TRENDS AND DIFFERENTIALS IN FERTILITY PREFERENCE IMPLEMENTATION IN KENYA

By:

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DECLARATION

This research project is my own original work and has not been presented to any college or institution of higher learning of academic credit for a similar or any other award. It is my original idea and all the work has been done by me, all the help has been acknowledged and the sources of information have specifically been acknowledged by reference.

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DEDICATION

This project is dedicated to my late father for the tireless sacrifice he made in instilling the benefits of education in my mind. Dad I know you are long gone but the fire you left are still burning.

ABSTRACT

The objective of this study was to examine the trends and differentials in fertility preference implementation in Kenya. Applied is the Bongaarts variant of Easterlin's supply-demand framework for the analysis of these trends and differentials, along the sub groupings like completed education, type of place of residence and regions in Kenya using the longitudinal data sets from the Kenya Demographic and Health Survey (KDHS)

Total Fertility rate has generally declined in Kenya with slight disparities across regions, type of place of residence and social class. This observed decline could be as a result of the relatively low costs and high benefits associated with fertility control; reduced time span that women spend in reproductive activities as they pursue educational goals, which has been leading to higher age at first marriage and first birth; incompatibility of childbearing and rearing especially the maternity leaves with labour force participation for women and the high cost of childbearing and rearing.

The decomposition procedure was done using data from two averaged sets of Demographic and Health Surveys categorised as average sets before stall (1989 and 1993) in fertility and another average set taken during stall (1998 and 2003). The result shows variation in the values of preference implementation especially between the regions, social class (completed education level) and type of place of residence. It is shown that women's fertility preference implementation has persistently remained low in Kenya. These results also indicate that on average, any significant changes in fertility were believed to be

due to the degree of fertility preference implementation and changes in wanted fertility. The Degree or the extent of fertility Preference implementation was found to be as important determinant of fertility decline as wanted fertility.

These figures are suspected to originate from a range of factors i.e. Apart from the structural effects; there are possibilities of real reversal in fertility decline that could arise from change in fertility preferences and implementation due to the factors like AIDS pandemic i.e. an insurance artefact Brass (2004). In addition, there may be possibilities arising from constrained access to contraception the major proximate determinant of fertility in the last few decades or so. Given the above issues it is therefore important to examine the dynamics of fertility in the above decades using indicators that are not likely to be distorted by changes in timing of childbearing (Udjo, 1998; Bongarts 1999, Sibanda, 1999).

The procedure shows that preference implementation is a very important determinant of fertility decline. The importance of the degree of preference implementation and the implication of this finding is discussed. The need for further investigation into the use of degree of preference implementation in demographic research is emphasized.

LIST OF ABBREVIATIONS

TFR	- Total Fertility Rate
HIV	– Human Immunodeficiency Virus
AIDS	– Acquired Immune Deficiency Syndrome
KDHS	– Kenya Demographic and Health Survey
UN	– United Nations
UNFPA	– United Nations Fund for Population Activities
FPAK	– Family Planning Association of Kenya
UNDP	- United Nations Development Agency
KFS	– Kenya Fertility Survey
ICPD	– International Conference on Population and Development
NCPD	– National Council for Population and Development
CBS	– Central Bureau of Statistics
Ip	– Index of fertility Implementation
F_n	- Natural Fertility
F_u	– Unwanted fertility
F_w	- Wanted Fertility
WHO	- World Health Organization

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CHAPTER ONE

1.1 GENERAL INTRODUCTION

Substantial fertility declines have occurred in many less developed countries. These trends have been extensively documented and analyzed by increasingly sophisticated methods but the great debate has continued on the methods invented and used in the analysis. According to (Bongaarts, 1993) only modest progress has been made towards the consensus despite the extensive efforts and elaboration of opposing views. He believes that neither sides in the debate can claim: victory which can fairly be interpreted to imply that both views are at least partially valid. Many analysts therefore take a more central position which sees declining fertility as a complex process that involves key roles for changes in the demand for children as well as for the diffusion of new attitudes about birth control and for greater accessibility to contraception provided by family planning programmes. The critical question here begging to answer is how much fertility change in a particular society can be attributed to each of the broad explanatory factors This has remained unanswered (Bongaarts, 1993).

The absence of agreement on this matter is certainly not due to lack of attempts to identify and measure the determinants of fertility (Bongaarts, 1993). Researchers have proposed a wide variety of analytic approaches and methods which have been applied to countless data sets. Among these numerous efforts, there is one that stands out: The supply Demand theory developed by Easterlin. It is the most widely used theoretical framework, in part because it is conceptually simple yet powerful, and it synthesizes economic and sociological approaches to the analysis of fertility. To Bongaarts, this justified why the model was adopted as the organizing framework for the comprehensive review of the determinants of fertility undertaken by the US bureau (Bongaarts, 1993).

Conventional theories have little to say about the level at which fertility will stabilize at the end of the demographic transition, although it is being assumed that fertility of about 2.1 births per woman will prevail (Bongaarts, 1998). He also confirmed that the developing world is currently going through a period of very rapid demographic change and the best known trend is the unprecedented increase in population size where birth rates have dropped in recent decades as women are having smaller families, i.e. a fraction of the levels that prevailed a century ago.

Kenya has not been spared this recent trend until recently when survey indicator measure results revealed a stall in the process of the fertility decline according to the Central Bureau of Statistics (1996a, b, 2004). The absence of any further decline in Kenya in recent past has alarmed the demographic community. Otieno, AIA (2007) concurs that while such a phenomenon is not new; it is also possible that the observed fertility as measured by Total Fertility Rate (TFR) maybe due to flaws in the distortion of TFR from changes in the timing of childbearing. He added that on the other hand, there may have been a real reversal in fertility decline that could arise from change in fertility preferences but, tracing fertility trends by traditional measures (such as TFR) in early stages of demographic transition is speculative and uncertain even if data is of good quality.

With the conventional indicators always used, fertility decline has been observed in the history of Kenya over the past few decades and is currently, it is believed to have stagnated lately and might as well rise, given the emerging diseases like HIV- AIDS and the constellation of cultural forms and norms that provide support for high fertility (Caldwell and Caldwell, 1987; Van de Walle, 1990). A number of analytical models have been designed to help study, clarify or even measure fertility (Easterlin, 1975; Bongaarts, 1978, 1991

Easterlin & Crimmins, 1985). The Easterlin's economic framework is a model of behavioural and biological factors affecting fertility in developing countries. It has proven influential as it continues to inform the thinking of demographers and economists. Therefore, to explain the current state of fertility, one could look into a measure i.e. the degree of fertility preference implementation and examine how it has changed over time since it is an integral component of the model.

1.2 Research Problem

Previous studies have mainly relied on the traditional conventional measures like Total Fertility Rate to determine the fertility achievements by various fertility programs and even inform the policy makers of the fertility situation in the world. With the fact that the overall fertility rate as estimated by traditional indicators from successive Kenyan Demographic and Health Surveys have remained unchanged in the past five years after three preceding decades of decline according to Westoff and Cross, (2005); and further that earlier studies and empirical examples like in Zimbabwe and Haiti failed to provide authentic and convincing justification to clarify why fertility remained the same in the cases of such like countries in 1989 (Pritchett, 1994), with very different levels of contraceptive use; questions have been asked as to where the effect of contraceptive use, which is a proximate determinant of fertility would go, and how it was possible. No satisfactory investigation has been carried out of the role of any other proximate determinants or any other measure of fertility that might have compensated the effects of contraceptive use on fertility, to make TFR of two populations, differing vastly in contraceptive use similar. Almost the same is available in the literature.

Consequently, around the mid 1999, the United Nations General Assembly convened a special session (ICPD+5) to review progress since the Cairo conference of 1994. Governments agreed on a set of key actions to further implement the ICPD programme of

action. New bench marks were set to measure progress. Among them were the reduction of the unmet need for contraception by half by 2005, 75% by 2010 and 100% by 2015. The extent at which these targets have been achieved is unknown.

Studies on the fertility transition across countries of the world revealed that the sub-Saharan Africa where Kenya belongs is lagging behind in terms of fertility implementation. It is also believed that there is still substantial unwanted fertility and unmet need for contraception in the country according to the Demographic and Health Survey (DHS) reports. Further the concept of behaviour change towards low fertility and the preference implementation of fertility have been for a long time supported by both the government and the nongovernmental organizations. However the extent at which programs have been able to achieve their targets or intentions is not known in discrete terms. Consequently, it has not been established as to what extent the women in the country implement their reproductive desires. There is therefore the need to know the degree or the extent at which the current observed changes in fertility can be explained by the ability of individuals to implement their fertility desires through informed choice.

An attempt to provide a comprehensive indicator which incorporates the role played by both basic social and economic determinants on the one hand and fertility on the other hand is likely to provide a hint on the fertility status and trends. By explaining trends and differentials in the degree of fertility preference implementation, one may gain an insight into the causes of the fertility transition that is currently underway in Kenya. The study of the extent at which women carry out their fertility preference implementation across regions, type of place of residence and social class could also provide an insight into the women's attitude (social or

cultural) towards future child-bearing and the structure of demand for contraception so as to guide policy decisions.

The degree of preference implementation is robust in that it is a composite index comprising of the TFR, the natural fertility (Fn) and the wanted fertility (Fw) rendering the measure resistant to distortions unlike the other conventional measures affected highly by slight data variability.

1.3 Justification

This study is carried out to help Kenya monitor and retract the path of its fertility progress for policy purposes. This is a follow up to the 1994 International Conference on Population and Development (ICPD) held in Cairo which emphasized "the right of men and women to be informed and to have access to safe, effective, affordable and acceptable methods of family planning of their choice, as well as other methods of their choice for regulation of fertility which are not against the law". These rights rest on the recognition of the basic right of all couples and individuals to decide freely and responsibly the number, spacing and timing of their children. The conference was attended by a Kenyan delegation led by the then Vice President Professor George Saitoti NCPD (1995).

Kenya embraced the notion of modern family planning way back, but still has a long way to go before the problem of unwanted pregnancy realized is adequately addressed. A need exists for additional information on the degree or the extent of the fertility preference implementation among women. In spite of continuing high rates of contraception countered by high rates of unwanted childbearing both within and outside consensual unions, there seems to be a relative death of research on the issue. A number of important studies have demonstrated high rates of unwanted fertility among women. However, far fewer studies

have looked at the degree at which women implement their fertility desires, which have become increasingly important in their decision-making. This is because contraceptive use has increasingly come to the fore front in unions as a means of controlling the family size that couples want.

The ***degree of fertility preference implementation (I_p) is the net result of decision making process in which couples weigh the cost of fertility regulation and that of unwanted pregnancy***. It is thus useful for the evaluation of the efforts that have been put in place by various programmes, justifying their continued existence. Finally, it is believed that studies exploring the correlates of the extent of fertility preference implementation and the linkages between it and actual fertility in Kenya are limited; in depth studies are necessary to understand the on-going fertility transition, and to provide an insight that could inform policies and programmes. This study is intended to fill this gap in part and act as a basis for further interrogations and research.

1.4 Key Research Questions

The intent of this study is to answer the following questions:

- How has the degree of fertility preference implementation (Ip) changed overtime in Kenya?
- What are the differentials across regions and social groups?

1.5 Research Objectives

1.6 Overall Objective

- The aim of this study is to examine the degree of fertility preference implementation across regions, type of place of residence and social class in Kenya

1.8 Specific Objectives

i. To establish the general trends in Total Fertility Rate (TFR), Fertility Implementation Index (I_p), Natural fertility (F_n), Wanted Fertility (F_w) overtime

ii. To establish the differentials in Total Fertility Rate (TFR), Fertility Implementation Index (I_p), Natural fertility (F_n), Wanted Fertility (F_w) across regions

iii. To establish the differentials in Total Fertility Rate (TFR), Fertility Implementation Index (I_p), Natural fertility (F_n), Wanted Fertility (F_w) across type of place of residence

iv. To establish the differentials in Total Fertility Rate (TFR), Fertility Implementation Index (I_p), Natural fertility (F_n), Wanted Fertility (F_w) across social class.

CHAPTER TWO

2.0 LITERATURE REVIEW

2.1 INTRODUCTION

On the quantum and tempo of fertility according to Bongaarts (2005), critiques of the total fertility rate as a measure, involve several common themes i.e. the problems posed by changes in the timing of childbearing; the relationship between period and cohort measures; the nature and validity of period measures interpreted as hypothetical cohorts; and the extent at which fertility measures should embody controls not only for age but also for such variables as parity, duration of marriage, or other demographic variables as also affirmed by Ni-Bhrolchain (1992). He argued that the traditional method of analyzing fertility trends based on annual data is inherently defective and should be abandoned.

Brass, (2004) also reaffirmed that tracing fertility trends by traditional measures in early stages of demographic transition is speculative and uncertain even if data is of good quality. His justification was based on the fact that the fertility dynamics can be influenced by changes in the timing of lower or higher order births, child spacing patterns and proportions remaining childless and any other combinations. Further, Bongaarts said that the widespread practice of fertility control makes it possible for families to time the arrival of their children in accordance with whatever factors they deem relevant, as well as to limit the total number of children born, and under such circumstances a change in the rate at which people are having children in a given year can no longer be taken as an indication of a change in the number of children they will bear altogether in the course of their reproductive lives.

Consequently, Fapohunda and Poukouta (1997) in their study of desired fertility trends and differentials in Kenya noted that two main criticisms have been leveled against the conventional measurement of desired fertility size. One relates to questions of post-facto-

rationalization bias and the other to the ability of respondents to give numeric responses to questions related to desired family size, especially in settings where fertility decision-making is beyond the control of the individual women Ascadi et al. (1990) said that the ability to respond to such queries is questionable in societies where fertility is controlled by lineage, ancestors and gods or other agents who do not recognize individual desires in fertility decision-making, and where fertility control is not widespread.

Conventional approaches measure fertility at a fixed point in time, assuming that a woman adopts the same fertility behaviour, and has the same views about the social and economic value of children throughout her reproductive life, whereas fertility preferences implementation are constantly reviewed over the life course (Fapohunda and Poukouta, 1997; Rasul, 1993). Similarly, they argued that the conventional measures of fertility are econocentric in that, individuals as decision-makers, are assumed to carefully weigh costs and benefits of making choices to satisfy personally-defined objectives. Rasul (1993) further stated that overlapping cultural, socio-economic and physical realities define the relative power of women and men in decision-making and, therefore, changes in the circumstances affecting women could force them to revise their fertility preferences over the life course irrespective of market considerations.

According to Bhushan and Hill (1995), responses to questions on desired fertility size are characterized by a great deal of ambivalence because individuals are not sure of what might happen in the future and that is why individuals say that the number of children to have is up to their gods or God. They were for the opinion that this uncertainty accounts for the high incidence of non-numeric answers to questions on desired fertility; usually related to fertility preference implementation. It logically follows that the lower the proportion giving non-numeric answers like in the case of Kenya, the higher the reliability of the answers, and the

less the role played by ancestors, gods or God in fertility desires as per their sentiments. Further, on the basis of this logic, they agreed that the measure of ideal family size is likely to be highly reliable in Kenya because the proportion giving non-numeric answers is one of the lowest in sub-Saharan Africa.

Fapohunda and Poukouta (1997) recognized two alternative measures of fertility proposed by Bongaarts (1993) and by Bhushan and Hill (1995) in order to remove the ex-post-rationalization and the uncertainty biases. These are: the wanted fertility and the prospective desired total fertility methods. They then agreed that none of these two alternatives is believed to be a better measure of desired fertility than the conventional approach i.e. both of the alternative measures are based on the wantedness of children which may also be rationalized for the same reason that children are given by God and that their wantedness is beyond the scope of the individual's choice. Besides, unless there is sound argument to the contrary, biases introduced by the above premises are assumed to be randomly distributed in the population and, as such, should not lead to any systematic errors (Fapohunda and Poukouta 1997). Even if we assume that it is not, only a small segment of the population mostly older women who have completed fertility are to be affected (Pullum, 1981; McCarthy & Oni, 1987).

Desired family size further is poised to have several advantages over other alternative measures like TFR as per the sentiments made by Fapohunda and Poukouta (1997). I.e. first, it is a measure of fertility preference: there is no measure that provides an equally effective index of the potential for change in family size in the developing countries. Secondly, it reflects the norms and culture of a place Bankole and Westoff, (1995), particularly, those that are related to the value of children (Kent and Larson, 1982). Thirdly, the literature reports significant correlation between desired fertility and fertility behaviour or implementation in

different contexts. But one undoing was the failure to compare its robust or superiority over the degree of fertility preference implementation as a measure too. The degree of fertility preference implementation is a proxy measure which tries to explain the desired family size a woman would achieve in her reproductive cycle (Ibisomi, 2002).

Fapohunda and Poukouta (1997) further argue that ex-post-rationalization bias as a threat to either wantedness or desire or preference in fertility studies could also be an artifact of the demographers' mind-set. This is because whenever the stated desired fertility is lower than actual fertility, responses are assumed to be valid but whenever the stated desired fertility size is greater than actual fertility, especially for women at the tail-end of their reproductive career, the response is said to have been affected by ex-post-rationalization bias. Campbell (1991) pointed out that findings from research conducted among men and women in Sierra Leone indicated that men and women whose desired family size exceeded their actual family size actually stopped child-bearing before they reached their desired fertility size and not because they rationalized desired fertility size on the basis of actual fertility.

The real correlation between desired family size and the degree of fertility preference implementation seems tight. It is suspected that those who intentionally implement their fertility preference head to the desired family size than those who don't implement (Ibisomi 2002, Ibisomi, Odimegwu, Otieno, Kimani, 2005). Other factors that have been found to be highly correlated with fertility implementation are economic status gender composition of children, knowledge of modern contraception, infant mortality and old age security, Pust et al. (1985); Smith, (1993)

Demand for children is a major component of completed fertility Bongaarts and Bruce (1995). A change in demand for children should lead to a change in supply of children, *ceteris paribus*. Therefore, the degree of preference implementation as an aggregate measure

tends to measure whether women achieve their desired family size. This is basically achieved through contraception or abstinence. Further the explanation that the extent at which women can implement their fertility desire should yield an understanding of changes in the supply of children. Moreover, an understanding of the fertility preference implementation could also provide an insight into women's attitude towards future child-bearing and the structure of demand for contraception (Bapohunda and Poukouta, 1997) and that an analysis of the extent at which women implement their fertility preference could enhance our understanding of their attitude towards fertility control and their intention to use contraception because: expressed preferences regarding desired family size should be related to behaviour. Concerns about HIV-AIDS would seem relevant also in the abstract to give an explanation but are difficult to connect unambiguously (Westoff and Cross 2005).

Many authors do not agree with the view that a family planning programme can have a major effect on fertility (Bairagi 1994). They opined that the major change in fertility has occurred not by birth control methods, but by other changes in demand for children. In their view, an improvement in birth control methods is mainly an induced response to other decreases in the demand for children rather than an important cause of the decreased demand (Becker, 1991). Pritchett (1994), argued that to reduce fertility in a population, preferred or desired fertility, which are dependent on development and culture (these influence the extent of fertility implementation) is important, and a family planning programme and even contraceptive use itself have a very minor role to play in decreasing fertility in a population. Citing the examples of different countries, he demonstrated that keeping the desired family size constant, contraception has no major role to play in bringing fertility down. The most notable example he gave was, in 1977, Haiti's desired fertility which was 4.3, with the modern contraceptive prevalence rate at only 4.7%; whereas Zimbabwe's desired fertility was at 4.3 (in 1989), but the modern contraceptive prevalence rate was 36.2%.....Surprisingly fertility in

Haiti was actually only 0.4 of a birth higher than Zimbabwe's fertility (5.6 versus 5.2), despite the large difference in modern contraceptive use. His argument has also support from the relationship between the TFR and the Contraceptive Prevalence Rate (CPR) in Bangladesh. The CPR in the country was 44.6% in 1993-1994, 49.2% in 1996/1997, and 53.8% in 1999/2000. Total fertility rate in these three periods were 3.4, 3.3, and 3.3 respectively (Mitra *et al.*, 2000). It means that, although there was an increase in the CPR by about 9% points since 1993/1994, there was virtually no decrease in TFR during this period.

Although Easterlin's work has brought conceptual clarity of the study of factors that underlie the child bearing process, it has thus far not succeeded in quantifying these factors in a convenient and generally accepted manner (Bongaarts, 1993). The variant of Easterlin's model aimed at removing obstacles to empirical implementation. By simplifying applications the model presumably becoming more widely accepted and this in turn should lead to a better understanding of the determinants of fertility. In addition to quantifying the supply and demand factor that are central to this model the variant described here introduces a new variable, The degree of fertility preference implementation to measure the role of the cost and benefits of fertility regulation (Bongaarts, 1993).

2.2 THE EASTERLIN MODEL

With his colleagues, Easterlin presented a detailed description and applications of the framework in a series of studies but the key features of the model are sufficiently simple (Bongaarts, 1993). The core variables in the model are the supply, and demand for children and the cost of fertility regulation. These play a crucial role in any comprehensive analysis of fertility because they mediate between the more basic social and economic determinants on the one hand and fertility on the other hand. In this model social and economic advancement,

modernization and other basic determinants are seen as affecting reproductive outcomes by operating through the following three mediating variables.

Demand

The number of surviving children parents would have (at the end of their reproductive lives) if fertility regulations were costless.

Supply

The number of surviving children couples would have if they made no deliberate attempts to limit family size.

Cost of fertility Regulation

It is defined broadly to include the economic, psychic, health and social cost of acquiring and using contraception or abortion.

These variables are expected to change over the cause of the process of development and thus determine the actual number of children couples have. The transition from the lowest to the highest level of development can be divided into three distinct phases according to Bongaarts (1993).

i) **Excess demand**

In many traditional societies average desired family size is high and couples may find that they cannot achieve their reproductive objectives i.e. demand exceeds supply. In this case there is no motivation to control fertility and actual fertility is constrained to its supply level.

ii) **Excess supply no control**

As a society modernizes demand for children typically declines due to changing costs and benefits of children. In addition supply rises largely as a result of declining child mortality. These trends produce an excess supply condition in

which couples become motivated to use birth control. At first however, this motivation is not sufficient to overcome the cost of fertility regulation, and as long as this is the case couples will not deliberately limit fertility. In this phase therefore, actual reproduction remains at the supply level, and couples bear unwanted children to the extent that supply exceeds demand.

iii) Excess supply with birth control

With continued declines in demand and increases in supply, motivation reaches the point at which it exceeds the cost of regulation, and couples begin to adopt birth control. For the remainder of the transition, the trend in the actual rate of child bearing is determined by trends in the cost of fertility regulation, demand for children and supply of children.

Bongaarts (1993) confirms that Easterlin's framework as used in the analysis of the determinants of fertility has attracted many adherents because of the models conceptual clarity and the fact that it incorporates at a fairly general level, key features of other theories of fertility proposed by economists, sociologist and demographers. Despite its broad acceptance and potential to resolve a number of conflicting views of fertility transition the model has thus far not been widely used to quantify the determinants of fertility. In this regard the framework has fallen short of original expectations.

2.3 Empirical Implementation of Easterlin's Framework

Past applications of the model have the determinants estimated either at the micro level with households as the units of analysis or at the macro level with its focus on variation across geographical units or social strata. According to Bongaarts (1993) the data required for applications of the model in specific populations have usually been taken from fertility surveys where the information on the number of living children and desired

family size is routinely collected. Unfortunately the data required to measure supply and regulation costs are not standardized and alternative estimation procedures have been used which depend on available information in particular surveys. While the lack of uniformity in the collection of data required for measuring these key factors is not an insignificant problem. It is probably not the main reason for the lack of widespread empirical implementation of the model.

2.4 Other contributing factors

i) **Choice of dependent variable**

The principle outcome variable in this model is the number of living children among married women at the end of child bearing years although this indicator of reproductive performance fits naturally here. Demographers prefer total fertility (Sum of age specific fertility rate as a measure), and this is not easily related to the number of surviving children.

ii) **Cohort versus period perspective**

The rate of childbearing and the supply and demand for children are measured at the end of child bearing years and hence refer to the past experience over the past reproductive life cycle of a cohort of women. A drawback of this approach is that it incompletely captures rapid recent changes in fertility behavior occurring in many less developed countries. A model that permits period rather than cohort specific analysis would therefore be preferable.

iii) **Fixed lifecycle demand**

In the basic derivation of the formal model, the demand for children is assumed to be determined at the time of marriage and will remain constant throughout the childbearing years. This may be reasonable approximation in some populations, but it causes problems in the not infrequent cases where changing socio economic

conditions lead couples to revise their demand for children downward. A period based model would avoid this compilation.

iv) **Lack of decomposition procedure**

The framework has one outcome variable (the number of living children) and three determinants – demand, supply and regulation cost; but there is no convenient equation that relates dependent to independent factors hence difficult to quantify the role of each independent variable in observed changes in the rate of child bearing accurately.

It should be emphasized that none of the above items represents errors or major shortcomings in this model. Bongaarts further asserts that instead, these features make the empirical implementation of the model less attractive to potential users than would otherwise be the case and they suggest avenues for further development of the framework.

2.5 Supply Demand Framework

An alternative approach to the implementation of this model was proposed by Bongaarts (1993) with an objective to simplify its application by hanging some of its key features while maintaining its original conceptual structure It differs with Easterlin's in the following

i) It measures reproductive performance as well as supply and demand in terms of births rather than surviving children

ii) It is period rather than cohort based

iii) It relies on a new variable the degree of preference Implementation to quantify the roles of the cost of fertility regulation and unwanted child bearing.

Concerning the wanted fertility existing approaches to its estimation concludes that previously available measures typically contain an upward bias (Bongaarts 1993). The same study then proposes a new method. The drawback of this approach is that its application requires access to survey tapes because estimation of wanted fertility (F_w) is not normally included in survey reports. He further stated that in cases where data tapes aren't available, an alternative procedure discussed elsewhere can provide a rough estimation or approximation to wanted fertility (F_w).

Since wanted fertility (F_w) is a much less frequently used preference indicator than desired family size, brief comments on the difference between these measures are desirable. In some surveys it noted that desired family size exceeds wanted fertility (F_w) by a substantial margin e.g. Studies in Burundi and Mali. The most notable reasons according to Bongaarts (1993) are:-

Rationalization- Women who have had unwanted births sometimes make an upward revision in their stated desired family size, so that it is closer or equal to their actual family size

Involuntary fertility limitation- Infecundity, marital disruption and non marriage represent fertility restrains that prevent some women implementing their demand for children.

Voluntary fertility Limitation – Some women report that they want no more children even though they have not reached their stated family size. A variety of social, economic or health factors may be responsible for this inconsistency usually common among older women. Apparently questions about desired or ideal family size sometimes produce responses that assume circumstances to be different from those the respondents have actually experienced.

In addition to these three factors that cause an excess of the reported desired family size over wanted family, Bongaarts (1993) confirmed that there are other factors that offset this influence. The most important of these is child mortality. For a given level of desired family size and other things being equal, an increase in child mortality would result in higher wanted fertility because women would attempt to replace some children who have died.

NB; - I_0 is a function of the cost of fertility regulation as well as the cost of unwanted child bearing. It would be desirable to expand the model and quantify the relationship between these variables. However, information that would permit estimation of the relevant cost is not collected in fertility surveys, and the matter will therefore not be pursued here.

2.6 Decomposition of fertility trends

According to Bongaarts (1993) the principal goal of the supply demand framework is the identification of the causes of fertility decline in specific population. Although the proceeding comparative analysis provided worthwhile insights, it did not achieve this objective. Turning to the most central issue; the decomposition of changes in fertility in a particular society and to simplify the exposition of the method, focus should be on trends in fertility and its determinants between two points in time T_1 and T_2. The derivation of the decomposition equation requires the introduction of the following variables.

Table 2.1: Decomposition of Changes in Fertility

	Observation Point	
Time Periods	T_1	T_2
Total Fertility	F_1	F_2
Natural Fertility	F_{n1}	F_{n2}
Wanted Fertility	F_{w1}	F_{w2}
Index of Implementation	I_{p1}	I_{p2}

The decline in fertility between the two periods is F_1-F_2, and this difference can be expressed as a function of the mediating variables by substitution of equation:-

$$F_1-F_2 = [F_{w1}I_{p1} + F_{n1}(1-I_{p1})] - [F_{w2}I_{p2} + F_{n2}(1-I_{p2})] \ldots\ldots\ldots\ldots\ldots\ldots a$$

Since the emphasis is to examine changes in fertility that result from changes in determinants, the above equation can be written as.

$$\Delta F = \Delta F_w \bar{I}_p + \Delta I_p (\bar{F}_w - \bar{F}_n) + \Delta F_n (1-\bar{I}_p) \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots b$$

Where ΔF, ΔF_w, ΔF_n and ΔI_p represent the absolute changes in F, F_w, F_n and I_p and $\bar{F}_w$, $\bar{F}_n$ and $\bar{I}_p$ are the average values of respectively, F_w, F_n and I_p [e.g. $\bar{I}_p = 0.5 \times (I_{p1} + I_{p2})$]

Table 2.2: Components Contribution to Fertility Change

Change in	Contribution to Fertility Change - ΔF
Natural fertility - ΔF	$\Delta F_n(1-I_p)$
Wanted fertility - ΔF_w	$\Delta F \times I_p$
Index of implementation, ΔI_p	$\Delta I_p(F_w-F_n)$

The contribution of change in wanted or natural fertility to the observed fertility decline depends on the average level of the implementation index. Similarly the fertility effect from a given change in the index of implementation depends on the average difference between natural and wanted fertility ($\bar{F}_w$-$\bar{F}_n$). The application of this decomposition procedure

requires that the estimates of observed, wanted and natural fertility as well as the index of implementation are available for two successive points in time in the same population.

2.7 Description of the theoretical framework

Fertility transition emerged after a long period of persistently high fertility. This transition is worth explaining through the underlying factors driving the phenomenon. Development as a key factor for the decline of fertility can be divided into four phases: excess supply no control, excess demand, and excess supply with birth control and even when supply equals demand Ibisomi (2002). In a premodern society, a couple cannot produce as many children as it wants. The demand exceeds supply due to adverse mortality condition, high pregnancy loss, extended lactation among others. The natural fertility prevails i.e. the number of surviving children corresponds to supply.

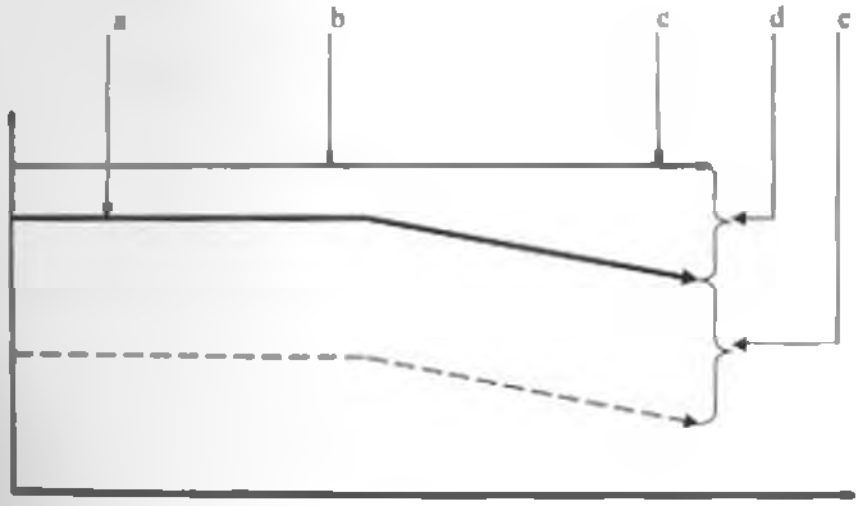

Figure 2.1: Hypothetical framework for the association of fertility and modernization

Source: Easterlin R. A. and Crimins E. M. (1985). The Fertility Revolution

KEY

a – Wanted fertility
b – Observed fertility
c – Natural fertility
d – Fertility limited by birth control
e – Unwanted fertility
X-axis Modernization/ Development
Y-axis - Fertility

With modernization, an excess supply condition emerges due to change in cost and benefit associated with child bearing. The excess supply generates a motivation for fertility control which is usually low in the initial stages and cannot offset the regulation costs sufficiently to result into deliberate family size limitation; hence the births surviving correspond to supply. As modernization progress, with motivation growing and regulation cost falling, deliberate restriction emerges. Thus the number of surviving children falls to correspond to demand at this point.

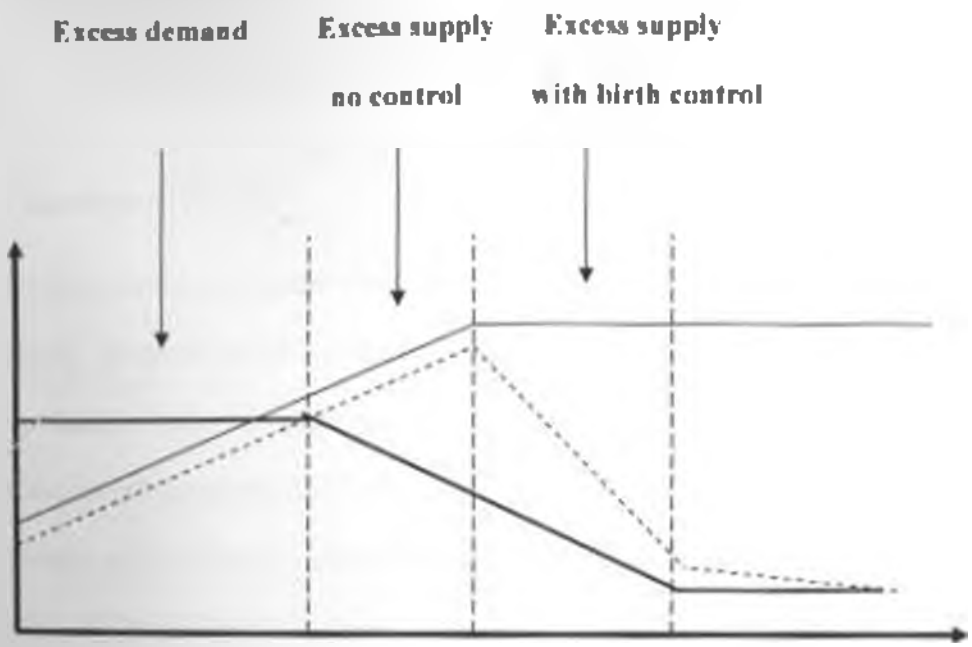

Figure 2.2: Hypothetical trends in supply, demand and number of surviving children associated with development – Easterlin's model

Source: Easterlin R. A. and Crimins E. M. (1985) The Fertility Revolution

KEY: X axis – Development

Y axis – Surviving Children

From this model, Freedman, R. and D. Freedman (1991) puts it that fertility follows changes in demand for children driven by economic status and tastes. "... It appears therefore that fertility parallels the long term pattern of child costs and benefits". Caldwell (1987) stresses

factors working wholly through demand (Intergenerational relationships). Van de walle and Knodel (1979) argues that the motivation in fertility control (an excess supply situation) exists prior to fertility transition as was in European countries. They stress the decline in the cost of fertility regulation as the key factor behind fertility transition

Karen Mason (1997) argued that while the factors attributed to fertility decline by various writers are plausible, they cannot be generalised for all areas. She added that the recognition of the continuity between the pretransitional and transitional population is important in understanding the observed fertility changes.

2.9 Analytical Model

This study will be conducted within the framework based on the premise that all social and economic determinants of fertility necessarily operate through a common set of proximate determinants to exert an impact on fertility. The Easterlin's economic framework is a model of behavioural and biological factors affecting fertility in developing countries. It has proven influential as it continues to inform the thinking of demographers and economists. The model consists of three central concepts: demand for children; the potential supply of children, and the momentary and psychic costs of contraception. According to the model, couples whose potential supply exceeds demand would consider contraception, taking account of contraceptive costs in choosing among family planning methods (Montgomery 1987). Though the model is simple and attractive, it cannot address dynamic issues and has not succeeded in quantifying these factors in acceptable manner (Bongaarts, 1993; Ibisomi, 2002; Ibisomi, Odimegwu, Kimani, Otieno, 2005). Lack of uniformity in the collection of survey data to address the concepts used in the model could also be problematic.

Bongaarts (1993) proposed an alternative approach to the implementation of the original model. The variant differs from Easterlin's formulation in the following ways: it measures reproductive performance in terms of births (being period-based). Additionally he introduced a new variable called the degree of preference implementation to quantify the roles of the costs of fertility regulation and unwanted childbearing. Degree of preference implementation is the net result of a decision-making process in which couples weigh the cost of fertility regulation and the cost of unwanted pregnancy. Emerging from the model is the fact that fertility (measured by the total fertility rate) is a function of three determinants namely: supply of births (natural fertility), demand for births (wanted fertility) and degree of preference implementation. The latter in turn is dependent on cost of fertility regulation and cost of unwanted childbearing.

Emerging from the model is the fact that fertility (measured by the total fertility rate) is a function of three determinants namely: supply of births (natural fertility), demand for births (wanted fertility) and degree of preference implementation. The latter in turn is dependent on cost of fertility regulation and that of unwanted childbearing.

The key variables and their relationship with fertility are illustrated below:

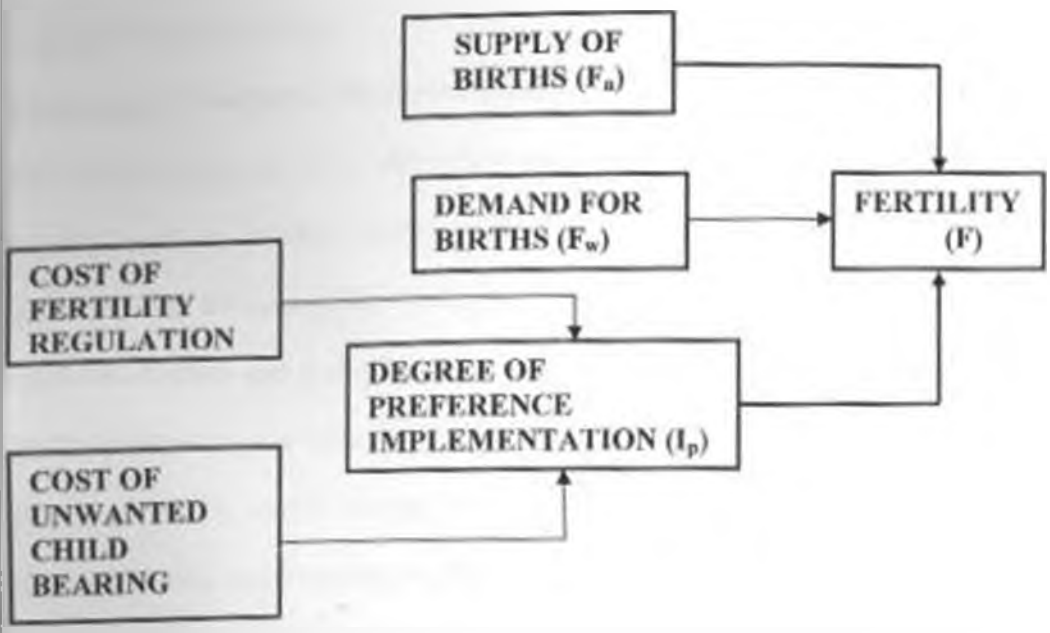

Figure 2.3: Key variables and interrelations in variant of supply-demand model.

Source Bongaarts J (1993) The supply-demand framework for the determinants of fertility: An alternative implementation.

2.10 Definition of Variables

Supply of births (F_a)

It is measured as the natural total fertility. Natural fertility means the rate of childbearing that would prevail in the absence of deliberate efforts by couples to limit family size.

Demand for births (F_w)

This is measured as wanted total fertility. Wanted fertility is the rate of childbearing that would be achieved if all women were able to eliminate unwanted births. In theory it is what the level of fertility would have been if all unwanted births are eliminated. It is calculated as the total fertility (F) but the unwanted births are excluded in the numerator. Unwanted births are those that occur after an achievement of the ideal family size. Mistimed births that occur before the desired family size is achieved are considered wanted. It will be calculated from

the total children ever born minus the unplanned (mistimed) births divided by the total women of reproductive age.

The Degree of Preference Implementation (Ip)

This is measured by an index with values ranging from 0 to 1. The level of implementation is the net result of decision making process in which couples weigh the cost of fertility regulation and the cost of unwanted child bearing. In general, the index rises as cost of regulation declines and that of unwanted children increases. If couples fully implement their fertility preferences, the index is equal to unity. This signifies that no unwanted births occur and actual fertility equals wanted fertility. Conversely, if the index is equal to zero, the observed fertility equals natural fertility, that is, fertility in the absence of deliberate fertility control. The value of the index chosen by couples determines where actual fertility falls within the range set by wanted and natural fertility.

Total Fertility (F)

This is the dependent variable. It gives the estimate of the number of children a woman would have by the end of childbearing if she were to pass through her reproduction period at the current age specific birth rates. The model shows that the operation of these variables determines the level of fertility in a community or society. In this variant of the original Easterlin's model, infant-child mortality affects the demand for births rather than their supply. Parents are considered to have a specific desired fertility size and they translate the goal into a level of desired fertility after taking into account past child losses as well as risk of future child mortality. This will be calculated by applying the Gomperts Indirect technique.

Relationship and Measurement of Variables

According to this variant, as society develops, the trend in actual fertility is a function of trends in wanted fertility, natural fertility and preference implementation. The wanted fertility changes over time as a result of changes in the cost and benefit of children as well as

reductions in infant and child mortality. The index of preference implementation rises as fertility regulation costs decline and its benefits rise; and the benefit of fertility regulation is in the elimination of unwanted births (Bongaarts, 1993; Montgomery 1987). According to Bongaarts (1993), the relationship between the variables and fertility can be expressed in statistical form as follows:

$F = F_w + F_u$ ..... (1)

Where F is total fertility (births per woman), F_w is wanted fertility and F_u is unwanted fertility (which can simply be expressed as $F - F_w$).

Also,

$F_u = (F_n - F_w) \times (1 - I_p)$ ..... (2)

Where F_n is total natural fertility and I_p is the index of preference implementation with values ranging from 0 to 1. With full preference implementation, $I_p = 1$ (which implies that $F_u = 0$ and $F = F_w$) and $I_p = 0$ i.e. no preference implementation (This implies a substantial level of unwanted childbearing and $F = F_n$).

F_u is a function of the difference between supply and demand, and the degree of preference implementation

Substitution of (2) in (1) yields

$F = F_w \times I_p + F_n \times (1 - I_p)$ ..... (3)

Natural fertility

$F_n = F/C$ ..... (4)

C is an index between 0 and 1 that measures the proportional reduction in natural fertility attributable to deliberate birth control

$C = 1 - 1.02 \times U$ ..... (5)

- U represents the proportion of married women who were practising contraception at the time of survey. It is measured as the number of married women using contraceptive method to the total number of married women.

Substitution of (5) in (4) gives an estimate of F_n while rearranging equation (3) gives

$$I_p = \frac{(F_n - F)}{(F_n - F_w)} \quad \ldots\ldots (6)$$

Equation 6 can now be used to estimate the degree of preference implementation once natural fertility, actual fertility and wanted fertility are known.

2.11 Other Study Variables and their Measurements

Past studies showed that these variables were important explanatory variables of fertility. They are as follows: level of education, region of residence and type of place of residence.

Variable Name	Measurement	Type of Variable
Education	1=No education	
	2=Primary Incomplete	
	3=Primary Complete	
	4=Secondary +	Control

Region residence	1=Nairobi	
	2=Central	Control
	3=Coast	
	4=Eastern	
	5=Nyanza	
	6=Rift Valley	
	7=Western	
	8=North Eastern	
Type of place of residence	1=Urban	
	2=Rural	Control

NB: On the control variable called Region of Residence, only the 2003 KDHS covered the eighth province i.e. North Eastern. The previous DHS failed to cover the region hence will not be used in the trend establishment.

CHAPTER THREE

3.0 METHODOLOGY

3.1 Data, Scope and limitation

Kenya demographic and health survey 1989, 1993, 1998 and 2003 survey data will be utilized in informing the study's findings. The study will focus on the women population aged 15-49 in Kenya interviewed during the same period 1989 to 2003. These are the age groups assumed to be at their peak reproductive periods hence determining the fertility of a country. The data will be analyzed to establish trends and differentials in fertility implementation across the country. Data from approximately 8195 women aged 15-49 years will be considered for each of the surveys.

3.2 Sampling Design

The 2003 KDHS covered the entire country including the sparsely populated northern districts unlike the other prior ones that have not been able to cover the North Eastern Province due to insecurity in the region. A two stage stratified sampling approach was utilized and the first stage involved sampling of clusters and the second stage involved selection of households within the sampled points from a list compiled during a KDHS household listing exercise. Since data on fertility from DHS is obtained from women in the age group 15-49 in each household, biases often arise on the misclassification of women in the extreme age groups 15-19 and 45-49 (Otieno 2005). It is plausible that the differences in misclassification (Arnold 1990) between the surveys could become one possible source of error trends expected i.e. under or over representation of the young and older women could become a possible source bias.

3.3 Questionnaire

The surveys had three kinds of questionnaires; the household questionnaire, the men's questionnaire and the women's questionnaire which will be of great concern in this study. All women aged 15-49 were targeted for the interviews in the selected households. Information collected include, background characteristics, reproductive history, knowledge and use of family planning methods, number of children alive and dead in terms of sex, health of children under age 5, marriage fertility preferences, husbands background, educational achievement, type of place of residence and region of residence. For the purpose of this study, data relating to the contraception and fertility will be utilized.

3.4 Data Quality

Non-sampling errors and sampling errors are two types of errors that affect estimates from sample surveys. Non-sampling errors may result from shortcomings in data collection and data processing, such as data entry errors, failure to interview the right household or misinterpretation of the questions. Non-sampling errors are difficult to avoid and to evaluate statistically. Data quality may have been compromised since the recording was done in retrospect hence could have led to underreporting or over reporting of births, especially those that died soon after birth, inability to ascertain a still birth, miscarriage and neonatal births. Secondary data also restricts this study to the utilization of only those variables used in the survey hence regarded as approximate variables rather than the actual variables needed. This therefore will not allow for total authenticity and control of the independent variables to be tested against the dependent variable consequently limiting the frontiers to some crucial knowledge. It is regarded as merely an approximate data set for the study but in reality it acts as the only suitable way to this study on trends.

Sampling errors are a measure of the variability between all possible samples. The degree of variability although not known, can be estimated from the survey results. A sampling error can be measured in terms of the standard error for a particular statistic, which is the square of the root of variance. The standard error can be used to calculate confidence intervals within which the true value of the population can reasonably be assumed to fall. Overall, it has been unanimously agreed by researchers that the KDHS data is of relatively high quality for the analysis of fertility preference and implementation. The general standard errors for most estimates for the country as a whole are small except for the estimates of very small proportions (NCPD et al 1999).

3.5 Methods of Data Analysis

SPSS version 15 and Ms Excel will be used in the analysis. The first will be to run descriptive statistics to determine the fundamental characteristics of the sample population CEB, and Women population in each category to determine the F_w F_n and TFR, marital status, contraception types and the decomposition of fertility trends for the same categories. (Seven provinces with continuous data in Kenya and education level)

The second level will be to estimate the degree of preference implementation for the same. At the second level of analysis, the dependent variable is total fertility rate (F), which is provided by the various KDHS reports. The independent variables are supply of births (F_n), demand for births (F_w) and the degree of preference implementation (I_p).

Some of the expected Key tables will be: These will each be done by region and social class and type of place of residence.

Table 1: Trends in Total Fertility Rate (TFR), Natural fertility (F_n) and Wanted Fertility (F_w)

Table 2: Trends in degree Implementation Preference (I_{pi}).

Table 3: Decomposition of Fertility Implementation Index (I_g).

4: Composite graphs outlining the trends.

CHAPTER 4

4.0 Trends in Total Fertility, Natural Fertility, Wanted Fertility and the Degree of Fertility Preference Implementation Index (I_p).

4.1 The rate trends

At the macro level, Kenyan TFR has been on a general decline from the Kenya National Demographic and Health Survey (KDHS) findings. From the findings of the surveys, study results shows that lately the TFR decline has stalled and might be headed for an upward rejuvenation as evidenced in the last two Demographic and Health Surveys compared i.e. 1998 and 2003 with 4.7 and 4.9 respectively. Much of the decline occurred before the beginning of the stall while during the stall not any fertility decline was evidenced instead there was a slight increase as shown in the table below on general trends.

On the Kenyan natural fertility, there has been a general decline by 27.7% from the National Demographic and Health Survey findings within the survey periods. As evidenced in the findings of the consecutive surveys, study results shows that lately the natural fertility (F_n) has stagnated and might be headed for a rise (3% rise currently) as evidenced in the last two surveys compared i.e. 1998 and 2003 with 6.6 and 6.8 respectively as shown in the below table. This is as opposed to the earlier results which gave substantial declines of about 23% before stall from 9.7 to 7.3 i.e. 1989 -1993.

Consequently, Kenyan wanted fertility (F_w) has generally declined by 38.2% to 2.1 from 3.4 within the period 1989 and 2003 from the National Demographic and Health Survey findings. Unlike the TFR and the natural fertility it is evidenced in the findings of these surveys that the wanted fertility (F_w) was still on the consistent decline by 2003 (see table below)

Table 4.1: General Trends for the Country

	1989	1993	1998	2003
TFR(F)	6.7	5.4	4.7	4.9
Natural Fertility(F_n)	9.5	7.3	6.6	6.8
Wanted Fertility(F_w)	3.4	2.5	2.3	2.1

Table 4.2: Type of place of residence

		1989	1993	1998	2003
TFR(F)					
	Urban	4.5	3.4	3.1	3.3
	Rural	7.1	5.8	5.2	5.4
Natural Fertility(F_n)					
	Urban	8.4	5.1	4.8	4.9
	Rural	9.7	7.7	7.1	7.3
Wanted Fertility(F_w)					
	Urban	2	1	1	1.53
	Rural	2.9	2.2	2.2	2.4

There was a general reduction in TFR across the category as shown by the above table. As was with the general trends much of the decreases occurred before the beginning of the stall i.e. 1989 and 1993. Comparing the first two surveys with the last two surveys with 1989 and

1998 as the base years respectively. The first two surveys before stall experienced 24% (urban) and 18% (rural) decreases compared to the increases in fertility by 6.5% and 3.8% for the same categories respectively during stall. Generally the urban category registered a reduction by 26.7% with the rural category registering only 23% decrease within the period 1989 – 2003. These are as shown by the table below controlling for place of residence.

It is also notable that there is a general reduction in the natural fertility (F_n) across this category. The urban category registered a general reduction by 41.7% with the rural category registering only 24.7% decrease. While comparing the two last surveys during stall with 1998 as the base year, both categories showed increases in fertility by 2% and 2.8% to 4.9 and 7.3 for urban and rural respectively. Just like the other earlier results most of the natural fertility decline took place before the period of the stall i.e. 1989, 1993 to 1998.

There is a general reduction in wanted fertility across this category within the period of the surveys. The urban category registered a general reduction by 23.5% to a wanted fertility (F_w) of 1.5 with the rural category registering only 17.2% decrease to a wanted fertility (F_w) of 2.4 in 2003. While further comparing the two last surveys (stalling period) with 1998 as the base year, both categories showed rejuvenation in fertility rise by 2% and 2.8% for urban and rural respectively. This contradicted the comparisons before stall which portrayed a declining wanted fertility by 50% and 24% to 1 and 2.2for urban and rural respectively.

Regional Trends

All regions have shown declines in TFR from the consecutive DHS except for Eastern, Nyanza, Rift Valley and Western Provinces that have shown slight increases in the last survey of 2003 compared to the immediate former survey of 1998 i.e. 2.1%, 12%, 9.4% and 3.6% rise in fertility respectively. This occurred during the stalling period. The results also reveal that there was a downward trend for the three earlier surveys with 1998 marking the turning point from the minima. The absolute values are as shown by the Table 4.3 below.

Together with the TFR there seems to be a general decline in the natural fertility (F_n) from the consecutive DHSs. However Eastern, Nyanza, Rift Valley and Western Provinces revealed slight increases in the last survey of 2003 compared to the immediate former survey of 1998 (i.e. 2.7%, 14.3%, 5.5% and 5.5% rise in fertility respectively). The exact figures are shown by the Table 4.3 below.

All regions have also shown general declines in the wanted fertility (F_w) from the consecutive Demographic and Health Surveys. Eastern province stagnated at a rate of 1.5, Nairobi and Coast Provinces increased by 22.2% and 212% to a rate of 1.1and 5 respectively, while Western, Rift Valley, Nyanza and Central Provinces registered slight decreases in the wanted fertility (Fw) between the 1998 and 2003 surveys i.e. 28.6%, 4.3%, 4.5% and 33.3% reduction to 2, 2.2, 2.1 and 1.6 respectively. It is worth noting that most of the wanted fertility fluctuations and variations are pegged around two to three children. The exact figures are shown by the Table 4.3 below.

Table 4.3: Regional trends

		1989	1993	1998	2003
TFR(F)	Nairobi	4.2	3.4	2.6	2.7
	central	6	3.9	3.8	3.4
	Coast	5.4	5.3	5.1	4.9
	Eastern	7.2	5.9	4.7	4.8
	Nyanza	6.9	5.8	5	5.6
	Rift Valley	7	5.7	5.3	5.8
	Western	8.1	6.4	5.6	5.8
Natural Fertility(F_n)					
	Nairobi	8.0	23.2	4.5	4.1
	central	12.0	6.6	7.2	6.0
	Coast	7.6	6.7	6.4	6.2
	Eastern	10.7	8.5	7.3	7.5
	Nyanza	8.7	7.2	6.3	7.2
	Rift Valley	9.2	7.3	7.3	7.7
	Western	11.0	8.1	7.3	7.7
Wanted Fertility(F_w)					
	Nairobi	2.2	0.9	0.9	2.3
	central	2.6	2.1	2.4	2.8
	Coast	3	2.1	1.6	4.3
	Eastern	3.3	2	1.5	3.3
	Nyanza	2.8	2	2.2	3.1
	Rift Valley	2.9	2.1	2.3	4.1
	Western	2.7	2.4	2.8	4.0

Educational Trends

There have also been substantial changes in the TFR across the social classes within this period. Noted is the general decline in fertility across all the classes up to 1998 before stall. However the final survey of 2003 showed slight increases in TFR for those women with no education and those with primary incomplete education compared to the earlier survey results of 1998. Those with primary complete education stagnated while those with secondary and above education slightly reduced their fertility. These latest figures were compared with their immediate preceding surveys i.e. 1998 DHS as shown in the table 4.4 below.

There have also been substantial changes in the natural fertility (I'_n) across the social classes within this period from the 1989 survey. Noted here was the general decline in natural fertility across all the classes. However, the final survey of 2003 showed slight increases in natural fertility for those women with no education and those with primary incomplete education compared to the earlier survey results of 1998 i.e. by 2.8% and 18.5% respectively. Those with primary complete education registered a decrease by 1.4% to 7.3 while those women with secondary and above education similarly reduced their fertility by 8.6% to 5.3. These figures were compared with their immediate preceding survey of 1998 whish acted as minima. The absolute trends are as shown by the table 4.4 below.

Table 4.4: Completed Educational Trends

		1989	1993	1998	2003
TFR(F)					
	None	7.5	6	5.8	6.7
	Primary incomplete	7.5	6.2	5.2	6
	Primary complete	6.4	5	4.8	4.8
	Secondary +	4.8	4	3.5	3.2
Natural Fertility(F_n)					
	None	9.0	7.3	7.1	7.3
	Primary incomplete	10.0	7.8	6.5	7.7
	Primary complete	9.5	7.2	7.4	7.3
	Secondary +	8.9	6.4	5.8	5.3
Wanted Fertility(F_w)					
	None	4.3	3.8	3.3	2
	Primary incomplete	2.6	2	2.1	1.5
	Primary complete	2.9	1.9	1.8	1.6
	Secondary +	2.2	1.3	1.8	2.6

From the above table there have also been substantial changes in the wanted fertility (F_w) across the social classes within this period. Notable here was the general decline in wanted fertility (F_w) across all classes except for those women with secondary and above education which actually increased. The percentage decreases in natural fertility were 53.4%, 42.3%, and 44.8% to wanted fertility (F_w) rates of 2, 1.5 and 1.6 for those women with no education, with primary incomplete education and those with complete primary education respectively.

Conversely, the women with secondary and above education increased their wanted fertility by 18.2% to a wanted fertility (F_w) rate of 2.6. These figures are as shown in table 4.4.

4.4 Levels of fertility preference implementation index (I_p)

Our analysis shows that the index of fertility preference implementation for the country Kenya has not been stable. Noticeable is the general change in the I_p quantum direction from just below medium to a level regarded as low. Table 1 shows the national trends in the degree of fertility preference implementation for the four surveys. There has been a fluctuation in the index of implementation; notably a high of 0.46 in 1989 and a low of 0.39 in 1993. However in general there has been a decline from 0.46 in 1989 to 0.41 in 2003 i.e. a decline by 10.9% for the period of the surveys.

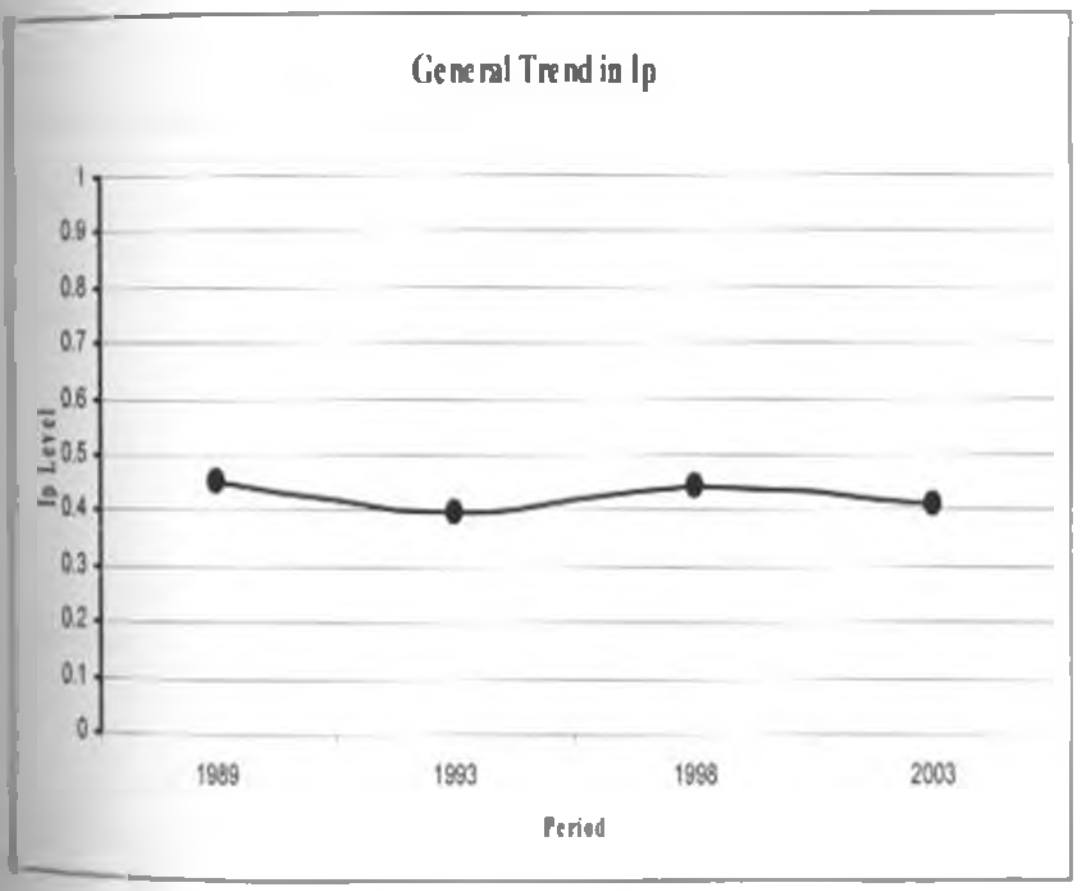

Figure 4.1: National fertility Implementation Trends

The indices have been categorized into three groups as follows: <0.50 grouped as low, 0.50-0.69 Medium and >0.70 as high.

Considering all the categories it is shown that attainment of couple's fertility preference is quite low in Kenya. In other words, analysis from the latest DHS i.e. 2003 shows that most couples have not been able to implement their fertility preferences. Only central province in the regional category and those with secondary and above education in the social class category in Kenya have been able to implement their fertility preference above average regarded as medium and high respectively as shown by the table (1a) below. As evidenced in the findings of the last survey, study results shows that the index of fertility Preference Implementation (I_p) is on a downward trend. This trend has been shown by table 4.1 and alternatively by the figure 4.1 above.

Table 4.5: Distribution of fertility preference implementation (I_p) – 2003 DHS survey.

Category		Fertility preference implementation Index (I_p)		
		Low < 0.5	Medium0.5-0.69	High ≥ 0.7
General		0.41		
Regional				
	Nairobi	0.47		
	Central		0.59	
	Coast	0.39		
	Eastern	0.45		
	Nyanza	0.31		
	Rift Valley	0.35		
	Western	0.34		
Social Class				
	No Education	0.12		
	Primary Incomplete	0.28		
	Primary Complete	0.44		
	Secondary >			0.78
Residence Type				
	Urban	0.47		
	Rural	0.39		

Implementation Index (Ip) by Region

All regions have registered general declines in the Index of fertility Preference Implementation (I_p) except for Nyanza and Rift Valley Provinces stagnating at 0.31 and 0.35 levels of implementation respectively from the consecutive Kenya Demographic and Health Surveys of 1998 and 2003 (table 4.6). These changes have been dogged by fluctuations in figures between the intermediate surveys as shown by figure 4.2. Nairobi, Central, Coast, Eastern and Western provinces are at levels 0.47, 0.59, 0.39, 0.45, and 0.34 respectively from the latest survey.

Table 4.6: Trends in Fertility Implementation Index (I_p)

Levels	Category	1989	1993	1998	2003
General Trend	Country Indices	0.46	0.39	0.44	0.41
	Regional Trends				
	Nairobi	0.66	0.89	0.53	0.47
	central	0.64	0.60	0.71	0.59
	Coast	0.48	0.30	0.27	0.39
	Eastern	0.47	0.40	0.45	0.45
	Nyanza	0.31	0.27	0.32	0.31
	Rift Valley	0.35	0.30	0.40	0.35
	Western	0.35	0.29	0.38	0.34
	Educational Trends				
	None	0.32	0.38	0.34	0.12
	Primary incomplete	0.34	0.27	0.30	0.28
	Primary complete	0.47	0.42	0.47	0.44
	Secondary +	0.61	0.47	0.57	0.78
	Trends by Residence				
	Urban	0.61	0.41	0.45	0.47
	Rural	0.39	0.34	0.39	0.39

Implementation Index (Ip) by Educational Levels (Social Class)

Consequently there has also been a substantial change in the Index of fertility Preference Implementation (I_p) across the social class within this period. Notable here was the general decline in Index of fertility Preference Implementation (I_p) across all classes except for those women with secondary and above education which actually increased from 0.61 to 0.78 level of their fertility Preference Implementation Index (I_p). The percentage decreases in the Index of fertility Preference Implementation (I_p) were by 62.5%, 17.6%, and 6.4% to Index of fertility Preference Implementation (I_p) levels of 0.12, 0.28, and 0.44 for those women with no education, with primary incomplete education and those with complete primary education respectively. Conversely, the increase in the Index of fertility Preference Implementation (I_p) was by 27.9% to an (I_p) level of 0.78 for those with secondary education and above. These figures are shown in the table above.

Implementation Index (Ip) by Type of place of residence

It is also notable that there is a general reduction in the Index of fertility Preference Implementation (I_p) for the urban category from 0.61 in 1989 to 0.47 in 2003, while the rural levels stagnated at 0.39 within the same period and with minor fluctuations in the intermediate surveys. The urban category registered reduction by 23% to an Index of fertility Preference Implementation (I_p) of 0.47 as at the last survey in 2003.

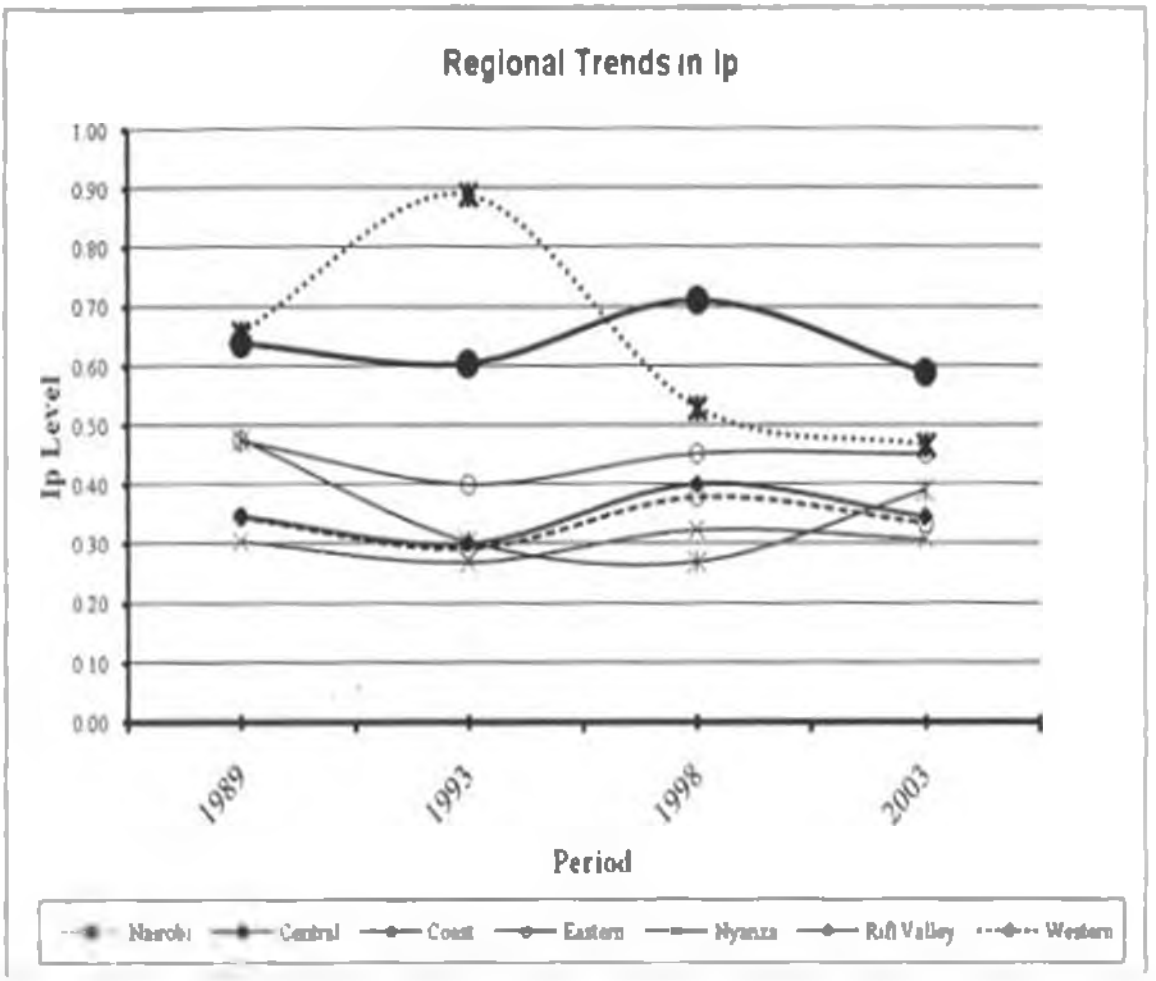

Figure 4.2 Regional Trends in Fertility Implementation Index

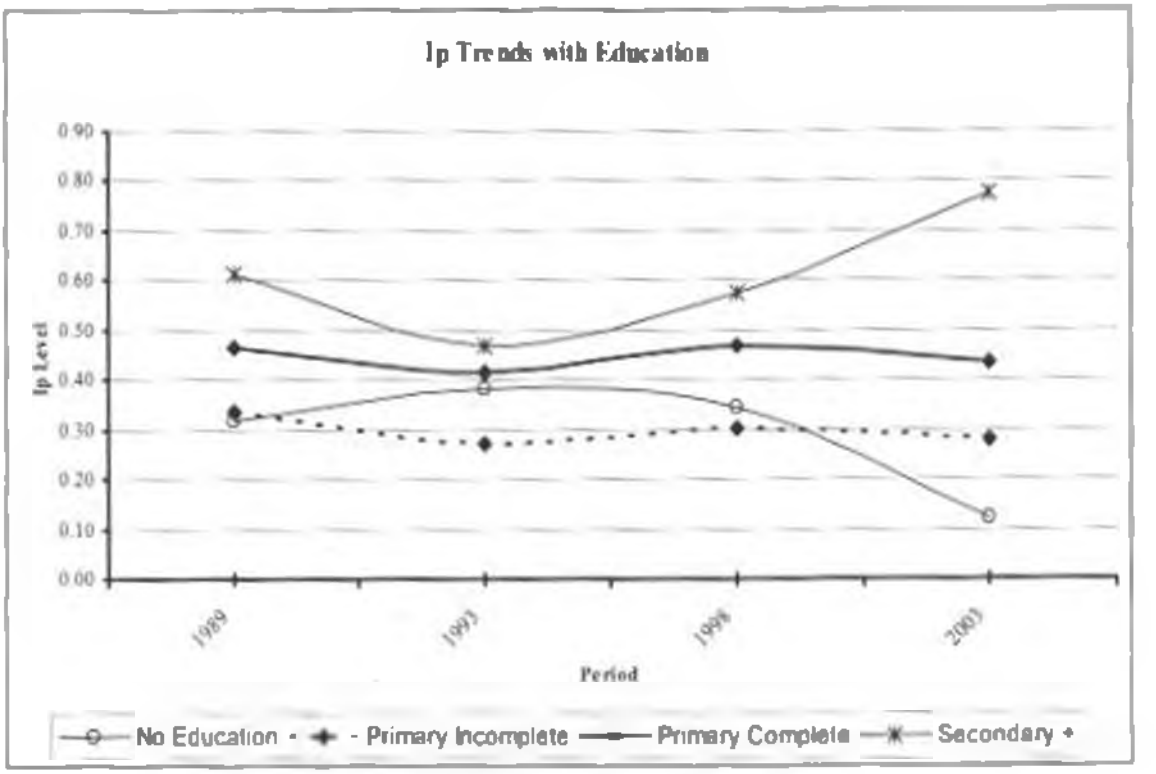

Figure 4.3 Fertility Preference Implementation Trends with completed education

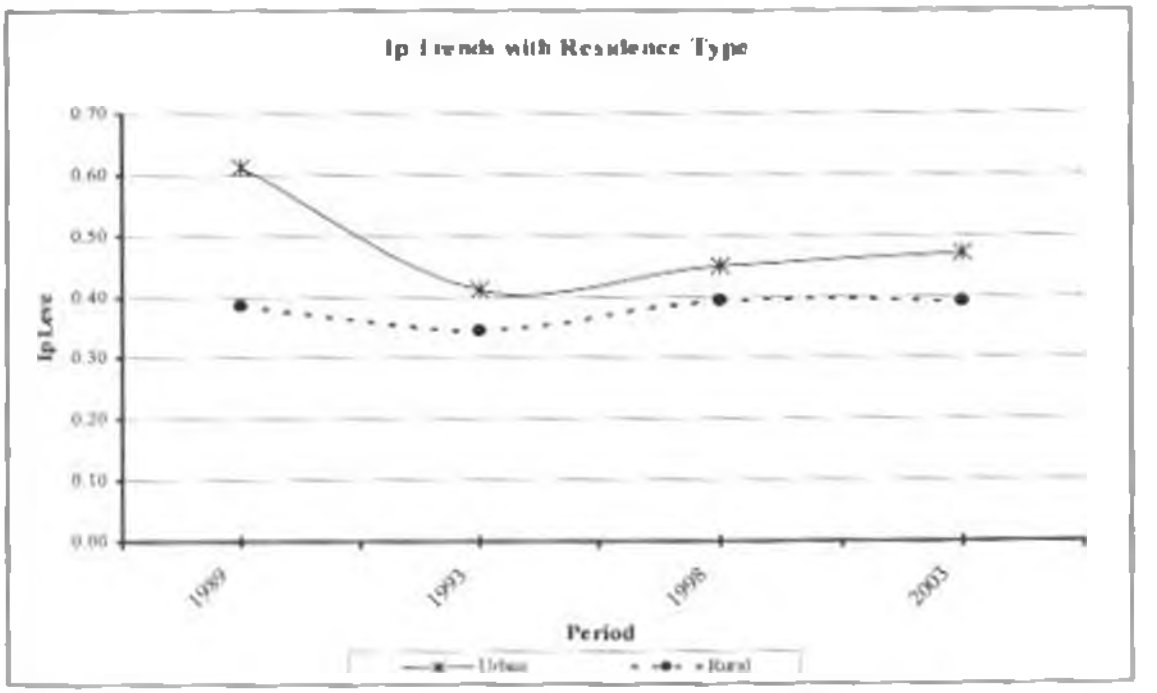

Figure 4.4: Fertility Preference Implementation Trends with Type of place of residence

Decomposition of I_p Trends

Table 4.7: Decomposition of the General trends

	Average Before stall	Average during stall	Change	Average	Contribution to fertility	% Contribution
Time Periods						
Total Fertility	6.1	4.8	-1.3	5.45		
Natural Fertility	8.4	6.7	-1.7	7.55	0.9	11.4
Wanted Fertility	3	2.2	-0.8	2.6	0.34	11.3
Index of Implementation	0.43	0.43	0	0.43	0	0

Table 4.8: Trends with Completed Education

	Average Before stall	Average during stall	Change	Average	Contribution to fertility	% Contribution
TFR(F)						
None	6.7	6.2	-0.5	6.45		
Primary incomplete	6.8	5.6	-1.2	6.2		
Primary complete	5.7	4.8	-0.9	5.25		
Secondary +	4.4	3.3	-1.1	3.85		
Natural Fertility (Fn)						
None	8.1	7.2	-0.9	7.65	-0.64	-7.9
Primary incomplete	8.8	7.1	-1.7	7.95	-1.19	-13.6
Primary complete	8.3	7.3	-1	7.8	-0.55	-6.7
Secondary +	7.6	5.5	-2.1	6.55	-0.82	-10.9
Wanted Fertility (Fw)						
None	4	2.6	-1.4	3.3	-0.39	-10.0
Primary incomplete	2.3	1.8	-0.5	2.05	-0.14	-6.4
Primary complete	2.4	1.7	-0.7	2.05	-0.31	-13.0
Secondary +	1.7	2.2	0.5	1.95	0.30	17.8
Degree of Implementation (Ip)						
None	0.34	0.23	-0.11	0.28	0.47	140.7
Primary incomplete	0.3	0.29	-0.01	0.29	0.05	19.7
Primary complete	0.44	0.45	0.01	0.44	-0.05	-13.1
Secondary +	0.54	0.67	0.13	0.60	-0.59	-110.7

Table 4.9: Trends within Region

	Average Before stall	Average during stall	Change	Average	Contribution to fertility	% Contribution
TFR(F)						
Nairobi	3.8	2.6	-1.2	3.2		
central	4.9	3.6	-1.3	4.2		
Coast	5.3	5	-0.3	5.1		
Eastern	6.5	4.7	-1.8	5.6		
Nyanza	6.3	5.3	-1	5.8		
Rift Valley	6.3	5.5	-0.8	5.9		
Western	7.2	5.7	-1.5	6.4		
Natural Fertility (Fn)						
Nairobi	15.6	4.3	-11.3	9.9	-4.1	-26.8
central	9.3	6.6	-2.7	7.9	-0.9	-10.7
Coast	7.1	6.3	-0.8	6.7	-0.5	-7.3
Eastern	9.6	7.4	-2.2	8.5	-1.2	-12.8
Nyanza	7.9	6.7	-1.2	7.3	-0.8	-10.7
Rift Valley	8.2	7.5	-0.7	7.8	-0.4	-5.6
Western	9.5	7.5	-2	8.5	-1.3	-14.1
Wanted Fertility (Fw)						
Nairobi	1.5	1	-0.5	1.25	-0.3	-21.0
central	2.3	2	-0.3	2.15	-0.1	-8.2
Coast	2.5	2.2	-0.3	2.35	-0.1	-4.2
Eastern	2.6	1.5	-1.1	2.05	-0.4	-18.6
Nyanza	2.4	2.1	-0.3	2.25	-0.08	-3.7
Rift Valley	2.5	2.2	-0.3	2.35	-0.1	-4.1
Western	2.5	2.4	-0.1	2.45	-0.03	-1.3
Degree of Implementation (Ip)						
Nairobi	0.77	0.49	-0.28	0.63	2.43	316.4
central	0.62	0.64	0.02	0.63	-0.11	-18.7
Coast	0.38	0.32	-0.06	0.35	0.26	68.7
Eastern	0.43	0.45	0.02	0.44	-0.12	-30.0
Nyanza	0.28	0.31	0.03	0.29	-0.15	-54.1
Rift Valley	0.32	0.37	0.05	0.34	-0.27	-85.9
Western	0.31	0.35	0.04	0.33	-0.24	-78.1

Table 4.10: Trends within Type of Place of Residence

	Average Before stall	Average during stall	Change	Average	Contribution to fertility	% Contribution
TFR(F)						
Urban	3.9	3.2	-0.7	3.55		
Rural	6.4	5.3	-1.1	5.85		
Natural Fertility (Fn)						
Urban	6.7	4.8	-1.9	5.75	-0.9785	-14.6
Rural	8.7	7.2	-1.5	7.95	-0.9375	-10.8
Wanted Fertility (Fw)						
Urban	1.5	1.2	-0.3	1.35	-0.1455	-9.7
Rural	2.5	2.3	-0.2	2.4	-0.075	-3.0
Degree of Implementation (Ip)						
Urban	0.51	0.46	-0.05	0.485	0.22	43.1
Rural	0.36	0.39	0.03	0.375	-0.1665	-46.3

From the decomposition of trends it has been established that there is a high contribution by the various indices towards the lag in the TFR. As evident here form the tables, the positive values imply that the index under consideration in each of the categories contribute positively to fertility decline. The converse is also true i.e. the negative values imply that the index under consideration in each of the categories have contributed positively to fertility decline. The values give the magnitude of their contributions. Since that is the case, it implies that at the country level, the natural fertility contributed about 11.4% towards fertility decline while the wanted fertility contributed about 11.3% for the same. However, there was no contribution at all by the made index of implementation towards fertility decline at the country level.

Nevertheless, although there are substantial variations between categories these results clearly indicate the important role of changes in preference implementation, wanted fertility and natural fertility. Below are the varying contributions across categories by the above indices of fertility. On the regional category, Nairobi Province had the highest level of I_p contribution towards the fertility decline at 316.3% while Rift Valley had the highest negative(lowest) contribution of the I_p at -85.9%. Percentage contribution of I_p to fertility decline was highest in urban at 43% while the rural category trailed with a negative I_p contribution at -46.3% when the type of place of residence was controlled for. Also with educational level those with no education had 140% of I_p contribution while those with secondary education had -110% I_p contributions as the others fluctuated between these two extremes.

Wanted fertility played a more dominant role in fertility decline. In Nairobi it accounted for about -21% towards fertility decline. Percentage contribution of the wanted fertility (F_w) towards fertility decline is highest in the educational or social class category at 17.8% i.e. Secondary and above education. The rest in terms of the wanted fertility (I_w) and preference implementation index (Ip) contributed either negatively or minimally towards fertility decline. Worth noting also is the effect of the natural fertility towards the fertility decline. These are shown by the above tables of decomposition

CHAPTER 5

5.0 Discussion and Conclusion

Data on fertility and contraception were available for the four time points from the DHS surveys conducted on sample basis in 1989, 1993, 1998 and 2003. The variant of the Easterlin model allows convenient quantification of the three key determinants of fertility: the supply of and demand for births, and the degree of preference implementation. Prior to this formulation, there has been very limited or just no such link between fertility and its basic determinants. Indices of preference implementation were calculated for the type of place of residence, educational level and region for each of the four surveys. This provided an insight on the categories levels of unmet need to contraception.

Changes in fertility were decomposed to estimate the change and contribution of each of the determinants of fertility (this was done by the averaged data indices categorised as those indices before fertility stall i.e. 1989 and 1993; and those indices during stall i.e. 1998 and 2003) to prevailing fertility levels at the time.

The results show very low values of the extent or degree of fertility preference implementation especially between the categories. Only those women with secondary education and above registered an index of implementation rated as high i.e. 0.78 (78% implementation) and only women in central province registered an implementation index rated as average i.e. 0.59 (59% implementation) while the rest of the subsets of the categories remained below 50% implementation i.e. less than 0.5 level meaning they were experiencing high levels of unmet need to contraception to allow for the implementation of births.

This lag in fertility implementation among the categories could be due to variation in family planning program efforts in the regions, HIV- AIDS as well as socio-cultural norms. On the AIDS hypothesis, there is generally a great concern over the increase in contraception figures used in the calculation of the index of fertility implementation, especially the condom use as women implement their fertility desires. The critique levelled on the indices is that they might be speculative and suspect i.e. believed is that of interest in the current contraception trends is partly, the prevention of the HIV-AIDS virus rather than the fertility preference implementation among users (Westoff and Cross, 2005); as such the values of the indices are based on the higher end values of the contraception figures hence need adjustment.

Further most attention to the connections between AIDS and contraception has understandably been focused on condom use. Whether the figures in general contraceptive practice in Kenya is related to the increase in HIV - AIDS prevalence is the question here (Westoff and Cross, 2005). There is a mix up in the resource use which is a serious concern; especially the competition for resources formerly targeted for family planning now being utilized in HIV-AIDS prevention activities and in addition to the decline in international donor funding towards contraceptive supplies as some of the Structural Adjustment Programmes (SAPs) in Kenya. Consequently one other speculation about the reversal of implementation of reproductive intentions in Kenya is that perhaps increasing concern about HIV-AIDS might induce parents to want more children – a kind of child insurance artefact. In fact, the prevalence of the disease is known to be concentrated among women at peak reproductive ages i.e. 25-39 (Central Bureau of Statistics, 2004).

The fertility implementation is further complicated by the fact that male condoms are the most commonly used while questions of contraception are generally asked to women; thus

provides a rich ground for biases in contraception figures coupled with the fact that most African cultures disapprove the female involvement or even knowledge about male condom use. As such, figures reflected on this kind of contraception desperately need serious adjustments (Westoff and Cross 2005, Nuken 2005). In most societies, the husbands are typically older than their wives, although the extent of the age gap varies widely across couples. The begging question here is that to what extent are girls and women in specific contexts able to negotiate the terms of a sexual relationship or implement their fertility desires in general under this scenario or, of a particular sexual act, including the choice of a partner, the nature and timing of the sex act, the achievement of sexual pleasure, and protection from unwanted pregnancy (Westoff and Cross, 2005). This is highly suspect and renders the principle of unmet need to contraception to be even more acute.

Some regions registered an all time low indices of implementation suspected to be culturally influenced to desire more children. This perhaps is similar to the finding of Ross & Stover (2001) who found in their study that the Sub Saharan African countries had extremely weak family planning programs leading to a low family planning program effort index. (Their index measured 30 features of program effort, which permitted an examination of the relationship between effort and outcomes. The low score among Sub Saharan African countries was attributed to varying program characteristics in the countries and pronatalist cultural practices – Ross & Stover, 2001).

Generally from this study, all the fertility indices decreased over the years. This observed decline in the indices of fertility i.e. (TFR, F_m, F_w and I_p) further confirms the strength of the program efforts by the various stake holders in making contraception available (to curb the

unmet need), accessible and affordable to their populace as well as improved contraceptive technology.

The observed trend in wanted fertility (F_w) could be due to changes in the costs and benefits of children and contraception, which makes couples to desire smaller family sizes; declining child and infant mortality due to developments in the health infrastructure which leads to the survival of many more children hence pressure on the family resources; growing individualism and desire for other alternative sources of mutual satisfaction which varied in degree across the categories outlined. These trends might have been made possible in part by advocacy and pressure put on the unhealthy cultural practices regarding the number of children as a measure of wealth level, change in trends of wealth flow due to modernization where upbringing has proved costly (Caldwell 1987).

The regional trends have shown disparities. Some regions like Nairobi had registered a wanted fertility of less than one in the previous surveys and as such revised their wanted fertility to just above one child. This is due to the general psychological satisfaction among women to at least have a child in a life time. Coast province also changed their preference to having many children. On the social class category the women with secondary and above education increased their wanted fertility unlike the rest; believed to be due to their economic advantage compared to the lower cadres in this category and conscious decision making considering upbringing costs. On the type of place of residence category the wanted fertility stalled at about two children for both urban and rural.

Total Fertility rate has generally declined in Kenya with slight disparities across regions, type of place of residence and social class. This observed decline could be as a result of the

relatively low costs and high benefits associated with fertility control; reduced time span that women spend in reproductive activities as they pursue educational goals, which has been leading to higher age at first marriage and first birth; incompatibility of childbearing and rearing especially the maternity leaves with labour force participation for women and the high cost of childbearing and rearing.

The decomposition procedure using data from two averaged sets of Demographic and Health Surveys categorised as average sets before stall in fertility and another average set taken during stall indicate that on the average, changes in fertility were significantly due to degree of fertility preference implementation and changes in wanted fertility. Preference implementation was found to be as important determinant of fertility decline as wanted fertility.

Their contributions were as per the tables above on decomposition trends. These values are suspected to originate from a range of factors i.e. Apart from the structural effects, there are possibilities of real reversal in fertility decline that could arise from change in fertility preferences and implementation due to the earlier mentioned like AIDS pandemic i.e. an insurance artefact; Brass (2004). In addition, there may be possibilities arising from constrained access to contraception the major proximate determinant of fertility in the last few decades or so. Given the above issues it is therefore important to examine the dynamics of fertility in the above decades using indicators that are not likely to be distorted by changes in timing of childbearing (Pandey et al 1997; Brass 2004, Udjo, 1998; Bongaarts 1999, Sibanda, 1999).

Further in this study, applied is Bongaarts variant of Easterlin's supply-demand framework for the analysis of fertility to the Demographic and Health Survey (DHS) data in Kenya to estimate the trends and differentials in fertility preference implementation. It is speculated that the attainment of couple's fertility preference is quite low in some regions (NCAPD 2004).

These findings are almost similar to that of Bongaarts (1993). The change between the two periods could be as a result of shifts in fertility and contraceptive usage. The variations in the figures given here could be as a result of the level and strength of reproductive health services and facilities in the various regions, the stage of the various regions in fertility transition as well as socio-cultural and economic factors. Data quality could also have contributed to the figures observed though the extent is not known in discrete terms. There is also a general reduction in the natural fertility. This could be as a result of lowered standards of living and changing patterns of childbearing/ rearing. For example, longer duration of breastfeeding and insignificant changes in foetal losses due to little medical advancement both increasing natural birth intervals and ordinarily reducing natural fertility. There is also the lack of better nutrition and limited availability to treatment for infecund couples.

The Kenyan population structure is a young structure, implying that the government programs expect an all time high female population entering their reproductive ages. This has an effect on the base population under consideration leading to lowered indices of development. This has also the effect of increasing the unmet need to contraception due to the limited available resources being competed for hence low levels of fertility preference implementation

5.1 Recommendations

The results of the analysis clearly show the importance of the degree of fertility preference implementation index. It tells the extent to which people have been able to implement their fertility preferences and by extension, measures the achievement of the various government programmes against their goals of providing family planning services to their people. This evaluation index can assist governments in designing and implementing appropriate strategies for the achievement of the set targets.

It is therefore recommended that development programmes are invested in, improved upon and pursued vigorously. This is in view of the strong positive relationship between development and the degree of preference implementation, which shows that the ability of people to implement their fertility preferences increases in the course of advancement in this area. It is also recommended that reproductive health service delivery systems be improved upon. This can be done by increasing and extending service delivery points to all corners of each region, type of place of residence, providing adequate human resource development like free or better and adequate education and material resources as well as logistic support for the sustainability and continuity of the systems. That is, governments should ensure that reproductive health services are available, accessible and affordable to that segment of the population that is desirous of the service.

Practical, meaningful and more effective collaboration between researchers and the respective government agencies in the design and implementation of policy programmes aimed at helping the populace achieve its fertility desires as aptly enunciated in the 1994 ICPD Resolutions is also recommended (Ibisomi, et al 2005). The wide disparities in the index of preference implementation among regions and over time clearly indicate that gaps

exist between programme objectives and their results. It is therefore imperative that governments and researchers work together to bridge these gaps.

In terms of research, the need exists to investigate how well the degree of preference implementation is a measure of the ability of couples and individuals to implement their fertility desires. There is further need to examine the picture within various age groupings within each category or country as opposed to general variability across categories considered in this work. This will provide further insights into associated socio-cultural, economic, and other factors that influence degree of preference implementation and wanted fertility. Efforts should also be made to operationalize the relationship between the degree of preference implementation and its basic determinants namely i.e. cost of unwanted childbearing and that of fertility regulation.

The ways and means by which the government provide birth control assistance to the people also needs to be looked into. This will help clarify the controversy of people being coerced into some birth control mechanisms and methods like sterilization recently introduced in some countries. This practice if true is a violation of the 1994 ICPD resolutions i.e. the freedom of choice of the individuals to decide if, when and how often to regulate their fertility. Further the HIV-AIDS interaction or linkages with the fertility preference implementation provides a rich area for investigations.

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ANNEXE

DATA ANALYSIS TABLES

1989 Data set.

Table 1: Region and Current use by method type

Region		No method	Folkloric method	Traditional method	Modern method	Total
Nairobi	Count	108	0	13	81	202
	% within Region	53.5	0	6.4	40.1	100
	% within Current use by method type	2.5	0	4.9	5.6	3.3
	% of Total	1.8	0	0.2	1.3	3.3
Central	Count	347	2	40	291	680
	% within Region	51	0.3	5.9	42.8	100
	% within Current use by method type	8.0	4.7	15.1	20.2	11.1
	% of Total	5.7	0	0.7	4.8	11.1
Coast	Count	558	0	28	191	777
	% within Region	71.8	0	3.6	24.6	100
	% within Current use by method type	12.8	0	10.6	13.2	12.7
	% of Total	9.1	0	0.5	3.1	12.7
Eastern	Count	618	2	61	230	911
	% within Region	67.8	0.2	6.7	25.2	100
	% within Current use by method type	14.2	4.7	23	15.9	14.9
	% of Total	10.1	0	1	3.8	14.9
Nyanza	Count	892	2	39	186	1119
	% within Region	79.7	0.2	3.5	16.6	100
	% within Current use by method type	20.4	4.7	14.7	12.9	18.3
	% of Total	14.6	0	0.6	3	18.3
Rift Valley	Count	1171	16	67	272	1526
	% within Region	76.7	1	4.4	17.8	100
	% within Current use by method type	26.8	37.2	25.3	18.8	25
	% of Total	19.1	0.3	1.1	4.4	25
Western	Count	670	21	17	192	900
	% within Region	74.4	2.3	1.9	21.3	100
	% within Current use by method type	15.4	48.8	6.4	13.3	14.7
	% of Total	11	0.3	0.3	3.1	14.7
Total	Count	4364	43	265	1443	6115
	% within Region	71.4	0.7	4.3	23.6	100
	% within Current use by method type	100	100	100	100	100
	% of Total	71.4	0.7	4.3	23.6	100

Table 2:Educational attainment and Current use by method type Cross tabulation

Complete Education		No method	Folkloric method	Traditional method	Modern method	Total
no education	Count	941	15	19	148	1123
	% within complete education	83.8	1.3	1.7	13.2	100
	% within Current use by method type	21.6	34.9	7.2	10.3	18.4
	% of Total	15.4	0.2	0.3	2.4	18.4
Primary incomplete	Count	1867	18	105	476	2466
	% within complete education	75.7	0.7	4.3	19.3	100
	% within Current use by method type	42.8	41.9	39.6	33	40.3
	% of Total	30.5	0.3	1.7	7.8	40.3
Primary complete	Count	865	7	47	348	1267
	% within complete education	68.3	0.6	3.7	27.5	100
	% within Current use by method type	19.8	16.3	17.7	24.1	20.7
	% of Total	14.1	0.1	0.8	5.7	20.7
sec +	Count	691	3	94	471	1259
	% within complete education	54.9	0.2	7.5	37.4	100
	% within Current use by method type	15.8	7	35.5	32.6	20.6
	% of Total	11.3	0	1.5	7.7	20.6
Total	Count	4364	43	265	1443	6115
	% within complete education	71.4	0.7	4.3	23.6	100
	% within Current use by method type	100	100	100	100	100
	% of Total	71.4	0.7	4.3	23.6	100

Table 3: Type of place of residence and Current use by method type Cross tabulation

Type of place of residence		No method	Folkloric method	Traditional method	Modern method	Total
Urban	Count	362		37	269	668
	% within Type of place of residence	54.2		5.5	40.3	100
	% within Current use by method type	8.3		14	18.6	10.9
	% of Total	5.9		0.6	4.4	10.9
Rural	Count	4002	43	228	1174	5447
	% within Type of place of residence	73.5	0.8	4.2	21.6	100
	% within Current use by method type	91.7	100	86	81.4	89.1
	% of Total	65.4	0.7	3.7	19.2	89.1
Total	Count	4364	43	265	1443	6115
	% within Type of place of residence	71.4	0.7	4.3	23.6	100
	% within Current use by method type	100	100	100	100	100
	% of Total	71.4	0.7	4.3	23.6	100

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Table 4: Region and Current use by method type Cross tabulation

Region		No method	Folkloric method	Traditional method	Western method	Total
Nairobi	Count	225	0	29	113	367
	% within Region	61.3	0	7.9	30.7	100
	% within Current use by method type	3.9	0	8.6	7.2	4.8
	% of Total	2.9	0	0.3	1.499	4.8
Central	Count	640	3	62	370	1075
	% within Region	59.5	0.2	5.7	34.4	100
	% within Current use by method type	11.3	11.1	18.5	23.8	14.2
	% of Total	8.4	0.04	0.8	4.9	14.2
Coast	Count	868	0	36	187	1091
	% within Region	79.5	0	3.3	17.1	100
	% within Current use by method type	15.4	0	10.7	12.0	14.4
	% of Total	11.5	0	0.4	2.4	14.4
Eastern	Count	731	2	71	240	1044
	% within Region	70	0.1	6.8	22.9	100
	% within Current use by method type	12.9	7.4	21.1	15.4	13.8
	% of Total	9.6	0.02	0.9	3.1	13.8
Nyanza	Count	1023	2	46	193	1264
	% within Region	80.9	0.1	3.6	15.2	100.0
	% within Current use by method type	18.1	7.4	13.7	12.4	16.7
	% of Total	13.5	0.02	0.6	2.5	16.7
Rift Valley	Count	1385	8	72	289	1754
	% within Region	78.9	0.4	4.1	16.4	100
	% within Current use by method type	24.6	29.6	21.4	18.6	23.2
	% of Total	18.3	0.1	0.9	3.8	23.2
Western	Count	754	12	19	160	945
	% within Region	79.7	1.2	2.0	16.9	100
	% within Current use by method type	13.4	44.4	5.6	10.3	12.5
	% of Total	10.0	0.1	0.2	2.1	12.5
Total	Count	5626	27	335	1552	7510
	% within Region	74.6	0.3	4.4	20.5	100
	% within Current use by method type	100	100	100	100	100
	% of Total	74.6	0.3	4.1	20.5	100

Table 5: Complete education and Current use by method type Cross tabulation

complete education		No method	Folkloric method	Traditional method	Modern method	Total
no education	Count	1064	10	30	193	1297
	% within complete education	82.0	0.7	2.3	14.8	100
	% within Current use by method type	18	37	8.9	12.4	17.2
	% of Total	14	0.1	0.3	2.5	17.2
primary incomplete	Count	2449	10	110	480	3049
	% within complete education	80.3	0.3	3.6	15.7	100
	% within Current use by method type	43.5	37	32.8	30.9	40.4
	% of Total	32.4	0.1	1.4	6.3	40.4
primary complete	Count	978	4	60	358	1400
	% within complete education	69.8	0.2	4.2	25.5	100
	% within Current use by method type	17.3	14.8	17.9	23	18.5
	% of Total	12.9	0.05	0.7	4.7	18.5
Sec +	Count	1135	3	135	521	1794
	% within complete education	63.2	0.1	7.5	29	100
	% within Current use by method type	20.1	11.1	40.2	33.5	23.7
	% of Total	15	0	1.7	6.9	23.7
Total	Count	5626	27	335	1552	7540
	% within complete education	74.6	0.3	4.4	20.5	100
	% within Current use by method type	100	100	100	100	100
	% of Total	74.6	0.3	4.4	20.5	100

Table 6: Type of place of residence and Current use by method type Cross tabulation

Type of place of residence		No method	Folkloric method	Traditional method	Modern method	Total
Urban	Count	784	0	62	315	1161
	% within Type of place of residence	67.5	0	5.3	27.1	100
	% within Current use by method type	13.5	0.	18.5	20.2	15.3
	% of Total	10.3	0.0	0.8	4.1	15.3
Rural	Count	4842	27	273	1237	6379
	% within Type of place of residence	75.9	0.4	4.2	19.3	100
	% within Current use by method type	86	100	81.4	79.7	84.6
	% of Total	64.2	0.3	3.6	16.4	84.6
Total	Count	5626	27	335	1552	7540
	% within Type of place of residence	74.6	0.3	4.443	20.5	100
	% within Current use by method type	100	100	100	100	100
	% of Total	74.6	0.3	4.4	20.5	100

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Table 7: Region and Current use by method type Cross tabulation

Region		No method	Folkloric method	Traditional method	Modern method	Total
Nairobi	Count	245	2	29	143	419
	% within Region	58.5	0.5	6.9	34.1	100
	% within Current use by method type	4.3	4.7	7.2	8	5.3
	% of Total	3.1	0	0.4	1.8	5.3
Central	Count	421	3	48	315	787
	% within Region	53.5	0.4	6.1	40	100
	% within Current use by method type	7.4	7	11.9	17.7	10
	% of Total	5.3	0	0.6	4	10
Coast	Count	981	6	22	215	1226
	% within Region	80.2	0.5	1.8	17.5	100
	% within Current use by method type	17.4	14	5.5	12.1	15.6
	% of Total	12.5	0.1	0.3	2.7	15.6
Eastern	Count	767	9	86	324	1186
	% within Region	64.7	0.8	7.3	27.3	100
	% within Current use by method type	13.6	20.9	21.3	18.2	15.0
	% of Total	9.7	0.1	1.1	4.1	15.0
Nyanza	Count	1101	6	40	243	139
	% within Region	79.2	0.4	2.9	17.5	100.0
	% within Current use by method type	19.5	14	9.9	13.6	17.6
	% of Total	14	0.1	0.5	3.1	17.6
Rift Valley	Count	1446	11	125	395	1977
	% within Region	73.1	0.6	6.3	20	100
	% within Current use by method type	25.6	25.6	31	22.2	25.1
	% of Total	18.3	0.1	1.6	5	25.1
Western	Count	690	6	53	147	896
	% within Region	77	0.7	5.9	16.4	100
	% within Current use by method type	12.2	14	13.2	8.2	11.4
	% of Total	8.8	0.1	0.7	1.9	11.4
Total	Count	5651	43	403	1782	7881
	% within Region	71.7	0.5	5.1	22.6	100.0
	% within Current use by method type	100	100	100	100	100
	% of Total	71.7	0.5	5.1	22.6	100

Table 8: Completed education and Current use by method type Cross tabulation

completed education		No method	Folkloric method	Traditional method	Modern method	Total
no education	Count	828	13	25	144	1010
	% within completed education	82	1.3	2.5	14.3	100
	% within Current use by method type	14.6	30.2	6.2	8.1	12.8
	% of Total	10.5	0.2	0.3	1.8	12.8
primary incomplete	Count	2321	16	109	457	2903
	% within completed education	80	0.6	3.8	15.7	100
	% within Current use by method type	41.1	37.2	27	25.6	36.8
	% of Total	29.5	0.2	1.4	5.8	36.8
primary complete	Count	1184	8	103	521	1816
	% within completed education	65.2	0.4	5.7	28.7	100
	% within Current use by method type	20.9	18.6	25.6	29.2	23
	% of Total	15	0.1	1.3	6.6	23
Sec +	Count	1320.0	6	166	660	2152
	% within completed education	61.3	0.3	7.7	30.7	100
	% within Current use by method type	23.4	14	41.2	37	27.3
	% of Total	16.7	0.1	2.1	8.4	27.3
Total	Count	5653	43	403	1782	7881
	% within completed education	71.7	0.5	5.1	22.6	100
	% within Current use by method type	100	100	100	100	100
	% of Total	71.7	0.5	5.1	22.6	100

Table 9: Type of place of residence and Current use by method type Cross tabulation

Residence		No method	Folkloric method	Traditional method	Modern method	Total
Urban	Count	951	7	83	425	1466
	% within Type of place of residence	64.9	0.5	5.7	29	100
	% within Current use by method type	16.8	16.3	20.6	23.8	18.6
	% of Total	12.1	0.1	1.1	5.4	18.6
Rural	Count	4702	36	320	1357	6415
	% within Type of place of residence	73.3	0.6	5	21.2	100
	% within Current use by method type	83.2	83.7	79.4	76.2	81.4
	% of Total	59.7	0.5	4.1	17.2	81.4
Total	Count	5653	43	403	1782	7881
	% within Type of place of residence	71.7	0.5	5.1	22.6	100
	% within Current use by method type	100	100	100	100	100
	% of Total	71.7	0.5	5.1	22.6	100

Table 10: Region and Current use by method type Cross tabulation

Region		No method	Folkloric method	Traditional method	Modern method	Total
Nairobi	Count	779	3	50	337	1169
	% within Region	66.6	0.3	4.3	28.8	100
	% within Current use by method type	13.2	6.7	13.3	18.2	14.3
	% of Total	9.5	0	0.6	4.1	14.3
Central	Count	760	6	77	471	1314
	% within Region	57.8	0.5	5.9	35.8	100
	% within Current use by method type	12.8	13.3	20.4	25.4	16
	% of Total	9.3	0.1	0.9	5.7	16
Coast	Count	741	7	32	158	938
	% within Region	79	0.7	3.4	16.8	100
	% within Current use by method type	12.5	15.6	8.5	8.5	11.4
	% of Total	9	0.1	0.4	1.9	11.4
Eastern	Count	641	4	72.0	276	993
	% within Region	64.6	0.4	7.3	27.8	100
	% within Current use by method type	10.8	8.9	19.1	14.9	12.1
	% of Total	7.8	0	0.9	3.4	12.1
Nyanza	Count	806	3	23	193	1025
	% within Region	78.6	0.3	2.2	18.8	100
	% within Current use by method type	13.6	6.7	6.1	10.4	12.5
	% of Total	9.8	0	0.3	2.4	12.5
Rift Valley	Count	1007	11	84	226	1328
	% within Region	75.8	0.8	6.3	17.0	10
	% within Current use by method type	17	24.4	22.3	12.2	16.2
	% of Total	12.3	0.1	1	2.8	16.2
Western	Count	749	11	39	192	991
	% within Region	75.6	1.1	3.9	19.4	100
	% within Current use by method type	12.7	24.4	10.3	10.4	12.1
	% of Total	9.1	0.1	0.5	2.3	12.1
North Eastern	Count	436	0	0	1.0	437
	% within Region	99.8	0	0	0.2	100
	% within Current use by method type	7.4	0	0	0.1	5.1
	% of Total	5.3	0	0	0	5.1
Total	Count	5919	45	377	1854	8193
	% within Region	72.2	0.5	4.6	22.6	100
	% within Current use by method type	100	100	100	100	100
	% of Total	72.2	0.5	4.6	22.6	100

Table 11: Completed education and Current use by method type Cross tabulation

Completed education		No method	Folkloric method	Traditional method	Modern method	Total
no education	Count	1180	4	28	79	1291
	% within completed education	91.4	0.3	2.2	6.1	100
	% within Current use by method type	19.9	8.9	7.4	4.3	15.8
	% of Total	14.4	0	0.3	1	15.8
primary incomplete	Count	1876	14	94	425	2409
	% within completed education	77.9	0.6	3.9	17.6	100
	% within Current use by method type	31.7	31.1	24.9	22.9	29.4
	% of Total	22.9	0.2	1.1	5.2	29.4
primary complete	Count	1292	9	101	537	1939
	% within completed education	66.6	0.5	5.2	27.7	100
	% within Current use by method type	21.8	20	26.8	29	23.7
	% of Total	15.8	0.1	1.2	6.6	23.7
sec +	Count	1571	18	154	813	2556
	% within completed education	61.5	0.7	6	31.8	100
	% within Current use by method type	26.5	40	40.8	43.9	31.2
	% of Total	19.2	0.2	1.9	9.9	31.2
Total	Count	5919	45	377.0	1854	8195
	% within completed education	72.2	0.5	4.6	22.6	100
	% within Current use by method type	100	100	100	100	100
	% of Total	72.2	0.5	4.6	22.6	100

Table 12: Type of place of residence and Current use by method type Cross tabulation

Type of place of residence		No method	Folkloric method	Traditional method	Modern method	Total
Urban	Count	1880	17	119	735	2751
	% within Type of place of residence	68.3	0.6	4.3	26.7	100
	% within Current use by method type	31.8	37.8	31.6	39.6	33.6
	% of Total	22.9	0.2	1.5	9.0	33.6
Rural	Count	4039	28	258	1119	5444
	% within Type of place of residence	74.2	0.5	4.7	20.6	100
	% within Current use by method type	68.2	62.2	68.4	60.4	66.4
	% of Total	49.3	0.3	3.1	13.7	66.4
Total	Count	5919	45	377	1854	8195
	% within Type of place of residence	72.2	0.5	4.6	22.6	100
	% within Current use by method type	100	100	100	100	100
	% of Total	72.2	0.5	4.6	22.6	100