DETERMINANTS OF FERTILITY AMONG THE POOR WOMEN IN KENYA

BY

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DECLARATION

I hereby declare that this research project is my original work and has not been presented for a degree in any other university.

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DEDICATION

I dedicate this work to my beloved late father Makuba M'Amburuka who inspired me in my childhood to work hard and I achieved in very peculiar circumstances of the time. This has given me strength to complete successfully this work.

I would like also to dedicate this research to my lovely wife Lucy Kagendo, my children Rachael, Jacob and Leah for their relentless encouragement and support.

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ABSTRACT

The objective was to determine the differentials and determinants of fertility among poor. Very few studies have focused on studying fertility among poor women in Kenya. The study used descriptive statistics to establish differentials in fertility among poor women of Kenya. Generalized linear model was used to establish factors associated with differentials of fertility and multiple linear regression was used to establish determinants of fertility.

The results revealed that age, age at first birth, age at first marriage, education level and region of a poor woman, were all significant and strongly associated children ever born. However the place of residence and current contraceptive use were all found not to be significantly associated with fertility. Analysis by multiple linear regression found that age, age at first birth and age at first marriage were each statistically significant and the most important factors influencing children ever born among the poor women of Kenya. However, education was less important but statistically significant.

The study recommends in-depth studies to establish why education, it's not one of the major contributing factor determining fertility of the poor women in Kenya. It also recommends for conducting of longitudinal studies to understand fertility change over time.

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CHAPTER ONE: INTRODUCTION

1.1. Background

Fertility is key factor of population growth in different countries of the world today. In Kenya, the population continues to grow rapidly and has more than tripled from 10.9 million people in 1969 to 38.6 million people in 2009. The current annual population growth rate in Kenya is 2.9 percent per annum. Since the country's population is youthful, this growth rate is still considered too high and if it persists, may lead to the doubling of the country's population in 2030 to reach 77 million (NCPD, 2012). Fertility level in Kenya is generally considered to be on the decline. This has declined from 8.1 children in 1979 to 3.9 children in 2014 (KNBS and ICF International, 2015). This TFR is still considered high as compared to the country's set target of 2.6 (Oketch et al., 2011).

Fertility remains the crucial factor contributing to a high population growth rate, and consequently has potential drawbacks on the economy and development of a country. Reductions in infant and maternal deaths, hailed world over as desirable, but these would increase population growth little compared with how powerfully reductions in fertility could curb it. According to Adhikari (2010), "fertility is the logical target for reducing population growth because of the place we occupy today in the history of population change."

Like other countries, the Kenyan government has put in efforts to controlling population growth. This is mainly through the adoption of different population policies and programmes. Kenya developed its first National Family Planning Programme in 1967, and was among the first countries to do so in Africa. This was after the realization of the potential adverse effects of high population growth on the benefits of economic growth. Kenya has invested significantly in family planning with the aim of increasing contraceptive prevalence rate (CPR) and generally reducing the country's total fertility rate (Cleland & Wilson, 1987).

Different factors drive variations in fertility such as those that are observable in the long sweep of human population history and in the pattern of fertility around the world. Determinants of fertility are considered in two classes: proximate determinants and background determinants. Different studies have examined the role of proximate determinants in reducing the level of fertility in different countries. For instance, Majumder and Ram, 2015 focused on "the role of proximate determinants on fertility decline among

poor and non-poor in Asian countries." Awes (2014) conducted a similar study in Kenya, on the role of proximate determinants of fertility inhibiting effects among the poor and non-poor of Kenya over the period 2003 and 2008/09. On the other hand, Anyara and Hinde (2005) conducted a regional analysis of fertility patterns in Kenya since 1989 using data from the four Demographic and Health Surveys of 1989, 1993, 1998 and 2003. The impacts of late and non-marriage, contraceptive use, sterility and postpartum non-susceptibility on fertility in 21 regions in Kenya were quantified using the model of the proximate determinants of fertility developed by John Bongaarts. Many other studies (Onoja and Osayomore, 2002; Dube et al., 2013; Makinwa, 1994; Ndahindwa et al. 2014; Mboup and Tulshi, 1998; Gupta and Mahy, 2003; Adhikari, 2010; Martin, 1995; Dube et al. 2013; Bledsoe and Cohen, 1993; Gomes, 2012; Zaba et al 2004; Rutaremwa, 2013; Nyarko, 2012; Nwogwugwu, 2013) have also focused on the socio-cultural and economic determinants of fertility in various regions.

Like most developing countries, Kenya is characterized by high levels of poverty even as more than 46 percent of the country's population is considered poor. For many years, the poor in Kenya are characterized by higher fertility compared to the non-poor. In this case, fertility has always been more than twice as high among the poor compared to the richest households (NCPD, 2012). Since the majority of the Kenyan population is poor and rural, fertility rates over the years have been higher in the rural areas compared to the urban areas, and among the poor compared to the rich. This implies that the poor in Kenya experience some unique factors that the non-poor do not experience. The high fertility rate and differences in TFR between the poor and non-poor remains a concern in the country, even as this maintains a high population growth and considerably hinders economic development in the country.

In his study, Adhikari (2010) 'hypothesized that the poor women would have higher fertility than the richest women'. The relationship between wealth and fertility is clearly seen in the results of his study. He further stated that, 'an inverse relationship was observed between wealth status and fertility, with significantly lower fertility among the richest women compared to high fertility among the poor women.' This result is the same as for other studies (Easterlin, 1980; Robinson, 1997; Onoja and Osayomore, 2002; Dube et al., 2013; Makinwa et al, 1994; Ndahindwa et al. 2014). According to Karki (1982), the reason for high fertility among the poor compared to the non-poor 'could be that poor people may perceive children as a source of income, thus motivating them to have more children. Another reason could be that the poor people have less access to education and family planning methods.' In Kenya,

such factors among the poor women must be established so that effective interventions can be developed.

1.2. Research Problem

The total fertility rate (TFR) in Kenya has decreased significantly from 8 births per women in the 1970s to 3.9 births per women in 2014. At 3.9, the country has not achieved its set target of 2.6 (Oketch et al 2011). Total fertility rates, as well as fertility decline rates have not been even among all the wealth quintiles (Appendix 1). For in instance, the TFR among the poorest wealth quintile was 7.2, 6.5, 7.6, 7.0, and 6.4 in 1993, 1998, 2003, 2008/9, and 2014 respectively while the richest wealth quintile had a TFR of 3.3, 3.0, 3.1, 2.9, and 2.8 in 1993, 1998, 2003, 2008/9, and 2014 respectively. Percentage decline in fertility from 1993 to 2014 is lowest among poorest wealth quintile (11 percent) compared to other wealth quintiles (23 percent; 32 percent; 42 percent; and 15 percent) (NCPD, 2013). Notably, the fertility among the poorest wealth quintile has been more than twice the fertility among the richest wealth quintile in all the surveys conducted under DHS series in Kenya (NCPD, 2013).

It is important to note that, in DHS program, wealth index is used as "a composite measure of a household's cumulative living standard. The wealth index is calculated using easy-to-collect data on a household's ownership of selected assets, such as televisions and bicycles; materials used for housing construction; and types of water access and sanitation facilities. Generated with a statistical procedure known as principal components analysis, the wealth index places individual households on a continuous scale of relative wealth. DHS separates all interviewed households into five wealth quintiles to compare the influence of wealth on various population, health and nutrition indicators." In this study, the poor woman of Kenya refers to the one classified as of lowest wealth quantile index during the survey time.

Fertility of the poor wealth quintile contributes significantly to the TFR of a country, yet the fertility of poor women in Kenya remains high. In order to effectively address the high TFR in Kenya, focus must also be drawn to the fertility of poor women in the country.

A sustained high fertility among the poor women in Kenya will derail the total decline of TFR in the country. This high fertility of poor women in Kenya may imply that the women experience some unique factors not experienced by women in other wealth quintiles.

However, the factors responsible for high fertility among poor women in Kenya are not clearly understood. Therefore, for effective interventional programmes to be developed, these factors must be clearly understood. By determining the differentials in fertility among poor women in Kenya, it will be possible to understand some of the factors responsible for high fertility in the poorest wealth quintile.

In Kenya, various studies have been done on fertility among the poor and non-poor women, Awes (2014); conducted a study to identify proximate determinants of fertility among poor and non-poor women in Kenya. The study showed that between 2003 and 2009, both poor and non-poor women had contributed to the decline in fertility. The TFR as estimated by the Bongaarts Model for the poor women reduced from 5.41 to 4.21 births per woman in 2008/09. Similarly, TFR for the non-poor women reduced from 3.32 births per woman to 3.28 births per woman over the same period. However, the TFR of poor women remained higher than that of non-poor women over the two periods.

Odwe (2014) in a study examining the relationship between household poverty and fertility in Coast and Western provinces and using both quantitative and qualitative data, he found that "the magnitude of the difference in fertility rates between poor and non-poor women declined during the 1989-1998 then widened between 1998-2008/9." He further, found that the "increase in the gap between fertility of poor women and non-poor women is attributed to an increase in fertility among poor women." These studies have generally focused on the fertility of poor and non-poor women and have not identified the factors responsible for high fertility of the poor women.

According to NCPD/PSRI Policy brief No. 35 of 2013, fertility levels for women in Kenya did not decline uniformly across the "different socio-economic groups. Much of the decline took place among the better educated and economically well-off women, while little change occurred among the less educated and poor women." It further states that, there is slow pace of fertility among the poor women of Kenya and that, this slow decline is probably due to increases in desire for more children among women who are poor or non-educated.

These studies have generally focused on the fertility of both the poor and non-poor women and have not identified the factors responsible for high fertility of the poor women of Kenya. This study will therefore, fill this knowledge gap of what differential key indicators of factors among the poor women of Kenya that make this decline to be little. The study will also

establish the determinants of fertilities by the socio-economic and demographic factors among the poor woman in Kenya.

1.3. Research Questions

The study will answer the following research questions:

i. What are the differentials of fertility among the poor women in Kenya?
ii. What are the factors associated with differentials of fertility among the poor women in Kenya?
iii. What are the determinants of fertility among the poor women in Kenya

1.4. Objectives

The general objective of this study is to examine differentials in fertility among the poor women in Kenya and establish determinants of fertility among them. The specific objectives of the study are:

i. To establish the differentials of fertility among the poor women in Kenya.
ii. To establish factors associated with differentials of fertility among the poor women of Kenya.
iii. To establish determinants of fertility among poor women in Kenya.

1.5. Justification of the Study

Many developing countries that are also poor are faced with major challenges arising from their rapid population growth. A high population and rapid population growth in most countries in Africa has adverse effects on the level of economic development. Therefore, the findings of this study will "guide health (reproductive) program planners and policymakers to incorporate various factors influencing fertility in order to assist in the implementation of a reproductive health program that will decrease fertility among poor women in Kenya."

This study will provide a basis for understanding the differentials as well as factors associated with differentials of the fertility of among the poor women in Kenya. It will also establish determinants of fertility among these poor women of Kenya. It will contribute in understanding why the fertility decline (by percentage computation) is low among the women

in the lowest wealth quintile compared to the highest wealth quintile. Further, it will provide a basis for understanding the determinants which influence the low fertility decline among the poor woman of Kenya.

A number of studies have been conducted to examine factors that influence fertility, but none has focused solely on the poor women in Kenya. Awes (2014) conducted a study to identify "proximate determinants of fertility among poor and non-poor women in Kenya." Results of this study showed that between 2003 and 2009, both poor and non-poor women had contributed to the decline in fertility. The TFR as estimated by the Bongaarts Model for the poor women reduced from 5.41 to 4.21 births per woman in 2008/09. Similarly, TFR for the non-poor women reduced from 3.32 births per woman to 3.28 births per woman over the same period. However, the TFR of poor women remained higher than that of non-poor women over the two periods.

This study will therefore, fill the existing gap by focusing on the differential fertility among the poor women in Kenya. The study will contributes knowledge by identifying factors contributing to differential fertility among the poor women of Kenya. The study will also establish fertility determinants among the poor women in Kenya. The results of the study will provide useful and important knowledge which can be used by program planners and policy makers in the reproductive health to understand the factors that influence fertility among the poor woman of Kenya. This will help in designing strategies to address fertility differentials among the poor women in Keya. The study will also contribute to more knowledge in the growing literature on fertility in Kenya

1.6. Scope and Limitation

This study will focus on the socioeconomic and cultural characteristics as well as differentials of fertility among the poor women in Kenya. The 2014 Kenya Demographic and Health Survey (KDHS) data will be used. Using the wealth index (poorest), all women of age 15 – 49 years, married and unmarried, living in urban and rural Kenya interviewed in the survey and found in household of the poorest wealth index, will form the scope of the study. The variables that will be used include current age of the woman, education, marital status, region, and residence, age at first birth, contraceptive use, desired family size, children ever born, and age at first marriage. In this study, wealth index will be used to disaggregate all

women interviewed into the economic index of poorest, thereafter referred to as the poor women of Kenya. This will form the target population.

One of the limitation, is that study relied on quantitative data with no reference to qualitative data, to understand the deep socio-cultural factors contributing to high fertility among the poor women. The qualitative data would have provided critical reasons behind some of the key findings. Secondly, the design of the study of the dependable and the independent variables included in the linear regression model were analyzed for statistical association between the variables and fertility, and not necessarily to show cause-effect relationship. Finally, migration (in and out) could have been an important factor in explaining fertility levels and behaviours of a population (Oucho, 1994), however these were not included in the study. This was a limitation because it could have provided an understanding on how migration affects the fertility of poor women in Kenya.

CHAPTER TWO: LITERATURE REVIEW

2. Introduction

This chapter presents a review of literature on factors responsible for high fertility among poor women in Kenya. The first part focuses on the theoretical background of the study, followed by findings by previous studies. The conceptual and operational frameworks that will guide this study are also discussed in this chapter.

2.1. Theoretical Background on Determinants of Fertility

High fertility can be explained using the demographic transition theory. This theory explains the transition from high to low fertility during the transition from a pre-industrial to an industrialized society. In the first stage of the demographic transition theory, population growth is slow even as the society is characterized by high fertility and high mortality rates. The traditional family structure pertinent to the first stage of the demographic transition is considered to be responsible for the high fertility in this stage. According to Caldwell (2005), family structure has an influence on fertility. During the pre-industrial period, wealth flows are from the younger to older generations. For this reason, it becomes economically important to have as many surviving children as possible, as these hold different benefits especially acting as the security of parents in old age besides providing free labour on the farms as the society is highly agricultural at this stage.

In the next stages of demographic transition, society begins to experience fertility decline. This is facilitated by increase in the level of urbanization, formal education, improvement in the economy, as well as lower levels of mortality which make parents to start desiring a smaller family size. In these stages, more people use contraceptives and family planning as well as abortion to control fertility (Easterlin, 1975). Overall, the demographic transition theory posits that there is fertility decline as countries develop. However, as Bongaarts and Casterline (2012) note, Africa is generally characterized by low level of social and economic development, thus high fertility.

Bongaarts and Blake classified the factors affecting fertility into background and proximate determinants as the different factors that influence fertility. Cultural, social, economic,

environmental, health, and psychological factors comprise the background determinants. These background factors, according to Bongaarts (1978), operate through proximate determinants such as postpartum infecundability, marriage, primary sterility, contraceptive use, and induced abortion to influence fertility. The socio-cultural and economic factors influencing fertility from the Bongaarts framework include education, place of residence, marital status, use of contraceptives, age at first sex, age at first marriage, exposure to mass media, and religion. These factors influence fertility in different ways. For instance, education as an economic factor is known to have a negative influence on fertility.

2.2. Review of Studies on Determinants of Fertility

Different studies in the developing world have shown that there is a strong correlation between fertility and educational level of a woman. Specifically, these studies have established that there is reduced childbearing as a woman advances in their educational level; thus women with high level of education have fewer children compared to those with lower level of education A study by Mboup and Tulshi (1998) found that in most countries of the sub-Saharan Africa, women with no schooling have about two to three children more than women with secondary or higher education. In areas that have not experienced mass schooling, it is expected that there will be slow behavioural changes because of the slower pace of social interaction and diffusion, hence slow decline in fertility. Gupta and Mahy (2003) argue that young women with no education are more than three times likely to have started childbearing by age 19 compared to those who have secondary and higher education. It has been established that low literacy levels can lead to unemployment, early marriage and non-use of contraceptive; thereby increasing pregnancy and childbearing among women.

In Nepal, Adhikari (2010) found "that illiterate women have almost double the number of CEB than do literate women. Education exposes women to information, empowers women, makes them more likely to be employed outside their home environment, and makes them more aware of their own health and the health of their children-all of which are negatively associated with the number of children a woman will have during her reproductive life. Similarly, educated women are more likely to postpone marriage, have smaller family size, and use contraception than are uneducated women (Martin, 1995).

In Nigeria, Onoja and Osayomore (2002) conducted a study to identify factors that contributed to the high level of fertility in the country. Results of this study indicated that the level of education was a major factor that determined the high fertility in the country. Women with low educational level were found to be more likely to have more children compared to women with higher education. In another study in Ethiopia to identify factors of high fertility among married women in Gilgel Gibe Field Research Center, Dube et al., (2013) found that women who had no education had three times as many children as those women with at least secondary education.

In Rwanda, Ndahindwa et al., (2014) found that educated women that were ever married or cohabiting were characterized by low fertility. The researchers explained that education exposes women to many messages related to fertility such as the importance of delayed sexual debut and marriage as well as the value of spaced and fewer children; yet girls and poor women that drop out of school do not get the opportunity to hear such messages. The researchers also noted that when women become educated, their social power increases, thus are able to control their reproductive decisions; have increased exposure to mass media; and have more opportunities for professional and economic growth, compared to the women that have no education. Overall, education delays sexual debut, makes the reproductive life of a woman shorter, thus decreasing a woman's fertility level.

Place of residence which has the urban and rural distinction is considered important because of differences in access to health facilities, cultural beliefs, living situations and opportunities. Studies by Bledsoe and Cohen (1993) showed that fertility in sub-Saharan African countries is higher in the rural areas than in the urban areas; knowledge of and access to contraceptive, higher education and aspiration for higher standard of living plays a role in lowering the fertility rate of adolescents in the urban areas. In a study of fifty-one countries which included twenty-nine countries in Africa, thirteen in Asia and nine in Latin America and the Caribbean, using data from demographic and health surveys trends and levels of fertility in the 1990s and 2000s were measured. The result showed that in all countries studied, except Rwanda, fertility was higher in rural areas than in the urban areas. In Ghana and Senegal, fertility rate in rural areas was almost three times more than the fertility rate in the urban areas (Gomes, 2012).

In Nepal, Adhikari (2010) found "that rural women had higher fertility than urban women." Other studies (Lee, 1993; Muhuri et al, 1994; Mboup and Tulshi, 1998) also found that there

is high fertility among women that lived in rural areas compared to those in urban areas. One reason could be that urban women are likely to access use of especially modern contraceptives than are rural women; therefore, the fertility levels in urban and rural areas are different (Retherford and Thapa, 2003). The other reason according to Zarate (1965) "could be that people who live in rural areas tend to marry at a younger age than do those in urban areas.

In Nigeria, Onoja and Osayomore, (2002) also found that women in the rural areas were more likely to give birth to more children than those in the urban areas. In many parts of Africa, most of the poor population lives in the rural area. Many urban areas are populated mostly by the rich and middle class who have an education and are working, as well as those that are pursuing higher education. For women in urban areas, employment and education makes them to delay marriage, thus lower fertility. For this reason, the rural area is characterized by higher fertility, since the poor women in rural areas are bound to give birth to more children as compared to their counterparts in the urban areas.

Age at first sexual intercourse is also another key determinant of fertility. In cases where the use of most effective contraceptive methods is absent, usually, the age at first intercourse is close to the age at first birth. Age at first intercourse varies in different countries since different factors determine this age. Ndahindwa et al., (2014) established that in Rwanda, women whose first sexual debut was earlier tended to have higher fertility. Additionally, Zaba et al (2004) established that in Uganda, the interval between first sex and marriage was short; thus women that failed to use contraceptives in their first sex contributed to a high fertility level in the country.

Age at first marriage equally plays an important role in influencing the fertility of a given country. Marriage is generally associated with fertility because it is correlated with exposure to risk of conception. "The duration of exposure to the risk of pregnancy depends primarily on the age at which women first marry. Women who marry earlier, on average, have their first child earlier and give birth to more children, contributing to higher fertility rates." Populations in which age at first marriage is low tend to have early childbearing and fertility. According to Letamo and Letamo (2002), early age at first marriage may result in large family sizes if effective birth control measures are not instituted to deter child bearing. Age at first marriage may be affected by social, economic, and cultural conditions prevailing at the time (Letamo and Letamo, 2002).

In sub-Saharan Africa, areas that have a high rate of early marriage tend to have a high fertility rate (ZDHS, 2007). In certain parts of the world, we have a legal minimum age at marriage which is fixed but this is not always adhered to.

In Nepal, Adhikari (2010) found that, "those women who married early were likely to a have higher number of children than their counterparts who married at a later age. An increase in the age at first marriage has an adverse effect on high fertility. Early marriage does not only mark a woman's entry into a sexual union and the beginning of exposure to childbearing but may also be an important gauge of women's status, since the older the woman is when she marries, the greater the likelihood that she has attended school or been employed, and the greater her chances of having a more equal relationship with her husband (Adhikari, 2010). Generally, different studies have established that "older age at first marriage played an important role in reduction in fertility" (Sibanda et al 2003; Serbessa, 2003; Mohammad, 1985). Furthermore, marriage is a primary indication of regular exposure of women to the risk of pregnancy and is therefore important for the understanding of fertility. The marital status of a woman will therefore to a greater extent determine her fertility. Many studies (Rutaremwa, 2013; Nyarko, 2012; Nwogwugwu, 2013) have found that women that were currently married had more children compared to the not married women. Married women as opposed to unmarried women are highly exposed to frequent sex, thus more likely to have children. In addition, many women marry so as to have children in a family setting.

There is an important association between contraceptive use and fertility. In sub-Saharan Africa, contraceptive prevalence is generally low compared to other regions of the world. There is also a substantial use of traditional methods in sub-Saharan Africa; which are not as effective as the modern methods in preventing pregnancy. However, knowledge of contraceptive use is quite high in sub-Saharan African countries even as the prevalence of contraceptives has been increasing starting from the 1980s.

Access to effective contraceptives and family planning is influenced by the economic status of women. Whereas non-poor women will easily access family planning services and afford more effective contraceptives, poor women may have a low access to effective contraceptives. This makes poor women to have a higher fertility compared to the non-poor women, since appropriate and consistent use of contraceptives is known to result in lower fertility. According to Dow and Werner (1983), there are different factors that are associated with the uptake of contraceptives and family planning in Kenya. These in their study

established some of the obstacles to greater use of contraceptives including isolation from FPP services, personnel, and methods. Whether a woman will visit a health facility for family planning services or not depends on the proximity of a clinic. In most rural and marginalized areas in developing countries, health facilities are insufficient, thus denying women (who are mostly poor) in these areas the opportunity to regular use of contraceptives. Dow and Werner (1983) also established that the direct and indirect costs of use of family planning also serve as a hindrance to the utilization of the services; while lack of financial resources to access the services ranging from bus fare and money to purchase contraceptives is a great hindrance to access. For this reason, poor women are mostly affected as they will have a limited or no access to family planning services and contraceptives because of their financial incapability.

Locally, while using group data from the Kenya Fertility Survey 1977/78 to examine the effect of the intermediate fertility variables on marital fertility in Kenya, Kalule-Sabiti (1984) found that variations in the proportion married among the population, level of contraceptive use and post-partum lactational infecundability can account for much but not all of the observed marital fertility differentials. Kavali (1998) found out that postpartum infecundability was the most important fertility-inhibiting variable at the national levels and among all sub-groups except in Nairobi and Central regions as well as among women with secondary level of education. Non-marriage was the second most important variable at the national levels and among sub-groups except in the urban areas where it took the leading role in reducing fertility. Kizito et al (1991) found that postpartum infecundability was the most important suppressing fertility inhibiting variable in Kenya in 1977-1978 and 1989. The study also found that contraceptive use did not have any appreciable effect in 1977-1978, but its impact increased significantly over the study period. The effect of marriage was more important in 1977-1978 than 1989

Another study by Njenga (2010) "indicated that "contraceptive practice contributed the highest impact in the lowering of fertility between 2003 and 2008/09 at the aggregate and across all sub population levels except among the most educated women At sub population level the decrease in TFR in all regions except Central province was mostly attributed to the shortening of the duration of postpartum infecundability. Western province had the highest increase in contraceptive practice. The study recommends that due to the important role contraception is playing in fertility reduction in the country, there is need to sustain the current trend in the increase in contraception prevalence. In particular, special attention

should be paid to regions that have continued to register low contraception prevalence such as North Eastern province." In a study, Ekisa and Hinde (2005) found that between 1989 and 1993 increased contraceptive use was the most important determinant of fertility change in Kenya.

The high fertility pattern experienced in Kenya during the post-colonial era was attributed to the socio- economic development from 1950 to the 1970s (Brass and Jolly (1993). During this period, there was an increase in living standards accompanied by a decline in child mortality. Other studies on fertility in Kenya have looked at the turning point in fertility transition (Blacker, 2002; Cross et al., 1991; Kelley and Nobbe, 1990). The downward trend in fertility observed in the 1980s was linked to the use of contraceptive methods (Blacker, 2002; Cross, Obungu and Kizito, 1991; Robinson, 1992), post-partum infecundibility and changes in marital patterns (Macrae, Bauni and Blacker, 2001). Although post-partum infecundity was considered the most significant fertility inhibiting factor then, contraceptive use was found to have overtaken marriage as the second most important determinant responsible for the incipient fertility decline.

While Westoff and Cross (2006) provided a detailed analysis of the stall in Kenya between 1998 and 2003, a number of authors (Bongaarts, 2006; Garenne, 2007; Moultrie et al., 2008; Shapiro and Gebreselassie, 2007; Westoff and Cross, 2006) focused on the reasons behind the stall. Several hypotheses have been suggested to be behind the stall. Bongaarts, (2006), Westoff and Cross, (2006) alluded the stall to changes in proximate determinants of fertility while other authors suggested trends in socioeconomic determinants (Bonngaarts, 2008; Shapiro and Gebreselassie, 2007). Other studies have shown that the loss of momentum was partly due to the desire for more children as a result of child mortality rates heightened by the HIV/AIDS epidemic (Ekisa, 2009; Magadi and Agwanda, 2007; Westoff and Cross, 2006; Moultrie et. al., 2008).

Despite the existence of numerous studies on fertility and its determinants in Kenya, understanding of the reasons for the recent lack of progress and specifically the stall in fertility decline remains scanty. In particular, the linkage between fertility and poverty has not been fully explored. Most studies have looked at the socioeconomic determinants of fertility by examining the differentials in education (Omariba, 2003), child mortality (Gyimah, 2002; Kimani, 1992) and urban rural fertility differentials (Shapiro and Tambashe, 2000).

Studies that examine the empirical relationship between measures of household poverty and childbearing are very rare. Schultz and Mwabu (2003), did a study on the causes and consequences of fertility in Kenya. Using Kenyan Welfare and Monitoring II and III data for the years 1994 and 1997, Schultz and Mwabu explored the relationship between fertility and household income. They found that the consequence of economic development on fertility depends on the composition as well as level of family economic resources. In particular, family income from returns on physical capital such as land holdings increase family consumption and raise fertility, whereas family income from returns on women's human capital increase family consumption and lower fertility (Schultz and Mwabu, 2003). Schultz and Mwabu (2003) observed that the relationship between poverty and fertility is complex.

In a study involving 25 sub-Saharan countries including Kenya Schoumaker (2004) "observed that better family planning services contributes to reducing fertility among the poor women." He singled out Kenya, Ghana, Zimbabwe and South Africa as example of countries where fertility has declined in all the economic groups. Recognizing that much of fertility decline in these countries has little to do with compositional changes, his findings were supported by the innovation-diffusion framework which is consistent with the idea that better off women are the first to control their fertility and that fertility control spreads to the rest of the population, including the poor women. In another study, (Dow, Kekovole and Archer 1997) examined wealth flow and fertility in rural Kenya between 1981 and 1992 using survey data of male household heads. They found a significant reduction in desired and observed fertility while nucleation levels remained unchanged. Dow and his colleagues suggested that both structural socio-economic changes and ideation factors played a prominent role in the desired fertility and determination of material parental obligations and household utilities. The diffusion of new ideas especially on future expectation of child support, education, form of marriage, and spousal communication and consensus on family size and family planning were key determinants of desired fertility. In deciding their family size or the number of children they demand, parents established priorities in the allocation of disposable income.

Odwe (2014) in a study examining the "relationship between household poverty and fertility in Coast and Western provinces and using both quantitative and qualitative data, he found that the magnitude of the difference in fertility rates between poor and non-poor women declined during the 1989-1998 then widened between 1998-2008/9. He further, found that the

increase in the gap between fertility of poor women and non-poor women is attributed to an increase in fertility among poor women. Consequently, from the study he concluded, despite social and cultural differences, large families are still viewed as important among poor households. His use of qualitative data, showed some light on possible explanations for the lack of fertility decline observed among women from poor households. In particular, polygyny, old age security, child mortality, lack of spousal communication on reproductive issues and low age at first marriage are important."

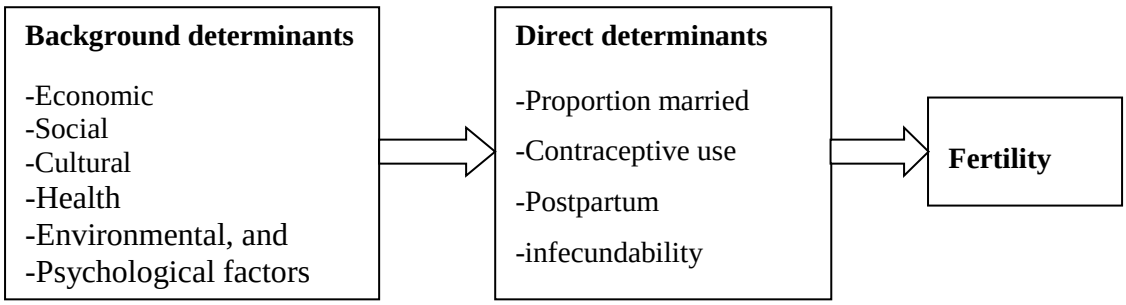
In a study on "proximate determinants of fertility among poor and non-poor women" in Kenya, Awes (2014) sought to determine the fertility inhibiting effect of each of the principal proximate determinants of fertility to change in TFR. The results of the study have showed that marriage played an important role in fertility decline. At the sub groups, he found that non poor women contributed to the increase in fertility while the poor women contributed to its decline. Furthermore, the study showed that at the aggregate level, urban and rural areas, poor women are delaying marriage while non poor women enter into marriage earlier in 2008/09 than in 2003. The study further showed despite Kenya has experiencing a decline in fertility rate between 2003 and 2008/09, "this change in fertility is not shared equally among the poor and non-poor women." The study also revealed that, that effects of the proximate determinants of fertility among the poor and non-poor vary based on rural-urban residence, region of residence and educational levels. It showed marriage pattern was the most important fertility inhibiting factor at the aggregate level for both poor and non-poor women in the two surveys periods.

In summary, the literature review above has revealed the different socio-cultural and economic factors that explain high fertility. In all the studies reviewed, education, marital status, age at first sex, age at first marriage, contraceptive use, frequency of listening to radio, and place of residence have been found to be significant determinants of high fertility. However, there are inconsistencies in different studies with regard to religion. While this was found to be a significant determinant of high fertility in some studies, in others it was not found to be significant. Nonetheless, although all the studies reviewed have attempted to explain of high fertility, none has focused specifically on explaining high fertility among poor women only, even in Kenya as a country.

2.3. Conceptual Framework

This study will be conducted within Bongaarts (1978) framework. According to this framework, socio-economic, environmental and cultural factors which influence fertility operate through proximate determinants. To explain fertility differentials among poor women of Kenya, variations in one or more of the indicators of proximate determinants will be looked at. Bongaarts (1978) enumerated eight proximate determinants of fertility. Among them, the four most important ones are; marriage patterns, post-partum infecundability, contraceptive use and induced abortion. The other four include sterility levels, spontaneous intra- uterine mortality, frequency of intercourse, and duration of fertility period. He noted that not all the intermediate variables are equally important in explaining level of fertility. Cultural, psychological, economic, and social, health and environmental factors affect fertility indirectly through these proximate determinants. Changes in fertility are the direct results entirely of changes in these proximate determinants, which thus mediate the effect of changes in social, economic, and cultural factors. Kingsley Davis and Judith Blake (1956) described the concept of intermediate variables as a set of factors through which and only through which, social, economic, and cultural conditions can affect fertility. However Bongaarts quantified the concept into a model. This study will look into the differentials in socio cultural, socio economic and demographic factors at national level that influence fertility levels among the poor women of Kenya. The proximate determinants of fertility are the biological and behavioral factors through which socio-economic and environmental variables affect fertility, the principal characteristics of a proximate determinants being its direct influence on fertility. This study will also explore differentials in indicators of proximate determinants that influence fertility levels among the poor women of Kenya.

Figure 1:- Conceptual Framework

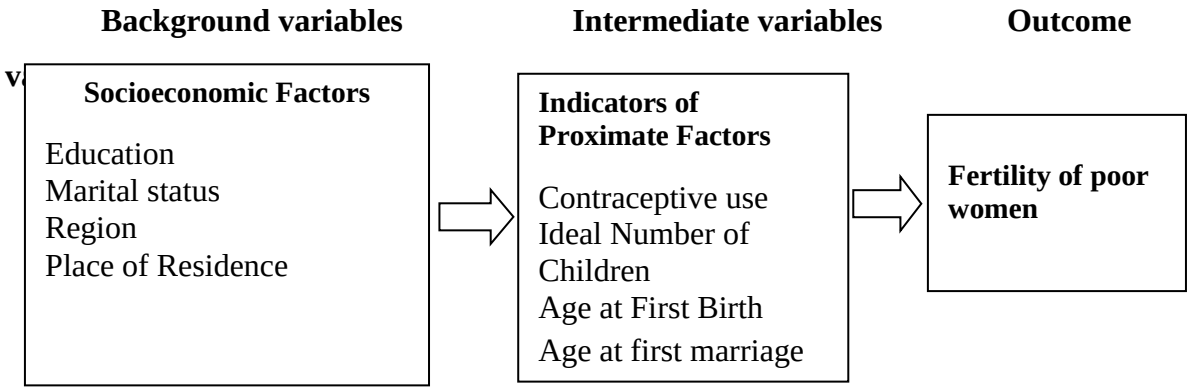


Source: Bongaarts' Fertility Framework, 1984

2.4. Operational Framework

In the operational framework below, this study will employ some social-economic and socio-cultural factors. It will not be possible to use all the variables in the conceptual framework. Nonetheless, this was relevant in showing the factors influencing fertility in poor women of Kenya.

Figure 2:- Operational Framework



Source: Adapted from the Bongaarts Framework (1984)

CHAPTER THREE: DATA AND METHODS

3. Introduction

This chapter presents a description of data source used in the study, analytical tools and procedures used in data analysis. It also presents variables used in the analysis and their respective definitions.

3.1. Data Source

This study has utilized secondary data obtained from the 2014 Kenya Demographic and Health Survey (KDHS). The 2014 Kenya Demographic and Health Survey (KNBS and ICT Macro, 2015) is a nationally representative sample survey that targeted 40,300 households in all of the 47 counties in Kenya, with an aim of collecting data on different aspects of population and health in the country. Each of the 47 counties in the country was stratified into urban and rural strata. There were 1,612 clusters spread across the whole country, with 995 clusters in rural areas and 617 in urban areas. Samples were selected independently in each sampling stratum, using two stage sample design. In the first stage, the 1612 EAs were selected with equal probability from the NASSEP V Frame. The households from listing operations served as the sampling frame for the second stage of selection, 25 households were each selected from each cluster,

The survey interviewed 31,079 women aged 15-49. Out of these 14,741were interviewed for the full women questionnaire and 16,338 for the short woman questionnaire. The 2014 KDHS was conducted by the Kenya National Bureau of Statistics (KNBS) in 2014.

The study has been limited to all poor women (women whose wealth index was ‘poorest’) aged 15 – 49 in Kenya that were interviewed during the survey. This was done by separating by use of SPSS version 20, the women who were categorized as being in a household of poorest wealth index. This therefore, created 7,262 sample of poor women in this study.

3.2. Method of Data Analysis

This section presents methods of data analysis used in the study. This include descriptive statistics to provide characteristics of the study population using frequency distribution and percentages. Generalized linear model has been used to establish differentials of fertility factors among the poor woman. The study has utilized generalized linear model to establish factors associated with differentials of fertility among the poor women of Kenya. Multiple

linear regression has been used to establish the determinants of fertility among the poor women of Kenya. The dependent variable is children ever born.

3.2.1. Descriptive Statistics

Descriptive statistics measures such as cross tabulation will be used to describe variables used in the study. Cross tabulations with chi square test will be carried out to test for association between the dependent and independent variables. These descriptive statistics will be used to examine the basic distribution characteristics of the variables and the differences in the poor women of Kenya.

3.2.2. Generalized Linear Model (GLM)

The General Linear Model (GLM) is a useful framework for comparing how several variables affect different continuous variables. In its simplest form, GLM is described as: Data = Model + Error (Rutherford, 2001, p.3). GLM is the foundation for several statistical tests, including ANOVA, ANCOVA and regression analysis

Hence, this study has employed generalized linear model to explain variations of factors associated with differentials of fertility among the poor women of Kenya. The results of generalized linear model has shown the magnitude contribution of every factor to children ever born. The intermediate variables have been all regressed at once against dependent variables to show the net effect of all the variables on children ever born.

3.2.3. Multiple Linear Regression

Multiple Linear Regression analysis is an extension of simple linear regression that attempts to predict a dependent variable from any number of independent variables (Blalock, 1972). It is used to test the joint effect of two or more variables upon a dependent variable.

The equation for the relationship is given as:

$Y_i = \beta_o + \beta_1 X_{1j} + \beta_2 X_{2j} + \ldots\ldots\ldots + \beta_k X_{kj} + e_j$

Where Y = independent variable β_o, β_1, ... β_k = Partial regression co - efficient.

X_{1j}, X_{2j}, ..., X_{kj} = observed values of the dependent variables X_1, X_2, ..., X_k

Where Y' is number of children ever born, βo is the Y-intercept or constant representing the average value of Y when Xs are set equal to zero; β_{i-k} represent partial regression coefficients of each explanatory variables representing the change in the dependent variable that arises

from a one-unit change in the explanatory variable; X represents the explanatory variables associated with children ever born or ideal number of children and ej is the error term representing random effects. Multiple linear regression is used to provide information on the predictive value of the overall model as well as how well each of the independent variable influences the dependent variable, controlling for each of the other variables. Under this analysis every independent variable will regressed against each dependent variable to establish gross effect of each variable on children ever born.

3.3. Dependent and independent variables

3.3.1. Dependent Variables

This study is using the number of children ever born as a specific measure of fertility (hitherto referred as CEB). Hence the dependent variable used in the study is children ever born. The survey question for the female respondent aged between 15 and 49 years was "How many live births have ever had in your life time?" children ever born comprises information on the number of all children born alive (lifetime fertility) up to the survey date. Mean number of children ever born to women represents the childbearing experience of a real age cohort and reflects current and past fertility behavior. Children ever born therefore, does allow for generalization of data and an understanding that can provide basis for further analysis (UN, 1983). Children ever born, the dependent variable was considered to be continuous variable for regress but as a dichotomous variable during bivariate analysis.

3.3.2. Independent Variables

Current Age of a Woman: This variable measures respondent's (woman) current age in complete years since she was born at the time of the interview. The variable is categorized into three categories, age below 25yrs, age between 25 and 34yrs, finally Age 35yrs and above.

Age at first birth: This variables measures the age at which a woman had her first child. It is expected that women who enter into child bearing at younger ages have higher fertility as compared to women who enter into child bearing at older ages.

Age at first Marriage: This variables measures the age at which a woman first got married.

Type of place of residence: This variable refers to where a woman resides, it's a dichotomous variable categorized as rural and urban. Those in the rural areas, in developing countries, are expected to exhibit higher fertility than those in the urban areas.

Regions of Residence: This variable refers to the former eight provinces of Kenya. However, in this study, the variable is categorized as, Coast, North Eastern, Low Fertility Region (Nairobi, Central and Eastern), Rift Valley, Nyanza /Western regions.

Education Level: This variable refers to the highest level of formal schooling the woman has attended at the time of survey. The variable is be categorized into three groups namely: No education, Primary Secondary and above.

Marital Status: This refers to whether the woman has never married, has ever married or she was formerly married. Marital status for respondents aged 15 years and above will be included. Those who have ever married are expected to have more children ever born compared to those who have never been married.

Contraceptive Use: Any deliberate parity-dependent practice-including abstention and sterilization-undertaken to reduce the risk of conception is considered contraception. It will be categorized as:- no contraceptive use, modern contraceptive and traditional contraceptive. Use of contraceptives has a direct effect on fertility as women are able to either delay or avoid births. Women who do not use contraceptives are expected to have higher fertility and thus the reference category was 'used modern'.

Ideal Number of Children: Refers to the number of children a woman would like to have during her reproductive life time.

3.3.3. Key study variables

Table 2:- Key study variables

Variable name	Measurement(Categories)	Remarks	
Fertility (Children Ever Born)	1= CEB Four and below 2= Above Four	This Categorization of Children ever born was only used during bivariate analysis	Dependent Variable
Current age of Woman	1= Age Below 25yrs, 2= Age between 25 and 34yrs 3= Age 35yrs and Above	Control variable	Independent variable
Region	1 = Coast 2 = North Eastern 3 = Low Fertility Region 4 = Rift Valley 5 =Nyanza/Western Region		Independent
Marital status	1 = Never Married 2 = Currently Married 3 = Formerly Married	Control	Independent
Place of residence	Rural =1 Urban =2	Control	Independent
Education	1= No Education, 2= Primary, 3= Secondary and above	Control	Independent
Contraception Method	1= No Method, 2= Modern Method 3= Traditional Method	Control	Independent
Age at first birth	1 = 19 and Below 2 = 20-24 3 = 25+	Control	Independent
Age at first marriage	1 = 19 and Below, 2 = 20-24, 3 = 25+	Control	Independent
Ideal family size	1 = Children 0-2, 2 = Children 3-5 3 = Children 6 and Above	Control	Independent

CHAPTER FOUR: RESULTS OF ANALYSIS

4. Introduction

This chapter presents discussions of results of the study showing how selected socio-economic and demographic characteristics variables contribute to differential fertility among the poor women of Kenya based on the 2014 KDHS data. The first section provides a description of key characteristics of the study population while the second section describes cross tabulation of children ever born by key characteristics of the study population. Finally, section three discusses the multi linear regression.

4.1. Characteristics of the Study Population

Table 4.1 shows the socio-economic and demographic characteristics of poor women (poorest quintile) aged 15 – 49 in Kenya at the time of the interview. Overall, a total of 31,079 females aged 15 - 49 participated in the 2014 KDHS. Out of the total women interviewed, 7,262 women were in the poorest wealth index which is the target study population.

The dependent variable of the children ever born is purposive dichotomous (four and below and five and above), so as to consider differential in fertility in relation to the present fertility at 3.9 according to 2014 KDHS. From the table 4.1, of the poor women, 63.9 per cent, had a Children Ever Born (CEB) 4 and below while the rest had a CEB above 4.

Likewise, of these poor women of the study population, 37.4 per cent were aged below 25 years, while as about a third (32.9 per cent) were aged between 25 years and above but below 35 years. In the 2014 KDHS, 84.7 percent of the poor women were of the rural residence; while a mere 15.3 percent were of urban residence. Majority of the poorest quintile of the women are married (64.5 per cent), 21 per cent have never been married, while the rest (14.5 per cent) were formerly married, that is, they are widowed, divorced or separated.

Regarding residence by region, 36.1 per cent of the poor women interviewed were from Rift Valley region, while 19.5 per cent were from Coast region. About 17.5 per cent of the poor women were from low fertility region (i.e. Nairobi, Central and Central regions), this can be attributed to these region being well endowed economically and the standardized wealth index (wealth index poorest) measure that is skewed to rural poor.

On educational level, nearly half (48.8) of the poor women had attained an education level of primary, at the time of the interview. However, a massive 42.6 per cent had no education and

only 8.5 had an education level of secondary and above. The percentage of the poor women whose age at first birth was below 20 years was found to be 64.8 per cent, while only 28.9 per cent of these poor women were aged between 20 and 24 years and rest was 6.3 per cent. This trend was confirmed further by age at first marriage, where 74.5 per cent of the poor women in Kenya, were married before the age of 20 years, while only 20.8 per cent of them were married between age 20 and 24 years. Only a partly 4.7 per cent of these poor women were married above age 25yrs.

Among the women of the poorest wealth index, about 46.1 per cent desired to have between 3 to five children as ideal number of children in their lifetime, while 42.7 per cent of them desired and number of children of six and above. Only 11.2 desired an ideal number of children of two and below in their lifetime. On use contraceptives, Current use by method type among the poorest of Kenya, only 18.5 of women used modern method of contraceptives, while about 2.1 percent used traditional method. Almost eighty per cent (79.4) never used any method of contraceptive.

Table 4.1:- The Percentage Distribution of Study Population according to the selected Socio-economic and Demographic Characteristics

Variable	Category	Frequency	Percent
Children Ever Born	CEB 4 and below	4,638	63.9
	CEB above 4	2,624	36.1
Age by Groups	Age below 25	2,719	37.4
	Age between 25 and 34	2,388	32.9
	Age above 35	2,155	29.7
Type of place of residence	Urban	1,113	15.3
	Rural	6,149	84.7
Current Marital Status	Never Married	1,522	21.0
	Married	4,685	64.5
	Formerly Married	1,055	14.5
Region	Coast	1,416	19.5
	North Eastern	1,019	14.0
	Eastern	1,205	16.6
	Low Fertility Region	1,273	17.5
	Rift Valley	2,625	36.1
	Nyanza/Western	929	12.8
Education Level	No Education	3,095	42.6
	Primary	3,547	48.8
	Secondary and Higher	620	8.5
Age at First Birth	Age 19yrs and below	3,751	64.8
	Age 20yrs to 24yrs	1,671	28.9
	Age above 25yrs	367	6.3
Age at First Marriage	Age 19 and Below	4,274	74.5
	Age 20 to 24yrs	1,193	20.8
	Age 25yrs and above	273	4.7
Ideal Number of Children	Children 0-2	352	11.2
	Children 3-5	1,454	46.1
	Children 6 and above	1,346	42.7
Current Contraceptive use by Method Type	No Method	5,767	79.4
	Modern Method	1,342	18.5
	Traditional Method	153	2.1

4.2. Socio-economic and Demographic Characteristics of the Study Population

Cross tabulations were performed between children ever born and other selected factors. From 2014 KDHS, 31,079 women aged 15-49 interviewed, out of which 7,262 women aged 15-49 and in the poorest wealth quintile were included in the analysis. As shown in Table 4.2 below, out of the nine independent variables used in the analysis, eight of them were significant. These independent variable were age in three Categories, age at first marriage, region, type of place of residence, educational level, current marital status, contraceptive use by method type and ideal number of children. Age at first birth was not however not significant.

The study found that age was a significant factor influencing children ever born (X^2= 3,250.098, $p<0.01$). Approximately 80 per cent of poorest wealth index women aged 35yrs and above had children ever born above 4. From the results of tabulation between the children ever born and age shows that, children ever born of 4 and below children decreases with age group but children ever born of above 4, the number children ever born rises with age.

The analysis indicates that age at first marriage of the women was a significant factor affecting children ever born (X^2=14.693, $p<0.01$).Out of 7,262 poor women interviewed, 5,740 of the women were married and were included in the analysis. About 53.3 per cent of women aged below 20 years had children ever born of four and below children ever born, while 59.5 percent of the women aged between 20 and 24 years had a children ever born of four and below years. While as women aged 25yrs and above, 54.8 per cent of them had a children ever born of four and below.

Region also emerged as significant factor affecting children ever born (X^2=35.269, $p<0.01$). Among the poor women in low fertility region, 68.3 per cent of them had children ever born of four and below. Further, of the poor women interviewed and were from Rift Valley, 64.8 of them, had children ever born of four and blow. Coast region had 64 percent of its poor woman having a children ever born of four or less, while Nyanza/Western region have 62.6 percent of the women with children ever born of four and less. North Eastern had the least percentage at 56.7 of the women in this region have four or less children ever born.

Type of place of residence was a significant factor to children ever born (X^2= 11.570, p<0.01). Majority, (63.1%) of the women from the rural had children ever born of less than or equal to 4, while as 68.4 percent of women from urban also had four or less children ever born.

Education level is another significant factor influencing children ever born (X^2=325.422, p<0.01). Nearly half of poor women (46%) who had no education had a children ever born of more than four number of children ever born. On the other hand, among the poor women who had secondary and higher, 88.5 per cent had a children ever born of less than or equal to four, while only 68.2 per cent of those who had primary level of education had a children ever born of less than or equal four.

Current marital status is also significant factor influencing children ever born (X^2=1004.297, p<0.01). Almost, 98.6 percent of poor women had who never married and 54.8 per cent of poor women who were married had a children ever born children ever born children ever born of below five children while 53.9 percent of poor formerly women had a children ever born of more than four, while as only 11.5 of women with secondary and higher education had children ever born of more than four.

Contraceptive use was also a significant factor children ever born (X^2=23.507, p<0.01).The results of the cross-tabulation between children ever born and contraceptive use by method type indicate that among those who had four and below children ever born, has 65.2 percent were not using any method of contraception while 59.5 percent were using a modern method. Of those who used traditional method, 52.9 per cent had a children ever born below 5 children.

Ideal number of children is another significant factor influencing children ever born (X^2=126.702, p<0.01). As such, 80.7 percent of poor women whose ideal number of children is 0-2 had a children ever born of less or equal to 4 children. Also 73.1 percent of poor women with ideal number of children of between 3-5 had a children ever born of above 4, while 50.5 percent of poor women with ideal number of children six and above had children ever born less than five children.

Table 4.2:- Differentials in Children Ever Born among the Study Population

Variable	Children Ever Born		Total (N)	Chi-Square, Df, Significance
	CEB ≤4 %(N)	CEB >4 %(N)		
Age in 3 Categories**				
Age below 25yrs	99.1(2,695)	0.9(24)	2,719	X^2 =3,250.098
Age between 25yrs and 34yrs	63.2(1,509)	36.8(879)	2,388	Df = 2
Age above 35yrs	20.1(434)	79.9(1,721)	2,155	P-value< = 0.000
Age at First Birth*				
Age 19yrs and below	53.6(2,010)	46.4(1,741)	3,751	X^2 = 5.735
Age 20yrs to 24yrs	57.1(954)	42.9(717)	1,671	Df = 2
Age above 25yrs	54.8(201)	45.2(166)	367	P value = 0.057
Age at First Marriage**				
Age 19 and Below	53.3(2,277)	46.7(1997)	4,274	X^2 = 14.693
Age 20 to 24yrs	59.5(710)	40.5(483)	1,193	Df = 2
Age 25yrs and above	55.3(151)	44.7(122)	273	P value = 0.001
Region**				
Coast	64.0(906)	36.0(510)	1,416	X^2 = 35.269
North Eastern	56.7(578)	43.3(441)	1,019	Df = 4
Low Fertility Region	68.3(870)	31.7(403)	1,273	P value< = 0.000
Rift Valley	64.8(1,702)	35.2(923)	2,625	
Western/Nyanza Region	62. 6(582)	37.4(347)	929	
Type of Place of Residence**				X^2 = 11.570
Urban	68.4(761)	31.6(352)	1,113	Df = 1
Rural	63.1(3,877)	36.9(2,272)	6,149	P value = 0.001
Education Level**				
No Education	53.9(1,669)	46.1(1,426)	3,095	X^2 = 325.422
Primary	68.2(2,420)	31.8(1,127)	3,547	Df = 2
Secondary and Higher	88.5(549)	11.5(71)	620	P value< = 0.000
Current Marital Status**				
Never Married	98.6(1,500)	1.4(22)	1,522	X^2 =1004.297
Married	54.8(2,569)	45.2(2,116)	4,685	Df = 2
Formerly Married	53.9(569)	46.1(486)	1,055	P value< = 0.001
Contraceptive By Method Type**				
No Method	65.2(3,759)	34.8(2,008)	5,767	X^2 = 23.507
Modern Method	59.5(798)	40.5(544)	1,342	Df = 2
Traditional Method	52.9(81)	47.1(72)	153	P value< = 0.001
Ideal Number of Children**				
Children 0-2	80. (284)	19.3(68)	352	X^2 = 126.702
Children 3-5	73.1(1,063)	26.9(391)	1,454	Df = 2
Children 6 and above	60.3 (3,291)	39.1(2,165)	5,456	P value< = 0.000

***p-value<0.05; **p-value<0.01**

4.3. Factors associated with differentials in children ever born

Demographic, socio-economic and cultural variables were correlated with children ever born using generalized linear model (GLM) analysis results are as reported in table 4.3 below. The results show gross effect of a unit change in independent variable on children ever born. All the categories in the factors of age of the woman, age at first birth, age at first marriage, current marital status and educational level were all found to be significantly ($p \leq 0.01$) related to children ever born.

Women's current age is significantly associated with children ever born. The relationship between children ever born and women's current age is statistically significant at $p<0.001$ levels for all the age categories. The children ever born depend on the age of a woman. The children ever born is 5 children less among women aged 25 years and below as compared to woman aged 35 and above. Similarly, women aged between 25 and 34 years, have about 2.7 less children ever born than women aged 35 and above years.

The relationship of children ever born and age at first birth is statistically significant at $p<0.001$ level for all categories. Women who gave birth for the first time at the age of 19 years and below years have about 1.9 more children ever born compared to women who had their first birth after age 25 and above among the poor woman. In addition, women who gave birth for the first time at the age between 20 years and 24 years, had about 0.9 more children ever born compared to women who had their first birth after age 25 years and above of these poor women Therefore, the younger the age at first birth is, the higher association with high number of children ever born, and this is partly due to long period of exposure to risk of pregnancy. This finding is consistence with Ndahindwa et al., (2014), who established that in Rwanda, women whose first sexual debut (and in effect age at first birth), was earlier tended to have higher fertility. Additionally, Zaba et al (2004) established that in Uganda, the interval between first sex and marriage was short; thus women that failed to use contraceptives in their first sex contributed to a high fertility level in the country. In cases where the use of most effective contraceptive methods is absent, usually, the age at first intercourse is close to the age at first birth.

Age at first marriage is positively and significantly ($p<0.001$) related to number of children ever born. Women who had their age at first marriage of the age of 19 years and below had 0.72 more children ever born as compared to women who had their age at first marriage of

the age of 25 years and above. In addition, women whose age at first marriage was between 20 years and 24 years had 0.38 more children ever born than women who had their age at first marriage as 25 years and above. This finding is consistent with other previous studies (Wasao, 2001). Further, a study in Nepal, by Adhikari (2010) found that those "women who married early were likely to a have higher number of children than their counterparts who married at a later age. An increase in the age at first marriage has an adverse effect on high fertility. Early marriage does not only mark a woman's entry into a sexual union and the beginning of exposure to childbearing but may also be an important gauge of women's status, since the older the woman is when she marries, the greater the likelihood that she has attended school or been employed, and the greater her chances of having a more equal relationship with her husband," (Adhikari, 2010).

Generally, different studies have established that "older age at first marriage played an important role in reduction in fertility," (Sibanda et al 2003; Serbessa, 2003; Mohammad, 1985). Furthermore, marriage is a primary indication of regular exposure of women to the risk of pregnancy and is therefore important for the understanding of fertility

Marital status has a positive and significant ($p<0.001$) relationship with children ever born among the poor women. Currently married women among the poor have 0.54 more children ever born than women who were formerly married. . The marital status of a woman will therefore to a greater extent determine her fertility. The finding of this study is confirmed by many studies (Rutaremwa, 2013; Nyarko, 2012; Nwogwugwu, 2013) that have found that women that were currently married had more children compared to the not married women. Married women as opposed to unmarried women are highly exposed to frequent sex, thus more likely to have children. In addition, many women marry so as to have children in a family setting.

Educational level has a positive and significant ($p<0.001$) relationship with children ever born among the poor women. Women with no educational level had 0.87 more children ever born compared to women who had secondary or higher educational level. Additionally, women whose education level was primary, had 0.48 more children ever born compared to women with secondary and higher level of education. This finding is shows, the high a woman is educated, and the less children ever born she has. This finding is agreement with an earlier literature review where, Adhikari (2010) found that "illiterate women have almost double the number of CEB than do literate women. This study further explained education

exposes women to information, empowers women, makes them more likely to be employed outside their home environment, and makes them more aware of their own health and the health of their children-all of which are negatively associated with the number of children a woman will have during her reproductive life. Similarly, educated women are more likely to postpone marriage, have smaller family size, and use contraception than are uneducated women," (Martin, 1995).

In this study, region merged was not a significant factor in determining the Children ever born in three of the four categories, except the low fertility region (Nairobi and Central) was significant ($p<0.001$).

Table 4.3 Results of Regression Analysis on Number of Ever Children Born and Selected Socio-economic and Demographic Factors

Parameter/ Variable	Category	β	Std. Error	95% Wald Confidence Interval		Hypothesis Test		
				Lower	Upper	Wald Chi-Square	df	Sig.
	(Intercept)	3.798	.1621	3.480	4.115	548.741	1	.000
Age at First Birth	Age 19yrs and below	1.888	.1182	1.656	2.119	255.065	1	.000
	Age 20yrs to 24yrs	.891	.1134	.669	1.114	61.803	1	.000
	Age above 25yrs	0[a]	.	.	.	.	.	.
Age at First Marriage	Age 19 and Below	.719	.1313	.462	.976	29.995	1	.000
	Age 20 to 24yrs	.383	.1300	.129	.638	8.697	1	.003
	Age 25yrs and above	0[a]	.	.	.	.	.	.
Current Marital Status	Married	.543	.0593	.426	.659	83.752	1	.000
	Formerly Married	0[a]	.	.	.	.	.	.
Education Level	No Education	.874	.1153	.649	1.100	57.563	1	.000
	Primary	.478	.1112	.260	.696	18.445	1	.000
	Secondary and Higher	0[a]	.	.	.	.	.	.
Region merged	Coast	-.129	.0838	-.293	.035	2.370	1	.124
	North Eastern	.059	.0991	-.135	.253	.351	1	.553
	Low Fertility Region	-.476	.0865	-.645	-.306	30.286	1	.000
	Rift Valley	-.134	.0771	-.285	.017	3.037	1	.081
	Nyanza/Western Region	0[a]	.	.	.	.	.	.
Age in three Categories	Age below 25	-5.089	.0650	-5.217	-4.962	6129.958	1	.000
	Age between 25 and 34	-2.757	.0525	-2.860	-2.654	2755.375	1	.000
	Age 35 and above	0[a]	.	.	.	.	.	.

The Table 4.4 below, shows estimated marginal means for poor women children ever born controlling for other factors, at various factor level. It displays the standard errors and confidence interval for each of the key factors at factor levels of poor women children ever born. The table of marginal means provides a clearer picture on the differentials in fertility levels.

In the table, women who are aged below 25years have mean children ever born of about 0.59, while women who are aged between 25 years and 34 years have a children ever born of 2.92, and women aged above 35 years have a children ever born of 5. 68. This confirms the expected trend, that, since the younger women have not attained full fertility level they have a very low fertility level compared to the older ones who have or almost attaining their fertility level. There were significant ($p \leq 0.01$) differences in parameter estimates between the factor levels of the age of poor women. The contrast estimates between age below 25 years and age 35 years and above (-5,09) is wider by almost two times than the one between age between 25 years and 34 years and 35 years and above (-2.76). The overall test of all of the contrasts in the individual test, was significance ($p \leq 0.01$), hence there is a difference in children ever born among the levels of age of women in the study population. Like other studies, this study also found out that older women have significantly higher number of children ever born compared to younger women (Wasao, 2001; Gwebu, 1997).

Also as shown in the table, women whose age at first birth is below 20 years have mean children ever born of about 4.02, while women whose age at first birth is between 20 years and 24 years have 3.03 children ever born, while as women whose age at first birth is above 35 years have 2.14 children ever born. The individual test results shows there are significant ($p \leq 0.01$) differentials of parameter estimates. Where the results show there is differentials for woman's age at first birth effect for the study population. The contrast estimates between age below 20 years and age 25 years and above (1.89) is more than twice wider than the one (0.89) between age between 20 years and 24 years and 25 years and above. These differentials are significance at p value< 0.01 hence there is a difference in children ever born among the levels of age at first birth of women in the study population.

From the table, it shows that, women whose age at first marriage was below 20 years have mean of about 3.41 children ever born, while women who were aged between 20 years and 24 years at their first marriage have 3.08 children ever born, and women whose age at first marriage was above 35 years have a children ever born of 2.69. This result shows the earlier the age at first marriage of a woman is, the higher the children ever born the woman has. The individual test showed there is significance ($p \leq 0.05$) difference of parameter estimates. The results show there are differentials for woman's age at first marriage effect for the study population. The contrast estimates between age below 20 years and age 25 years and above (0.72) was almost two times wider than the one between age between 20 years and 24 years

and 25 years and above (0.38). The overall test results of a test of all of the contrasts was is significance at value of less than 0.01 hence there is a difference in children ever born among the levels of age at first marriage of women in the study population.

It can be deduced that, women who are married have their mean children ever born of about 3.33 more than women who were formerly married (2.79) though the difference was small. The test results showed there is significance ($p \leq 0.01$) difference of parameter estimates. The contrast estimates between formerly married and married is (0.54). The overall test of all of the contrasts has a significance value of less than 0.01 hence there is a difference in children ever born among the marital status of women in the study population.

The table further shows that women who had no education had mean of about 3.49 children ever born, far much higher than the mean of women who had education level of secondary and above who had 2.61 children ever born, while women who had education level of primary had a 3.09 children ever born. The result confirms that, the higher the level of education of a woman, the lower the children ever born even among the poor women. The individual test results below showed there is significance ($p \leq 0.05$) difference of parameter estimates. The results show there is noticeable differentials for woman's education level effect for the children ever born. The contrast estimates between no education and secondary and above (0.87) is more than twice than the one between primary and secondary and above (0.48). The overall test was significant at a value of less than 0.01 hence there is a difference in children ever born among the levels of education of women in the study population. This implies that education is a key factor to lower fertility even among the poor women.

Lastly, the table shows, women who were from North Eastern had mean children ever born of about 3.26 as the highest of the regions, followed by women from Nyanza/Western region who had a mean children ever born of 3.20. The lowest mean of women children ever born was from low fertility regions (Nairobi, Central and Eastern) with a children ever born of 2.72, while other regions of Nyanza/Western 3.20 children ever born and Rift Valley had 3.06 children ever born. The individual test results shows there is significance ($p \leq 0.05$) difference of parameter estimates. The results show there are differentials for woman's region effect for the children ever born. The simple contrast estimates between North Eastern and Low Fertility Region (0.53), while the contrast between Rift Valley and Low Fertility region (0.34) is the lowest contrast. Further, the simple contrast between Coast and low fertility region is 0.35, however, the one between low fertility and Rift Valley is higher with 0.48.

However, shows the overall test results of all of the contrasts were significant at a value of less than 0.01 hence there is a difference in effect of children ever born among the various levels of region of women in the study population.

Table 4.4:- Estimated Marginal Means for the CEB according to the study variables

		Estimates			
Variable	**Categories**	**Mean**	**Std. Error**	**95% Wald Confidence Interval**	
				Lower	Upper
Age in three Categories	Age below 25	.59	.074	.44	.73
	Age between 25 and 34	2.92	.063	2.80	3.04
	Age 35 and above	5.68	.057	5.56	5.79
Age at First Birth	Age 19yrs and below	4.02	.068	3.89	4.16
	Age 20yrs to 24yrs	3.03	.068	2.89	3.16
	Age above 25yrs	2.14	.101	1.94	2.33
Age at First Marriage	Age 19yrs and below	3.41	.064	3.29	3.54
	Age 20yrs to 24yrs	3.08	.067	2.95	3.21
	Age above 25yrs	2.69	.116	2.47	2.92
Current Marital Status	Married	3.33	.053	3.23	3.44
	Formerly Married	2.79	.071	2.65	2.93
Education Level	No Education	3.49	.055	3.38	3.59
	Primary	3.09	.055	2.98	3.20
	Secondary and Higher	2.61	.112	2.39	2.83
Region merged	Coast	3.07	.073	2.93	3.21
	North Eastern	3.26	.085	3.09	3.42
	Low Fertility Region	2.72	.074	2.58	2.87
	Rift Valley	3.06	.061	2.94	3.18
	Nyanza/Western Region	3.20	.079	3.04	3.35

4.4. Determinants of Fertility of Poor Women of Kenya

While as the previous section analysis was based on gross differences only, this section presents results of Multiple Linear Regression analysis providing simple and multiple correlation coefficient methods for both dependent variables. It also further provides simple tests of significance and partial regression coefficients. This model is suited for any non-experimental research in which there several independent variables and one dependent variable (or one dependent variable at a time (Kerlinger and Pedhasur 1973, 445).

Step wise multiple linear regression procedure is used in this analysis and it provides correlation coefficient indicating the degree of association between the dependent variable and the

independent variables. It also has R^2 (squared multiple correlation coefficient) to measure the amount of variance on the dependent variable explained by the independent variables. The unstandardized partial regression coefficient (β) will indicate the amount of change in the dependent variable produced by a unit change in any one of the independent variables when others are controlled. The standardized partial regression coefficient (Beta weight) is going to measure the relative importance of each independent variable in predicting the dependent variable. The F-ratio which measures the statistical significance of the standardized regression coefficients (Hohm 1975:638).

In view of the above, the table 4.3 below show the simultaneous effects of the determinants of fertility using the multiple regression analysis, this will determine the effect of independent variables on fertility performance. The table shows that the total explained variation in the fertility performance of the poor women in Kenya resulting from a combined effects of variables involved in the regression is 42.4 percent (R^2=0.424), 57.6 percent was explained by other factors not involved in the analysis. From the table, we find that all the seven variables involved in the analysis were statistically significant. These factors include age, age at first birth, age at first marriage, education level, and type of place of residence, current marital status and ideal number of children.

Controlling for all other variables, the data reveals that, the beta of 0.671 for the current age of the poor woman, is the largest of the betas and the most highly statistically significant of the standardized regression coefficients. The beta coefficient sign is positive and therefore in the right direction indicating that all things being equal, the older a poor woman is, the higher children ever born.

The next largest beta coefficient is -0.184 for age at first birth, it is highly statistically significant of the standardized regression. This beta coefficient is negative, indicating that the younger the age at first birth of a poor woman, the higher the children ever born. The third largest beta is -0.071 for age at first marriage, it indicates that, the age at first marriage is highly statistically and significantly associated with children ever born of poor women. The negative beta can be interpreted to mean that, the later a woman gets married the less the children ever born. These two beta coefficients confirm similarity in children ever born associated with age at first birth and age at first marriage, where the early sexual debut determines how long a woman will be exposed to risk of pregnancy.

The fourth beta coefficient is -0.065 for current marital status, and it's highly statistically significant of the standardized regression. Marital status is negatively associated with children ever born, it is interpreted to mean that, similar to, age at first marriage, women who are in union are exposed to the risk of pregnancy. Hence, the less a poor woman is not in union, the less the children ever born she has. The beta coefficient for ideal number of children, 0.057 follows, it positively associated with children ever born and it's statistically and significantly associated with children ever born.

Education is highly statistically significant with a beta of -0.043 of the standardized regression. Once more this beta is negative, the interpretation of this is that, the more educated a poor woman is, the less children ever born she will have. The significance of this variable, confirms how education exposes women to information reproductive health, empowers women with her own decision making, makes them more likely to be employed outside their home environment, and makes them more responsive to their own health and the health of their children - all of which are negatively associated with the number of children a woman will have during her reproductive life (Adhikari, 2010). Similarly, educated women are more likely to postpone marriage, postpone age at first birth, postpone age at first sex, have smaller family sizes, and use contraception than are uneducated women.

From this study, the first three determinants of children ever born are demographic factors (age, age at first marriage, age at first marriage) and the most important variables. This is followed by sociocultural factors (marital status and ideal number of children) are very significant, however, their contribution is little compared to the demographic factors. Education though very significant, it contributes very little to the children ever born by poor women, the reason could be attributed to very low education level among them (only 8.5 percent had secondary and above education level).

Table 4.5 Results of regression analysis of the factors affecting fertility among the Poor Women of Kenya

Variable Name	Unstandardized Coefficients		Standardized Coefficients	F-Ratio	Sign. Level
	β	Std. Error	Beta		
Age in three Categories	0.449	0.007	0.671	3,122.923	.000
Type of place of residence	0.040	0.015	0.028	1,888.234	.000
Current Marital Status	-0.083	0.013	-0.065	1,292.316	.000
Education Level	-0.037	0.009	-0.043	989.169	.000
Age at First Birth	-0.150	0.011	-0.184	803.156	.000
Age at First Marriage	-0.064	0.012	-0.071	674.627	.000
Ideal Number of Children	0.055	0.010	0.057	580.000	.000
	R^2=0.424				

CHAPTER 5: SUMMARY CONCLUSIONS AND RECOMMENDATIONS

5. Introduction

The main objective of this study was to identify differentials in fertility among the poor women in Kenya. This study further examined the factors associated with differential factors of some the selected socio- economic and demographic factors on fertility among the poor women in Kenya. It also sought to establish determinants of fertility among the poor women of Kenya. The study used descriptive statistics to analyze characteristics of the population variables, as well cross tabulation to establish differentials of fertility factors of the study population. It also used generalized linear regression to establish factors associated with differentials in fertility of the poor women in Kenya. In order to establish the determinants of fertility among the poor women, multiple linear regression. This chapter is presented in three parts namely summary, conclusion and recommendations.

5.1. Summary of Findings

The main objective of the study was to establish fertility differentials in fertlity among the poor of women in Kenya. Specifically, the study sought to examine the relationship between, age, age at first birth, age at first marriage, place of residence, education level, marital status, current contraceptive use and children ever born. It also sought to establish the determinants of fertlityy among the poor women. Fertility was measured in terms of children ever born. The study was guided by Bongaart's Fertility framework of 1984.

This study utilized data obtained from the 2014 Kenya Demographic and Health Survey (KDHS). The 2014 was conducted by the Kenya National Bureau of Statistics. The 2014 Kenya Demographic and Health Survey (KDHS) was a nationally representative sample survey that targeted 40,300 households in all of the 47 counties in Kenya, with an aim of collecting data on different aspects of population and health in the country. Each of the 47 counties in the country was stratified into urban and rural strata. There were 1,612 clusters spread across the whole country, with 995 clusters in rural areas and 617 in urban areas. The survey interviewed 31,079 women aged 15-49. Out of these 14,741were interviewed for the full women questionnaire and 16,338 for the short woman questionnaire. The study population which consisted of women aged 15-49 who were from the poorest wealth quintile households, was extracted to form a target population of 7,262.

Descriptive statistics (cross tabulation) was used to outline key characteristics of the study population using frequency distribution and percentages. Regression analysis was used to establish differences by controlling for other factors using generalized linear regression methods each study variable of children ever born. Multiple linear regression was used to determinants of fertility.

The results from regression analysis (GLM) revealed that current age, age at first birth, age at first marriage were the most statistically significant and the largest determinants of children ever born among the poor women of Kenya. Current marital status and education level are statistically and significantly associated with children ever born, and hence important determinants of children ever born among poor women of Kenya, However, region and current contraceptive use by method type and region were all found not to be significant determinants of number of children ever born.

Linear regression analysis results show that age, age at first Birth and age at first marriage were the largest and most important factors influencing children ever born among the poor women of Kenya, other important factors were marital status, ideal number of children. However, education level and type of place of residence had little influence on the children ever born for poor woman of Kenya.

5.2. Conclusions

The study has met all its specific objectives. This study intended to establish the differentials in fertility and to determine the determinants among the poor women in Kenya. The study established that significant differentials in fertility exist among the poor women and it also established, using the means of CEB, the factors associated with the differentials. Finally the study established the determinants of fertility among the poor women in Kenya.

5.3. Recommendations

5.3.1. Recommendation for Policy

Fertility preference rates in Kenya are still considerably high. According to Kenya Demographic and Health Survey, 2014, the fertility rate was 3.9 and ideal number of children is 3.6 (ICF Macro and KNBS, 2014). The total fertility rate target is 2.6 by 2030 and 2.1 by 2050 is still very high. From the findings of this study, there is need for deliberate policy interventions to be adopted focusing on the major factors that will influence a poor woman's

fertility (children ever born) so as to influence on age at first birth, age at first marriage, current marital status and improve on education level.

In terms of policy, particular attention should be made on education policies, which are targeting the poor, as this factor (education) though statistically significant, its beta value is very small compared to the others. When interpreted it means that education is an important factor influencing fertility among the poor women, but because the poor are grossly uneducated (only 8.5 percent have secondary and above level of education), education is not a major contributing factor of fertility among them as shown by multiple linear regression analysis. Hence, education policies should be geared to raising education standard for the poor, so that it can impart positively on fertility of the poor women.

5.3.2 Recommendation for further research

The study recommends for conducting of in-depth study to establish why education is not a major determinant of fertility the poor women of Kenya. It also recommends for longitudinal studies on the fertility among the poor women so as to understand how fertility changes over time among this sub-population of women.

APPENDICES

Appendix 1: Fertility change among the wealth quintiles

Wealth Quintiles	1993	1998	2003	2008-09	2014	% Change 1993-2008/09	2008/09 - 2014	%Change 1993 - 2014
Lowest	7.2	6.5	7.6	7.0	6.4	2.8	8.6	11.1
Second	6.2	5.6	5.8	5.6	4.8	9.7	14.3	22.6
Middle	5.6	4.7	5.1	5.0	3.8	10.7	24.0	32.1
Fourth	5.3	4.2	4.0	3.7	3.1	30.2	16.2	41.5
Highest	3.3	3.0	3.1	2.9	2.8	12.1	3.4	15.2
Total	**5.4**	**4.7**	**4.9**	**4.6**	**3.9**	**14.8**	**15.2**	**27.8**

Source: Kenya Population Situation Analysis, NCPD (2013)

REFERENCES

Adhikari, R. (2010). Demographic, Socio-economic, and cultural factors affecting fertility differentials in Nepal. BMC Pregnancy and Childbirth, 10(19): 1-11.

Anyara, E. L. & Hinde, A. (2006). Fertility transition in Kenya: A regional analysis of the proximate determinants. Applications & Policy Working Paper A06/0 (2006). Southampton Statistical Sciences Research Institute.

Awes, A. A. (2014). Proximate Determinants of Fertility among Poor and Non-poor Women in Kenya. Unpublished MSc Research project in Population studies, University of Nairobi.

Balasubramanjan, K. (1984). Hindu-Muslim differentials in fertility and population growth in India: role of proximate variables. Artha Vijnana, 26:189-216.

Blacker, J. 2002. "Kenya's Fertility Transition: How Low Will it Go?" in Completing the Fertility Transition (ESA/P/WP.172/Rev.1). New York: United Nations.

Bledsoe, C. H. & Cohen, B. (1993). Population Dynamics of Adolescent Fertility in sub-Saharan Africa. National Research Council, 1-40.

Bongaarts, J. (1984). A simple method for estimating the contraceptive prevalence required to reach a fertility target. Studies in Family Planning, 15(4):184-90.

Bongaarts, J. (1978). A Framework for Analyzing the Proximate Determinants of Fertility. Population and Development Review, 4, pp. 105-131.

Bongaarts, J. and Casterline, J. (2012). Fertility Transition: Is sub-Saharan Africa Different? Population and Development review 38 (Supplement): 153–168.

Caldwell J. (1992). Fertility decline in Africa: A new type of transition? Population and Development Review, 18(2):211-242.

Caldwell, J. C. (2005). On net intergenerational wealth flows: An update. Population and Development Review 31(4): 721-740.

Cleland, J. & Wilson, C. (1987). Demand Theories of the Fertility Transition: an Iconoclastic View". Population Studies 41(1): 5-30.

Cochrane, S. H. (1979). Fertility and education. Baltimore: The John Hopkins University Press.

Thomas E. Dow, Jr., Linda Archer, Shanyisa Khasiani, John Kekovole. (1994). Wealth Flow and Fertility Decline in Rural Kenya," Population and Development Review, Vol. 20, No. 2 pp. 343-364.

Dube J., Tariku, D., and Mohammed, T. (2013). Determinants of High Fertility Status among Married Women in Gilgel Gibe Field Research Center of Jimma University, Oromia, Ethiopia: A Case Control Study"- Published online at http://journal.sapub.org/phr Copyright Scientific & Academic Publishing

Dutta, P. & Sarkar, S. (2014). Trend and Differentials of a Socio-Demographic Scenario and Extent of Adolescent Fertility in Maharashtra, India. Journal of Settlement and Spatial Planning, 5(1):31–47.

Easterlin, R. A. (1975). An Economic Framework for Fertility Analysis." Studies in Family Planning, Vol. 6, pp. 54-63.

Easterlin, R. A. (1980). Population and economic change in developing countries. Chicago: University of Chicago Press.

Flora, J. A. and Maibach, E. W. (1990). Cognitive responses to AIDS information: the effect of issue involvement and message appeal. Communication Research, 759-774.

Gomes, C. (2012). Adolescent fertility in selected countries of Latin America and Caribbean. Journal of Public Health and Epidemiology, 4(5): 133 – 140.

Gupta, N. & Mahy, M. (2003). Adolescent childbearing in sub-Saharan Africa: Can increased schooling alone raise ages at first birth? Demographic Research, 8(4):93-106.

Gwebu, T.D. (1997) "Intra-Rural Fertility Determinants in Zimbawe: A Path Analysis" Department of Environmental Science, University of Botswana, Gaborone.

Hohm, C.F. (1975) Social Security and Fertility: An International Perspective, Demography, 12.

Karki, Y.B. (1982). Fertility and the value of children: A study of rural and urban populations in Nepal. In Ph.D. Thesis London school of economics, London.

Kenya National Bureau of Statistics and ICF Macro (2015). 2014 Kenya Demographic and Health Survey: Key Findings. Calverton, Maryland, USA: KNBS and ICF Macro.

Kerlinger, F.N. & Pedhazur, E.J. (1973), Multiple Regression in Behavioural Research, N.Y., Holt, Renehart and Winston.

LaValley, M.P. (2008). Statistical Primer for Cardiovascular Research: Logistic Regression. Journal of American Heart Association 117:2395-2399.

Lee, B. S. and Louis, G. P. (1993). The influence of rural-urban migration on migrant's fertility in Korea, Mexico and Cameroon. Population and Development Review, 12:3-26.

Letamo, G. and Letamo, H. (2002). The Role of Proximate Determinants in Fertility Transition: A Comparative Study of Botswana, Zambia, and Botswana. SA Journal of Demography, 8(1): 29-35.

Makinwa-Adebusoye, Pauline, K. 1994. Changes in Costs and Benefits of children to Parents in The Onset of Fertility, Transition in Sub-Saharan African. Therese Locoh and Veronique Hertirich (eds.), International union for the Scientific Study of Population (IUSSP), pp. 175-192.

Martin, T. C. (1995). Women's education and fertility: Result from 26 demographic and health surveys. Study in Family Planning, 26(4):187-202.

Mboup, G. and Tulshi, S. (1998). Fertility levels, trends, and differentials. In Demographic and Health Surveys Comparative Studies No. 28 Calverton, MD: Macro International.

Mohammad, A. (1985). Age at first marriage and cumulative fertility in Pakistan. Asian Population Studies Series 1985, 59:40-50.

Muhuri, P. K., Ann, K. B. and Shea, O. R. (1994). Socioeconomic differentials in fertility. In Demographic and Health Surveys Comparative Studies No. 13 Calverton, MD: Macro International.

NCPD (2013). Kenya Population situation analysis. Nairobi: Government of Kenya.

NCPD (2012) Sessional Paper No. 3 of 2012 on Population Policy for National Development

Ndahindwa et al. (2014). Determinants of fertility in Rwanda in the context of a fertility transition: a secondary analysis of the 2010 Demographic and Health Survey". Reproductive Health, 11:87.

Nwogwugwu, N. C. (2013). Socio-Demographic Determinants of Adolescent Fertility in Zambia. Student Thesis. University of the Witwatersrand, Johannesburg.

Nyarko, S. H. (2012). Determinants of Adolescent Fertility in Ghana. International Journal of Sciences: Basic and Applied Research (IJSBAR), 5(1):21-32.

Timothy C. Okech, Dr. Nelson W. Wawire, Dr. Tom K. Mburu (2011). Contraceptive Use among Women of Reproductive Age in Kenya's City Slums. International Journal of Business and Social Science, 2(1):22-43.

Onoja M, and Osayomore, I. (2012). Modeling the Determinants of Fertility among Women of Childbearing Age in Nigeria: Analysis Using Generalized Linear Modeling Approach. International Journal of Humanities and Social Science Vol. 2 No. 18.

Oketch T. C., Wawire N. W. and Mburu T. K. 2011. "Contraceptive Use among Women of Reproductive Age in Kenya's City Slums," *International Journal of Business and Social Science* Vol. 2 No.1, January 2011.

Population Reference Bureau – PRB (2009). World population data sheet. Washington DC 2009.

Retherford, R. D. and Thapa, S. (2003). Fertility in Nepal, 1981-2000: Level, trend, and component of change. Population and Health Series, No. 111.

Robinson, W. (1997). The economic theory of fertility over three decades. Population Studies, 51:63-74.

Rutaremwa, G. (2013). Factors associated with adolescent pregnancy and fertility in Uganda: analysis of the 2011 demographic and health survey data. Social Sciences, 2(1):7–13.

Rutstein, S. O. and Kiersten J. (2004). "The DHS wealth index" DHS Comparative Reports No. 6. Calverton, Maryland, USA, ORC Macro.

United Nations (1983). Manual X: Indirect techniques for demographic estimation. Population Studies, No. 81. New York 1983.

Schultz, T. Paul (2005), "Fertility and Income" Yale University Economic Growth Center Discussion Paper No. 925.

Serbessa, D.D. (2003). Differential impact of women's educational level on fertility in Africa: The case of Ethiopia. Addis Ababa.

Sibanda, A., Woubalem, Z., Hogan, D. P. and Lindstrom, D. P. (2003). The proximate determinants of the decline to below-replacement fertility in Addis Ababa, Ethiopia. Studies in Family Planning, 34(1):1-7.

Wasao, S. (2001). "A Comparative Analysis of the Socio-economic Correlates of Fertility in Cameroon and the Central African Republic". A paper presented at the Workshop on Prospects for Fertility Decline in High Fertility Countries, New York, 9-11 July 2001.

Wasao, S. (1998). "Some Socioeconomic Correlates of Fertility in Kenya - A District Level Analysis". APHRC. New York: Population Council

Zaba, B., Pisani, E., Slaymaker, E. & Ties Boerma, J. (2004). Age at first sex: understanding recent trends in African demographic surveys. Sexually Transmitted Infection, 80:28-35.

Zambia Demographic and Health Survey (2007). Central Statistics office Lusaka: Zambia.

Zarate, A. O. (1967). Some factors associated with urban-rural fertility differential in Mexico. Population Studies, 21(3):283-293.