planning services into every stage of service delivery at Primary Health Care. This is easier said than done, but can be introduced slowly in line with the existing capacity in the health facilities. Integration at all levels can be the beginning, and then slowly increase the capacity to handle the increase in family planning services utilization. Further, there is need for all health care workers to under-go training in family planning services.

This is to ensure provision of all types of contraceptives in all health facilities to reduce family planning inequalities. Practice (service provision at primary level) is one way of reducing inequalities in family planning service utilization thus by increasing capacity of the health care providers who trained on how to offer different types of family planning services in order to match a woman's fertility intentions.

5.4 Strengths and Limitations

The study results are more precise due to a larger sample size which was used. This study has also added to the literature on the use of family planning services as it has contributed to the limited evidence available on socio-economic related inequalities in the utilization of family planning services in Zambia. The few studies in understanding the drivers to socio-economic inequalities in family planning utilization in Zambia among women of childbearing age and related studies in Zambia make this study of utmost importance by filling in the gap in local research.

This study, however, is not without limitations. The variables were limited as the data was not meant for this research and the limitation in the number of covariates chosen had an effect on the power and robustness of the results. However, the broader picture is still clear and the most imperative factors explaining use of family planning have been captured. This study did not measure some variables such as side effects, cultural expectations or beliefs and accessibility which might also affect the rural-urban gap in the use of family planning services.

5.5 Future Research

For effective public health policy, research backed advice is very useful and it is hoped that further studies in this area on Socio-economic related inequalities in the utilization of family planning services among men of childbearing age in Zambia, and Ability and willingness to spend on family planning services could be conducted to further look at the reasons for unequal and low utilization in family planning services in Zambia.

CHAPTER SIX: CONCLUSION AND RECOMMENDATIONS 6.0

Conclusion

The main findings from this analysis build a strong case for policies particularly targeted at improving the health of rural and poor urban women by reducing the disparities in the utilization of family planning services among women of reproductive age. Inequality in the use of family planning services exist and have persisted despite efforts by the Zambian government in ensuring availability of the commodities. Socio-economic inequalities were mostly to the disadvantage of the rural women and in favour of the urban women. These disparities are mainly due to ruralurban differences in the level of education, ages, level of wealth and number of children.

The results of the decomposition analysis clearly show that the rural and urban poor women were not utilizing family planning services not only due to poverty or lack of wealth but also due to limited use resulting from lower educational status. If policy makers want to bridge the gap in utilization of family planning services among women of reproductive age, the problem of low education should be addressed. In addition, health-promotion awareness programs, and economic and non-formal educational empowerment among the rural population should be implemented to enhance the rural and urban poor women's ability to make rational decisions on reproductive health issues. Provision of literacy training for women of reproductive age could be a solution in the utilization of family planning services. In addition, consideration of improving the ways health care systems effectively interact with illiterate and poor women could be a favourable solution in reducing inequality in family planning use. These findings are not only applicable for reducing the rural-urban disparities in use of family planning services, but also to contribute to reducing overall burden of socioeconomic related inequalities in Zambia.

6.1 Recommendations

In view of the above findings, it is therefore recommended as follows:

1. The Zambian government should encourage the private sector to establish health services in the rural areas.
2. The Zambian government through the Ministry of Health should put up serious monitoring measures and follow up mechanism for health workers in rural areas to ensure family

planning services are available, offered, accessible and utilized by the rural women of reproductive age.

3. Women economic and non-formal educational empowerment should be provided to enhance their ability to make rational decisions on reproductive health issues.
4. Awareness messages and education specifically targeted towards women of childbearing age should be enhanced as it may help increase the use of family planning services. Such a strategy would increase accessibility and use of family planning services.
5. In order to increase family planning utilization, Zambia needs to adopt more focused efforts to increase uptake in rural areas. In addition, both rural and urban women of reproductive age need additional interventions targeted by demand and supply.
6. There is need to offer family planning services at all points of health service delivery at all times in order to increase uptake.

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APPENDICES Appendix 1: Timeline for Dissertation

Gantt chart: September, 2018 - December, 2019

	2018				2019									
Activity	Sept	Oct	Nov	Dec	Jan	Mar	Apr	May	Jun	Sep	Oct	Nov	Dec	
Data Extraction														
Data Cleaning and Analysis														
Submission for Supervisors Reviews														
Departmental presentations														
Presentation at Graduate Forum														
Submission for Supervisors Reviews														
Submission for final Supervisors Reviews														
Submission for marking														
Public Defence of findings														
Application for Publication														

Appendix 2: Budget

Budget summary

Stationary.....	K 1,100.00
Ethics committee.....	K 1,000.00
Implementation.....	K 12,500.00
Data analysis cost.....	K 3,270.00
TOTAL.....	K 9, 370.00

However, the budget was liable to change depending on prevailing economic situation especially on the implementation and analysis costs as these activities were carried on to the following year. Below was the detailed breakdown of the budget.

Proposed budget

SN	ITEM DESCRIPTION	UNIT COST (ZMK)	QUANTITY	TOTAL COST (ZMK)
STATIONARY COSTS				
1	Reams of paper	60	3	180
2	External hard disc	500	1	500
3	Flash disc	250	1	250
4	Printing costs (proposal)	30	5	150
5	Pens, pencils and rubber	1	20	20
6	Ethics committee costs	1000	1	1000
IMPLEMENTATION COSTS				
7	Transport	100	25	2500
8	Lunch	50	30	1500
DATA ANALYSIS COSTS				
10	Data analysis cost	500	1	500
11	Printing and photocopying costs	520	1	520
12	Binding final research paper	250	5	1250
13	Publication of results	1000	1	1000
GRAND TOTAL				9, 370.00

Appendix 3: Data extraction form SECTION 1: General information

Name of Researcher:

Date of data extraction:

SECTION 2: Study characteristics

Aim of the study:
.....
.....

Study design:

Sampling method:

SECTION 3: Participants Characteristics

Family planning utilization (dependent variable)

Yes.....

No.....

Age groups

15 to 19 years.....

20 to 24 years.....

25 to 29 years.....

30 to 34 years.....

35 to 39 years.....

40 to 44 years.....

45 to 49 years.....

Marital status

Not married.....

Married.....

Religious denominations

Roman Catholic.....

Protestants.....

Muslim.....

Others.....

Level of education

No education

Primary education..... Secondary
education.....

Tertiary education.....

Number of children

No children.....

1-3 children.....

4-6 children.....

7 & more children.....

Wealth index

Poorest.....

Poorer.....

Middle.....

Richer.....

Richest.....

Province

Central.....

Copperbelt.....

Eastern.....
Luapula.....

Lusaka.....

Muchinga.....

Northern.....

North Western.....

Southern.....

Western.....

Place of residence

Urban.....

Rural.....

Appendix 4: Linear Probability Model

Source	SS	df	MS
Model	508.5914	30	16.9531
Residual	2574.0836	12467	0.2065
Total	3082.675	12497	0.2467

Number of obs = 12498

F(30, 12467) = 82.11

Prob > F = 0.0000 R-squared = 0.165

Adj R-squared = 0.163

Root MSE = .45439

Family planning	Coef.	P> t	95% CI	
Age Groups				
15-19 yrs ^(ref)	Ref			
20-24 yrs	0.0309	0.051	-0.0001,	0.0619
25-29 yrs	0.0295	0.084	-0.0039,	0.0628
30-34 yrs	0.0009	0.962	-0.0353,	0.0371
35-39 yrs	-0.0596	0.002	-0.0978,	-0.0214
40-44 yrs	-0.0984	0.0001	-0.1392,	-0.0576
45-49 yrs	-0.2833	0.0001	-0.3277,	-0.2389
Marital Status				
Not married ^(ref)	Ref			
Married	0.2461	0.0001	0.2268,	0.2655

ReligionCatholics^(ref)

Ref

Protestants

-0.0054

0.618

-0.0269,

0.016

Muslims

-0.0998

0.09

-0.2153,

0.0156

Others

-0.13

0.011

-0.2305,

-0.0294

Level of Education

No education ^(ref) Ref				
Primary 0.0748		0.0001	0.0457,	0.1039
Secondary 0.1401	0.0001 0.107, 0.1732	Tertiary 0.1741	0.0001 0.1248,	0.2233
No. of Children				
No children ^(ref) Ref				
1-3 children 0.2741		0.0001	0.2444,	0.3038
4-6 children 0.3608		0.0001	0.3236,	0.3981
7 & more children	0.4038	0.0001	0.3602,	0.4474
Wealth Groups				
Poorest ^(ref) Ref				
Poorer 0.0398		0.003	0.0131,	0.0665
Middle 0.0834		0.0001	0.0555,	0.1113
Richer 0.0763		0.0001	0.0436,	0.109
Richest 0.0889		0.0001	0.0503,	0.1276
Provinces				
Central ^(ref) Ref				
Copperbelt 0.0483		0.012	0.0108,	0.0858
Eastern 0.1383		0.0001	0.1026,	0.174
Luapula -0.0308		0.11	-0.0685,	0.007
Lusaka 0.1026		0.0001	0.0655,	0.1398
Muchinga 0.0512		0.01	0.0121,	0.0903
Northern 0.0603		0.002	0.0219,	0.0988
North western	0.0134	0.481	-0.0238,	0.0506

Southern	0.0933		0.0001	0.0567, 0.1299	Western	0.0427	0.03	0.0042, 0.0813	
Regions									
rural ^(ref)	Ref	urban	0.042	0.0001	0.0198, 0.0642	cons	-0.2016	0.0001	-0.2545, -
			0.1487						

Appendix 5: Letter from UNZABREC Appendix 6: Letter from National Health Research Authority (NHRA) Appendix 7: Letter from Assistant Dean