PROXIMATE DETERMINANTS OF FERTILITY: A COMPARATIVE STUDY OF WESTERN AND CENTRAL PROVINCES, KENYA

BY

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DECLARATION

This research project is my original work and has not been submitted for a degree at this or any other university or institution.

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Dedication

I dedicate this work to my mother Mrs. Rosemary Wambani Rapando and my brother Juvenalyse Enock Ogolah.

Acknowledgement

In preparing this project paper, I have benefited immensely from my supervisors Mr. Ben Jarabi and Prof. John Oucho who always gave me guidance, advice and support during the writing of my proposal, analysis of data and compilation of the final report and my entire life as a student at the University of Nairobi. Secondly, I want to thank all the staff members at PSRI especially Mr. Andrew Mutuku and Mr. George Odipo who helped me in understanding the Bongaarts Fertility model, and fellow students for helping and supporting me. Thirdly, Mr.Nzomo Mulatya for taking me through the Bongaarts Fertility model. Special thanks go to my mother Mrs. Rosemary Wambani and Uncle Hon. Wycliffe Ambetsa Oparanyah for encouraging me during my course work; Bonventure Agolla, for helping me in the grammatical corrections. Last, but not least, I thank God for blessing me with health, brain, and spirit to finish my studies.

Abstract

The study aimed at finding out the contribution of the proximate determinants of fertility in Western and Central provinces using the 1983 Bongaarts fertility model. The general objective of the study was to find how proximate determinants of fertility have influenced the level of total fertility in Western and Central provinces in 2008/09. Specifically the study was focused on examining the effects of demographic and socio-economic factors on fertility in Western and Central provinces among women aged 15-49 years in 2008/09 and estimating the extend of fertility inhibiting effects of the indices of each proximate determinants of fertility among women aged 15-49 years in Western and Central provinces in 2008/09.

The data used in the study was drawn from the Kenya Demographic and Health Survey (KDHS 2008-09). The type of information collected relevant to this study included; fertility levels, age at first marriage and birth, contraceptive prevalence, place of residence, wealth index and women's education level. The sample size involved was of and 8,444; women in 2008/09 both aged 15-49. There were three levels of computation procedures

There were three levels of computational procedures: First was the decomposition of proportional change in TFR into the components Pm, Pc, Pi, Pp and Pr using the Bongaarts Analytical Framework. Secondly, running the frequencies and cross tabulations for demographic and socio-economic variables using SPSS to estimate their effect on fertility in the two regions, measures of the proximate determinants was then determined i.e. proportion of women married, proportion currently using contraceptive, average duration of postpartum infecundability, proportion of women aged 45-49 years who are infecund and average contraceptive use effectiveness. Lastly, estimation of the indices of Cm, Cc, Cp, and Ci against socio-economic and demographic characteristics in the two regions.

The findings of the study indicated that, as much as contraceptive use played a big role in fertility reduction in Central province with (Cc) being 0.62, marriage played the biggest role of the three principal proximate determinants in reducing fertility in the two regions. If all births were occurring in marital unions, as the formulation of the Bongaarts framework assumes, marriage would have a much stronger fertility inhibiting effect in fertility. The index of primary sterility was not common enough to significantly lower aggregate fertility levels. Therefore Non-marriage (due either to delayed marriage or the exit from marriage) and prolonged use of contraceptives are the two most important factors that keep fertility below its biological maximum in Central province which Western province could highly emulate.

The predicted TFRs for Central and Western provinces were slightly different to the TFRs estimated from information on births in the last five years (3.5 compared to 3.4 in Central and 5.9 compared to 5.6 in Western). This difference between the model estimate and the observed value was consistent with the omission of the index of abortion, which was an important proximate determinant from the model. However, the result suggests that the proximate determinants included in the model were the principal mechanisms by which fertility was reduced below its biological maximum.

The study recommends that efforts should be put on family planning programmes, women empowerment and education specifically to reduce fertility and enhance well being of the family.

CHAPTER ONE

INTRODUCTION

1.0 Background

The world population has experienced a continuous growth from 2.5 billion in 1950 to 6.7 billion in 2008. The proportion living in the developing countries of Africa, Asia, Latin America and the Caribbean has expanded from 68 percent to more than 80 percent. Projections for 2050 show this shift continuing in developing countries. The proportion living in more developed countries was projected to drop from about 18 percent in 2008 to less than 14 percent by 2050. Africa's population is currently growing faster than any other major regions. It is projected to account for 21 percent of world population by 2050, up from just 9 percent in 1950 (UN, 2010).

With an annual growth rate of 2.2 percent, population has been increasing substantially in sub-Saharan Africa making it face serious political, economic and social challenges. Estimates show that there were increases from 906 million in 2005, to 1.1 billion in 2010; this has outpaced economic gains, leaving Africans on average 22 percent poorer than they were in the mid 1970s. Despite improved economic performance in recent years, the overall gross domestic product growth rate is below the 8 percent that is required in order to achieve the Millennium Development Goals. At aggregate level, research has established that lack of progress in socio-economic development is associated with those developing countries which registered a slowdown in their rate of fertility decline (Bongaarts 2006, 2007; Shapiro and Gebreselassie, 2007).

Kenya has undergone a remarkable decline in fertility, after being famous for having the highest fertility and population growth rate in the world, with a Total Fertility Rate (TFR) of 8.0

in 1980s, which declined to 4.7 in the 1990s and slightly rose to 4.9 in 2003 before dropping to 4.6 in 2008 (NCPD, 1989 and 1994; CBS, 1969 and 2008). This fertility transition has generated a lot of interest and responses from researchers and policy makers both locally and internationally.

The 1998 Kenya Demographic Health Survey (KDHS) showed a four percentage point increase in contraceptive prevalence rate (CPR) from 26 percent in 1993 to 30 percent in 1998 with TFR declining substantially over the same period, from 5.4 to 4.7. These findings reinforced the impression that fertility transition in Kenya was on cause and that the strategies being implemented were appropriate for the country at this stage of fertility transition. Consequently, a slight drop in CPR to 29.5 percent and an increase in TFR to 4.9, according to the 2003 KDHS, came as a shock to most observers both nationally and internationally. A flurry of activities ensued to try to "reposition" both family planning and population as key issues worthy of attention and investment. For example, the Millennium Development Goals (MDGs) provided a platform for examining the role, impact and measures to manage population growth in pursuit of sustainable development. The result was an increase in CPR from 30 percent to 46 percent and a drop in TFR from 4.7 to 4.6 between 2003 and 2008/09, showing a further sixteen percentage point increase in CPR.

Contraceptive use at regional level varies from one region to the other, according to the 2008/09 KDHS - Central province was leading with 67 percent, followed by Nairobi with 55 percent, Eastern had 52 percent, Western 47 percent, Rift Valley 42 percent, Nyanza 37 percent, Coast 34 percent, while North Eastern had the lowest with 3.5 percent. The dynamics of this trend can better be understood by studying the role played by different factors influencing fertility. Many factors have been noted to determine the differences in fertility levels in many

regions in the world; for example, higher education levels, increased female participation in labour force, urbanization and contraceptive use. Sabiti (2008) applied the Bongaarts' model to the 1977-78 Kenya Fertility Survey (KFS) data and found that induced abortion and unreported contraception use had the highest impact on observed fertility rate. In 1991, three key proximate determinants of fertility, namely postpartum infecundability, contraception and marriage were found to be having varying effect on fertility change (Kizito et al, 1991).

According to Ian (2009), a stall in contraceptive use has been identified as one of the reasons why fertility decline has also stalled. Chuks (2002) carried out a study on the effects of proximate determinants of fertility on reproductive change in Ghana and came up with the conclusion that these determinants had varying effects on fertility, with postpartum infecundability having a far more inhibiting effect than the other determinants. A close assessment of these studies does not explicitly give a clear picture of which proximate determinant of fertility can be expected to have the most impact on observed fertility change. Therefore, this study sought to answer the role of proximate determinants of fertility in the observed fertility change, as any other factor known to influence fertility acts through these proximate determinants, hence their importance in trying to explain the observed trend and levels of fertility change in Western and Central provinces.

1.1 Problem Statement

Fertility variations regionally are a key concern in Kenya. Statistics show that, fertility levels in Central province have continued to decline from 3.7 in 1998, to 3.4 in 2003, and maintained the 3.4 level in 2008/09. However, Western province recorded an increase from 5.6 in 1998, to 5.8 in 2003, and back to 5.6 in 2008/09, which is still higher than the national total fertility rate (TFR) of 4.6 according to the 2008-2009 KDHS. This implies that the TFR recorded

in Western province is approximately double that of Central province. The annual population growth rate of Western province is currently at 2.1 percent compared to Central province annual population growth rate of 1.6 percent (KNBS, 2010).

One of the national demographic targets was to reduce TFR from 5.0 to 3.9 children per woman by 2012 and a further reduction to 2.6 by 2030 (Sessional Paper No.2 of 2000 and Sessional Paper No.3 of 2012). Western province has not been able to reach near this target while Central province on the other hand, has surpassed the national target of 3.9 and moving fast towards 2.6 which is to be achieved by the year 2030. This annual population growth rate of Western province together with its TFR poses a great threat to sustainable development and achievement of MDG 1 on poverty and hunger reduction, MDG 2 on reduction of child mortality and MDG 5 on improvement of maternal health. Although there are a lot of differences between Central and Western provinces in terms of their demographic, socio-economic and socio-cultural aspects, the specific factors responsible for the differences in fertility levels hence population growth rates are not clear. Therefore, it is important to understand factors contributing to their different fertility level hence this study.

1.2 Research Questions

The study addressed the following research questions:

- What demographic and socioeconomic factors contributed to the difference in fertility between Western and Central provinces among women aged 15-49 years in 2008/09?
- What was the extent of fertility inhibiting effects of proximate determinants in Western and Central provinces among women aged 15-49 years in 2008/09?

1.3 Objectives of the study

The main objective of this study is to find out how proximate determinants of fertility have influenced the level of total fertility in Western and Central provinces in 2008/09.

The specific objectives of this study are:

- To examine the effects of demographic and socio-economic factors on fertility in Western and Central provinces among women aged 15-49 years in 2008/09.
- To estimate the extend of fertility inhibiting effects of the indices of each proximate determinants of fertility among women aged 15-49 years in Western and Central provinces in 2008/09.

1.4 Justification of the study

This study aims to contribute to the understanding of proximate determinants of regional fertility levels in Kenya, by examining the situations prevailing in two regions of Kenya, namely Western and Central provinces. Currently married women were used as they are assumed to be the sexually active once and chances of them contributing to high fertility are very high (Lubaale et al, 2007). The focus in these regions is mainly because of the disparities in demographic and socio-economic development. Western province has a higher population growth rate of 2.1 percent with TFR of 5.4 compared to Central which has 1.6 percent with TFR of 3.4 (KDHS, 2008/09). Westerns' high population growth rate has demonstrated to have negative effects on economy, employment, education, health, environment, agriculture and urbanization (NCPD, 2010). The Government of Kenya and other stakeholders in matters of demographic change, have all the reason to want to know what factors have attributed to continuation of fertility transition and how it can be managed. Therefore, a clear understanding of the proximate determinants of fertility will contribute to achievement of both national and global goals.

Although some previous studies on proximate determinants of fertility have been studied before by Njiru (2005) and Wakoli (1991), they only looked at trends in proximate determinants of fertility in Kenya and applying the Bongaarts model of proximate determinants of fertility on the 1989 KDHS. This study focuses on understanding which proximate factors are responsible for fertility differentials between Western and Central provinces of Kenya.

A comparative study will therefore be very useful in coming up with a policy that would be more appropriate in attaining a continued reduction in fertility. The findings and recommendations of this study will inform policy formulators to set priorities in allocation of resources towards important programmes that will contribute to fertility reduction in the two regions.

1.5 Scope and limitations of the study

The study focused on two regions in Kenya, namely Western and Central provinces. The sample size involved a total of 8,444 women in Kenya, of whom 973 and 1039 were from Central and Western provinces respectively. A total of 1168 women reported to be currently married, while those who were currently using any form of contraceptive were 741 in both regions. Only currently married women who were currently using any method of contraceptive were used in the analysis with the exception of the index of sterility where all ever married women were included.

Since this study involved only two regions, the findings for these two provinces may not be generalized neither to the other provinces nor nationally. Only currently married women were used in the analysis of indices of marriage, contraception, postpartum infecundability while all ever married women were used in the index of sterility to increase their numbers hence limiting

the number of the indices. Induced abortion is one of the key measures of proximate determinants of fertility, this will not be assessed due to lack of appropriate data from the 2008/09 KDHS.

CHAPTER TWO

LITERATURE REVIEW

2.0 Introduction

This chapter reviews literature on proximate determinants of fertility from a historical and theoretical perspective, and the current thinking in regard to these determinants that are relevant for this study. Part one discusses the theoretical basis of the study and application of the Bongaarts model of proximate determinants of fertility and the second part makes a discussion on the analytical framework used in the study.

2.1 Fertility and Proximate Determinants

Several factors may explain the changes of fertility within societies. However, its tentative mechanism fails in explaining on what way and why these factors could affect fertility. Davis and Blake (1956) constructed a framework which may describe differential in fertility through their investigation on the biology of population. The work covers three stages of human reproduction namely: intercourse, conception and gestation. According to this framework, eleven factors affect the level of fertility directly: age of entry into sexual union, permanent celibacy, reproductive period spent after or between union, voluntary abstinence, involuntary abstinence, coital frequency, fecundity, infecundity, use or non use of contraception, foetal mortality from involuntary causes and foetal mortality from voluntary causes. This list of variables was not widely accepted in quantitative fertility due to the difficulty of operationalizing them in a reproductive model (Bongaarts et al. 1983). To improve on this seminal work, Henry (1957) proposed a different but closely overlapping list of proximate determinants based on analysis of the reproductive process. This set of proximate determinants simplified greatly the task of

constructing fertility models. The analysis of the reproductive process identified seven proximate determinants grouped into two categories i.e. factors that determine the duration of the reproductive period and the rate of child bearing and the duration of birth interval, (Bongaarts et al, 1983). The seven factors are: marriage, onset of permanent sterility, postpartum infecundability, natural fecundability, use and effectiveness of contraception, spontaneous intra uterine mortality and induced abortion. Bongaarts (1978) collapsed the set of eleven variables identified by Davies and Blake (1956) into eight variables, i.e. proportion of women married, contraception, induced abortion, lactational infecundability, frequency of intercourse, sterility, spontaneous intra-uterine mortality and duration of fertile period. These were further grouped into three broad categories of exposure factors, deliberate marital fertility control factors and natural marital factors. He stated that these key proximate determinants are also influenced by some other factors existing in societies namely the explanatory or indirect variables. The influence of these variables on fertility can only be there if these variables were operated through the proximate determinants. Bongaarts (1982) demonstrated that differences in fertility among and between populations are mainly a function of four intermediate variables: proportion married among females, contraceptive use and effectiveness, prevalence of induced abortions, and duration of postpartum infecundability.

Bongaarts and Kirmeyer (1982) observed that, fertility on average increases with ages 30-34, it then declines slightly to other older ages of 35-39, and drastically in ages 40-49. This may be attributed to greater inclination to use of contraception for spacing purposes. Gaisie (1984), in a study on the proximate determinants of age at first birth in Ghana, found that low age at first birth persists in the country. In analysis of the Kenya Fertility Survey, Kongolo (1985) found that women in Kenya started child bearing early as well, but where child bearing

started early, fertility was above average. This shows that there is an inverse relationship between age at first birth and fertility. Women who start child bearing at early ages are likely to have lower levels of education. They are likely to be rural residents or urban poor, these women would also adhere more to traditional patterns of birth spacing that results in long birth intervals and thus reduced fertility. The first visible outcome of the fertility process is the birth of the first child.

In the demographic literature, age at marriage has long been regarded as one of the proximate determinants of fertility (Davis and Blake, 1956; Bongaarts, 1982). However, empirical evidence for the effects of age at marriage on fertility is inconsistent (Van de Walle and Foster 1990). As a result, the effect of age at marriage on fertility in developing countries remains mostly speculative. There are arguments that age has a major impact on fertility because the female reproductive span of life is determined by age at marriage. While this may be true when age specific fecundability is invariant for changes in age at marriage, others argue that the contribution of age at marriage to fertility may be limited. They assume that a couple, that marries later, will compensate this delay by reducing the birth interval. This latter effect is likely to be less important when age and duration of marriage interact to influence fecundability.

The proportion of women of reproductive age that is regularly engaged in sexual intercourse is believed to be the major determinant of high fertility in sub-Saharan Africa since contraceptive prevalence is still very low (Mturi and Hinde, 1994). Various measures of marital status are used as proxies for this concept. A few studies have been able to employ direct data on coital frequency but so far these attempts have been limited to only a few developed countries. The only sub-group of women who can be assumed to be sexually active was the currently married women. In the past, marriage was thought to be universal Bongaarts et al, (1984; Page

(1988) and postponement of first marriage has been outlined as the main determinant of fertility decline (Cleland et al, 1994). But marital dissolution through divorce or widowhood is a common phenomenon (Diamond and Rotenberg, 1993). In studying recent trends in age at first marriage using data from 14 regions in Tanzania, Van de Walle observed that the proportion of women never marrying decreases progressively along the age distribution. This led him to conclude that 'the Tanzanian data suggest the old norm of universal female marriage may be changing' (Van de Walle, 1993). Yet he noted that the definition of marriage was problematic, where marriage in African societies was considered 'a process'; there was some ambiguity in determining exactly when a couple was getting married (Van de Walle, 1993). This implies that the magnitude of the proportion of married women will depend on the indicator of marriage used. Van de Walle (1993) says, the use of data of the proportion of married women was misleading because there was a rise in premarital sexuality and child bearing in sub-Saharan Africa which downplays the use of the 'proportion of married women' variable in the study of proximate determinants of fertility.

The principal proximate determinants of differentials of fertility in sub-Saharan Africa are lactational amenorrhea due to breastfeeding, decreased exposure to conception due to postpartum sexual abstinence, and pathological, involuntary infertility due to diseases like gonorrhea. These proximate determinants depend on behaviors that are susceptive to modern influences in Africa namely education and urbanization. Thus educated urban women, although they tend to marry later, generally abstain sexually for shorter periods after delivery and replace breastfeeding earlier or altogether with alternative milk or solid foods (Frank, 1993).

Lubaale (2007) carried out a study in Uganda on why fertility had declined in urban areas and established that change in the proportion of married and postpartum infecundability due to

breastfeeding had the greatest inhibiting effect on fertility in urban areas while contraception use had the least effect on fertility. This study, therefore, recommended that, the promotion of contraceptive use, prolonged breastfeeding habits, female education, employment and general reproductive health education were vital if fertility in Uganda had to reduce. In a comparative study done in Botswana, Zambia and Zimbabwe aimed at investigating the changes within and between countries in order to determine the extent of fertility change and fertility inhibiting factors most responsible for change, a study found that the effect of modern contraception was the major factor behind fertility decline, while delayed marriage had a significant role in fertility transition (Latemo et al, 2002).

Cleland (1985) observed that fertility reducing impact of marriage and contraception is nearly always greater among women living in towns and small cities than for rural women. The expectation is that fertility reducing effect of marriage and contraception will increase with education, but that the opposite relationship will hold for postpartum infecundability. For contraception and infecundability, this expectation was fulfilled due to unrealistic estimates based on small number of women. Thus, the effect of contraception increases monotonically with ascending levels of education while that of lactational infecundability decreases.

In Kenya, the Bongaarts' model has been used generating varying results. Ferry and Page (1984), used the 1977-1978 Kenya Fertility Survey data and found that lactational amenorrhea had the greatest effect on fertility, followed by marriage patterns (Kizito et al, 1991). A study carried out on the impact of late and non-marriage, contraceptive use, sterility and postpartum non-susceptibility on fertility in different regions of the country using the Bongaarts' model of proximate determinants of fertility, showed that postpartum infundability had a significant impact in increasing the length of birth intervals in Kenya between 1998 and 2003(Ekisa, 2005).

Use of contraceptives is an important proximate determinant on fertility, while acknowledging that fertility had begun to decline in Kenya, Sherries et al. 1985; Robinson 1996, found that contraceptive prevalence in Kenya was rising and fertility was declining. They noted that couples in Kenya were conceptualizing an ideal family size and that a rational weighing of costs and benefits of having children was occurring in Kenya more frequently than before. They argued further that government programmes were becoming effective and were increasing the cost of children and lowering the cost of obtaining contraceptive services.

Using the Bongaarts' (1978) framework and the 1998 KDHS data, Mutetei (1998) found that fertility differentials regionally in Kenya are due to various factors such as postpartum infecundability, higher levels of women's education, late age at marriage, contraception, and non-marriage. However, contraception was the most important fertility inhibiting variable in Nairobi and Central regions among women with secondary and higher levels of education and least important at the national level and other regions. Contraception and non marriage mainly contributed towards achieving declines in fertility between the periods 1989 to 1993. The prediction of fertility using contraceptive prevalence rate indicated that Eastern province was the only region with excess fertility of more than one birth. The other regions did not have excess fertility. Therefore, it can be concluded that, observed fertility matches with contraceptive prevalence rates in these regions. Therefore, projections for future matches on contraceptive use can be made for any region once the desired future fertility has been determined.

Studies have indicated that difference in levels of contraception explains 92 percent of the variation in fertility (Robey, Rustein and Morris, 1992). This implies that where use of contraception is widespread, fertility is low. The use of contraception to delay or limit the number of children born clearly affects a society's fertility level (Mturi and Hinde, 2001). Wasao

(2000) on the other hand, found that contraceptive use was linked to higher fertility in Cameroon, due to the high fertility desires existing in the country, such that women only turn to contraception for birth limitation after having achieved their family desires.

Ekisa and Hinde (2006), using data from the four Kenya Demographic and Health Surveys of 1989, 1993, 1998 and 2003 and in 21 regions, used the model of proximate determinants by Bongaarts 1978. The results show substantial and persistent regional differences in fertility. Generally, fertility was lower in urban areas than rural areas in the entire country and higher in both Coastal and Western areas. Ekisa (2006) further notes that, the pattern of increasing contraceptive use and rising age at marriage offsetting the impact of shorter durations of breastfeeding as modernization progresses was only found in a small number of regions in Kenya. These regions include Central, Eastern and Nairobi provinces. Elsewhere, a variety of demographic regimes was observed some associated with fertility declines, and others associated with constant or even increasing fertility. Therefore contraceptive use explained regional differences in fertility in Kenya.

A series of demographic surveys in Kenya have plotted the progress of family planning and fertility, with the 1989 survey showing a significant decline in fertility and a simultaneous rise in contraceptive use to the level documented earlier. Regional trends have also emerged showing that adoption of family planning is uneven over the country, a phenomenon confirmed by several local-area studies carried out by GTZ/FP Support Unit (NCPD, 1989). The contraceptive prevalence rate (CPR) varied from 50 percent in Nyanza to 52.2 percent in Kirinyaga district. Even at the provincial level, differences in the CPR were substantial with rates of around 14 *percent in Western and Nyanza contrasting with those of around 40 percent in* Central Province. The same uneven pattern was prevalent in 1993. TFR was 5.4 with 32.7

percent of currently married women using any method of contraception. Nairobi had a CPR of 45.4 percent, Central 56 percent, Nyanza 23.8 percent; Coast 20.2 percent; Eastern 38.4 percent, Rift Valley 27.8 percent and Western 25.1 percent (NCPD, 1994).

Sterility, whether primary or secondary, has been known to affect fertility particularly in areas where there is high incidence of sterility. In Gabon for example, the key determinant of the exceptionally low fertility (TFR of 4.1) was noted to be widespread pathological sterility (Bongaarts and Frank, 1988). If sterility is reduced, fertility is likely to rise this is the trend in countries where the prevalence of sterility is high. However, sterility seems to be relatively lower in East and West Africa compared with Central Africa. Bongaarts et al (1984) have noted that the highest levels of infertility are found in Central Africa where over a large area more than 20 percent of women aged 45-49 are childless. The percentage range of women aged 45-49, who were childless was 12 to 20 percent and 3 to 12 percent in East and West Africa respectively. A more recent estimation procedure developed by Larsen and Menken (1991) has shown that prevalence of sterility in Kenya is relatively low compared with other sub-Saharan African countries included in their analysis (Ghana, Lesotho, Cameroon and Sudan). This implies that sterility is still low in East Africa and its impact on fertility is small.

Data on induced abortion, a practice that deliberately interrupts the normal course of gestation, are very rare in Africa. This is due to the fact that in most African countries, induced abortion is illegal unless performed to save the mother's life. It is therefore difficult to assess the effects of induced abortion on fertility in this part of the world. It has been observed, however, that abortion is in fact not uncommon, particularly in urban areas, and that the number of cases presented at hospitals for abortion is increasing though it is restricted to young and unmarried women (Coeytaux, 1988; Justesen et al., 1992).

2.2 Summary of Literature Review

In conclusion, research findings demonstrate that variation in fertility in Kenya can be explained by socioeconomic factors, sociocultural factors, demographic factors and proximate determinants. The key factors pointed out in the literature that contribute towards fertility variation in Kenya include marriage age and patterns, contraceptive use, sterility, place of residence, age at first birth, postpartum infecundability and proportions of women engaged in sexual relations, some of these factors will be included in my study to find out how they affect the fertility in Western and Central provinces.

2.3 Analytical Framework

The Bongaarts' extended model of 1983 estimates the total fertility rate as a residual value derived by relating the fertility measures to the proximate determinants. The following equations summarize the basic structure of the Bongaarts' 1983 model.

$TFR = Cm \times Cc \times Ca \times Ci \times Cp \times TF$ (1)

$TM = Cc \times Ca \times Ci \times TF$ (2)

$TN = Ci \times TF$ (3)

Where TFR is the total fertility rate, TM is the total marital fertility rate, TN is the total natural marital fertility rate, TF is the total fecundity rate, and Cm, Cc, Ca, Cs and Ci are the indices of marriage, contraception, induced abortion, permanent sterility and postpartum fecundability respectively. The Bongaarts' 1983 model summarizes the relationship between the total fertility rate and the proximate determinants of fertility, and is worldwide known as the Bongaarts model of proximate determinants. The Bongaarts model assumes that the natural reproductive capacity, i.e. total fecundity (TF) rate of women is nearly the same for all women, but their actual reproductive performance is modified by four major proximate determinants. The fertility effects

of the four most important proximate determinants, marriage, contraception, induced abortion and *postpartum* infecundability are measured by four indices Cm, Cc, Ca, Ci and Cp respectively.

Where Cm= index of marriage (Cm ranges from 0 to 1; is equal to 1 if all women of reproductive age are married and 0 in the absence of marriage).

Cc= index of contraception (Cc ranges from 0 to 1; is equal to 1 in the absence of contraception and 0 if all fecund women use 100 percent effective contraception).

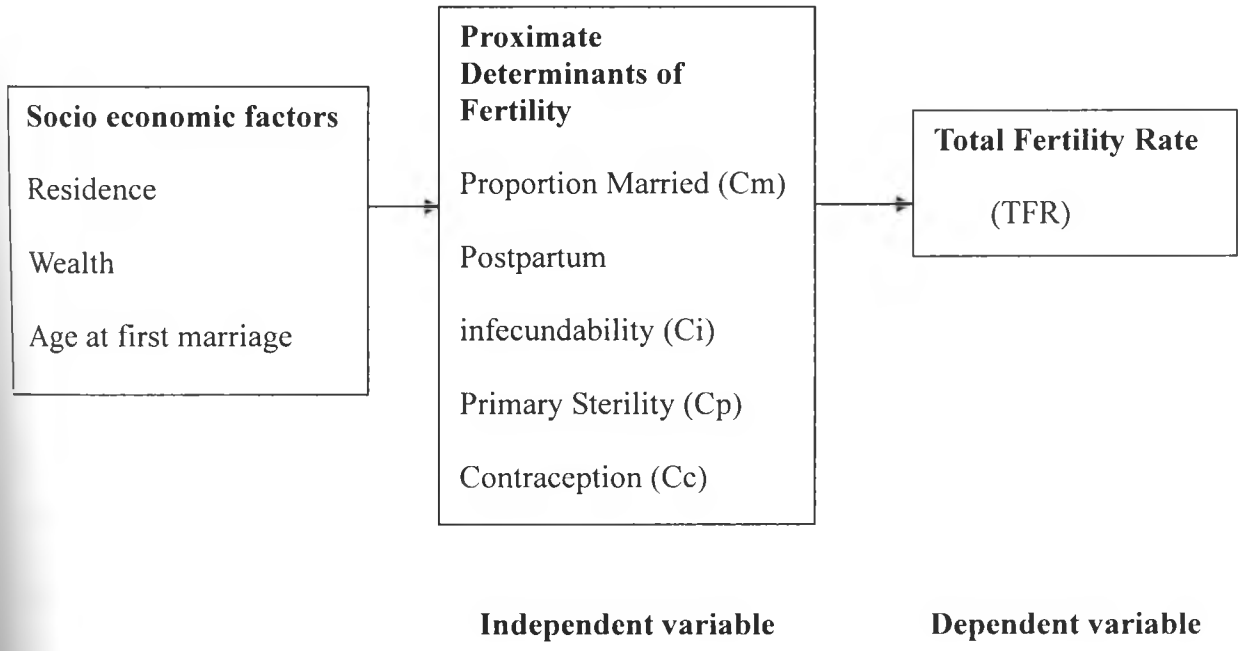
Ca = index of induced abortion (Ca ranges from 0 to 1; is equal to 1 in the absence of induced abortion and 0 if all pregnancies are aborted).

Ci = index of postpartum infecundability (Ci ranges from 0 to 1; is equal to 1 in the absence of lactation and postpartum abstinence and 0 if the duration of infecundability is infinite).

Cp= is the index of primary sterility (Cp ranges from 0 to 1; is equal to 1 in the absence of primary sterility, and 0 if all women of reproductive age are sterile).

The Bongaarts model of 1983 was applied to data from the 2008-09 Kenya Demographic Health Survey (KDHS) to estimate the relative contribution of the different proximate determinants in understanding fertility in Western and Central Provinces.

Figure 2.3: The Bongaarts Analytical Framework



Source: Bongaarts et al, 1984

The above model was used in its original form.

CHAPTER THREE

STUDY METHODOLOGY

3.0 Introduction

This chapter presents a description of the source of data used for the study, data required for analysis, definition of the variables, procedures used to analyze relative contribution of each of the four principal proximate determinants of fertility according to the 2008/09 KDHS in Western and Central provinces, and finally how the results of the analysis were presented and interpreted.

3.1 Data Source

The data used in the study were drawn from the 2008/09 KDHS. The surveys obtained detailed information on fertility levels, marriage, sexual activity, fertility preferences, awareness and use of family planning methods, breastfeeding practices, nutritional status of women and young children, childhood and maternal mortality, maternal and child health, awareness and behavior regarding HIV/AIDS and other sexually transmitted infections (STIs). The type of information collected relevant to this study include; age at first marriage, fertility levels, marital status and patterns, primary sterility, duration and frequency of lactational infecundability, contraceptive prevalence and region of residence. The segment of population involved includes women aged 15-49 in Western and Central provinces.

The sample size involved a total of 8,444 women in Kenya, of whom 973 and 1039 were from Central and Western provinces respectively. A total of 1168 women reported to be currently married, while those who are currently using any form of contraceptive were 741 in both regions.

In calculating the indices, only currently married women were included in the analysis with the exception of index of sterility where all ever married women were included.

3.2 Data Required for Analysis

The following data elements were used for analysis: place of residence, wealth index, age at first marriage, level of education, marital status, postpartum amenorrheaic status, sterility, children ever born and current use of contraception.

3.3 Definition of Variables

Place of residence: This refers to where the mother currently lives, either in urban or rural. It is assumed that urban dwellers have fewer children compared to their rural counterparts.

Wealth index: This is based on household ownership of material possession such as radio and television. It also includes the housing quality, whether the house has electricity, finished floor and permanent roof that is corrugated iron or tiled. It serves as a proxy for household wealth and disposable income. It was classified as low, medium or high. Those in the low wealth index are expected to exhibit high fertility rates.

Age at first marriage: This represents the time when women are exposed to regular sexual intercourse and consequently to childbearing.

Level of education: This refers to the highest level of formal schooling attained by a woman at the time of the survey. It is categorized as no education, primary education and secondary plus. The expected trend is that the number of children ever born reduces with increase in the level of a woman's level of education.

Postpartum infecundability: This refers to the period following birth when women are not susceptible to the risk of conception because they are either breastfeeding (lactation amenorrhea)

or postpartum abstinence.

Primary Sterility: This is when a woman of age 45-49 years reaches the end of child bearing without conceiving at all despite being sexually active and not using any form of contraception.

Children ever born: This is the total number of children a woman has ever given birth to.

Current use of contraception: This refers using any type of contraceptives to deliberately reduce the risk of conception.

3.4 Computational Procedures

There were three levels of computational procedures: First was the decomposition of proportional change in TFR into the components Pm, Pc, Pi, Pp and Pr using the Bongaarts Analytical Framework. Secondly, running the frequencies and cross tabulations for demographic and socio-economic variables using SPSS to estimate their effect on fertility in the two regions, measures of the proximate determinants was then determined i.e. proportion of women married, proportion currently using contraceptive, average duration of postpartum infecundability, proportion of women aged 45-49 years who are infecund and average contraceptive use effectiveness. Lastly, estimation of the indices of Cm, Cc, Cp, and Ci against socio-economic and demographic characteristics in the two regions.

3.5 Direct Estimation of the Fertility Effects of the Principal Proximate Determinants

A major application of the Bongaarts' aggregate fertility model was the estimation of the fertility inhibiting effects of proximate determinants as measured by the indices Cm, Cc, Ci, and Cp (Bongaarts et al 1983). These indexes were estimated directly from the measures of the proximate determinants.

3.5.1 Estimation of the index of marriage (Cm)

The index of marriage measures the inhibiting effect of marriage on fertility in the population. It has to be noted that the higher the level of marriage in the population the less the inhibiting effect and vice versa. The index of marriage is estimated using the formula;

$C\ m = \Sigma\ m\ (a)\ g\ (a) / \Sigma\ g\ (a)$

Where Cm = Index of marriage;

m(a)= Age specific proportion of married females, m(a) is obtained by dividing the number of married women of a particular age group by the number of women in the same age group;

g(a) = Age specific marital fertility rates, g(a) is obtained by dividing the births of a particular age group by the number of women in the same age group.

3.5.2 Estimation of the index of contraception (Cc)

The index of contraception in the model measures the inhibiting effect of contraception on fertility in the population. The higher the level of contraception in the population, the higher the inhibiting effect due to contraception. The index of contraception is estimated using the formula;

$Cc = 1 - 1.08 * u * e$

Where u = Proportion using contraception among married women of reproductive age (15-49 years).

e = Average use effectiveness of contraception. The coefficient 1.08 represents an adjustment for the fact that women do not use contraception if they know that they are sterile. The indices of use effectiveness proposed for particular contraceptives are: pill, 0.90; intra uterine device, 0.95, sterilization, 1.00 other modern methods (injectables, norplant, condom and diaphragm), 0.70 and traditional methods, 0.3 (adapted from Otieno 2008).

3.5.3 Estimation of the index of postpartum infecundability (Ci)

The index of postpartum infecundability measures the inhibiting effect of breastfeeding or abstinence on fertility in the population. The index of postpartum infecundability in the model is estimated using the effect of breastfeeding (lactation amenorrhea) or postpartum abstinence. The ratio of natural fertility in the presence or absence of postpartum infecundability, therefore, is equal to the ratio of the average birth interval without or with postpartum infecundability. If no breastfeeding and postpartum abstinence are practiced, the birth interval averages about 20 months, which is the sum of;

i) 1.5 months of minimum postpartum in ovulation

ii) 7.5 months of waiting time to conception

iii) 2 months of time added by spontaneous intrauterine mortality

iv) 9 months for a full term pregnancy

Bongaarts et al (1983) state that, in the presence of breastfeeding and postpartum abstinence, the average birth internal is equal to approximately 18.5 months (7.5 + 2 + 9) plus the duration of postpartum infecundability. The index of postpartum infecundability (Ci) is estimated as;

$Ci = 20/ (18.5+i)$

Where C = the index of postpartum infecundability, i = average duration of postpartum infecundability caused by breastfeeding or postpartum abstinence. In this study, the index of postpartum infecundability was estimated using the mean duration of breastfeeding and this was obtained from a question, which aimed at establishing the duration the most recent child was breastfed.

3.5.4 Estimation of the index of primary sterility (Cp)

The index of sterility was estimated as: Cp= (7.63-11s)/7.3,

Where s= proportion of ever married women between ages 45 and 49 who have never had a live birth, the assumption being that all married women should have had a child by age 45 in Kenya.

3.6 Presentation and Interpretation of Results

The findings of the study were presented in tables and narrative form. Tables giving a summary of demographic characteristics of the study subjects were presented for both regions. For each of the four proximate determinants, summary tables for both regions were presented by various socio-economic and demographic characteristics of the study subject and finally a table of the proximate determinants of fertility.

In comparing two or more proximate determinants, the determinant with the lowest index had the most inhibiting effect. For example a comparison of marriage, contraception and postpartum infecundability, marriage would have the greatest inhibiting effect if the values of the indexes were 55 percent, 60 percent and 65 percent respectively.

CHAPTER FOUR

RESULTS AND DISCUSSIONS ON PROXIMATE DETERMINANTS OF FERTILITY

4.0 Introduction

This chapter addresses the socio-economic factors and proximate determinants of fertility that affect a woman's risk of becoming pregnant. These factors include children ever born, age at first marriage, education level, place of residence, wealth index, proportion married, contraceptive use, postpartum infecundability and sterility.

4.1 Background and proximate characteristics of the study subjects

Table 4.1 displays the demographic and socioeconomic characteristics of women in Western and Central provinces from the 2008/09 KDHS data. In terms of demographic characteristics, women in Western province have more children ever born than Central province. This means that women from Central province prefer smaller families compared to their counterparts in Western province. For instance, results from descriptive statistics show that about 27 percent of women in Western province have given birth to more than 6 children as compared to 13.3 percent in Central province. Results further reveal that Western province has more women in the younger age group i.e. (26.8 percent at 15-24 years) compared to Central which is has 15.7 percent of women at 15-24 years. There was a slight difference of 3.9 percent of women in ages 15-24 who got married for the first time in the two regions, although Western was still leading at 92.5 percent and Central at 88.6 percent. Contraceptive use was high in Central

Table 4.1: Demographic and socioeconomic characteristics of currently married women of reproductive age (15-49) in the 2008/09 KDHS-based on unweighted cases.

Proportion with characteristics (%)		
Characteristics	**Central (N=565)**	**Western (N=603)**
Total Children Ever Born		
0-2	42.1	34.3
3-5	44.6	38.6
6+	13.3	27.1
Age distribution		
15-19	1.2	4.6
20-24	14.5	22.2
25-29	21.1	21.9
30-34	21.1	15.7
35-39	13.8	13.9
40-44	15.4	12.6
45-49	12.9	9.1
Age at first marriage		
15-24	88.6	92.5
25-34	10.9	7.1
35-49	0.5	0.4
Contraceptive use		
Not using	34.5	54.5
Currently using	65.5	45.5
Education Levels		
No Education	1.2	5.3
Primary Education	63.4	67.3
Secondary +	35.4	27.4
Place of Residence		
Rural	16.6	22.7
Urban	83.4	77.3
Wealth Index		
Low	11.7	45.1
Middle	26.5	22.4
High	61.8	32.5

Source: 2008/09 KDHS

province at 66 percent compared to 46 percent of women in Western province. These variations in use and non use can partly explain differentials in children ever born in the two regions.

The socio-economic characteristics that were considered for the study were: Education level, place of residence and wealth index. The two regions reported variations in education level. Central province recorded a higher proportion of 35.4 percent of women who have at least secondary education, while Western province on the other hand recorded 27.4 percent. Although Western province had a higher proportion of 67.3 percent of women with primary education compared to Central's 63.4 percent, the proportion of those with no education was higher at 5.3 percent to that of Central's 1.2 percent making the illiteracy level in Western to be relatively higher.

In terms of place of residence, 83.4 percent of women in Central province live in urban areas compared to Westerns 77.3 percent. More than a half of the women in Central province reported to be wealthy while only a quarter of the Women in Western province were wealthy. Poverty was four times severe in Western than in Central province.

4.2 Indices of Marriage, Contraception, Postpartum Infecundability and Sterility

This section presents the estimated indices of the four proximate determinants of fertility.

4.2.1 Index of Marriage

Table 4.2 below shows the fertility inhibiting effect of marriage, which was determined by calculating the index of marriage. The index of marriage was itself a function of proportion of women married within a given age group. The index of marriage determines the proportion by which marriage reduces actual fertility levels below total marital fertility rate. Total marital fertility rate was the fertility that would have been observed if the fertility inhibiting effect of delayed marriage and marital disruption was removed without other changes in fertility behaviour. At aggregate level, the index of marriage (Cm) was equal to 0.73 in Western and

(Cm) was equal to 0.72 in Central province. This meant that delayed marriage and non marriage reduced fertility by 27 percent and 28 percent respectively below what it would otherwise be if marriage was universal among all women age 15-49. Marriage had a greater inhibiting factor on fertility among women in urban areas at 53 percent in Central province and 47 percent in Western province, while rural had 33 percent and 22 percent in Central and Western provinces respectively. This indicates that women in rural areas marry at younger ages than their urban counterparts. The data also shows a clear pattern on the effect of marriage across women of different education levels and wealth categories. Marriage patterns had a great fertility inhibiting effect among most educated women at 48 percent and 46 percent in Central and Western province respectively. Women with no education had a small fertility inhibiting effect at 35 percent in both regions while those with at least primary education had the least percentages at 34 and 25 in Central and Western province respectively, thus it can be concluded that

Table 4.2: Estimated Index of marriage by demographic and socioeconomic characteristics of currently married women of reproductive age (15-49) in the 2008/09 KDHS

Characteristics	Central (N=565)	Western (N=603)
Education Levels		
No Education	0.65	0.65
Primary Education	0.66	0.75
Secondary +	0.58	0.54
Place of Residence		
Rural	0.67	0.72
Urban	0.47	0.53
Wealth Index		
Low	0.64	0.62
Middle	0.69	0.73
High	0.52	0.53
TOTAL	0.72	0.73

postponement of marriage has a greater fertility inhibiting effect (Cleland et al, 1994). In v categories, the richest women in both regions delayed marriage by 48 percent in Central pro and 47 percent in Western province. Wealthy women in most cases tend to be independen single and even when they settle down to marry; it was at an advanced age thus ending wit short duration of exposure to the risk of pregnancy.

4.2.2 Index of Contraception

Fertility inhibiting effect of contraception was quantified through calculation of the index of contraception. The reciprocal of this index indicates the magnitude by which total natural marital fertility rate (TN) was reduced relative to total marital fertility rate (TM) by contraceptive practice. Table 4.3 below shows TM was reduced by 38 percent (Cc= 0.62) in Central province and 16 percent (Cc = 0.84) in Western province. It was expected that women with higher education would have a higher fertility inhibiting effect, but in the two regions that was not the case. The fertility inhibiting effect was seen to be low in women with at least primary education at 33 percent and 18 percent in Central and Western province respectively, while those with higher education exhibited a high fertility inhibiting effect of 59 percent and 36 percent respectively in Central and Western province. Contraception had no fertility inhibiting effect in women with no education in Central province (Cc= 1.00). The fertility inhibiting effect was at 44 percent for women in Central province living in rural areas and 21 percent in Western Province, while those in urban areas was at 9 percent and 7 percent in Western and Central province. The fertility inhibiting effect according to wealth categories had the highest effect in middle class women in Central province at 33 percent while Western had only 12 percent in the same category. Wealthiest women are expected to have the lowest index of contraception but in this case they had the highest index at 0.87 and 0.96 in Central and Western province respectively.

Looking at the contraceptive patterns, it can be assumed that issues of availability, access,

Table 4.3: Estimated Index of contraception by demographic and socioeconomic characteristics of currently married women of reproductive age (15-49) in the 2008/09 KDHS

Characteristics	*Central (N=565)*	Western (N=603)
Education Levels		
No Education	1.00	0.99
Primary Education	0.67	0.82
Secondary +	0.41	0.64
Place of Residence		
Rural	0.56	0.79
Urban	0.91	0.93
Wealth Index		
Low	0.94	0.89
Middle	0.67	0.88
High	0.87	0.96
TOTAL	0.62	0.84

affordability and awareness played a key role in determining contraceptive prevalence in the two regions. The type of contraception used may vary across the regions hence the varying contraceptive effectiveness and the index of contraception.

4.2.3 Index of postpartum infecundability

The index of postpartum infecundability was determined by the duration that a woman remains insusceptible to pregnancy after the birth of a child. The longer the duration of breastfeeding, the smaller the index and the bigger its effect in inhibiting fertility. Postpartum sexual abstinence and duration and frequency of lactation in return determines the duration of postpartum infecundability. When calculated, the index of postpartum infecundability shows the extent to which this factor reduces total fecundity rate. Table 4.4 below summarizes both at aggregate and sub population levels.

Table 4.4: Estimated Index of postpartum infecundability by demographic and socioeconomic characteristics of currently married women of reproductive age (15-49) in the 2008/09 KDHS

Characteristics	Central (N=565)	Western (N=603)
Education Levels		
No Education	0.89	0.85
Primary Education	0.76	0.72
Secondary +	0.87	0.79
Place of Residence		
Rural	0.75	0.75
Urban	0.73	0.69
Wealth Index		
Low	0.83	0.77
Middle	0.70	0.72
High	0.87	0.70
TOTAL	0.86	0.81

Postpartum infecundability at aggregate level reduced total fecundity rate by 14 percent in women of Central province and 19 percent in women of Western province. When it came to education levels, we found that postpartum infecundability had the highest inhibiting effect on women with at least some education. It was high in Central province in women with primary education at 24 percent and 28 percent in Western province. It was low in women with no education at 11 percent and 15 percent in Central province and Western province while those with secondary education and above had 13 percent and 21 percent in Central province and Western province respectively. This could be assumed that women with no education did not find it important to breast feed exclusively while those with high education were in employment thus had to go back to work early. It was assumed that women in rural areas were expected to breastfeed for long but there was a slight difference in the two regions. Women leaving in urban areas in Western province were breastfeeding more than their rural counterparts as out of a possible number of 565 only 305 women were breastfeeding in Central province while those

breastfeeding in Western province were a total of 442 out of 603 women. Thus postpartum infecundability had the highest fertility inhibiting effect in Western province at 31 percent while Central province at 27 percent. Wealthy women according to the findings did not breastfeed for long since most of them were working; in Central province the fertility inhibiting effect was low in women who were wealthy at 13 percent and slightly higher in Western province at 30 percent. This might be so because they only breastfed in the morning and evening after work.

4.2.4 Index of sterility

The index of sterility was calculated using all ever married women (both formerly married and currently married). The main aim was to increase the proportion of women who have ever been exposed to the risk of pregnancy and who had no live births, were not currently using any contraception and were not currently pregnant. The findings show that primary sterility had no fertility inhibiting effect in both regions. Western province reported not to have any infecund women while Central province only reported 1.1 percent. This revealed that fertility would have reached the optimal total fecundity rate of 10.73 children per woman in Western province and 9.07 children per woman in Central province had all women been married and not practicing deliberate birth control measures.

4.3 Fitted Bongaarts' Fertility Model

Bongaarts fertility model used the indices of proximate determinants of fertility to estimate total fertility rate. Using this model, TFR for Western and Central provinces was estimated using the formula: TFR=Cm*Cc*Ci*CP*TF, as shown in table 4.5 below. TF was taken to be 9.07 in Central and 10.73 in Western. The table below illustrates how TFR varied across sub populations based on their demographic and socio-economic characteristics. In

Central province place of residence had the lowest TFR at 2.6 in rural and 2.9 in urban areas where Western province can emulate to bring their high TFR of 5.0 in rural and 4.1 in urban areas down. Having no education mattered a lot when it came to reducing fertility as women with no education gave birth more probably because they did not know the importance of having a small family. This was seen in the results as women with no education in Western and Central province had a TFR of 6.6 and 5.4 respectively. Wealthy women normally have the lowest TFR according to Wasao (2000), but this was not the case in Western province, we found that women in Western province had a TFR of 6.7 which was twice that of rich Women in Central province who have a TFR of 3.7. Based on the demographic and socio-economic characteristics we found that the TFR in Western province was still high compared to Central province, as a result Western province needed to emulate practically everything that Central province is doing if their TFR is to reduce.

Table 4.6: Estimated indices and Fitted TFR by demographic and socioeconomic characteristics of ever married women of reproductive age (15-49) as estimated by fitting the Bongaarts proximate determinant model in the 2008/09 KDHS

Characteristics		Index of marriage		Index of contraception		Index of postpartum infecundability		Index of sterility		Fitted TFR	
		Central	Western	Central	Western	Central	Western	Central	Western	Central	Western
Residence	**Rural**	0.67	0.72	0.56	0.79	0.75	0.75	1.05	1.03	2.63	5.05
	Urban	0.47	0.53	0.91	0.93	0.73	0.69	1.03	1.05	2.97	4.10
Education	**No education**	0.65	0.65	1.00	0.99	0.89	0.85	1.03	1.03	5.40	6.60
	Primary	0.66	0.75	0.67	0.82	0.76	0.72	1.05	1.05	3.20	5.24
	Secondary +	0.58	0.54	0.41	0.64	0.87	0.79	1.05	1.05	1.93	3.29
Wealth index	**Low**	0.64	0.62	0.94	0.89	0.83	0.77	1.03	1.05	4.76	5.03
	Middle	0.69	0.73	0.67	0.88	0.70	0.72	1.05	1.03	3.02	5.58
	High	0.52	0.53	0.87	0.96	0.87	0.70	1.05	1.05	3.75	6.73

4.4 Indices for Proximate Determinants of Fertility for women in Central and Western province in the 2008/09 KDHS

The Table 4.6 below illustrates that, as much as contraceptive use played a big role in fertility reduction in Central province with (Cc) being 0.62, marriage played the biggest role of the three principal proximate determinants in reducing fertility in the two regions. The index of marriage (Cm) was 0.72 in Central province and 0.73 in Western province. If all births were occurring in marital unions, as the formulation of the Bongaarts framework assumed, marriage would have a much stronger fertility inhibiting effect than just 28 percent and 27 percent in Central and Western provinces. The index of primary sterility (*Cp*) was approximately 1 in both regions indicating that primary sterility was not a common enough to significantly lower aggregate fertility levels. Therefore non-marriage (due either to *delayed marriage* or the exit from marriage) and prolonged use of contraceptives were the two most important factors that kept fertility below its biological maximum in the Central province which Western province could highly emulate.

The predicted TFRs for Central and Western provinces were slightly different from the TFRs estimated from information on births in the last five years (3.5 compared to 3.4 in Central and 5.9 compared to 5.6 in Western). This difference between the model estimate and the observed value was consistent with the omission of the index of abortion, which was an important proximate determinant from the model. However, the result suggests that the proximate determinants included in the model were the principal mechanisms by which fertility was reduced below its biological maximum.

Table 4.6 Indices for Proximate Determinants of Fertility for of ever married women of reproductive age (45-49) in the 2008/09 KDHS in Central and Western province

Index/Measure	**Region**	
	Central	**Western**
Cm (index of marriage)	0.72	0.73
Cc (index of contraception)	0.62	0.84
Ci (Index of postpartum infecundability)	0.86	0.81
Cp (index of sterility)	1.03	1.05
Predicted TFR 1 by Bongaarts model	3.59	5.99
Predicted TFR 2 based on 2008/09 KDHS data	3.40	5.60

Source: Analysis of 2008/09 KDHS Data

CHAPTER FIVE

SUMMARY, CONCLUSION AND RECOMMENDATIONS

5.0 Introduction

This chapter gives a summary of the study, conclusions of the main findings as well as recommendations for policy and further research.

5.1 Summary

The general objective of the study was to find how proximate determinants of fertility have influenced the level of total fertility in Western and Central provinces in 2008/09. Specifically the study was focused on examining the effects of demographic and socioeconomic factors on fertility in Western and Central provinces among women aged 15-49 years in 2008/09 and estimating the extend of fertility inhibiting effects of the indices of each proximate determinants of fertility among women aged 15-49 years in Western and Central provinces in 2008/09.

The data used in the study was drawn from the Kenya Demographic and Health Survey (KDHS 2008-09). The type of information collected relevant to this study included; fertility levels, age at first marriage and birth, contraceptive prevalence, place of residence, wealth index and women's education level. The sample size involved was of and 8,444; women in 2008/09 both aged 15-49.

The Bongaarts model as proposed in 1978 and modified in 1983 was used in this study. Marriage, contraception, postpartum infecundability and sterility were examined. The other factor abortion, which was identified by Bongaarts' as being a key factor, was not examined due to lack of data from the 2008/09 KDHS. There were three levels of computational procedures: First was the decomposition of proportional change in TFR into the components Pm, Pc, Pi, Pp

and Pr using the Bongaarts Analytical Framework. Secondly, running the frequencies and cross tabulations for demographic and socio-economic variables using SPSS to estimate their effect on fertility in the two regions, measures of the proximate determinants was then determined i.e. proportion of women married, proportion currently using contraceptive, average duration of postpartum infecundability, proportion of women aged 45-49 years who are infecund and average contraceptive use effectiveness. Lastly, estimation of the indices of Cm, Cc, Cp, and Ci against socio-economic and demographic characteristics in the two regions.

During the analysis, I found out that marriage patterns had a great fertility inhibiting effect among most educated women at 48 percent and 46 percent in Central and Western province respectively. Women with no education had a small fertility inhibiting effect at 35 percent in both regions while those with at least primary education had the least percentages at 34 and 25 in Central and Western province respectively, thus it can be concluded that postponement of marriage has a greater fertility inhibiting effect (Cleland et al, 1994). It was also assumed that women in rural areas are expected to breastfeed for long but there was a slight difference in these two regions. Women leaving in urban areas in Western province were breastfeeding more than their rural counterparts. The postpartum infecundability had the highest fertility inhibiting effect in Western province at 31 percent while Central province at 27 percent.

5.2 Conclusions

Kenya has undergone a remarkable decline in fertility, after being famous for having the highest fertility and population growth rate in the world, with a Total Fertility Rate (TFR) of 8.0 in 1980s, which declined to 4.7 in the 1990s and slightly rose to 4.9 in 2003, then dropped to 4.6 in 2008, (NCPD, 1989, and 1994; CBS, 1969 and 2008). From the results of this study, the proximate determinants of fertility in Western and Central provinces were as expected from the

theoretical assumptions of fertility from previous studies. However, distinctions have been observed in regards to variables whose expected influence did not conform to previous studies. For instance, Wasao (2000) found that women with higher fertility were insignificantly associated with higher use of modern methods of contraception than those with lower fertility. Though marriage was almost universal in the two regions, the findings of this study indicates that many women today were delaying marriage thus decline in fertility. Despite this, the study revealed that the contribution of marriage in the fertility decline varied across sub populations and contrary to what one would suppose. It would be expected that the urban, the rich and the most educated women would have more delayed marriage than their counterparts but the findings of the study show a clearly different scenario. It was observed that women with no education had a greater fertility inhibiting effect at 35 percent in both regions than those with at least primary education at 34 percent and 25 percent in Central and Western province respectively.

As much as contraceptive use played a big role in fertility reduction in Central province, marriage played the biggest role of the three principal proximate determinants of fertility in reducing fertility in the two regions thus for Western province to be at par with Central province, the two proximate determinants have to be considered.

5.3 Recommendations

The findings of this study clearly show that proximate determinants of fertility vary in the two regions with some having a higher fertility inhibiting effect than others. Despite these Central Province still has the lowest TFR using the fitted Bongaarts fertility model of 1983. To increase the fertility inhibiting effects in Western province in an effort to reduce the fertility levels in the region, the government should embark on series of campaigns to create awareness,

educate the masses and persuade the people to accept the benefits a small family. A strong family planning programme in Western province with verve and political will to effect substantial fertility reduction is necessary.

5.3.1 Policy Recommendations

Education played a key role in delaying marriage, women with at least secondary education tend to delay marriage more than those with at least primary education. This implied that implementation of policy approach aimed at increasing the opportunities in higher education for girls especially in Western province should be reinforced and this would result in fertility reduction in the region. Though efforts in regard to girl child education have been made, there was still a gap in promoting women empowerment in Western province. The government therefore should reinforce education for girls up to higher levels if the goals of the current population policy on National goals for education 2010 have to be realized. With this they will stay longer in schools, get employment and be able to make informed decisions on the number of children they will have.

Policy Programmes that integrate population and development should be encouraged in the two regions to foster rapid economic development as women who are poor tend to have large families compared to their wealthy counterparts. More emphasis should be put in resource allocation and income generating activities in order to improve the living standards.

5.3.2 Recommendations for Further Research

The low use of contraceptives in the two regions among women in urban areas was of great concern which requires a further research to find out reasons as to why they were not using contraceptives yet they still have a low TFR. Although breastfeeding was considered one of the family planning methods, the study revealed that this was not the preferred method in the two

regions; there was need of a qualitative research to be carried out to find out why many women were not using breastfeeding as a method of contraceptive. The role of induced abortion in Kenya need to be studied in order to give more accurate estimates of the impact of fertility inhibiting variables and their implication on family planning.

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