# FACTORS UNDERLYING UNMET NEED FOR CONTRACEPTION IN KENYA

BY

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## DECLARATION

Except for citations, this is my original piece of work and has not been presented for a degree in any other higher institute of learning.

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# DEDICATION

I wish to dedicate my work to my parents who toiled to see me through my academic life. My special thanks goes to my father, Mr. Japheth Wafula Mwanja and my mother, Mrs. Ruth Naliaka Namenge for their tireless efforts in educating me.

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# ABSTRACT

The levels of unmet need for contraception are not only high but the underlying causes behind the observed levels are poorly understood. This study utilizes data drawn from the 1998 KDHS to examine the magnitude of unmet need for contraception by selected characteristics and to assesses the factors that explain the various components of unmet need for contraception. The unit of analysis is the currently married women who constituted 61 percent of all the sampled women. Out of the 4847 currently married women, 4004 resided in the rural areas while 843 were urban residents.

Analytical tools employed in this study are frequency distributions, cross tabulations and multivariate logistic regression. Frequency distributions provided a summary of the selected characteristics used in this study. Cross tabulations served to show the magnitude and differentials of the various components of unmet need for contraception by selected characteristics. Finally, logistic regression models provided predictor variables that were significantly associated with the various components of unmet need for contraception. The Westoff and Bankole (1995) algorithm, which was used in the 1998 KDHS, was also used in this study to estimate unmet need for contraception.

Findings revealed that unmet need for contraception to space was much higher than that to limit further childbearing (14.7 % against 10.4 % respectively). Additionally, the causes of unmet need for contraception to space were not necessarily similar to those for unmet need for contraception to limit births. In general, the various components of unmet need for contraception appeared to be higher in rural areas, among women who are not exposed to mass media, among those whose husbands disapprove of their use of family planning, among those who have a higher number of living children and those who are still young. This was true in both bivariate and multivariate analyses. However, except for unmet need to limit, the association between education by various components of unmet need for contraception appeared to be inconsistent in our multivariate analysis. This association is similar to that of other DHS sub-Saharan African countries (Robey et al., 1996).

Upon the backdrop of the above findings, this study recommends for increased accessibility and availability of effective and side effect free contraceptives to people who need them. This could be done by improving the performance of existing health facilities and by expanding some. Community based delivery contraceptive services such as the popular CBD, and Depot Service Arrangements could be used to complement the Clinic-Based Delivery System.

Mass media family planning awareness campaigns should be enhanced in order to disseminate information to a large proportion of the Kenyan women given the fact that literacy levels are still low in Kenya. Similarly, there is also need to enhance Behaviour Change for Communication (BCC) campaigns, which entail Information, Education, and Communication (IEC) for awareness creation and IEC for behaviour change.

Future studies should focus on qualitative and in-depth methods of data collection since DHS questionnaire is not detailed enough to enable us appreciate fully underlying causes of unmet need for contraception. There is also need for refinement of the measures of unmet need for contraception by redefining terms such as infecundity and reconsidering periodicity in the measure in order to yield reliable estimates of unmet need.

Future researches should also study the underlying causes of unmet need for contraception among the unmarried and ever married women. In Kenya where cases of unwanted pregnancy are substantial among the unmarried, the omission of the previously mentioned target population only serves to understate the actual levels of unmet need among women.

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| | |
|---|---|
| CBS | - Central Bureau of Statistics |
| CPS | - Contraceptive Prevalence Survey |
| DHS | - Demographic and Health Surveys |
| FLE | - Family Life Education |
| ICPD | - International Conference on Population and Development |
| KDHS | - Kenya Demographic and Health Survey |
| KAP | - Knowledge, Attitude and Practice |
| NASSEP | - National Sample Survey and Evaluation Program |
| NCPD | - National Council for Population and Development |
| WFS | - World Fertility Survey |
| CBD | - Community Based Distributors |
| SDPs | - Service Delivery Points |
| BCC | - Behaviour Change Communication |
| IEC | - Information Education and Communication |

# CHAPTER ONE

## ,0 INTRODUCTION

was not until the 1960's and 1970's that Knowledge Attitude Practice (KAP) surveys revealed ıat in a number of countries, a substantial proportion of women wanted to stop childbearing but 'ere not practicing contraception (Robey et al., 1996:1). These women had unmet need for )ntraception to limit births. Since then, the concept of unmet need for contraception has been a ıoving target' (Westoff 1978), undergoing a number of refinements and today, unmet need for )ntraception constitutes the limiting and spacing components.

ıst literature shows a growing number of currently married women or those in union with ımet need for contraception especially in the developing world where, contraceptive prevalence still low. For instance, using Demographic and Health Surveys (DHS) data from a number of veloping countries, Robey et al., (1996) using the Westoff- Ochoa (1992) measure found that er 100 million women had unmet need for contraception either to space or limit births. Under s study, it was found that Kenya had the second highest level of unmet need for contraception 5 percent), after Rwanda (37 percent).

though Kenya established a national family planning program in 1967- the first in sub-Saharan rica, contraceptive prevalence remained low until the late 1980's. For instance, the use of ıtraceptives among married women increased from 6.8 percent in 1977/78 to 17.0 percent in 84 to 26.9 percent in 1989, 33.0 percent in 1993 and 39.0 percent in 1998 (National Council Population and Development, et al., 1999). The use of modern contraception showed an rease from 9.7 percent in 1984 to 17.9, 27.3, and 31 percent in 1989, 1993 and 1998 pectively (NCPD, et al., 1999). The above trends in modern contraception have been the jor driving force behind the recent decline in fertility and population growth rate. As a result,

ertility decline in Kenya is now a reality and is no longer a statistical artifact (Robinson and 'leland 1992. NCPD. et al., 1999). Past researches elsewhere, also attribute fertility decline in ther developing countries largely to increased use of modern contraception (Berelson. et al., 980: Bongaarts 1986; cited in Njogu 1992).

espite a remarkable increase in contraceptive use. the slowing pace in contraception adoption nce 1993 means that a large proportion of women who wish to use contraception to delay or to oid pregnancy will continue suffering from the persistent consequences of unplanned sexual haviour. Such consequences range from increased school drop out among females. early arriages. increased dependency, unwanted pregnancy, mistimed pregnancies, and increased IV/AIDS related cases all of which have grave socio-economic, socio-cultural and mographic implications.

rther. the factors behind the observed high levels of unmet need for contraception in Kenya are orly understood. For instance, we do not actually understand why married women in the roductive ages in Kenya should exhibit low levels of contraceptive adoption yet contraceptive owledge in Kenya is almost universal (97 percent are aware of family planning methods). en though NCPD et al., (1999) attribute the decline in contraceptive uptake to the two-months rses strike prior to the 1998 KDHS survey, the ongoing sharp controversies that currently exist ween the church and the government about the introduction of family life education in schools d the use of condoms have grave implications for the sexually active population. One of the jor implications is that a large group of women in the reproductive ages will continue failing meet their fertility preferences and hence end up having unwanted and mistimed pregnancies. e most other African countries, marriage in Kenya is still universal and given the fact that st sexual activities and reproduction occur within marriage, married women are likely to

suffer more from the consequences of unmet need for family planning as compared to the rest of the population. Furthermore, in Kenya where husband approval has been one of the major reasons for unmet need for contraception among their spouses' (Ferguson 1992, NCPD et al., 1999), married women who exhibit unmet need for contraception are likely to continue suffering.

There is an urgent need to motivate women to adopt contraception so as to reduce the existing gap between actual contraceptive use and potential contraception. This is necessary because the assessment of unmet need and the demand for contraception is important both for family planning purposes and for population policy (Ross, 1994, Sinding, 1994).

Further, the assessment of unmet need for family planning is important to family planning program managers and policy makers. It provides programs with information concerning the magnitude and characteristics of the additional market for contraception and enables policy makers to estimate the impact on fertility that would result if the additional contraceptive needs of the market were met (Westoff and Bankole 1995).

## 1.2 PROBLEM STATEMENT

The levels and magnitude of unmet need in Kenya are not only high but also the underlying causes for the observed levels are poorly understood. For instance, the 1998 KDHS reveals that 47 percent of the currently married women do not want any more children while 25 percent would like to wait for two or more years before having their next birth. In addition, about 4 percent are undecided about whether they want to have another child. Thus, about 78 percent of the married women in Kenya want either to space their next birth or to end childbearing altogether. Despite these, only a half of these women are currently contracepting (39 percent) and thus almost the other half is exposed to the risk of unwanted or mistimed childbearing.

This study is therefore a step in the right direction of filling the knowledge gap surrounding the causes of unmet need for contraception in Kenya. This study is also in line with the government policy of providing quality family planning services to all Kenyans desiring them so as to make significant progress towards meeting the unmet need for family planning (NCPD, 1995). Such efforts are unlikely to be achieved unless the underlying causes of unmet need for contraception are identified and addressed.

This topic is important as it addresses the problem of poor reproductive health status of women in Kenya. Evidence shows that although fertility decline has been tremendous in the past decade, it has decelerated in the 1990s. In particular, total fertility rates reduced from 8.1 in 1977/78 to 7.7 and then to 6.7, 5.4, and 4.7 in 1984, 1989, 1993 and 1998 respectively. An inter-survey analysis however reveals that fertility reduced by 0.066 births per woman between 1977/78 and 1984, and 0.2, 0.325 and 0.14 births during the 1984-1989, 1989-1993 and 1993-1998 inter-survey periods respectively (NCPD et al., 1999).

The observed decline in total fertility rate especially between 1993-1998 inter-survey period calls for renewed efforts to increase contraceptive prevalence rate in the country. One way of doing this is to attempt to understand why women who are in need of contraception are not actually contracepting. Addressing the problem of unmet need is important as it may help to reduce the number of unintended and mistimed pregnancies in Kenya. Suffice it to say a better understanding of the causes of unmet need is essential to modify service delivery programs and to assess their contribution toward satisfying the existing unmet need for contraception.

From the foregoing discussion, this study will be guided by the following research questions: -

1. Is unmet need for contraception actually real and how has it evolved over time?

2 How do the components of unmet need for contraception vary by selected characteristics?

3 What are the underlying causes of unmet need for contraception in Kenya?

4 What policies and programs should be put in place to address the problem of unmet need for contraception?

## 1.3 BACKGROUND OF THE STUDY AREA

Kenya covers an area of 582,000 square kilometres and is bordered by Ethiopia in the north, Sudan in the northwest, Uganda on the west, Tanzania in the south and Somalia in the east. The country is not landlocked and in fact has 400 kilometres of the Indian Ocean shoreline. Basically, Kenya can be divided into two distinct regions - the lowland and highland/upland Kenya. This affects the climate, patterns of human settlement and agricultural activities. Approximately 80 percent of the land is arid and semi-arid and only 20 percent is arable. The major rainy seasons are two- long rains starting from March to May and short rains from October to December. An exception to this is around the lake Victoria in the west where, rains are well distributed throughout the year.

Kenya is basically an agricultural economy and in fact agriculture accounts for 25 percent of the gross domestic product while manufacturing accounts for only 13 percent. The main stable food crop is maize. Other food crops grown include beans, cassava, potatoes and bananas. Cash crops grown include coffee, tea, and sugarcane. These earn the country some foreign exchange. Besides, tourism also earns the country some foreign exchange.

In terms of administrative boundaries, Kenya has eight provinces namely; Western, Central, Nyanza, Rift Valley, Eastern, North Eastern, coast and Nairobi. Although the KDHS surveys since their inception in 1989 have been national in scope, not all the provinces have been included in the survey. For instance, the 1998 KDHS upon which, this study is based excluded

the North Eastern province, two districts in Rift valley and in Eastern province. It should however, be noted that the excluded regions carry only 4 percent of the country's total population.

Additionally, Kenya is a multi- lingual society with 43 ethno-linguistic groups. Out of these, the Kikuyu, Luo, Luhya, Kamba, Kisii, Kalenjin, Embu, Meru, and Mijikenda are the main ethnic groups. The numerous ethnic groups imply diverse socio-cultural and economic activities within Kenya, which predisposes these ethnic groups to different fertility. The main religions in Kenya are Christianity and Islam.

The population distribution of Kenya has been growing fast over the past years as exemplified in the numerous divisions of former districts in two or more. Currently, Kenya has over 45 districts. Since 1948 when the first census was done, five other census have also been done. The increase in population from 5.4 million in 1948 to about 28 million by august 1999 represents a 419 percentage increase in population growth over the 51-year inter-censal period.

Further, there has been growing evidence that Kenya has entered the once long awaited demographic transition (Robinson and Cleland 1992, Brass and Jolly 1993, NCPD et al.,1999). For instance, total fertility rate reduced from 7.9 in 1979 to 4.7 in 1998 and inter-censal population growth rate reduced from 3.8 percent in 1979 to 2.7 percent in 1998 (CBS, et al., 2000). Likewise, mortality rate has been decreasing over the years but since 1993 the trend appears to have reversed.

For instance, infant mortality rate reduced from 119 births per 1000 women in the 15-49 age groups to 69 births per 1000 women in the 1989 period. However, from 1989 to 1993, there apparently appears to be no change in childhood mortality according to the birth histories

recorded from women interviewed in the survey. Worse still, there seems to be an upsurge in mortality in general, since 1993 to date. Regional differentials in fertility and mortality are diverse and thus it is true that some regions are at a later stage of demographic transition while others may have just started.

## STUDY OBJECTIVES

The general objective of any family planning program is to enable couples and individuals to effect or realize their reproductive or fertility intentions and to avoid unintended childbearing. In Kenya, there is a large gap between actual and preferred contraceptive use among married women. This study has therefore, the general objective of examining the correlates of unmet need for contraception among currently married women in Kenya, aged 15-49 years.

### 1.4.1 Specific Objectives

(a) To investigate the magnitude and components of unmet need for family planning by selected characteristics.

(b) To establish the factors underlying unmet need for contraception among the currently married women.

## 1.5 STUDY JUSTIFICATION

The contraceptive uptake in Kenya is still low and only 39 percent of the women are currently contracepting (NCPD et al., 1999). This low acceptability of family planning services only serves to worsen the already poor reproductive health status of women in Kenya. Worse still, a large proportion of married women wishes to use contraception to space or limit their childbearing activities but are not doing so. This unmet need for contraception accounts for the observed increased cases of unwanted and mistimed pregnancies, which have adverse demographic, health, social, cultural and economic implications.

The Kenyan situation is worsened by the fact that reproductive preferences among women are not even and in fact vary widely by region. As a result, unmet need for contraception is likely to be higher than the national average in most of the provinces or even districts. Furthermore, although Kenya has had initial gains in contraceptive uptake and a sharp decline in fertility in the recent past, the now decelerating trends in family planning adoption as well as upsurge in mortality calls for an understanding as to why many women with unmet need for contraception are reluctant to use family planning services.

Unfortunately the factors underlying the observed high levels of unmet need for contraception in Kenya are poorly understood. There is need for a better understanding and identification of the correlates of unmet need for contraception because the assessment of unmet need and the total demand for family planning is important both for family planning purposes and for population policy (Ross, 1994; Sinding, et al., 1994). Further, for any family planning program to operate effectively or evaluate its own effectiveness, it must involve the search for the extent and composition of the potential need for services (Westoff; 1988:45). Indeed, this study is important owing to the fact that little research has been done on the extent and composition of the potential demand for services in Kenya.

Furthermore, the prevailing research that exist on unmet need for family planning in Kenya has tended to overlook the role of such factors as spousal communication, husband approval of family planning, the number of living children and ethnicity, as correlates of unmet need for contraception (Karanja 1997, Muganzi and Takona 1984). This is an important limitation since such factors have been found to be quite important elsewhere (Casterline et al., 1997, Ngom 1997). In the African context where the traditional gender arrangements skew reproductive decision-making authority away from women (Dodoo 1993; Ezeh 1992), the exclusion of

husbands' attitude towards approval of spouses' use of family planning is for instance, a very important omission. This study resolves this problem by including some of the above important variables that have been overlooked by past researchers in Kenya.

Recent studies also show that unmet need can also be used for evaluating family planning programs from a health policy perspective. These studies contend that some women who are not using contraception because they want to have more children may actually have unmet need for contraception because is it is not advisable on health grounds to have any more children or to have another soon (DeGraff and de Silva, 1996). This study may help in addressing the health-related risks of non-contraception among the currently married women in Kenya. Such risks range from having births outside the 20-34 years age bracket; having high parity births and also having reduced child spacing intervals to less than 24 months (Ainsworth 1985). Suffice it to say this study may provide insights on improvement of women's reproductive health, which was also, one of the major recommendations (that is, every pregnancy should be intended) of the International Conference on Population and Development (ICPD) held in Cairo, Egypt in 1994.

There is indisputable evidence that an increase in contraceptive use can reduce fertility (Njogu 1992). Kenya can attain a higher level of contraceptive prevalence by eliminating the unmet need for contraceptive use. For instance, according to the NCPD et al., 1999, although the desired number of children among ever-married women is 3.8 children per woman, the fertility rate stands at 4.7 children per woman. Thus if the desired fertility was to be at par with the actual fertility, then 0.9 births per woman would have been averted resulting in a further decline in fertility.

The estimate of the potential demand for contraception is also vital as it may influence the amount of resources committed to family planning programs and the operation of those programs. In the late Bernard Berelson's words "if there were signals by which to identify women who wanted to avoid a pregnancy but would nevertheless conceive, family planning programs could restrict their efforts to enrolling those women, with a considerable saving in time, effort and funds" (Nortman, 1982:126).

## 1.6 SCOPE AND LIMITATION OF THE STUDY

The study focuses on currently married women of reproductive age who are classified as fecund and wish to avoid or postpone pregnancy but are not using contraception. The never married women and the formerly married women (who include the widowed, the divorced and those who have separated from their husbands) are not part of this study. This is because, it is the married women who are the most vulnerable group in experiencing unmet need for contraception since most reproductive activities take place within marital unions. Further, the traditional measure of unmet need has largely been focusing on the married women and thus its methodology is much better developed as compared to measures targeting other subsets of the population.

The 1998 KDHS upon which, this study is based adopts the standard formulation largely propounded by Westoff and Bankole (1995) in estimating the extent of unmet need in Kenya. This measure takes women who are married, fecund, and sexually active and are not using any method of contraception but who do not want to have any more children or want to postpone their next birth for at least two more years as having unmet need for contraception. In addition, all pregnant married women or those who are amenorrhoeic who report their pregnancies or their last pregnancies as unintended or mistimed are equally defined as having unmet need for contraception.

This measure has, however, a number of limitations. First, it does not identify the full extent of unmet need for family planning (Mueller and Germain, 1992) as it excludes the never married and the formerly married women. Additionally, some contraceptive users may have an unmet need if they are using an ineffective method, are using a method incorrectly, or are using a method that is unsafe or unsuitable for them.

Further, according to this measure, the unmet need group does not include pregnant or amenorrhoeic women whose current pregnancy or recent birth was intended even if they do not want to become pregnant again right away. Also, the inclusion of only currently married women or those living in union rather than all sexually active women as the basis for measuring unmet need may imply that other women do not need contraception (Mueller et al., 1992). This is an important limitation, as it tends to underestimate the prevailing levels of unmet need for contraception.

However, since there is no best estimate so far, the Westoff-Bankole estimate of unmet need for contraception will be used in this study. This is one of the most recent estimates and has been widely applied in the estimation of unmet need in a number of DHS countries (Westoff and Bankole 1995; Stash 1999; Ezeh and Bankole 1999).

This study is based on the 1998 KDHS dataset. This is the most reliable and recent data that can currently be used to study this topic on a national scale. Additionally, most of the past studies on unmet need have been based on DHS datasets. Sampling and non sampling errors that may have however, been introduced in this dataset are beyond the control of the researcher. Such errors include sampling wrong households, incorrect coding and data entry, misinterpretation of the questions on the part of the interviewee, incorrect recording of the responses on the part of the

interviewer, and non-response which may compromise the sampling size among other things.

Both descriptive and inferential statistics are used in the data analysis stage with the aid of the statistical package for social sciences (SPSS version 10.1) computer package. The frequencies in this study show the distribution of the respondents by the dependent variable as well as the independent variables. In addition, cross tabulation with the use of the chi-square statistic is used to show the association and magnitude of selected background variables on the dependent variable. For inferential statistics, the multivariate logistic regression analysis is used to determine the probability of having unmet need given the selected independent variables. This study is limited to regression analysis because the dependent variable is dichotomous.

# CHAPTER TWO

# LITERATURE REVIEW

## 2.0 INTRODUCTION

A review of past literature not only point out the existence of a large proportion of currently married women with unmet need for contraception but also shows the diverse estimates that have been utilized in the measure of this concept. For instance, Robey et al., (1996) using Westoff-Ochoa (1992) measure of unmet need for contraception found from Third world DHS countries that over 100 million women who were currently married or in union had unmet need for spacing or limiting births. Locally, it has been estimated that in 1993, 36.5 percent of all married women had unmet need for contraception (NCPD, 1994). Since there has been no change in fertility preferences between 1993 and 1998, it is likely that unmet need for contraception is still rampant (NCPD, et al., 1999).

This review endevours to examine some of the underlying causes of unmet need as well as the methodological issues that have been at the centre stage in the search for the "best" estimate of unmet need for contraception. The purpose of this review is therefore threefold: firstly, it is intended to provide evidence that unmet need for contraception actually exists and is in fact not a statistical artifact. Secondly, it serves as a guide to proper specification of the measurement tools, conceptual framework, hypothesis and interpretation of our analyses. Lastly, it is aimed at simplifying the selection of the desirable predictor variables that have been found to correlate unmet need for contraception.

Proponents of family planning programs have argued that family planning programs have played a big role in terms of diminishing the existence of unwanted fertility and large unmet need for family planning (Freedman and Freedman 1992 cited in Jensen 1995). The standard formulation

of unmet need for contraception has traditionally been defined as currently married women who say either that they do not want any more children or that they want to wait for at least two years before the next birth, but are not using contraception. The measure propounded by Westoff and Bankole (1995), which was also utilised in the 1998 KDHS, is adopted in this study.

The first part of this review examines the methodological issues that have been employed in estimating unmet need for contraception while the second part examines some of the underlying factors that have been found to cause unmet need for contraception.

## 2.1 MEASUREMENT OF UNMET NEED FOR CONTRACEPTION

Studies utilising KAP survey data in the 1960s showed that there existed a gap between some women's reproductive intentions and their contraceptive behaviour. This gap was referred to as KAP-gap and was later renamed unmet need for contraception (Bongaarts, 1991).

In 1978, based on World Fertility Survey (WFS) data from five Asian countries, Westoff published the first comparative estimates of unmet need for limiting births. According to this measure currently married women who were sexually active and wished to use contraceptives to limit their births but were not using contraceptives were categorized as having unmet need for contraception. Estimates of unmet need for contraception to space were not made due to inadequacy of data since WFS data did not ask women about their desire to space births. In addition, Westoff excluded pregnant and amenorrheic women because, according to him, they did not currently need contraception.

Westoff and Pebley (1981) in their measures of unmet need for contraception across 18 third world countries that participated in the WFS confined their attention exclusively to the practice of contraception to avoid any further births. Both of these authors showed differing estimates of

the size of unmet need for contraception to limit births based on a variety of refinements regarding fecundity status, breast feeding status, type of contraceptive method used (modern / all methods) and desire to cease childbearing.

The confinement to limiting births only without incorporating the need for spacing was due to data availability rather than theoretical issues. Given the fact that WFS data did not question women about spacing their next wanted births, it was rational for the measurement of unmet need for contraception to be confined to limiting births only. This confinement is, however, an important limitation, owing to the fact that in sub-Saharan Africa, the need for spacing constitutes the larger proportion of the potential demand for contraception (Westoff and Ochoa, 1991; Ngom 1997:192).

With the coming of Contraceptive Prevalence Survey (CPS), it became possible to calculate unmet need for contraception to space in addition to limiting births. For instance, using CPS data. Anderson and Morris estimated the percentage of women of reproductive age who were "exposed to the risk of unintended pregnancy but were not using contraception" in five Latin American countries.

Before the Nortman - Lewis (1982) model for unmet need for contraception, the earlier models mentioned above produced arbitrary estimates of unmet need for contraception because of their inability to recognize analytically that some women not exposed to the risk of unintended pregnancy one month (and hence not in need of contraception), may be in need the following month. For instance, the Westoff and Pebley 1982 measures of unmet need for contraception were only a point in time models and thus could not account for the changes in the unmet need for contraception status over time. The Nortman - Lewis (1982) measure of unmet need was seen

as the first attempt to measure the total demand for contraception. Using data from CPS, the authors built a model that calculates the number of women with unmet need over a period of one year rather than one point in time. This model operationally differentiated demand into the unmet need for contraception in order to space and limit births.

Despite being a remarkable improvement on unmet need measure over the previous models, Nortman -Lewis (1982) dynamic model has been criticized for being costly in terms of complexity of calculation and description involved. Moreover, their innovative work has not found widespread acceptance owing to the somewhat arbitrary one-year interval over which potential demand was measured. Finally, other writers such as Westoff (1988) have devised simpler estimates of unmet need that produce quite close to the estimates derived from the Nortman-Lewis (1982) dynamic model.

Boulier (1984) using a different approach, constructed high and low estimates of "unmet need" for contraception to limit and to space births for 36 countries based on World Fertility Survey (WFS) and Contraceptive Prevalence Survey (CPS) data. According to these measures, the "low" estimate included women who wanted no more children (or wanted to space births) who were exposed to the risk of pregnancy and who were not using any method of contraception. The "high" estimate, in addition, excluded women who were not using effective contraceptive methods (such as withdrawal, rhythm, douche or abstinence).

Boulier (1984) in his "high" estimate of unmet need for contraception seems to reason that if unmet need is to measure the number of women who would benefit from modern contraception, then users of traditional, inefficient methods should be counted as having unmet need. The author is, however, not alone in questioning the rationale of including traditional methods in the

unmet need for contraception measure. A number of other scholars have also called for limiting the measure to use of modern methods arguing that traditional methods are ineffective and their users are in need of more effective methods (Dixon- Mueller and Germain, 1993; Perez and Palmore, 1997). Inspite of such demands, our knowledge of demographic transition shows that in Western Europe, declines in marital fertility were achieved prior to the use of modern methods (Coale and Watkins, 1986 cited in Bankole and Ezeh 1999:4). Hence when the will to check on fertility is strong, traditional methods can be effectively used.

Boulier (1984) also seems to assume that failure rates of contraceptive use are a preserve of only traditional methods. Yet, there are a number of studies that reveal that traditional methods can be equally effective in regulating fertility. For instance, Caldwell et al., (1988), using data from the Sri Lanka Department of Census and Statistics, found that women preferred traditional methods (such as rhythm) to modern methods (such as the pill and IUD) but exhibited the lowest fertility level among all the countries of South Asia. Moreover, a study in rural Bangladesh found that 46.5 percent of all IUD users experienced expulsion (Croley et al., 1968 cited in Ainsworth 1985) and there are several cases where users conceived even after using the pill, the IUD or the condom.

Westoff's (1988a) model was an improvement of the operational concept of unmet need for contraception in comparison to the foregoing estimates. This model was based on DHS data, which are more detailed than those obtained in the WFS and CPS. For instance, in addition to information on birth limitation, the DHS, like the CPS, collects information on whether or not, women who want more children wish to postpone the next birth and thus allowing the estimation of demand for contraception in order to delay childbearing.

Secondly, unlike earlier surveys, the DHS asks direct questions about postpartum amenorrhoea thus avoiding the necessity of using breast-feeding as a proxy for anovulatory cycles. Thirdly, in contrast to the CPS, the DHS project collects direct information that permits currently pregnant women to be classified according to whether their pregnancy was intentional, mistimed or unwanted, and whether or not they were using birth control at the time of conception.

Using DHS Westoff model (1988a), revised the definition of unmet need to include pregnant and amenorrheic women whose pregnancies were mistimed or unwanted. This model firstly, separates women who are current users of family planning from those who are not. This distinction helps in identifying women who are potentially in need of family planning services. Secondly, it separates women who are pregnant or amenorrheic from those who are not. This is however problematic on several accounts: First, there is some unreliability in the reporting of current pregnancy, especially during the early months of gestation. Additionally, the measurement of postpartum amenorrhoea is subject to both heaping and reporting error, since reporting of the resumption of menses can be unreliable. This is worsened by the fact that pregnancy can occur prior to the resumption of menstruation. Hence, amenorrhoea is an imperfect measure of infecundity though it is a better alternative to breast-feeding as a proxy for the absence of ovulatory cycles.

Westoff (1988a) also includes pregnant women who had wanted to avoid or postpone pregnancy into the unmet need measure. This is because such women will be back in the market for contraceptives soon, yet they represent those in need of family planning services that were "caught" (Westoff 1988a: 47). In summary, Westoff considers the following categories of married women as having unmet need for contraception:

- Pregnant or amenorrheic women whose current or most recent pregnancy was mistimed

or unwanted, and non pregnant, non-amenorrheic women who are fecund and wish to postpone their next birth or wish to terminate childbearing.

The Westoff (1988a) definition is thus an improvement over Westoff - Pebley (1982) model that excluded pregnant or amenorrheic women whose current or most recent pregnancy was mistimed or unwanted from the measure of unmet need for family planning (for details see page 13).

A further refinement on Westoff's model is seen in Westoff and Ochoa (1991) model. While Westoff's model, included pregnant or amenorrheic women who had failed with a contraceptive method into the measure of unmet need, the Westoff - Ochoa (1991) estimates excludes these women. This is consistent with the fact that only nonusers are included in the whole scheme. Thus, if every woman were pregnant because her method failed, then there would be an unmet need for more reliable contraception, not an unmet need for family planning as such. A part from this refinement, the Westoff - Ochoa (1991) estimate defines categories of women in need of family planning as defined in the Westoff's model shown above.

Bongaarts (1991), however, critiques Westoff - Ochoa measures on two accounts. Firstly, that although their measure has the appeal of simplicity, its interpretation is not straightforward; that by combining women who are currently in need of contraception with those who had unmet need before their unintended pregnancy but are not actually in need at the time of the survey, it is not clear what this amounts to. Bongaarts argument is valid given the fact that the periodicity assumption is central in the measure of unmet need. Recognizing this fact, Ezeh and Bankole (1999) argue that any measure of unmet need that fails to take into account the periodicity assumption loses its meaning in setting program target goals and measuring program success.

Secondly, Bongaarts (1991) argues that Westoff's (1991) measure is frequently misinterpreted, as an estimate of the additional contraceptive prevalence that would have been observed had past obstacles to use not existed. By this, Bongaarts argues that Westoff implicitly assumes that unintentionally pregnant and amenorrheic women would be current users of contraception if they were fully implementing their reproductive preferences, an assumption, which may not be accurate.

Bongaarts further argues that Westoff-Ochoa definition from the way it is, overestimates the true level of unmet need measure on two accounts: - firstly, he argues that the level of contraceptive prevalence required to satisfy the demand for contraception to space is substantially smaller than the proportion of women estimated by Westoff to have an unmet need for spacing. The author further argues that satisfying the unmet need for spacing reduces the need for contraception for limiting purposes. Therefore, he proposes adjustments to Westoff's procedure to avoid the errors in the estimates of unmet need and total demand that result from Westoff-Ochoa assumptions.

Bongaarts model has two major adjustments based on the Westoff-Ochoa (1991) model. Firstly, he attempts to adjust the measure, to take into account the fact that in the steady state, the satisfaction of spacing needs would reduce the need for limiting. This is so simply because women will be older at the time they complete their desired fertility and will accordingly be exposed to the risk of an unwanted birth for a shorter period of time.

The second adjustment tries to take into account the fact that current spacers will sooner or later deliberately discontinue contraception in order to have a child. The purpose of this adjustment according to Bongaarts is to provide a better estimate of what contraceptive prevalence would be in the future if the unmet need for spacing were satisfied. Bongaarts adjustments yield a

minimum and maximum estimate of unmet need depending on whether only the first or both adjustments are incorporated and thus result in a range from which he then takes the average. There is no doubt that Bongaarts definition of unmet need for contraception is plausible. However, like in the preceding models discussed under this section, the question asked to women in the DHS to ascertain their desire or ideal family size (whose answer is central in the computation of Bongaarts (1991) estimate) is bound to yield wrong information. Respondents are asked, *" If you could (go back to the time you did not have any children and you could) choose exactly the number of children to have in your whole life, how many could that be?"*

The disadvantage with the above question as a measure of determining family size includes rationalization by respondents, and the difficulty some respondents have in understanding abstract concepts. Answers given by respondents in countries, which have mass media campaigns promoting family planning, may be influenced by the number of children suggested in these campaigns (Rodgers, 1976; Westoff, 1991 cited in Sri Poedjastoeti 1991: 1870). Needless to say, Kenya is not an exception to this bias given the considerable impact that exposure to mass media has had on contraceptive use. The complexity involved in computing Bongaarts (1991) measure also renders it unpopular.

This study therefore, utilizes Westoff and Bankole (1995) definition to measure unmet need for contraception in Kenya because this measure is easy to compute. This measure was also used in the 1998 KDHS survey dataset. Applying this measure to 27 DHS countries (14 of which were Sub-Saharan countries), where surveys were done between 1990 and 1994, the authors found that unmet need for contraception ranged from 35.6 percent in Malawi to 11.2 percent in Turkey. According to this study, 35.5 percent of the currently married women in Kenya had unmet need for contraception. The Westoff and Bankole (1995) definition is exactly the same as Westoff-

Ochoa (1991) definition apart from the fact that the definition of infecundity has been expanded to include women who said that they were unable to get pregnant or did not intend to use contraception because they had reached menopause. Additionally, the cutoff for menstruation period has been changed to six months rather than six weeks as in Westoff-Ochoa definition. Finally, women who were pregnant or amenorrheic have been re-classified as having the need for limiting if they reported the pregnancy as never wanted and had no intention to have more children in the future.

The choice of Westoff and Bankole definition in this study is based on several factors: - Firstly, it incorporates time as a factor in the estimation of unmet need for contraception. This allows for the fact that exposure is not constant, that pregnancy is a temporary state, that breast-feeding is not a reliable contraceptive method beyond the anovulation postpartum period, and that a change in the contraceptive prevalence affects the percentage of demand satisfied.

Secondly, the measure allows for changes in exposure to the risk of unintended pregnancy. Thirdly, it recognizes that pregnancy and breast-feeding women who are frequently excluded from estimates of contraception need, rejoin the group of exposed women and require contraceptive protection for at least part of the time under review.

The Westoff-Bankole (1995), definition is also the best choice at the moment owing to the fact that this model is gaining popularity very fast. For instance, in a very recent study by Stash (1999: 271) in Chitwan District in rural Nepal, the author estimated the level of unmet need using the Westoff-Bankole 1995 definition. Findings from this study revealed that 18 percent of currently married women aged 15-49 had unmet need for contraception for spacing while approximately 13 percent had unmet need for limiting births.

Likewise. Bankole and Ezeh (1999) using matched data for couples from six DHS countries compared their estimates of unmet need for contraception among couples with those computed from Westoff-Bankole (1995) definition in order to gauge the overestimation of unmet need that results from the exclusion of husbands in the former measurement. According to this study, the Westoff-Bankole definition of unmet need for contraception ranged from 36.7 percent in Kenya to 14.3 percent in Zimbabwe while the couple measure of unmet need ranged from 15.3 percent in Uganda. to 5.2 percent in Zimbabwe.

## 2.2 FACTORS UNDERLYING UNMET NEED FOR CONTRACEPTION

There are various factors that affect unmet need for contraception among the currently married women as revealed by past studies. However, the commonly cited ones (Bongaarts and Bruce, 1995; Robey et al., 1996; and Westoff and Bankole, 1995) are: weakly held fertility preferences; little perceived risk of conceiving and lack of knowledge of means of avoiding pregnancy, including modern contraception. Others include perceptions that practicing contraception is socially and culturally unacceptable; fear of side effects on health; inadequate family planning services (inaccessible or of poor quality); and opposition from husband, or other relatives.

Unmet need for contraception has also been found to vary with age, educational attainment of the mother. type of place of residence. ethnicity and number of living children a woman has and period of time since last birth (Robey et al., 1996). Most of these factors are reviewed in order to enable us select variables (from 1998 KDHS for further analyses) that are most likely to determine unmet need for contraception in the Kenyan context.

### 2.2.1 Lack of accessibility to contraceptive services

Casterline. et al., (1997) in their study of factors underlying unmet need for contraception in the Philippines found that inaccessible family planning services appeared to carry little weight in the Philippines. Bongaarts and Bruce (1995) while analyzing the DHS data for 13 countries observed

that unmet need exists because there is a cost associated with practicing contraception - that is lack of information about contraception. For Easterlin (1975), cost not only includes expenses for commodities, travel and services, but also health, psychological and social considerations brought into play as women decide whether or not to adopt or continue a method.

A survey done in Bangladesh also found that apart from the side effects and anticipated consequences on health, many potential users of family planning methods lost interest in practice and discontinued the methods owing to such situational obstacles like distance to service points from home, lack of privacy in clinics, and lack of proper facilities (Mia et al 1977 cited in Alauddin and Faruquee 1983).

According to WFS, women who know of an outlet less than 30 minutes away, are more likely to practice contraception in both urban and rural areas of Korea, Malaysia, Paraguay, and Venezuela, and in rural areas of Columbia, Mexico, and the Philippines than women who know of outlets at greater distances (Lightbuorne and Singh 1982 cited in Ainsworth 1985).

In a multi-country study at institutions providing maternal care the Association for Voluntary Surgical Contraception (AVSC) found substantial unmet need for contraception information during the postpartum period. The unmet need was greatest in Columbia, India, and Turkey, where those services are limited or did not exist. By contrast, hospitals in Mali and Kenya clearly met the demand for postpartum IUD insertions. A survey in Kenya by AVSC and Family Health International (FHI) for instance revealed that about one for every four mothers interviewed left the hospital with an IUD (Family Health International, 1994).

Although many studies suggest that distance to service points has some inhibiting effect, relevant evidence points out the fact that "except in settings with low densities of service points, it is

apparently not an overriding deterrent to contraceptive use" (Bongaarts and Bruce 1995:61). Given a high density of contraceptive service points in Kenya (NCPD, et al., 1999), this factor is unlikely to be important in explaining the variations in the level of unmet need for family planning and thus is excluded from this study.

### 2.2.2 Lack of Knowledge about Contraception

Another principal cause of unmet need in developing countries is lack of knowledge. For instance in their analysis of DHS data for 13 sub-Saharan countries, Bongaarts and Bruce (1995) found that in totality, more than half of the women with unmet need lacked knowledge of a method in all the countries with the exception of Kenya.

Generally, it has been stated that "lack of familiarity with the characteristics of a product, how it will be used, how it will be perceived, what the associated side effects may be, etc., are barriers to the adoption of all new products, including the contraceptives" (Mauldin 1979:91 cited in Ainsworth 1985:31).

In Bangladesh, Alauddin and Faruquee (1983) found that poor knowledge of methods and the low socio-economic status of some family planning village workers accounted for their limited success in motivational work. Using WFS data for 7 countries, Pebley and Bracket (1982) found that knowledge of a contraceptive outlet had a significant and positive effect on contraceptive use even when factors such as age, parity, education, husband's occupation, residence and fertility desires were held constant.

Westoff and Bankole (1995) in their analysis of DHS data for 27 countries concluded that though lack of knowledge about methods is an obstacle to use in Sub-Saharan Africa, it is much more easily overcome than attitudes related to religion or other forms of opposition.

Likewise, Ross (1994) in his analysis of demographic data found that half of the women not using contraception in low prevalence countries lacked knowledge of family planning. In Kenya knowledge of family planning is almost universal (that is about 97 percent of women know at least one method of family planning method), thus it is unlikely that this factor is significant in determining contraceptive adoption among women with unmet need and thus will be excluded in this study.

### 2.2.3 Side Effects and Health Concerns About Contraception

A direct inquiry into the causes of non-use indicates that health concerns and side effects of contraceptive methods play a predominant role. For instance, in a DHS survey for 10 countries, among women who expressed concern regarding the three most frequently used methods (that is the pill, the IUD, and sterilization), health concerns were expressed with greater frequency than any other problem (Bongaarts and Bruce 1995: 63).

A follow-up of past family planning acceptors also indicates that discontinuation is due to side effects. For instance, Ainsworth (1985: 20) while analyzing contraceptive prevalence survey found that in Bangladesh, Barbados, Columbia and Honduras, 10-25 percent of discontinuers cited side effects as the most important reason. Estimates made by Quddus (1979 cited in Ainsworth 1985) further show that in Bangladesh, 62.3 percent of contraceptive acceptors discontinued a method because of side effects. Osteria et al., (1978 cited in Ainsworth 1985) also reported that a decline in the use of the pill in Bangladesh from 17.1 percent to 8.7 percent between 1975 and 1977 was due to side effects.

Bongaarts and Bruce (1995) using DHS data found that health concerns reduced prevalence on average by 71 percent for the pill, 86 percent for the IUD and 52 percent for the sterilization. In the Philippines, 66 percent of those who stopped using the pill and 43 percent of those using the

IUD cited the reason of side effects.

While evaluating the gradual decline in the rate of acceptance following a programs of intensive distribution. Khan et al (1977 cited in Ainsworth 1985), identified two main problems responsible for the failure of continuation; first was the intrinsic factors related to the methods. such as side effects which lead to a high drop out rate and second, was the programs deficiencies, such as male distribution and the lack of follow up services and treatment facilities.

Further. the CPS for five countries revealed that pill users are more likely to discontinue for a desired pregnancy, side effects. and personal reasons, while IUD users are more likely to have the device removed due to side effects (Ainsworth 1985:20). Spontaneous expulsion of the IUD is also an important reason for discontinuation (Kreager 1977, Laing 1974, cited in Ainswoth 1985:20). For instance. in Java-Bali, pill users are more likely to discontinue because of desired pregnancy. health reasons and physical or emotional reasons than users of other methods (Teachman et al., 1980 cited in Ainsworth 1985).

In rural Bangladesh. one of the early studies of IUD retention reported that 60 percent of all IUD users experienced side effects while expulsion was reported in 46.5 percent of all the cases (Croley et al 1968 cited in Ainsworth 1985). Likewise, many couples because of their bothersome use and diminished sexual enjoyment disliked jelly and condoms. Even though there was widespread knowledge of sterilization as a contraceptive device, the acceptance rate was lower than for other contraceptive methods. A number of studies reported postoperative health problems and sexual impotency as the main concerns of the clients before their acceptance for sterilization (Alauddin and Faruquee 1983).

The problem of side effects is important owing to the fact that it has usually been compounded by widespread rumors of rare or unproved side effects. For instance rumors which circulate about the pill often implicate it as a cause of cancer, and in Mexico the pill is believed to cause birth defects in children conceived after the method is discontinued (Schearer 1983, Warwick 1982 cited in Ainsworth 1985). In Kenya, it has been observed that many people are aware of family planning, but fears and rumors about the methods plague the majority. In addition, those who are willing to contracept are filled with doubts on their safety. Not surprising then, it has been found that 50 percent of those who opt to try contraceptive methods discontinue or need further counseling to continue using (Ainsworth 1985).

### 2.2.4 Husband Approval of Family Planning

Opposition from husbands is another reason that has been cited as a cause of unmet need for family planning among married women. There is enough evidence to show that many women do not use contraception because their husbands are opposed to it (Casterline et al., 1997; Rutenberg and Watkins, et al., 1996). According to Nag (1984), a woman may have unmet need for contraception because of the high "social cost of challenging the opposition from her spouse or anyone else in her social influence group" (Nag 1984 cited in Robey et al., 1996:15).

Bongaarts and Bruce (1995) found that in seven Sub Saharan Africa countries, contraceptive use among women whose husbands disapprove of family planning averages only one third as much as among women whose husbands approve of it. Further they found that in Kenya, 28.6 percent of the husbands disapproved family planning, 49.6 percent approved and 21.6 percent did not know. Furthermore, 34.5 percent of the couples had never discussed about family planning. In fact, they found that 68 percent of women who reported their husbands as disapproving had never discussed family planning with them.

Bongaarts and Bruce (1995: 64) concluded that the above finding is likely the result of an asymmetrical male - female power relationship and women's concerns about not offending their husbands. This asymmetry means that when spouses disagree, women's family planning aspirations will be more often frustrated than men's (Biddlecom et al., 1997).

Biddlecom et al., (1997) in their analysis of spouses' views of contraception in the Philippines found that nearly 20 percent of that need could be attributed to husbands' negative perceptions of contraception and its attributes. For Ngom (1997:195), the existing patterns of reproductive control suggest that husbands' pro-natalist attitudes may dampen wives' willingness to adopt family planning. He further argues that because of wide discrepancies between husbands and wife's unmet need statuses; family planning programs that foster spousal communication are likely to facilitate the transition to lower fertility.

Casterline et al., (1997:182) in their study of the underlying causes of unmet need for contraception in the Philippines found that the conflicting preferences of spouses and the pro-natalism of some husbands make an important contribution to unmet need for family planning. Further they found that women with unmet need for contraception are more likely to describe their husbands as controlling decisions about fertility and contraception.

Using the 1988 DHS data from Ghana and qualitative information from focused group discussions, Ezeh (1993:163) found that spousal influence, rather than being mutual or reciprocal, is an exclusive right exercised only by the husband. Using a multivariate logit regression analysis, the author found that, whereas the effect of men's attitudes on the attitude of their wives is significantly different from zero, the effect of women's attitudes on those of their husbands is not. The author concluded that men's influence over their wives' contraceptive

attitudes seems to operate both through their comparative advantage in mate selection and through cultural norms that subjugate women to men.

Lasee and Becker (1997) in their analysis of 1989 KDHS couple data, however, found that both knowledge and approval of family planning are virtually universal in Kenya. Among 98 percent of couples, these authors found that one or both partners know at least one modern method, and that among 85 percent of couples, both partners approve of family planning. Despite this, both of these authors found that although discussion with the partner about family planning was reported in 82 percent of the couples, only 67 percent of wives and 75 percent of husbands correctly predicted their spouses' approval of family planning.

Although disapproval may come from some other source other than the husband, there is overwhelming evidence that husband's approval is an important determinant of unmet need for contraception among currently married women. For instance, Rutenberg and Watkins (1997:294) carrying out a study in Nyanza with the use of Focused Group Discussions found that disapproval of family planning by mother in laws could hinder contraceptive use by the daughter in laws. Further they found that women were more willing to discuss about family planning with people who they think approve of it and they thus rarely mentioned men as conversational partners.

In an evaluation of the radio soap opera on contraceptive use in Tanzania, Rogers et al., (1999:42) found that there was a statistically significant association between *"Twende na wakati"* (an entertainment-education radio soap opera that was broadcast on Tanzania Radio station) and approval of family planning. The authors further found that approval of family planning increased by 3 percent in the treatment area and decreased by 6 percent in the comparison area

between 1993 -1995.

### 2.2.5 Spousal communication about family planning

Spousal communication is another important factor of unmet need for family planning. Biddlecom et al (1997) in their analysis of 1993 Philippines survey for instance found that the amount of communication between partners was positively associated with contraceptive use. From a couple level analysis, they found that there appeared to be much less agreement between spouses. One half to two-thirds of the couples sampled shared the same view. However approximately one-third of the spouses did not accurately perceive their partner's approval. A further analysis of spousal agreement about approval revealed that when spouses disagreed (especially about relatives and friends' approval), husbands were less approving. Yet it has been documented that where there is low approval, there is a likelihood of differing views between spouses, which will then stymie contraceptive use (Biddlecom et al 1997:114).

In an evaluation of a radio soap opera on family planning, Rogers et al (1999: 43) did a cross sectional analyses of the 1996 Tanzania DHS data which showed a significant association with exposure to the soap opera- *"Twende na wakati"*. It was found that the there was a significant association between the soap opera and (1) spousal discussion of ideal family size, (2) spousal discussion about family planning, and intention to use a family planning method. The authors concluded that exposure to the radio soap opera stimulated spousal communication about family planning, which in turn was related to the adoption of family planning methods.

Couples desire for children also influences contraceptive use. For instance, in a study done by Ferguson (1992) in Kenya, it was found that among women who had stopped using contraception for reasons other than having another child, 12 percent had stopped because their husbands wanted another child or had forced them to discontinue for another reason. Casterline

et al., (1997) carrying out a study in the Philippines found that the husbands of women with unmet need for contraception were more pro-natalist as compared to the husbands of contraceptive users.

### 2.2.6 Age of the women and number of living children

Past studies also show an association between unmet need for contraception and age of the woman. For instance, in a CPS survey in five countries, desired pregnancy and health reasons were found to be more important reasons for non-use among younger women. Among older women of higher parity who had discontinued, non-exposure was relatively more important for non-use (Teachman et al., 1980; Nair and Smith 1984 cited in Ainsworth 1985:22).

Westoff and Pebley (1981) in their study of 18 Third World countries that participated in the WFS found that generally, unmet need for contraception typically increases with age until age 35-39, and declines afterwards. The exceptions to the above pattern were observed in Bangladesh and Pakistan where unmet need for contraception increases sharply from the early to the middle years of childbearing, and falls to low levels for the 45-49 years.

The authors concluded that the increase in unmet need for contraception with age is due to a dramatic decline in the proportions of women who want- and have- more children as they get older. On the other hand, the dramatic decline in unmet need at the end of the childbearing period results from a rapid increase in the proportions not at risk of pregnancy because of infecundity.

On the other hand, Westoff and Bankole (1995) in their analysis of DHS data for 27 countries found little overall relationship between current age and total unmet need for contraception. This was because of the offsetting positive and negative associations between age and the need for

spacing (which declines with age) and the need for limiting (which increases with age). Decomposing unmet need for contraception, both of these authors found that the need for spacing begins to decline after age 30, whereas the need for limiting peaks at age 35-44.

Robey et al (1996:17), in their review report argue that most unmet need among younger women, like most contraceptive use, is for spacing births, because younger women still want to have more children. However, among older women, most unmet need for contraception and most contraceptive use is for limiting births because older women have had as many children as they want, and often more. These authors argue that the need for limiting typically peaks among women in their late thirties or early forties and thereafter declines.

Applying multivariate analysis to Kenya Demographic and Health Survey (KDHS) of 1993, Karanja (1997), found that women of older ages were less likely to have unmet need for contraception to space as compared to those aged 15-19 years. For instance, he found that women aged 45-49 years were only 0.0234 times more likely to have unmet need for contraception to space as compared to those aged 15-19 years. The author however did not find any consistent relationship between unmet need for contraception to limit and total unmet need for contraception on the one hand and age on the other hand.

The author attributed these unexpected findings to the contrasting effects of unmet need for contraception to space and unmet need for contraception to limit, which appear to render an inconsistent association between total unmet need for contraception with age.

In a related study, Lwanga (1999) using the 1996 Zambia Demographic and Health Survey (ZDHS) found that unmet need for contraception only increases with age reaching the peak at

age 20-24 (25.7 percent) and drops thereafter. The author also found that unmet need to limit increased with age reaching the peak of 24.3 percent at age 35-44 years and declined thereafter. Multivariate analysis revealed however that although the association between age and unmet need for contraception to space was negative, the association became positive with unmet need for contraception to limit. According to Lwanga (1999), the observed relationship may be due to the stage in the family formation cycle where younger women have just entered family formation and hence are more in need of contraception for spacing as compared to the older women who appear to be much more in need of limiting births.

The association between number of living children and unmet need for contraception is almost similar to that between age of the woman and unmet need for contraception. Westoff and Bankole (1995:9) for instance found that like age, unmet need for contraception to limit births tends to increase with number of living children while that to space births declines after three surviving children. On the overall however, there seems to be little association between unmet need and number of living children due to the offsetting effect between the two components of unmet need (spacing vis-a-vis limiting).

Except in few countries (such as Bolivia and Peru), Westoff and Bankole (1995) found that there is little evidence of an unmet need for contraception to space among women with no children. The authors however found that the need begins mainly after the birth of the first child and peaks at three children and declines thereafter. Looking at unmet need for contraception to limit, the authors noted that the proportion of women with unmet need to limit remains low (under 10 percent) up to women with four children and rises sharply thereafter.

Westoff and Pebley (1982) in their study of 18 WFS countries found that the proportion of women classified as in need of contraception increases regularly in each country. Unmet need for contraception increased with the number of children a woman had, starting virtually at zero and reaching an average level of 12 percent for women with five or more children. This study however focused only on unmet need for contraception to limit births since WFS did not collect data on women's need for spacing births.

In Zambia, it was also observed that a positive and significant association exists between unmet need to space and number of living children (Lwanga 1999). Although Lwanga (1999) found a positive association between unmet need for contraception and unmet need to limit, the association was not significant and the standard error was large hence the interpretation is to be done with caution. The author concluded that the positive association between unmet need for contraception and the number of living children is a pointer to the fact that childless women may want to have a child soon and therefore may not need contraceptives.

The number of living children a woman has has a negative association with unmet need for contraception. However, in rural Nepal, Stash (1999:271) found that the number of living children *per se* seemed not to matter very much but son preference did. The author found that although several women stated their clear preference for limiting childbearing (typically explaining that too many children were difficult to feed and care for), many greatly desired the birth of one son or more.

Stash (1999:271) also found that where women's preferences regarding the birth of additional children varied during the span of interviews, it reflected the influence of a strong cultural preference for sons (in conjunction with the consideration of the costs of having additional

children) and the demands of influential family members.

### 2.2.7 Educational attainment of the respondent

Other correlates of unmet need include place of residence, level of education of the woman and exposure to mass media. Unmet need has for instance been found to decline with increasing level of schooling (Westoff and Bankole 1995; Ainsworth 1985; Ngom 1987). Women with few children who want no additional children are likely to be drawn from the more educated segments of society and hence, to be using contraception; whereas those with larger families are more likely never to have used contraception and perhaps, to be more ambivalent about future childbearing (Westoff, 1978).

Yet according to NCPD et al., (1998), it is women who had not yet completed primary schooling that had the highest level of unmet need for contraception (32.5 percent), followed by those with no education and lastly with secondary education and above. Similarly, in a comparative analysis of WFS data, it was also found that education of women exerts an important influence on contraceptive practice, but by itself seems to fall short of explaining international variations (Westoff 1978). Suffice it to say, education of women shows the expected effect on contraceptive practice, but at the same level of education there is considerable variation across countries, suggesting that education alone, is far from sufficient to erase the effects of other factors.

Westoff and Pebley (1982:134) found a negative association between unmet need for contraception and educational level. It was found that the difference between women with no education and those with in the highest education is quite large in some countries, and averages about 5.6 percent.

### 2.2.8 Exposure to Mass Media

Exposure to mass media is also an important unmet need for contraception. An important illustration of this is demonstrated by a study done by Kane et al (1997), in Bamako, Mali to evaluate a 1993 Information Education and Communication (IEC) campaign that integrated traditional forms of communications and modern mass media to present family planning messages through radio and television to men and women. According to this study, reductions in the proportion of both men and women who think talking about family planning with their spouses is difficult were observed.

For men, the decrease was from 11 percent for the baseline survey to 6 percent in the post-intervention survey while among women, the change was from 17 percent to 13 percent respectively. Also, there were significant declines in the proportion of both men and women who believed that Islam opposes family planning. For instance among women, this ranged from 57 percent in the baseline survey who believed that Islam is against family planning to only 17 percent in the post-intervention survey who said they believed that this was so.

Exposure to mass media tends to increase contraceptive prevalence, which in turn reduces unmet need for contraceptive use. In Bamako, Mali, Kane et al., (1997) found that after intervention, modern contraception among the married women increased from 12 percent in November - December 1992 to 15 percent in the July-August 1993, a high increase after only 7 months yet, before intervention the increase from 6 percent in 1987 to 12 percent in the 1992 baseline survey, had taken 65 months. Thus intervention sped up the acceptance and adoption of contraception.

Rogers et al., (1999:193) in an entertainment-education radio soap opera that was broadcast on Tanzania Radio station found that the program had a strong behavioural effect on family

planning. The authors found that the program increased listener's self-efficiency regarding family planning adoption and influenced listeners to talk with their spouses and peers about contraception. For instance, findings revealed that married women, who listened to "*Twende na wakati*" radio soap opera program, were more likely to be adopters of family planning (49 percent) than were non-listeners (19 percent).

Using multivariate regression analysis, the authors found that there was a significant effect of exposure to the radio soap opera on ideal number of children ($\beta$ = -0.62, $p < 0.01$) and on the number of births reported in the previous year ($\beta$= -0.22, p=0.03). This significance was however, lacking for the 1993-1995 Tanzania DHS.

It should however, be noted that evidence of the effect of mass media campaigns on contraceptive use is mixed. For instance, Mensch et al (1997:25) found that despite renewed attention in the literature to examine the role of mass media campaigns in promoting family planning, having heard such messages had no effect on women's ability to avoid unwanted births in Peru.

### 2.2.9 Type of Place of Residence and Province of Residence

Past studies have not found a consistent association between place of residence and unmet need for contraception. In some studies the difference between urban and rural areas in terms of unmet need for contraception has been significant while in others it has been found to be negligible. For instance, Shah and Ahmed (1982: 36) found that generally, in Pakistan, unmet need for contraception by rural-urban residence was negligible.

Despite this, minor differences were found among four provinces with one province (Baluchistan) having a lower percentage of women in the unmet need category than other

provinces. The authors attributed this difference to the fact that women in Baluchistan desire another child soon and hence are excluded from unmet need for contraception group as compared to other provinces.

However, in their study of 18 WFS, Westoff and Pebley (1982) found that women in urban areas are somewhat less likely to have unmet need for contraception than those in rural areas in all the countries analysed except Pakistan. The authors also noted that despite the above trends, the differences between urban and rural areas are rather small. They concluded that although, in general, urban women are more likely to say they want no more children, and are more likely to be currently at risk of childbearing, these factors are more than counterbalanced by greater contraceptive use among women in urban areas.

Generally, women who live in areas with better services for contraception are selected for certain unobservable characteristics that predispose them to have fewer unwanted births. Alternatively, higher quality services may be deliberately situated in areas where the demand for them is greater (Robey et al., 1997).

## 2.3 THEORETICAL FRAMEWORK

There are various theories that have been formulated and applied to explain use or nonuse of contraceptives among males and females. For instance, the diffusion -of -innovations model is the field's dominant paradigm for understanding and measuring the adoption of modern, clinical contraceptive methods. It portrays potential users as passing sequentially through four stages: becoming aware of the possibility of fertility control, becoming informed about and evaluating the means of fertility control, trying out a contraceptive and adopting a method.

According to the above model, lowering the cost of contraceptive use to those with weak motivation is one acceleration mechanism of fertility transition. The other way of accelerating fertility transition is to increase the contraceptive efficiency of adopters. For Bulatao (1982), costs associated with contraceptive use include such factors as effectiveness, reversibility, side effects and convenience of use and contraindications. This model is however inadequate because unmet need for contraception not only includes modern but traditional or folkloristic methods of contraception as well.

According to the health belief model as applied to change in contraceptive behaviour, an individual would be motivated to use a contraceptive method if he or she has the following four perceptions. First, that he/she is susceptible to unplanned pregnancies or at risk of having a large family size than desired. Second, if she perceives a high degree of negative consequences in terms of health risks or economic or social costs resulting from having a family size larger than desired or from an unplanned pregnancy. Thirdly, if there are potential benefits of practicing contraception and finally, the barriers that must be overcome in order to practice contraception (Becker 1974, Hornik, 1990).

On the other hand, according to Fishbein's theory of reasoned action (Fishbein 1980), contraceptive behaviour may be seen as subject to two major influences: first, is the attitude of the individual toward the practice of contraception and second, the individual's "subjective norm". The later means the belief concerning what the individual's sexual partner(s) will think regarding the practice or non-practice of contraception. This study, however, utilises Casterline et al., (1997) to study the correlates of unmet need for contraception in Kenya because Casterline's model is the most intensive empirical research that has been done on this subject to date (Casterline, et al., 1997:174).

Casterline et al., (1997), in their formulation of this framework were influenced by the insight that attitude-behaviour consistency is conditioned by the strength of motivation and by the opportunities and resources available to carry out the behaviour implied by the attitudes. In addition, they were also influenced by the past literature advanced in the study of the problem of non-use of contraception among couples that are apparently motivated to use contraceptives.

On the basis of these influences, the authors posit two sets of explanations for unmet need for contraception. First, that unmet need for family planning is an artifact of survey measurement. That people's fertility preferences are inaccurately measured in the DHS surveys and so is contraceptive practice. Unfortunately, this explanation has no support from their study.

Assuming that the first explanation is therefore unrealistic, the authors propose a second set of explanation based on existing literature about the causes of unmet need for contraception. According to this explanation, certain factors serve as disincentives or obstacles to use of contraceptives for women who have unmet need for contraception.

From the second explanation, our question is what are these disincentives? In addressing this issue, Casterline et al., (1997:175) seeks explanation from past literature and cites a number of the major underlying causes advanced for the observed levels of unmet need for contraception. These range from weakly held fertility preferences; little perceived risk of conceiving, including modern contraception; perceptions that practicing contraception is socially and culturally unacceptable; fear of contraceptive effects on health; inadequate family planning services and opposition from husband, other kin and other community members.

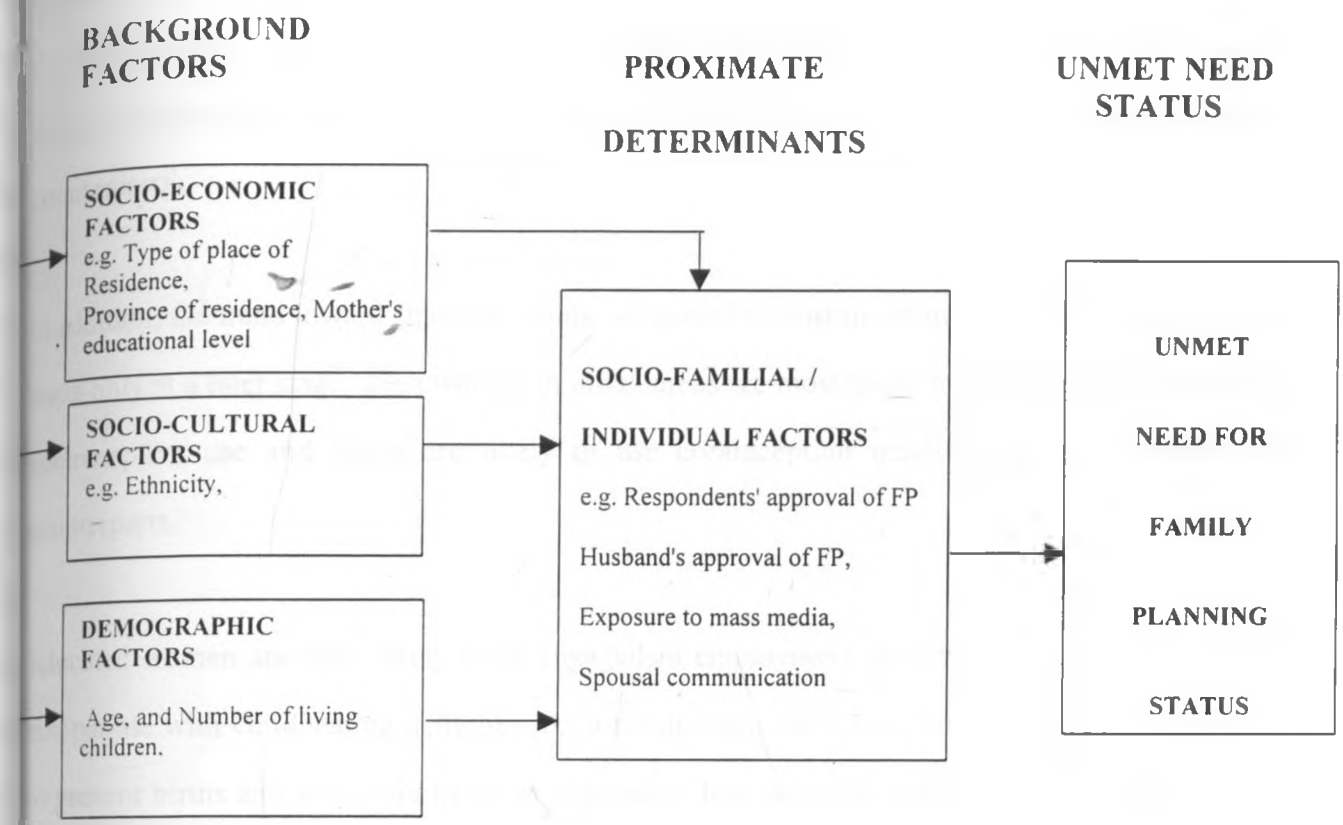
The authors argue that women with unmet need have little motivation to practice contraception, either because of their weak attachment to desires to postpone or terminate childbearing or because a perception that they are at low risk of perceiving. The other possibility proposed is women with unmet need for contraception are uninformed about contraception. Finally that among women who are motivated to use contraceptives and informed about methods, various obstacles (social, economic, cultural) may prevent their adopting and continuing use of contraceptive methods.

Basing on Casterline's et al., (1997) theoretical framework, this study advances the assumption that due to social, economic and cultural obstacles that exist, a considerable proportion of fecund, married women who are sexually active and wish to practice contraception end up not doing so. However before these barriers to contraception come into limelight, the strength to practice contraception must first be confirmed and; secondly, appropriate knowledge about contraception must be assessed.

## 2.4 CONCEPTUAL HYPOTHESES

This study will be guided by Casterline et al., (1997), theoretical framework presented in the preceding section. According to this framework socio-economic, socio-cultural, socio-familial and demographic factors act in isolation or affect each other to cause unmet need for contraception among currently married women.

FIG. 2.1 OPERATIONAL MODEL




*Source: Casterline et al.., 1997 Modified*

Type of place of residence has an effect on the level of unmet need for contraception. In urban areas, family planning services are closer to a large majority of the population and this explains why urban residents have comparatively higher levels of contraceptive prevalence rates and lower levels of unmet need than their rural counterparts.

In urban areas, there is proximity to contraceptive services, which accelerates contraceptive adoption as it increases the proportion of users who rely on highly effective clinical methods. This in turn leads to reduced level of unmet need for family planning as compared to rural areas. In addition, proximity to contraceptive facilities reduces the objective costs of contraception.

In rural areas there is a comparatively higher fertility levels and gender inequality. In addition, spouses' fertility desires are likely to be less compatible, given that low levels of education and the confinement of women to social norms further compound this problem. As a result fewer women use contraception and hence experience higher levels of unmet need than their urban counterparts.

In addition, the trend toward "modern" ideas, are bound to start in urban areas and spread to rural areas only at a later stage. Thus women in urban areas are most likely to get new ideas regarding contraceptive use and hence are likely to use contraception much earlier than their rural counterparts.

Educated women are most likely to be engaged in employment activities, which are not easily compatible with childbearing activities. As a result, they easily resort to contraceptive adoption to prevent births and hence are likely to experience low levels of unmet need for contraception than those who are unemployed.

Education also exposes women to a wide range of mass communication as well as face-to-face communication. As a result, a larger proportion of the educated women are likely to listen to radio, watch television or read newspapers than the uneducated. Consequently, they are more likely to understand better the biology of reproduction as well as information about contraception than their uneducated counterparts. This leads to their higher rates of contraceptive use and consequently their lower levels of unmet need than the uneducated.

One other important effect of education is that it lowers the value of children. Children are no longer seen as a form of investment for their parents during old age. Rather they are seen as a

cost that parents have to incur during their upbringing. Thus education is one of the factors that tend to reverse the direction of the inter-generational flow of wealth as the society moves from the traditional stage to the modern one. In the former, children are seen as a source of investment and thus desired, while in the latter, their value to parents is reduced and hence is perceived, as a cost to be incurred and thus are less desired.

Educated women are also likely to marry educated husbands a phenomenon usually referred to as educational homogamy. The educated couples are more likely to have open discussion on various issues including family planning matters. Increased spousal communication is related to increased contraceptive uptake and hence low levels of unmet need and vice versa. Due to increased spousal communication among the educated, their comparatively high coital frequency does not result in higher fertility levels as they use contraceptives much more often than the uneducated. This leads to their lower risk of conception and hence lowers levels of unmet need than the uneducated. It is also argued that the message of family planning and the ability to use contraceptives correctly increases with the mother's education.

Different ethnic groups have different social norms that affect their decisions regarding their reproductive behavior. As a result, some are more pro-natalist than others are. Not surprising then, unmet need for family planning is bound to differ by ethnicity.

There is also a direct, monotonic relationship between total number of living children and unmet need for contraception. Women who have more children that are presently living are more likely to use contraception since the higher number of living children act as an insurance against child loss. Thus they are likely to exhibit lower levels of unmet need as compared with those who have less number of living children.

## 2.5 OPERATIONAL HYPOTHESES

(1). Education is associated with unmet need for contraception. Women with little or no education are likely to be associated with a higher level of unmet need for contraception as compared to women who are better educated.

(2) Type of place of residence affects unmet need for contraception. Urban women are less likely to have unmet need for contraception as compared to rural women.

(3). Age is negatively associated with unmet need for contraception. Age is negatively associated with unmet need for contraception to space but positively associated with unmet need for contraception to limit.

(4). The total number of living children a woman has is positively associated with unmet need for contraception.

(5). Ethnicity affects unmet need for contraception.

(6). Spousal communication is negatively associated with unmet need for contraception. Women who have never initiated a discussion about family planning with their partners are likely to have a higher level of unmet need for contraception as compared to those who have.

(7). Province of residence affects unmet need for contraception.

(8) Husbands approval of family planning is associated with a lower level of unmet need for family planning and vice versa.

(9) Women who are exposed to mass media are associated with a lower level of unmet need for contraception as compared to those who are not.

## 2.6 DEFINITION OF KEY CONCEPTS

**Socio-economic factors:** This refers indicators that shape the lifestyle of women. This includes their type of place of residence, region of residence, and their level of educational attainment.

**Demographic factors:** This entails the age of the respondent and her number of children that

were alive during the time of the survey. This excludes those children who had died by the time of the survey. It is only women who were aged between 15-49 years at the time of survey that are included in this data set.

**Contraceptive Use:** Is the use of a drug, object or method to prevent an act of sexual intercourse from resulting in the woman becoming pregnant.

**Contraceptive Prevalence Rate:** Is the proportion of women currently using contraceptives.

**Unmet Need to space:** This refers to the percentage of women who wish to use family planning methods to space their childbearing but are not contracepting for one reason or another.

**Unmet need to limit:** This refers to the proportion of women who wished to use family planning methods to limit any further births but did not adopt contraception for one reason or another.

**Total unmet need:** Currently married women or those in union are said to have total unmet need if they fecund, sexually active, are not currently contracepting, and wish to use contraception either to space their next wanted pregnancy or to limit further childbearing. Included in this category are pregnant or amenorrhoeic women who owe their pregnancy or amenorrhoea to a mistimed or unwanted pregnancy.

**Socio-familial factors:** This refers to family arrangements that influence the use or non use of contraception by the woman within a family set up. These factors include husband approval of family planning, respondents' approval of family planning, and spousal communication about family planning.

**Socio-cultural factors:** This refers to the norms that govern peoples' reproductive behaviour, which may or may not precipitate their level of unmet need for contraception. Under this, we examine the role of ethnicity in influencing unmet need for contraception. Ethnicity will be grouped as follows: the Kamba, Kikuyu, Kalenjin, Kisii, Luhya, Luo and Other. The last category includes smaller ethnic groups such as the Embu/Meru, Somali, Taita, Taveta and Miji Kenda among other groups.

## 3.2 SAMPLING

The 1998 KDHS sample points were the same as those used in the 1993 KDHS, and were selected from a national master sample maintained by the Central Bureau of Statistics (CBS). From this master sample, called NASSEP-3, were drawn sample points. This was based on a two stage stratified sample of urban and rural sample points and it consisted of 536 sample units. From the entire master plan, 1048 were rural sample points while 325 were urban. Of the 536 clusters that were selected, 92 were urban while 444 were in the rural areas. A total of 530 clusters were successfully sampled while 6 were inaccessible for one reason or the other.

It was seen as impossible to obtain district level data for planning purposes for all the 48 districts lest the sample were expanded to unmanageable size. Therefore, only 15 districts were over-sampled in order to produce reliable estimates of certain variables. These districts were Bungoma, Kakamega, Kericho, Kilifi, Kisii, Machakos, Meru, Murang'a, Nakuru, Nandi, Nyeri, Siaya, South Nyanza, Taita Taveta, and Uasin Gishu. In addition, Nairobi and Mombasa were also targeted. The over-sampling of this survey data disqualifies it from being self- weighting at the national level.

Due to the over-sampling of some districts, the sample weights are used in this analysis to derive nationally representative estimates. Our study makes use of three sets of variables: the background, intermediate and the outcome variables (as shown in the theoretical model above).

## 3.3 QUALITY OF DATA

There were various measures that were undertaken to ensure high quality of the 1998 KDHS. Firstly, a nationally representative data set was selected from NASSEP master plan that is maintained by the Central Bureau of Statistics (CBS). Such a representative sample is important since it was intended that the findings from this data collection should approximately reflect the

demographic and health characteristics of the entire population.

Secondly, the 1998 KDHS utilised four well-designed questionnaires in the data collection namely, the Household questionnaire, the Woman's questionnaire, the Man's questionnaire and the Service Availability questionnaire. Apart from the household questionnaire, which gives the background characteristics of the respondents, the woman's questionnaire is very important in this study. In order to ensure accurate collection of information, the questionnaires were also carefully translated into eight major local languages. After a pre-test was done on the translated questionnaires, modifications were later made on the basis of the results of the pre-test. The pretest was important also as it helped in minimizing non-sampling errors.

The selection of interviewers and field supervisors was carefully done. In addition, the selected staff, most of whom were university graduate students and came from the sampled areas were adequately trained to equip them with skills of probing, keeping the information confidential, being neutral, tactful and friendly to the respondents among other essential aspects of a good interviewer. Leadership skills were also imparted to the Supervisors and editors were also well trained to detect inconsistencies in the collected data even before such data reached the NCPD headquarters that were the coordinators of the whole fieldwork. Lastly each fieldwork team was provided with a four-wheel drive vehicle, to enable them faster movement with the field. The staff was also given a reasonable remuneration package, which was good enough to motivate them to be results oriented. The foregoing procedures undertaken before and during the field worked to reduce the level of sampling and non- sampling errors. For instance, the training minimized non-sampling errors such as failing to locate and interview the correct household, wrong asking or coding of responses, and data entry errors.

The woman's questionnaire among other things asked women about their fertility intentions. This facilitated the computation of a measure of unmet need among the currently married women. One of the questions that respondents were asked was *" if you could (go back to the time you did not have any children and you could) choose exactly the number of children to have in your whole life, how many could that be?"*

The disadvantage with the above question as a measure of determining family size includes rationalization by respondents, and the difficulty some respondents have in understanding abstract concepts. Answers given by respondents in countries that have mass media campaigns (like Kenya) of promoting family planning include the influence of the number of children suggested in these campaigns (Rodgers, 1976; Westoff, 1991 cited in Sri Poedjastoeti 1991: 1870). This appears to be a major setback in the validity of the measure of unmet need.

However it can also be argued that the responses to such a question are randomly distributed among the sampled women irrespective of their unmet need status and hence there is no major bias in the measure. Even if there were to be biases, the fact remains that we do not have the best measure of unmet need (see Westoff 1978) and what counts usually is the purpose served by the measure.

Despite the above precautions, the 1998 KDHS was not self-weighting at the national level and hence the differential sampling rates that were used required the weighting of data. This problem is addressed during the bivariate analysis in this study. The sample size of the weighted data is 4834 women (4009 of which resided in the rural areas and 838 were urban residents). This was necessary to better represent the actual urban-rural distribution of the population sampled and also to compensate for differential non-response and other shortcomings in sample

implementation. Under logistic regression analyses, no weighting of data was done because past authorities have argued that is not necessary to do so (Retherford and Choe 1993).

## 3.4 DATA ANALYSIS TECHNIQUES

Both descriptive and inferential statistics are utilised in this study. The statistical package for social sciences (SPSS Version 10.01) is used for the data analysis. Descriptive statistics involve the use of frequencies and percentages. Bivariate analysis utilises the Cross-tabulations. Cross tabulations are run with the help of the Pearson's chi-square statistic. Multivariate analyses entail the use of stepwise logistic regression analysis since our dependent variable - unmet need for contraception is dichotomous. The relative odds are used in the interpretation of the significant variables included in the logit model of unmet need for contraception while the t-test are computed to show the strength of the association between the values included in the model and unmet need for contraception. In measuring the strength of the relationship between unmet need for contraception by selected characteristics, the level of significance is specified.

## 3.5 FREQUENCY DISTRIBUTIONS

Frequency distribution measures how often an occurrence of a variable and its values occurs in the data set. Frequencies are used in this study therefore to give a summary of the distribution of the currently married women by selected independent and dependent characteristics used in this study. The percentage distribution of the selected characteristics is important in giving us a general idea about how skewed our variables are owing to the fact that in social science, most distributions are rarely absolutely normal (Mugenda and Mugenda 1999: 123).

## 3.6 CROSS TABULATION

In order to measure the relationship between unmet need for contraception by selected characteristics, cross tabulations will be run. Given the fact that the mere associations between our dependent variables (unmet need for contraception to space/limit, overall unmet need for contraception) and the selected independent characteristics do not show the strength of the

relationship, chi-square statistic will be used as well. The chi-square is a statistical technique, which attempts to establish a relationship between two variables, both of which are categorical in nature (Mugenda and Mugenda 1999: 134).

In this study, the chi-square statistic determines the magnitude of the relationship between the dependent variables (overall unmet need for contraception, unmet need for contraception to space and unmet need for contraception to limit) and selected independent variables and shows the strength of the observed relationship. To determine whether or not the measured strength is significant the level of significance (which is usually $\alpha$=0.05) will be specified. The interpretation is that if the association between the dependent variable and any of the selected background characteristics has a significant value, which is less than 0.05, then the relationship is very strong and vice versa. In the computation of chi-square statistic, the following procedures will be followed:

1. The chi-square statistic will be computed using the SPSS analytical package. Mathematically this can be presented as

$$\chi^2 = \Sigma (O_i - E_i) / E_i$$

Where $\chi^2$ = chi square statistic,

$\Sigma$ = Summation

$O_i$ = Observed frequency

$E_i$ = Expected frequency

2. The null hypothesis ($H_o$) will be stated. In our case, this hypothesis states that there is no significant association between any of the three measures of unmet need for contraception and any of the selected independent/ background characteristics.
3. The levels of significance at which the hypothesis is to be tested will be specified as well

(where $\alpha$=0.05).

4. The degree of freedom (which is the number of independent observations in the sample size minus the number of population parameters, which must be estimated from sample observations) will be computed as well. This is presented mathematically as (R-1) (C-1) where R-1=row total minus 1 and (C-1)= column total minus 1. The product of (R-1) (C-1) gives the degree of freedom (d.f.).

5. We will only reject the $H_o$ on account that we have no enough evidence to support it only if, the computed value of the chi-square statistic is equal to or more than the critical/ threshold/ tabulated value of the $\chi^2$ at 0.05 level of significance using a stated degree of freedom.

The use of chi-square statistic has however shortcomings in the sense that it is principally used to test the null hypothesis. There is therefore a need to employ other analytical procedures to test the strength of the association among selected characteristics.

## 3.7 REGRESSION ANALYSIS

The bivariate associations have one important shortcoming - they do not show the effect of other confounding factors that are included in the study on the dependent variable. Further, where the dependent variable is dichotomous, there are several problems in using linear models. One of the problems relates to the linearity of the relationship between a conditional probability and independent variable. In this case, what is needed is a probability model that has the S-shaped feature of the cumulative distribution function (CDF). Although the choice of the CDF is wide, in practice, the logistic and the normal CDFs are chosen. The former gives rise to the logit and the latter to the probit model (Gujarati 1995).

In this study, the dependent variable is dichotomous taking the values of 1 for all the women who had unmet need for contraception and 0 for those who did not have unmet need for contraception. In such a case both the logit and probit models can be used since they guarantee

that the estimated probabilities lie in the 0-1 range and that they are nonlinearly related to the explanatory variables. Despite this, this study will utilize the logit model in estimating the dependent variable, since it is slightly less involved than the probit model.

The fact that logistic regression is slightly less involved as compared to the probit model can be demonstrated by taking the logarithm of the odds ratio, which transforms what appears to be a highly non-linear model to a linear (in the parameter) model that can be estimated within the standard ordinary least squares (OLS) framework. However, in the case of probit, one is required to invert the normal CDF, leading to errors of approximations unless one has a readily available computer routine (Gujarati, 1995).

The logit model assumes that the variables (before dichotomisation) are distributed according to the logistic distribution rather than the normal distribution. In this study, all the independent variables are categorized to meet this objective as indicated later in this chapter. For all practical purposes, the logistic distribution is equivalent to the normal distribution, but there is a dramatic computational parsimony advantage in favour of the logistic model. The logistic function upon which logit model is based may be expressed as:

$$f(x) = 1 / (1 + e^{-bx}) \quad \text{equation 1.}$$

Where $f(x)$ = logistic function,

$X$ = is the variable of interest/ predictor variable,

$B$ = is a "scaling" parameter,

$E$ = is the base of the natural logarithm.

It turns out that the log of the odds {that is the ratio that an event will occur ($f_x$), to the event that it will not occur ($1-f_x$)} is equal to bx.

Thus log $\{fx / 1 - f_x\} = bx$...Equation 2.

The above equation however is applicable in the case of simple logistic regression where the dichotomous variable f(x) is expressed as a non-linear function of the explanatory variable x. However, in real life, phenomenon is affected by more than one factor and hence this necessitates the use of multivariate logit analysis.

## 3.8 MULTIVARIATE REGRESSION ANALYSIS

The multivariate logistic analysis is important since unlike simple logistic regression, it entails the introduction of additional variables in the model. These additional variables are important in reducing the stochastic error. The stochastic error is defined as the effect on the dependent variable of many omitted variables, each with an individually small effect.

The logistic regression relates the log odds (logits) to a set of variables and is often expressed in terms of logits. The ratio that an event will occur ($P_x$), to the event that it will not occur ($q_x$), is called the odds. Therefore, in this study the odds ratio will simply refer to the probability that a woman has unmet need for contraception to the probability that she does not. Thus when we talk of a logit, we are simply referring to the natural logarithm of the odds. The logistic regression model can mathematically be expressed as:

$$\text{Ln}\,(P_x / q_x) = \beta_0 + \beta_1 x_1 + \beta_2 x_2 + \ldots + \beta_n x_n + \varepsilon \ldots \text{Equation 3.}$$

Where, $P_x$ = probability that an event will occur (in our case, is the probability that a woman will have unmet need for contraception),

$q_x$ = Probability that an event will not occur (in our case, the probability that a woman will not have unmet need for contraception),

ln = natural log which is approximately equal to 2.71828.

$\beta_0$ to $\beta n$ = are logistic regression coefficients. They represent unknown parameters that have to be estimated basing on data obtained on the

independent variable ($x_1, x_n$)

$x_1 .. + x_n$ = are dichotomous/ interval independent or predictor variables which are basically expressed as a series of dichotomised variables and

$\varepsilon$ = the error term.

Expressed in terms of logits as shown in equation 3, a unit change in the variable $x_1$, changes the logit of risk Ln ($P_x$ /$q_x$) by an amount $\beta n$. The logit model is a linear function of the variables $x_1 + x_n$ indicating that the effect of $x_1$ does not depend on the values of the other variables.

Each $\beta_1$ measures the change in the logit of risk resulting from a change of one standard deviation in the variable $x_1$. In this study, each predictor variable has a reference category. The reference category selected, was one that theoretically exhibited the lowest risk of unmet need for contraception. For instance, women who reside in urban areas are more likely to be contraceptive users and hence are less likely to have unmet need for contraception as compared to those who reside in rural areas (see chapter 2). Thus for type of place of residence, urban is used as our reference category.

## 3.9 INTERPRETATION OF LOGISTIC REGRESSION COEFFICIENTS

In interpreting the logistic regression, the odds of an event occurring are mostly used. The odds of an event occurring are defined as the ratio of the probability that that event occurs to the probability that it will not. In order to use the odds, the logistic regression model is rearranged and rewritten in terms of the log of the odds, which is called a logit. This is as shown below:

$$\frac{\text{Log \{prob. (event)\}}}{\text{Prob. (no event)}} = b_0 + b_1x_1 + ...+ b_px_p ...\text{equation 4.}$$

From the above equation, it is clear that the logistic coefficient can be interpreted as the change in the log odds associated with one unit change in the independent variable. But it is easier to think of odds rather than log odds. Thus the logit model can be written as:

Prob. (event)
---------- $= E^{(b0 - b1X1 - \ -bpXp)}$...equation 5.
Prob. (no event)

The then e raised to the power b1 is the factor by which the odds change when the $i^{th}$ independent variable increases by one unit. If b is positive, this factor will be greater than 1, which means that the odds are increased: If b is negative, the factor will be less than 1, which means that the odds are decreased. When b is 0, the factor equals 1, which leaves the odds unchanged.

In our case, the probability of having unmet need for family planning is predicted to be dependent upon (or to be correlated with) the selected independent characteristics of married women such as the age of the woman, her number of living children, ethnicity, and her educational level among others. Supposing that exposure to radio was represented by $x_1$ for those who listened to radio daily and $x_2$ for those who did not and that this covariate increased the odds of unmet need to space by say, 1.3456 times, then we can interpret a shift from women $x_1$ to $x_2$ to be associated with a 1.3456 times increase in the logit of unmet need for spacing. The coefficients represent the magnitude of the increase in the log odds of having unmet need when there is a unit increase in the predictor variables (in this case exposure to radio). In summary, each can thus be interpreted as the log odds of the given variable and measures the extent to which the regressor contributes to unmet need for contraception. Exponentiating the coefficient provides the more easily interpreted log odds.

**3.10 TEST FOR SIGNIFICANCE**

The t-test is also used in this study to calculate the probability associated with the null hypothesis. The "t" test is given by the formula: $t = \beta - \beta_0 / S.E.$...Equation 6.

Given the fact that $\beta_0$ is usually equal to zero, the above equation may be expressed as

$t = \beta / S.E.$...Equation 7.

Where t = student's t distribution

S.E= standard error

$\beta$ and $\beta_0$ = regression coefficients

If the value of "t" is more than 1.96, the difference between our response variable (unmet need for contraception) is supposed to be significant at a given specific level of significance, for instance, say at 0.05. If "t" is less than 1.96, then the difference between our response variable and the predictor variable is said to arise due to chance and hence the association is not significant and thus the null hypothesis is accepted.

The null hypothesis ($H_0$) may mathematically be stated as follows:

$H_0$: $\beta_n = \beta_0$.

Since $\beta_0$ is usually taken to be zero, the null hypothesis $H_0$, is taken that the explanatory variable has no effect on the response variable. In this study therefore our null hypothesis postulates that all of the selected independent variables have no effect on unmet need for contraception. If the null hypothesis is true, then the mean of the sampling distribution of "t" will be zero. Our alternative hypothesis ($H_1$) will be that there are several predictor variables which have an effect on the response variable (unmet need for contraception) and that their effect differ in significance. Thus this can be presented as $H_1$: $\beta_n \neq \beta_0$.

## 3.11 ESTIMATION OF THE LOGISTIC REGRESSION PARAMETERS

There are two basic approaches in the estimation of logistic parameters ($\beta_1$) that is, maximum likelihood estimation (MLE), and discriminant analysis (Schlesslman, 1982). The MLE is used in this study to fit the logit regression model. This is because discriminant analysis tends more often to violate the normality assumption and hence yields wrong estimates of the regression coefficients. It is particularly argued that if any of the independent variables in the model are dichotomous or categorical in nature, then the discriminant analysis tends to give biased results;

usually giving estimated odds ratios that are too high (Kleinbaum 1992:105).

Maximum likelihood estimation (MLE), gives a better fit to the logistic model and also the total expected number of cases equaling the observed total. In addition, maximum likelihood estimation works well when trying to estimate the actual magnitude of the parameters or the probability of events under the logistic model (Schlesselman, 1982).

In using the MLE, the first step is to formulate a likelihood function - that is, we choose values of the unknown parameters that maximize the likelihood of the observed data and call these the best fitting parameters. Once the likelihood function has been determined for our data, the method of maximum likelihood chooses that estimator of the set of unknown parameters, which maximizes the likelihood function.

The likelihood ratio ($LR\chi^2$) for goodness of fit is also used to test the $H_0$ of linearity against an alternative model. Computer using SPSS software program will do these computations.

### 3.12 STEPWISE REGRESSION

The logistic regression model can be run using various ways such as enter, forward, and backward methods. Under forward or backward methods, there are various methods such as likelihood ratio, Wald and conditional. This study utilizes the forward-regression likelihood ratio method.

In stepwise regression the numerous predictor variables are entered in the regression model one at a time in order to determine the sequence that makes $R^2$ (that is the coefficient of determination) climb the fastest. Only predictor variables that are the most powerful by this

criterion are retained in the final model (Retherford and Choe 1993:62).

The forward stepwise regression works in an interesting way. First, the software program (in this case the SPSS analytical package), runs a series of bivariate regressions, one for each predictor variable included in the model. It retains the predictor variable from the regression with the highest $R^2$. The program then runs a second series of regressions with two predictor variables, each of which includes the predictor variable retained from first series, plus one of the remaining predictor variables. From these remaining predictor variables, the program retains the one from the multiple regressions with the highest $R^2$ in the second series and selects the next predictor variable and repeats the process. This is done in steps on the basis of the descending value of $R^2$ until the desired number of retained predictor variables is reached or until there is no additional variable that improves $R^2$ significantly by the given test of significance.

In the final run, the variables that appear to have significance with the dependent variable are included in the model. Variables excluded from the model on the basis of their insignificance in explaining the dependent variable are shown separately. Generally, although stepwise has been regarded as a brute force technique (in the sense that the computer is let to dictate the form of the model rather than letting the model specification to be guided by theory), it is a useful technique for exploring data (Retherford and Choe 1993:63).

### 3.15 DUMMY VARIABLES USED IN THIS STUDY ANALYSIS

The logistic regression model requires that the independent variables be dichotomized. The presence of discrete nominal scale variables such as exposure to radio, the type of place of residence, and region of residence among other variables in this study thus calls for the use of logistic regression. This is because it would be inappropriate to include them in the analysis as if they were interval scaled since the numbers identifying the various levels of these variables are

merely identifiers and lack any numerical significance.

For instance, it is inappropriate to measure the effect of age on unmet need for contraception without dichotomizing age. This is because unmet need for contraception is highly sensitive to changes in age and thus including age in the analysis as an interval scaled variable leads to concealing of information. Thus age should be broken into various groups each of which is entered in the logit model as a separate variable. If age therefore is represented as x, and has four categories say $x_1, x_2, x_3, x_4$ then the logistic regression model will be shown as

$\text{Ln}(P_x/q_x) = \beta_0 + \beta_1 x_1 + \beta_2 x_2 + ... + \beta_3 x_3$ .....equation 6

Instead of $\text{Ln}(P_x/q_x) = \beta_0 + \beta_1 x$ ..... equation 7.

Note that one category ($x_4$) called the reference category is not shown. The rest of the dummies are interpreted on the basis of this reference category. Dummies for various variables of interest will thus be created. This is as shown below:

### 3.16 AGE

The four subcategories of age are used in this analysis. Although it is possible to measure the risk of unmet need by age in single years, the categorization below is used for convenience. Additionally, women within a given age category often tend to have similar characteristics in terms of their fertility preferences hence there was no need to use the continuous values of age. Lastly, age measured as a continuous variable has potentially conflicting effects on unmet need for contraception. For instance, while young women are probably further from their reproductive goals, they may be less traditional and more accepting of contraceptive technology (Dodoo 1998:232). The following are the age categories used in this study: -

40-49 = 1 (This is our reference category)
35-39 = 2
25-34 = 3
15-24 = 4

Age took the value of 1 if a woman fell in any of the specified categories or else it took the value of 0 if the woman was not aged between 40-49 years.

## 3.17 NUMBER OF LIVING CHILDREN

Despite overwhelming evidence of the positive significant association between *children eve born* and unmet need for contraception (as shown in the literature review), this study uses *number of living children* as the most appropriate variable. This has been prompted by the fact that Kenya in the recent times is experiencing an upsurge in childhood mortality (NCPD et al., 1999). Thus it is likely that *number of living children* a woman has, has a more impact on her potential use or non-use of contraception rather than *children ever born.* The following are the various categories for this variable.

0 = 1 (reference category),
1-2 = 2
3-4 = 3
5-6 = 4
7+. = 5

The values took the value of 1 if a woman belonged to any of the above-specified categories; otherwise it was 0 if the woman was childless.

## 3.18 ETHNICITY

It has been argued that culture is an important facet affecting people's fertility preferences. This variable is therefore important in this study. The Kikuyu are our reference category given their propensity to exhibit the lowest levels of unmet need for contraception. The categories are:Kikuyu = 1 (reference category).

Kamba = 2
Luhya = 3
Kisii = 4
Kalenjin = 5
Luo = 6 and lastly, Other (e.g Somali, Miji-Kenda,Taita/Taveta, Swahili, etc) = 7.

It took the value of 1 if the woman belonged to any of the above ethnic groups otherwise it took the value of 0 if the woman was a Kikuyu.

## 3.19 PROVINCE

The large disparities in socio-cultural, economic, and demographic phenomena can be better captured by province of residence of the respondent. Below are the various categories of province utilized in this study: -

Central = 1 (reference category)
Western = 2
Coast = 3
Eastern = 4
Nyanza = 5
Rift Valley = 6
Nairobi = 7

It took the value of 1 if the province of residence was Central; otherwise it took the value of 1 for the rest of the provinces.

## 3.20 EDUCATIONAL ATTAINMENT OF THE RESPONDENT

This variable refers to the highest level of education attained by the respondent. The following are the categories used in this analysis.

Secondary complete or above = 0 (reference category)
Secondary incomplete = 1
Primary complete = 2
Primary incomplete = 3
None = 4

## 3.21 PLACE OF RESIDENCE

Type of place of residence is a binary variable coded 1 for urban residents and 0 for their rural counterparts. Urban areas offer greater access to family planning and related services (Tuladhar 1985 cited in Dodoo 1998:232) and hence urban dwellers are bound to use contraception more than their rural counterparts. In sum this variable has two sub categories viz.:

Urban = 0 (our reference category).
Rural = 1

## 3.22 HUSBAND APPROVAL OF FAMILY PLANNING

Recent studies suggest that husbands' preferences are indeed important determinants of the reproductive behaviour of couples (Ezeh and Bankole 1999). Furthermore, it has been argued

that in the African setting, male preferences (including those of spouses) more often than not prevail over those of females and hence male preferences are a major reason for the nonuse of contraception among females who would consider contracepting (Dodoo et al., 1997; Ezeh 1993). It is on this basis that I examine this variable in this study. The following are the sub-categories utilized: -

Approves = 0 (reference category)
Disapproves = 1
Don't know = 2

Despite the importance of husband approval of family planning as measured in DHS surveys, it raises some pertinent concerns. For instance, it has been argued that although many women report limited verbal communication with their male partners, awareness of spouse's views or preferences need not be consistent with lack of discussion. In fact, it has been rightly argued that knowledge of partner's preferences may be obtained indirectly through nonverbal communication or through third parties (Dodoo1998: 232).

### 3.23 DISCUSSED FAMILY PLANNING WITH PARTNER

The KDHS 1998 like other past DHS surveys asked of women respondents whether or not the respondent had ever discussed about family planning with their spouses within the past five years before the survey. Below are the sub-categories of the responses to this question that are utilized in this study:

More often = 0 (reference category).
Once or twice = 1
Never = 2

It took the value of 1 if the respondent had discussed about family planning with spouse more often otherwise it took the value of 0 if the spouses had discussed about family planning with partner for only once or twice or else had never. Despite this categorization, the actual interpretation of the discussion effect on our dependent variables is tentative. This is because it is

unclear whether or not discussion preceded the wish to use contraception or not (Dodoo1998: 232). Additionally, the content or nature of discussion is not known (Dodoo 1998:232).

### 3.24 EXPOSURE TO MASS MEDIA

Exposure to mass media in this study is measured by whether or not the respondent listened to radio daily or not. The choice of radio as a mass media is influenced by the fact that the radio is the primary source of both women's and men's first information about family planning (Inambao and Lewis 1989). Generally, the application of mass media to influence fertility is a natural extension of the basic idea that the media can both inform and motivate people, event about such complex subjects as their reproductive means and goals (Westoff and Rodriquez 1995). The following are the sub-categories for this variable:-

Yes = 0 (This is our reference category).

No = 1

It took the value of 1 if the respondent did not listen to radio on a daily basis otherwise it took the value of 0 if the respondent listened to radio daily. Despite this, past literature has reached disparate conclusions on the general question of whether the mass media can influence behaviour. Additionally these investigations have emphasized the difficulty of inferring causality (Westoff et al., 1995).

### 3.25 RESPONDENTS' APPROVAL OF FAMILY PLANNING

Some women inevitably act against their partner's preferences regarding family planning and it would be interesting therefore, to examine this factor in this study. The following are the sub-categories utilized: -

Approves = 0 (reference category)

Disapproves = 1

Don't know = 2

Despite the importance of husband approval of family planning as measured in DHS surveys, it raises some pertinent concerns. For instance, it has been argued that although many women

report limited verbal communication with their male partners, awareness of spouse's views or preferences need not be consistent with lack of discussion. In fact, it has been rightly argued that knowledge of partner's preferences may be obtained indirectly through nonverbal communication or through third parties (Dodoo1998: 232).

# CHAPTER FOUR

# THE LEVELS, COMPOSITION AND DIFFERENTIALS OF UNMET NEED FOR CONTRACEPTION

## 4.1 INTRODUCTION

This chapter presents the distribution of the respondents according to the selected characteristics as well as the bivariate results based on currently married women aged 15-49 years who were interviewed in the 1998 KDHS. The results presented and discussed here focus on the distribution of respondents by selected characteristics as well as the levels, composition and magnitude of unmet need for family planning.

In this study, three aspects of unmet need are presented that is unmet need for contraception to space, unmet need for contraception to limit and the total unmet need for contraception (which is the summation of unmet need to space and unmet need to limit). The presentation of three aspects of unmet need is necessary since women with the need for spacing may not share similar characteristics with those who are in need for limiting.

## 4.2 BASIC CHARACTERISTICS OF THE STUDY POPULATION

The 1998 KDHS interviewed 7881 women out of whom 4834 were currently married, 676 were divorced, separated or widowed and 2372 were never married. This study focuses on the currently married women, who constitute 61.3 percent of all the sampled women. Women who were currently married constituted those who were staying with their spouses in their marital unions (58.8 percent of all the sampled females) and those who were cohabiting or living together with their male partners (2.6 percent of all the sampled females). The merging of these two groups of women is appropriate given the fact that sexual activity and fertility preferences between the two groups are likely to be similar.

It is also evident that the distribution of the selected characteristics is skewed. For instance, more

than three-quarters of the respondents interviewed lived in rural areas while only 20.9 percent lived in urban areas. This uneven distribution is expected owing to the fact that majority of Kenya's population lives in the rural areas.

Likewise. the distribution of the population by age showed that the heaviest concentration of women was in the 25-34 - age group while the least was in the 35-39- age group. There were however marginal differences in the distribution of women in the 35-39 and 40-49 age groups. The higher concentration in the 25-34 age group was expected since this is the age bracket at which most people get married or engage in unions.

The proportion of women who listened to radio measures exposure to mass media. Table 4.1 shows that about 60 percent of the respondents listened to radio daily while 39.6 percent did not. The results revealed that although exposure to radio was high, over one third of the responses did not listen to radio and thus a substantial proportion of the people are yet to enjoy the full benefits of exposure to radio as the commonest mass media outlet.

The number of living children a woman had was highly concentrated among women who had 1-2 children while the lowest was among those with no child at all. The low percentage of women with no children was expected because, in developing countries, almost all women want to have children once married and they want them soon (Robey et al., 1996: 17). Women however tend to achieve their desired fertility preferences after the second child and hence the proportion who wish to have more children tend to decrease thereafter.

Educational attainment of the woman showed that a large proportion of the population was less educated. For instance, 14.2 percent had no education at all while 33.7 percent had only incomplete primary education. Thus almost a half of the women had no education at all or had only primary incomplete education. Women who dropped out of secondary school were also many (9.9 percent) which implies that about 10 out of every 100 women randomly sampled who joined secondary education ended up abandoning school before completing secondary education.

Table 4.1 Percentage Distribution of Respondents According to Selected Characteristics

| Variables | Number of cases (4834)* | % |
|---|---|---|
| **Age** | | |
| 15-19 | 1234 | 25.5 |
| 25-34 | 1892 | 39.1 |
| 35-39 | 832 | 17.2 |
| 40-49 | 876 | 18.1 |
| **No. Of Living children** | | |
| 0 | 354 | 7.3 |
| 1-2 | 1594 | 33.0 |
| 3-4 | 1370 | 28.3 |
| 5-6 | 877 | 18.1 |
| 7+ | 638 | 13.2 |
| **Educational attainment** | | |
| None | 688 | 14.2 |
| Primary incomplete | 1630 | 33.7 |
| Primary complete | 1182 | 24.5 |
| Sec incomplete | 478 | 9.9 |
| Sec complete + | 855 | 17.7 |
| **Ethnicity** | | |
| Kikuyu | 838 | 17.3 |
| Kamba | 578 | 29.3 |
| Kalenjin | 647 | 13.4 |
| Kisii | 478 | 9.9 |
| Luhya | 721 | 14.9 |
| Luo | 719 | 14.9 |
| Other | 853 | 17.6 |
| **Province** | | |
| Central | 517 | 10.7 |
| Nairobi | 408 | 8.4 |
| Coast | 373 | 7.7 |
| Eastern | 824 | 17.0 |
| Nyanza | 1048 | 21.7 |
| Rift valley | 1089 | 22.5 |
| Western | 575 | 11.9 |
| **Type of place of Residence** | | |
| Urban | 1010 | 20.9 |
| Rural | 3824 | 79.1 |
| **Exposure to mass media** | | |
| Yes | 2907 | 60.4 |
| No | 1908 | 39.6 |
| **Husband approval of FP.** | | |
| Approves | 3173 | 65.7 |
| Disapproves | 1028 | 21.3 |
| Don't Know | 626 | 13.0 |
| **Respondents Approval of FP** | | |
| Disapproves | 386 | 8.0 |
| Approves | 4261 | 88.2 |
| Don't Know | 182 | 3.8 |
| **Spousal communication about FP** | | |
| Never | 1353 | 28.1 |
| Once or twice | 1865 | 38.7 |
| More often | 1606 | 33.3 |

** Some variables do not add up to this figure because of missing cases*

Source: *Primary Analysis of 1998 KDHS*

Finally, the distribution of the respondents by province was modest ranging from 7.7 percent in the coastal province to 22.5 percent in the Rift valley. This roughly represented the uneven distribution of the population in Kenya by province. The distribution of the ethnic groups ranged from 9.9 percent among the Kisii to 29.3 percent among the Kamba. Interestingly the Luhya and the Luo had a similar percentage of women sampled (14.9 percent).

## 4.3 THE LEVELS AND COMPOSITION OF UNMET NEED FOR CONTRACEPTION

Table 4.1 only shows the distribution of the selected dependent and independent variables that are included in this study. However frequency distributions as shown in Table 4.1, do not show the distribution of the selected characteristics by the unmet need for contraception. As a result, we cannot decompose women with a given characteristic (such as educational attainment or age) by unmet need for contraception to space/ limit further childbearing. This problem is resolved by a run of cross- tabulations with the help of the Pearson's chi-square statistic.

From Table 4.2, out of the 4834 currently married women included in this analysis, 14.7 percent have unmet need to space while 10.4 percent have unmet need to limit. Thus the total unmet need for contraception in Kenya is 25.1 percent. This implies that for any random selection of four currently married women, at least one has unmet need for contraception. The above findings are expected on several grounds: firstly, findings from DHS countries show that in sub Saharan African countries, women's unmet need for spacing constitute the largest component of the total demand for family planning (Westoff and Ochoa 1991; Ngom 1997:192, Robey et al., 1996). Secondly, past findings also show that potential birth limiters are much more likely to practice contraception than are birth spacers (Bongaarts and Bruce 1995), hence the former are more likely to exhibit lower levels of unmet need for contraception as compared to the later.

On the overall, the national average of total unmet need is about 25.1 percent. Though this is below the actual contraceptive use level (which is about 39.0 percent), it is evident that a quarter of the currently married women or those living in union in Kenya have unmet need for contraception. Thus if all potential users of contraception were motivated to adopt contraception, then contraceptive prevalence could have increased from the current level of 39 percent to 64.1 percent.

**Table 4.2: Percentage distribution of currently married women by unmet need for contraception status and selected characteristics, Kenya 1998 KDHS.**

| Characteristic | Unmet Need to space | Unmet Need to limit | Total unmet need | Cases* |
|---|---|---|---|---|
| **AGE** | | | | |
| 15-24 | 26.0 | 4.1 | 29.0 | 1234 |
| 25-34 | 18.8 | 9.8 | 26.8 | 1892 |
| 35-39 | 8.8 | 18.4 | 25.6 | 832 |
| 40-49 | 2.7 | 12.8 | 15.6 | 876 |
| $\chi^2$ | **220.244** | **116.050** | **59.174** | |
| P-Value | **<.001** | **<.001** | **<.001** | |
| **NUMBER OF LIVING CHILDREN** | | | | |
| 0 | 10.2 | 0.5 | 10.7 | 354 |
| 1-2 | 18.3 | 3.6 | 21.8 | 1594 |
| 3-4 | 17.1 | 9.3 | 26.4 | 1370 |
| 5-6 | 11.9 | 16.9 | 28.8 | 877 |
| 7+ | 6.6 | 26.3 | 32.9 | 638 |
| $\chi^2$ | **67.370** | **332.486** | **76.525** | |
| P-Value | **<.001** | **<.001** | **<.001** | |
| **EDUCATION** | | | | |
| None | 10.8 | 15.8 | 26.6 | 688 |
| Prim. Incomplete | 20.1 | 12.4 | 32.5 | 1630 |
| Prim. Complete | 14.5 | 9.9 | 24.4 | 1182 |
| Sec. Incomplete | 12.8 | 6.3 | 19.1 | 478 |
| Sec. Complete + | 8.7 | 5.2 | 13.9 | 638 |
| $\chi^2$ | **71.816** | **67.246** | **114.553** | |
| P-Value | **<.001** | **<.001** | **<.001** | |
| **TYPE OF PLACE OF RESIDENCE** | | | | |
| Rural | 15.7 | 11.2 | 26.9 | 3824 |
| Urban | 10.6 | 7.4 | 18.0 | 1010 |
| $\chi^2$ | **16.797** | **12.456** | **33.997** | |
| P-Value | **<.001** | **<.001** | **<.001** | |
| **ETHNICITY** | | | | |
| Kikuyu | 8.6 | 6.1 | 14.6 | 838 |
| Kamba | 11.2 | 11.3 | 22.5 | 578 |
| Kalenjin | 18.7 | 12.9 | 31.7 | 647 |
| Kisii | 10.6 | 6.9 | 17.6 | 478 |
| Luhya | 18.9 | 12.4 | 31.3 | 721 |
| Luo | 19.1 | 14.2 | 33.4 | 719 |
| Other | 14.8 | 9.0 | 23.8 | 853 |

Table 4.2 continued

| | | | | |
|---|---|---|---|---|
| $\chi^2$ | **67.377** | **44.180** | **121.957** | |
| P-Value | **<.001** | **<.001** | **<.001** | |
| **PROVINCE** | | | | |
| Central | 5.8 | 6.0 | 11.8 | 517 |
| Nairobi | 20.3 | 12.9 | 33.2 | 575 |
| Coast | 21.0 | 10.2 | 31.2 | 373 |
| Eastern | 11.3 | 10.8 | 22.1 | 824 |
| Nyanza | 15.8 | 12.1 | 27.9 | 1048 |
| Rift Valley | 17.5 | 11.3 | 28.8 | 1089 |
| Western | 8.6 | 4.5 | 13.1 | 408 |
| $\chi^2$ | **86.918** | **34.232** | **124.063** | |
| P-Value | **<.001** | **<.001** | **<.001** | |
| **SPOUSAL COMMUNICATION ABOUT FAMILY PLANNING** | | | | |
| Never | 15.7 | 28.9 | 26.4 | 1353 |
| Once/Twice | 15.5 | 42.7 | 27.0 | 1865 |
| More often | 13.0 | 28.3 | 21.8 | 1606 |
| $\chi^2$ | **5.765** | **6.67** | **13.865** | |
| P-Value | **<.001** | **<.001** | **<.001** | |
| **HUSBAND APPROVAL OF FAMILY PLANNING** | | | | |
| Disapproves | 20.7 | 14.5 | 35.2 | 1028 |
| Approves | 12.3 | 9.3 | 21.6 | 3173 |
| Don't Know | 16.8 | 9.1 | 25.9 | 626 |
| $\chi^2$ | **46.420** | **23.916** | **76.804** | |
| P-Value | **<.001** | **<.001** | **<.001** | |
| **RESPONDENTS' APPROVALOF FAMILY PLANNING** | | | | |
| Disapproves | 13.7 | 11.4 | 25.1 | 386 |
| Approves | 14.7 | 10.5 | 25.2 | 4261 |
| Don't Know | 17.1 | 5.4 | 22.5 | 182 |
| $\chi^2$ | **1.182** | **5.459** | **0.663** | |
| P-Value | **>0.05** | **>0.05** | **>0.05** | |
| **EXPOSURE TO MASS MEDIA** | | | | |
| Yes | 12.8 | 8.4 | 21.3 | 2907 |
| No | 17.4 | 13.4 | 30.8 | 1908 |
| $\chi^2$ | **19.056** | **31.330** | **56.346** | |
| P-Value | **<. 001** | **<. 001** | **<. 001** | |
| **TOTAL** | **14.7** | **10.4** | **25.1** | **4834** |

*Notes: * 4834 cases are included in this analysis. Some variables however do not add up to this figure because of missing cases. $\chi 2$ is the chi-square statistic, a measure of the association between the dependent variable and each of the selected characteristics. P-values show the significance of the relationship. Although not shown, the degree of freedom (d.f) may be computed as n-1, where n is the total number of categories representing each selected characteristic.*

*Source: Primary analysis of 1998 KDHS*

## 4.4 DIFFERENTIALS IN UNMET NEED FOR CONTRACEPTION

Table 4.2 shows that unmet need for spacing appears to decrease with age. On the other hand, unmet need for limiting tends to increase with age reaching a peak of 18.4 percent at 35-39-age category. Beyond this age group, unmet need for limiting decreases with age. On the overall, however, age appears to be inversely associated with total unmet need for contraception.

The above results are to be expected for a number of reasons: firstly, younger women tend to exhibit a higher level of unmet need for spacing because they are yet to achieve their fertility goals. However as age increases, women tend to achieve their fertility desires and hence shift their need from spacing to limiting births. The peak for unmet need for contraception to limit at age 35-39 years is also expected. Past studies show that many women in forties have become infecund (Robey et al., 1996:17), are bound to perceive themselves to be at lower risk of conceiving (Casterline et al., 1997:173) and hence are reluctant to use contraception to limit further childbearing.

On the other hand, age is negatively associated with overall unmet need for contraception. The inverse association between total unmet need for contraception and age is also expected. In Kenya where unmet need for contraception to space not only constitute the largest demand for contraception (see Table 4.2) but also show an inverse association with age, it is likely to bias the association between overall unmet need for contraception and age to be negative as well. In addition, most women tend to achieve their fertility desires with increasing age and thus unmet need for contraception is bound to decrease with age (Robey et al., 1996).

Unmet need to space increases with number of living children reaching the peak at 1-2 parity. Beyond this number of surviving children, unmet need for spacing decreases with any additional

surviving children. On the contrary, the need for limiting further births consistently increases with number of living children. Likewise, total unmet need is also positively associated with number of surviving children.

It is interesting to note that it is not women who are childless that, have the lowest level of unmet need for contraception to space; instead it is women who have seven or more surviving children. This supports the fact that women with more children are likely to be in need of contraception to limit further births rather than space their births and hence may experience a much lower level of unmet need for contraception to space as compared to those who are childless.

The positive association between unmet need for contraception to limit with number of surviving children is highly anticipated. It is likely that those with seven children or more have already attained their desired number of children or have even exceeded it (see also Westoff and Bankole 1996). Hence they are much more in need of limiting further births than any other category of women.

Evidence from Table 4.2 also shows that differentials in unmet need by province of residence are modest. On the overall, Western province has the highest level of unmet need while Central Province has the least. Despite these, it is clear from the table that there exists a marginal difference in the overall unmet need between Nairobi and Central Provinces. This is to be expected since these two provinces exhibit higher levels of contraceptive use in general as compared to the rest (NCPD et al., 1994). Additionally, these two provinces express a higher desire to limit further childbearing as compared to the rest of the provinces. Such expressions are likely to result into lower levels of unmet need since past findings also show that potential birth limiters are much more likely to practice contraception than are birth spacers (Bongaarts and Bruce 1995).

It could also be that the differences in unmet need by province indicate varying socio-economic statuses of Kenya's provinces. Also, as expected, Western province has the highest total unmet need. This could be explained in terms of low contraceptive prevalence, which implies that not all women who desire spacing their next wanted pregnancy or limiting further childbearing do so. In addition the high fertility levels in Western province depict a large degree of unwanted or mistimed births (Jensen 1995:263) both of which are important indicators of unmet need for contraception.

The higher unmet need by rural residence as opposed to urban residence is also expected. It is probable that contraceptives are more diverse and easily accessible to urban residents than is the case for rural areas. Hence women dwelling in urban areas are more likely to practice contraception, which reduces the proportion of those with unmet need for spacing or limiting, and the inverse is also true.

Another possibility could be that trend toward modern ideas are bound to start in urban areas and only spread to rural areas much later (Singh and Casterline 1985). As a result, women in urban areas are more likely to use contraception thus reducing their exposure to the risk of experiencing unmet need for contraception as compared to their rural counterparts.

Closely related with type of place of residence vis-a-vis unmet need is exposure to mass media, which is measured in this study by the number of respondents who either listen to radio daily or not. From the table, women who listens to radio daily exhibit much lower levels of unmet need for contraception as compared to those who never. Exposure to mass media tends to increase contraceptive prevalence, which in turn reduces unmet need for contraceptive use (Kane et al., 1997).

The relationship between educational level and unmet need for spacing is not consistent. It is women who have not completed primary schooling that exhibit the highest level of unmet need to space. On the other hand, there is only a marginal difference between women with no education at all and those with secondary schooling or above. Generally, education is positively associated with unmet need for limiting. On the other hand, it is women who did not complete their primary schooling who, exhibit the highest level of unmet need.

As the level of education increases, the level of unmet need tends to reduce reaching a minimum of 13.9 percent among those with complete secondary education or above. The observed association between unmet need and total unmet need is interesting to note. Past studies have demonstrated that in sub-Saharan Africa, women with more education are more interested in avoiding pregnancy than other women but face the same obstacles as other women (Robey et al., 1996:18) and thus there seems to be no meaningful association between education and unmet need. This is contrary to the findings found in this study, which shows the inverse.

Likewise, the observed inverse association between education and unmet need to limit is also expected. Usually, women who are highly educated are more likely to want fewer children and thus are likely to use contraceptives (Kono and Hayase 1994). As a result, they are likely to exhibit low levels of unmet need for limiting and the inverse is true. Also, the more educated are likely to be working in formal employment which may not be easily compatible with childbearing activities and thus use contraceptives to reduce their propensity of having unwanted pregnancies.

It could also be argued that the more educated women are bound to marry the more educated men (a phenomenon usually referred to as educational homogamy). Studies show that, the more

educated husbands more often than not, allow their spouses to use contraceptives. As a result it is likely that the spouses of such husbands will experience lower levels of unmet need to limit and vice versa. The results appear to suggest that in general, there is a threshold level (in this case, primary incomplete level of schooling), beyond which education is negatively related with unmet need for contraception. Before this level is attained, education has in fact a positive association with unmet need for contraception.

There are two variables that are used in this study to measure the association between spousal communication and the various aspects of unmet need-spousal discussion about family planning and husbands' approval of family planning. Women who have discussed about family planning with their spouses either once or twice exhibit the highest levels of total unmet need. The lowest levels of unmet need for family planning associated with couples', which have discussed about family planning more often are to be anticipated. This is because "the amount of communication between partners is positively associated with contraceptive use" (Oni and McCarthy, 1991) and by implication therefore, spousal communication is associated with low levels of unmet need for contraception. It is women who have little or no communication at all about family planning with their spouses that report low levels of contraceptive use (Kane et al., 1989). Such women are thus likely to exhibit high unmet need levels for contraception.

From the foregoing discussion, one would expect women who have never discussed about family planning to exhibit the highest levels of unmet need. It is however those women who have had such discussion for only once or twice that exhibit the highest levels of unmet need. It thus appears that there is a threshold level beyond which spousal communication about family planning is associated with a reduced level of the various components of unmet need. Before this level is reached, spousal communication has in fact a positive effect on unmet need for contraception.

On the other hand, husbands' approval of family planning shows that wives' whose husbands disapprove of their (wives') use of contraception exhibit the highest level of unmet need while those whose husbands approve of their use have the lowest levels of unmet need for contraception. The above results seem to point out the fact that whenever we have disagreement between couples as far as family planning is concerned, it is the husbands' view that prevails. Suffice it to say husbands' approval of family planning is a precondition for the wives adoption of spacing methods of contraception. The above results are expected given the asymmetrical male-female power relationship and women's concerns about not offending their opposing husbands (Bongaarts and Bruce 1995:64).

The rather higher unmet need among women who are uncertain about their husbands' approval of family planning (as compared to those whose husbands approve of family planning) is also to be expected. This may imply that such women are poorly informed of their partner's attitudes often believing that their partner is ignorant about and opposed to family planning (McGinn et al., Cited in Salway 1994:1).

One conspicuous finding as shown in Table 4.2 is that respondent's approval of family planning has no significant association with any of the three dependent variables of unmet need for contraception. This could be due to the stronger influence of husband approval of family planning, which renders any meaningful association between the woman and unmet need for family planning to lack.

Ethnicity vis-à-vis unmet need shows that the Kikuyu women have the lowest level of unmet need either to space or to limit while the Luo and Luhya have the highest. This is to be expected for several reasons: Firstly, the high contraceptive prevalence among the Kikuyu coupled with

low fertility and attitudes towards small family size norm means that fewer women are exposed to the risk of experiencing unmet need for contraception. Unlike most other ethnic groups in Kenya, the Kikuyu were among the first people to "have adopted or to have sought adopting the complex, specialized culture that is associated with the industrial world" (Dow and Werner 1983). Such a culture is anti-natalist and hence works against increased childbearing.

On the other hand, Luhya and Luo women have low contraceptive usage (NCPD et al., 1999) and hence a sizeable proportion of these women suffer from the risk of not using contraception despite their desire to do so. Additionally, the large family size norm among these communities means that a large proportion of pregnancies are either mistimed or unwanted (Jensen 1995:263). Thus among the Luo and Luhya women, there exists a wide gap between actual and desired fertility accruing from non-use of contraception among those willing to use - an important indication of unmet need for contraception.

As shown on Table 4.2 the selected characteristics associated with our three aspects of unmet need for contraception varies in magnitude from one aspect to the other. In the case of unmet need for spacing births, age is the most important factor while respondent's approval of family planning is the least. On the contrary, the number of surviving children is the most important factor associated with unmet need to limit while respondents' approval of family planning remains the least. Looking at total unmet need, province of residence is the most important factor associated with unmet need and respondent's approval of family planning is still the least. Further analyses in the next chapter will exclude respondents' approval of family planning since it seems to have no significance association with all the three aspects of unmet need for contraception.

## 4.5 CONCLUSION

This section presented and discussed the distribution of the selected characteristics and bivariate associations of the selected characteristics by unmet need for contraception. The distribution of the respondents by the selected characteristics was largely skewed. Further, as expected, the level of unmet need for contraception to space exceeded that for limiting. Most of the selected characteristics were significantly associated with the three aspects of unmet need for contraception examined under this study except respondents' approval of family planning. Age of the mother had the highest association with unmet need for contraception to space while the number of living children a woman had, had the highest association with unmet need for contraception to limit. On the other hand, province of residence showed the highest association with total unmet need for contraception. Due to the lack of significance between respondents' approval of family planning and unmet need for contraception, no further analysis will be made of this variable in the next chapter.

# CHAPTER FIVE

# FACTORS UNDERLYING UNMET NEED FOR CONTRACEPTION

## 5.1 INTRODUCTION

This chapter presents results obtained from multivariate analysis. Multivariate logistic regression was necessitated by several factors: firstly, the bivariate analyses presented and discussed in the preceding chapter do not control for the possible effects of other confounding factors that affect the dependent variable - unmet need for contraception.

Secondly, even if we were to use the simple logistic regression analysis (where each selected independent variable is run against the dichotomous dependent variable), there would still be the problem of introducing stochastic error (that is the effect on the dependent variable of many omitted variables, each with an individually small effect) in our estimation.

Thus the multivariate logit regression analysis was deemed to be the most appropriate tool. This is because it allows our dichotomous dependent variable (unmet need for contraception) to be run against a number of selected independent variables. The need for a detailed analysis of the factors underlying unmet need for contraception necessitated the run of three different multivariate logit models: unmet need for contraception to space, unmet need for contraception to limit and total unmet need for contraception.

There are a number of variables that are run against the aforementioned three aspects of unmet need. These include the following: - age of mother, province of residence, the number of living children, ethnicity, the type of place of residence, educational attainment of the mother, husbands approval of family planning, discussion about family planning and exposure to mass media measured by whether or not the respondent listened to radio daily or not).

The choice of the above variables in our multivariate analysis is based on various reasons. Firstly, our findings from the bivariate analysis revealed that these variables were significantly associated with the dependent variables included in this study. Additionally, some of the above variables have been omitted from local studies on this topic yet evidence shows that these are important factors affecting unmet need for contraception (Bongaarts and Bruce 1995; Robey et al, 1996; Casterline et al, 1997; Stash 1999).

## 5.2: FACTORS UNDERLYING UNMET NEED FOR CONTRACEPTION TO SPACE

Table 5.1 shows the results of the correlates of unmet need for contraception for spacing. Looking at the overall contribution of each of the selected characteristics, age, exposure to mass media (measured by the whether or not the respondent listens radio daily), province of residence, the number of living children, husbands' approval of family planning, type of place of residence, and educational attainment of the respondent were significant in explaining unmet need for spacing. No analysis is made of insignificant variables excluded in the model (see Appendix 1) [1].

A detailed discussion and interpretation of variables that are significantly related with unmet need for contraception to space is done to show the effect of dummies of each characteristic on the dependent variable on the basis of their respective reference category.

[1] To what extent do insignificant variables excluded in the model explain unmet need for contraception to space? To address this question, appendix I uses enter method to include both the significant and insignificant variables included in the model. This is necessary since this analysis aims at explaining only those factors that explain unmet need for contraception to space pregnancy.

Table 5.1 Parameters of logistic regression model and associated statistics of the selected characteristics significantly related with unmet need for contraception to space in Kenya: KDHS 1998

| | Log odds | $LRX^2$ | d.f | p-Value | Odds Ratio | Cases |
|---|---|---|---|---|---|---|
| AGE | | 246.5 | 2 | < .001 | | |
| 40-49 | 0.0000 | | | | 1.0000 | 905 |
| 35-39 | 1.3360 (5.404)*** | | | | 3.8039 | 828 |
| 25-34 | 2.3869 (10.016)*** | | | | 10.8795 | 1848 |
| 15-24 | 3.2018 (12.410)*** | | | | 24.5773 | 1232 |
| REGION | | 71.5 | 6 | <.001 | | |
| Central | 0.0000 | | | | 1.0000 | 477 |
| Western | 1.4979 (2.4888)* | | | | 4.4722 | 577 |
| Coast | 1.2490 (5.2812)*** | | | | 3.4869 | 740 |
| Eastern | 0.6355 (2.6702)** | | | | 1.8880 | 699 |
| Nyanza | 0.9241 (4.0584)*** | | | | 2.5196 | 874 |
| Rift Valley | 1.1992 (5.5060)*** | | | | 3.3173 | 1225 |
| Nairobi | 0.8681 (6.5183)*** | | | | 2.3824 | 221 |
| NO. OF LIVING CHILDREN | | 62.9 | 4 | <.001 | | |
| 0 | 0.0000 | | | | 1.0000 | 342 |
| 1-2 | 1.1095 (5.6234)*** | | | | 3.0329 | 1549 |
| 3-4 | 1.5606 (7.2183)*** | | | | 4.7615 | 1336 |
| 5-6 | 1.4848 (6.1892)*** | | | | 4.4143 | 912 |
| 7+ | 1.5701 (5.5935)*** | | | | 4.8073 | 674 |
| HUSB' APPROVAL OF FP | | 27.6 | 2 | <.001 | | |
| Approval | 0.0000 | | | | 1.0000 | 3116 |
| Disapproval | 0.4913 (4.9457)*** | | | | 1.6344 | 1061 |
| Don't know | 0.4301 (3.2732)*** | | | | 1.5374 | 636 |
| EDUCATION | | 10.4 | 4 | <.05 | | |
| Sec+ | 0.0000 | | | | 1.0000 | 762 |
| None | 0.2602 (0.7535) | | | | 1.2972 | 754 |
| Prim Incomplete | 0.4367 (2.0337)** | | | | 1.5476 | 1628 |
| Prim comp | 0.3140 (2.8844)** | | | | 1.3688 | 1199 |
| Sec Incomplete | 0.1434 (1.3659) | | | | 1.1542 | 470 |
| TYPE OF PLACE OF RESIDENCE | | 10.8 | 1 | <.001 | | |
| Urban | 0.0000 | | | | 1.0000 | 827 |
| Rural | 0.4782 (3.2267)*** | | | | 1.6132 | 3986 |
| EXPOSURE TO RADIO DAILY | | 5.9 | 1 | <.05 | | |
| Yes | 0.0000 | | | | 1.0000 | 2907 |
| No | 0.2160 (2.4462)* | | | | 1.2411 | 1906 |
| -Log Likelihood | 3650.1 | | | | | |
| Model chi-square (df) | 571.9 (21) | | | | | |
| % of women correctly predicted | 84.25% | | | | | |
| Constant = -7.2260 | Standard error = .4017 | | | | | |

*Notes: Figures in the parenthesis indicate the students' t-distribution values for each category of the respective variable included in the model.***p-value<.001, **p-value<.05, * p-value<0.01.. Dummies without an asterisk were not significant since their t-test values were < 1.96..*

*Source: Primary Analysis of the 1998 KDHS data*

The results shown in Table 5.1 reveal that unmet need to space decreases with age of the woman. The negative but significant association between age and the dependent variable (unmet need for contraception to space) is expected and thus confirms our hypothesis that the level of unmet need for contraception for spacing tends to decrease with age. Usually, younger women are yet to achieve their fertility goals and thus are more likely to experience unmet need for contraception to space their next wanted birth as compared to those aged 40-49 years. However as age increases, women tend to shift their need for contraception from spacing to limiting any further childbearing (Robey et al., 1994:17) and thus unmet need for contraception to space appears to decrease with age. These findings are similar to those in Chapter Four.

Further, as compared to women aged 40-49 years, those aged 39 years and below are more likely to experience unmet need for contraception for spacing their next birth. For instance, as compared to our reference category, women aged 35-39 tend to be 3.803 times more likely to have unmet need for contraception to space. Such women are more likely to show reluctance to use spacing methods despite the fact that they concede a higher risk of becoming pregnant as compared to women aged 40-49 years (Njogu 1991, Robey et al., 1996; Casterline, et al., 1996). Findings from a recent study in rural Chitwan district, in Nepal also revealed that women who perceive themselves to be at a substantially reduced risk of unwanted pregnancy are unlikely candidates for contraceptive use, particularly when it comes at some cost (Stash, 1999:274).

The number of living children a respondent has is also another demographic variable that is important in explaining the dependent variable. For instance, as compared to women who are childless, those who have 7 or more children are almost five times (see Table 5.1) more likely to exhibit unmet need for contraception to space. In general, there is a positive and significant association between the number of surviving children and the likelihood of having unmet need

for contraception to space.

As compared to Central province, the rest of the provinces are more likely to have unmet need for contraception to space. For instance, as compared to Central province, women from Western province are 4.5 times more likely to have unmet need for contraception to space. These results be explained by the socio-economic hypotheses. For instance, the distribution of contraceptive facilities are uneven, with the heaviest distribution in Central, Nairobi and Eastern provinces while the rest have sparse distribution of these facilities. In addition, Central province has the highest prevalence of contraceptive use (NCPD, et al., 1999) and thus most women who would otherwise be in need for contraception to space their births have already fulfilled that need by adopting contraception. As a result, Central province is expected to exhibit the lowest levels of unmet need for contraception for spacing as compared to the rest.

Generally, where demand for family planning is high (as in Central province), the percentage of demand that is satisfied becomes also very high (NCPD et al., 1999). The contraceptive use (which proxies supply) and demand interact in such a way as to encourage growth in the other and hence one expects Central province to exhibit the lowest risk of unmet need for contraception as compared to the rest of the other provinces. Suffice it to say the high contraceptive use in Central province has a "contagion effect" attracting potential users into actual users and thus reducing the actual level of unmet need for contraception as compared to other provinces.

It is expected for Western province to exhibit higher levels of unmet need for contraception for spacing as compared to Central province. This is because western province is a high fertility zone (NCPD, et al.,, 1999). It has been observed that such high levels of fertility is a depiction of a large degree of unwanted or mistimed births (Jensen, 1995:263) both of which are important

pointers for the existence of unmet need for contraception.

As compared to urban women, rural women are 1.6132 times more likely to exhibit unmet need for contraception to space births. Studies show that urban residence offers greater access to family planning and related services as compared to rural areas (Tuladhar 1985 cited in Dodoo, 1998:232). As a result, urban areas have higher contraceptive use, which is likely to result into a "Contagion effect" with more and more, women adopting contraception. This results into their reduced levels of unmet need for contraception to space births as compared to rural women.

Literature also shows that trend toward "modern" ideas (including those to do with family planning) are bound to start in urban areas and only spread to rural areas much later (Singh and Casterline, 1985). Hence it is expected that urban residents are likely to use contraception much more easily than their rural counterparts and are thus likely to have a reduced risk of having unmet need unlike their rural counterparts. A research done in Nigeria also found that spousal communication and decision-making on family planning matters are more common in cities than in rural areas (Donovan, 1995:39). The observed significant association between unmet need for contraception to space and place of residence confirms our hypothesis that urban areas are less likely to be associated with high levels of unmet need for contraception as compared to rural areas.

Table 5.1 further shows that apart from women who have no education or those who did not complete secondary schooling, the rest are more likely to be associated with a higher level of unmet need for contraception to space. For instance women with primary complete level of schooling are 2.8 times more likely to experience unmet need as compared to those with secondary education or higher. The lack of a consistent relationship between education and unmet need for contraception to space though not expected is not unique. For instance, it was

found that in sub Saharan Africa there seemed to be no consistent relationship between education and unmet need for contraception (Robey et al., 1996: 17).

Husband approval of family planning is also an important correlate underlying unmet need for spacing. The results, however, indicate that women whose husbands disapprove or are uncertain about their husbands attitude towards their use of family planning, are 1.6344 and 1.5374 times more likely to exhibit unmet need for contraception to space respectively as compared to those whose husbands approve of their use of contraception. The above associations between husband approval and unmet need for contraception are both significant (see "t" test > 1.96).

The above association is expected given the fact that past studies acknowledge that men's leverage in the reproductive arena is approved by both sexes with women frequently deferring to men in reproductive decision-making (Bongaarts and Bruce1995; Dodoo et al., 1997; Ezeh, 1993). Thus husbands' approval of family planning is less likely to be associated with a higher unmet need for contraception to space as compared to husbands' disapproval.

Usually, husbands' approval is associated with increased contraceptive use among women hence the observed association is to be expected. Lasee and Becker (1997) utilizing the 1989 KDHS couple data, for instance, found that wives who believed that their husbands approved of family planning were more likely to be practicing contraception than those who felt that their husbands disapproved or were uncertain about their husbands' attitude.

Finally, exposure to radio is also important in explaining the unmet need for contraception to space. Women who do not listen to radio daily seem to be 1.2411 times more likely to have unmet need for contraception to space as compared to those who do. This association confirms

our hypothesis that women who are exposed to radio information about family planning daily are associated with lower unmet need for contraception as compared to those who are not. Generally, the application of mass communications to influence fertility is a natural extension of the basic idea that the media can both inform and motivate people, even about such complex subjects as their reproductive means and goals (Westoff and Rodriguez, 1995).

The expected observed association between unmet need for contraception and exposure to mass media is backed by past literature. Past studies show a strong positive and significant association between exposure to mass media and contraceptive use (Westoff and Rodriguez 1995; Kane et al., 1997; Rogers et al., 1999).

It can be concluded that this model is adequate in explaining unmet need for contraception to space. For instance, Table 5.1 shows that the model correctly predicted about 84.25 percent of women with unmet need for contraception or those without unmet need for contraception. Further the overall p-value, which is below the 0.05 level of significance shows that the model is good as a predictor of our dependent variable- unmet need for contraception to space.

## 5.2 FACTORS UNDERLYING UNMET NEED FOR CONTRACEPTION TO LIMIT

The results of logistic regression analysis of unmet need to limit further births are shown in Table 5.2. From the table, the dummies of age, the number of living children, ethnicity, husbands approval of family planning, educational attainment of the mother, and exposure to mass media (measured by whether or not the respondent listens to the radio daily) are significantly associated with unmet need for contraception to limit. On the contrary, the dummies for type of place of residence, province of residence, and couple discussion of family planning seemed not to have any significance with our dependent variable. As a result, no further analysis is made of these

insignificant variables (see Appendix II)[2].

From the table, the number of surviving children a woman has is one of the factors determining unmet need to limit further births. For instance, as compared to women who are childless, those who have 7 children or more are 2.1 times more likely to have unmet need for contraception to limit. The rest of the dummies can be interpreted in a similar way. The positive and significant association between number of living children and unmet need for contraception to limit is anticipated. However, the results should be interpreted with a lot of caution due to the rather extraordinarily high t-test values, which may be a pointer to the high standard error in the reporting of the number of surviving children.

Generally, as more and more children survive, women tend to attain their desired family size and hence, wish to use contraceptive means to limit further childbearing. Elsewhere, the relationship between unmet need for contraception and the number of living children has also been found to be additive (Lwanga, 1999; Dodoo, 1998). It could be that, as more and more children survive, women tend to be insured against child loss and hence wish to adopt contraception to limit further childbearing. Hence those with more children are more likely to exhibit higher levels of unmet need for contraception to limit births as compared with those who have none.

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[2] insignificant are the excluded variables in explaining unmet need for limiting? To address this question, Appendix II uses enter method to include both the significant and insignificant variables included in the model. This is necessary since this analysis aims at explaining only those factors that are significantly associated with the dependent variable.

Age is also significantly associated with unmet need for contraception to limit as shown in Table 5.2. One would expect women who are 40 years and above to exhibit a much lower risk of unmet need as compared to women below these ages. This is because contraceptive use is likely to decline at older ages even among apparently fecund women due to declining frequency of intercourse (Njogu, 1991:85). In addition, it is also likely that the need for limiting childbearing among the older women has already been met which in turn reduces their risk of having unmet need for contraception to limit.

Bivariate analysis in the preceding chapter revealed that as age increases, unmet need to limit also tends to increase reaching the peak at 35-39 age group and drops thereafter. An examination of age in this section also confirms the fact that women in the 35-39-age category exhibit the highest level of unmet need for contraception to limit as compared to women who are 40-49 ears. This is anticipated because as age increases, women tend to achieve their fertility goals nd hence more and more wish to use limiting methods of contraception to control their fertility. Robey et al., (1996:17) using 1993 DHS data also found that in Kenya, unmet need to limit peaks t age 35-39 years and drops thereafter.

Inicity is also an explanatory factor underlying unmet need for contraception to limit further ildbearing. The table shows that as compared to Kikuyu women, it is only the Kisii women at tend to be less likely associated with unmet need for contraception to limit. Despite this, it is y the Luhya, Luo and Kamba that show a significant and positive association with unmet need contraception to limit.

Table 5.2 Parameters for logistic regression model and associated statistics of selected characteristics that are significantly related with unmet need for contraception to limit in Kenya

| | Log odds | LRx $^2$ | df | p-Value | Odds Ratio | CASES |
|---|---|---|---|---|---|---|
| **NO. OF LIV.CHILDREN** | | **191.7** | **4** | **<. 05** | | |
| 0 | 0.0000 | | | | 1.0000 | 342 |
| 1-2 | 0.4386 (6.2555)** | | | | 1.5506 | 1549 |
| 3-4 | 0.5614 (3.0362)*** | | | | 1.7532 | 1336 |
| 5-6 | 0.6472 (4.4634)*** | | | | 1.9101 | 912 |
| 7+ | 0.7419 (6.2554)*** | | | | 2.1000 | 674 |
| **AGE OF RESPONDENT** | | **31.7** | **3** | **<. 001** | | |
| 40-49 | 0.0000 | | | | 1.0000 | 905 |
| 35-39 | 0.7296 (5.1416)*** | | | | 2.0742 | 828 |
| 29-34 | 0.6848 (4.4525)*** | | | | 1.9834 | 1848 |
| 15-24 | 0.4921 (2.0624)** | | | | 1.6357 | 1232 |
| **ETHNICITY** | | **28.9** | **6** | **<. 001** | | |
| Kikuyu | 0.0000 | | | | 1.0000 | 741 |
| Kamba | 0.5211 (2.4362)** | | | | 1.6839 | 488 |
| Kalenjin | 0.2333 (1.2082) | | | | 1.2627 | 803 |
| Kisii | - 0.1343 (-0.5323) | | | | .8743 | 367 |
| Luhya | 0.5028 (2.6038)** | | | | 1.6533 | 715 |
| Luo | 0.7491 (3.7968) | | | | 2.1151 | 643 |
| Other | 0.1603 (0.8345) | | | | 1.1739 | 1056 |
| **EDUCATIONAL LEVEL** | | **13.6** | **4** | **<. 05** | | |
| Sec.Comp+ | 0.0000 | | | | 1.0000 | 762 |
| None | 0.2634 (-1.8342) | | | | 1.3013 | 470 |
| Prim Incomp. | 0.1653 (-0.3358) | | | | 1.1798 | 1199 |
| Prim comp. | -0.0640 (0.9018) | | | | .9380 | 1628 |
| Sec. Incomp. | -0.4547 (1.2937) | | | | .6346 | 754 |
| **LIS.TO RADIO DAILY** | | **11.2** | **1** | **<. 001** | | |
| Yes | 0.0000 | | | | 1.0000 | 2907 |
| No | 0.3392 (2.4362)*** | | | | 1.4038 | 1906 |
| **HUSB' APPROV. OF FP.** | | **8.3** | **2** | **<. 05** | | |
| Approves | 0.0000 | | | | 1.0000 | 3116 |
| Disaprov. | 0.3320 (2.8920)** | | | | 1.3937 | 1061 |
| DK | 0.0584 (0.3741) | | | | 1.0601 | 636 |
| -2 Log Likelihood | 2882.6586 | | | | | |
| Model chi-square (df) | 442.8 (20) | | | | | |
| % of women correctly predicted | 89.07% | | | | | |
| **Constant =** | **-7.0016** | **Standard Error =** | | **0.7758** | | |

*Notes: The numbers in the parentheses are the students' t-test values of dummies of the respective variables. Reference categories appear first under each variable that showed significance with the logit of unmet need to limit.* ***p-value<.001, **p-value<.05, *p-value<.01.*

*Source: Primary Analysis of the 1998 KDHS Data.*

The variations in the logit of unmet need to limit by ethnicity may be explained by differentials in use of contraceptives. Other factors may be related to norms and customs affecting age at marriage, type of marital unions, postpartum abstinence, breast-feeding and resilience in the face

of innovation (Clignet 1970; Lesthaege 1989; Murty and De Vos 1984 cited in Njogu 1991:85). As evidenced from Table 5.2, it is expected that the other ethnic groups besides the Kikuyu women will tend to exhibit higher levels of unmet need for contraception to limit given their lower contraceptive prevalence and rather weaker desire to limit further childbearing (NCPD, et al., 1999: 43).

A study using the 1989 KDHS by Lasee and Becker (1997) revealed that in Kenya, there exists a strong statistical association between women's reports of having heard or seen messages about family planning through various media outlets and their use of contraceptives and their reproductive preferences (Westoff and Rodriguez 1995). Exposure to mass media in this study is measured by whether or not the respondent listens to radio daily. On the overall, women who do not listen to radio daily appear to be 1.4080 times more likely to be associated with unmet need for contraception to limit as compared to those who listen.

Although past studies on mass communications have reached disparate conclusions on the general question of whether the mass media can influence reproductive behaviour (Westoff and Rodriguez 1995), our results show clearly that mass media has in fact a significant effect on unmet need for contraception to limit. The results confirm our hypothesis that, women who do not listen to radio daily are much more likely to experience unmet need for contraception than those who do. Similar findings have been found elsewhere. For instance, Rogers et al., (1999:193) in an entertainment-education radio soap opera that was broadcast on Tanzania Radio station found that the program had a strong behavioural effect on family planning. The authors found that the program increased listener's self-efficiency regarding family planning adoption and influenced listeners to talk with their spouses and peers about contraception.

Husband approval of family planning is also an important determinant underlying unmet need to limit as per the results of Table 5.2. Women who are uncertain about their husbands' approval of family planning or those who disapprove of it are bound to experience a higher level of unmet need for contraception to limit births as compared to those whose husbands approve family planning. However Table 5.2 shows that it is only women whose spouses disapprove of family planning that are significantly associated with unmet need for contraception to limit ("t" >1.96). This is to be expected. Usually, husbands' approval is associated with increased contraceptive use among women.

In one study for instance, it was found that wives who believed that their husbands approved of family planning were more likely to be practicing contraception than those who felt that their husbands disapproved or were uncertain about their husband's attitude (Lasee and Becker 1997). In a related study in rural Chitwan district in Nepal, Stash (1999:273) found that because a woman's position within her marital home hinges on her reproductive success, she was likely to give in to the demands of her husbands even when she clearly wished to end childbearing.

From Table 5.2, as compared to women who have completed secondary education or higher, those who have never gone to school or have incomplete primary schooling are more likely to be associated with unmet need for contraception to limit. Beyond primary incomplete level of schooling, education tends to be negatively associated with the logit of unmet need for contraception. For instance, women with secondary incomplete level of schooling are only 0.6346 times likely to have unmet need as compared to those with secondary complete schooling or higher. None of the dummies of education is however significantly associated with unmet need for Contraception ("t" < 1.96).

From the table, it seems there is a threshold level of schooling (which is primary complete) beyond which education is less likely to be associated unmet need for contraception to limit. Before this level is attained, educational attainment of the respondent is associated with an increased risk of unmet need for contraception. Thus although we expected an inverse relationship between educational attainment and unmet need to limit, we do not have enough evidence to reject our null hypotheses.

An assessment of the overall model is adequate. As shown in Table 5.2, 89.07 percent of women with unmet need for contraception to limit or those without unmet need for contraception to limit are correctly predicted by the model. Additionally, the standard error (S.E) estimates are generally low ranging from 0.4993 for respondents from Kisii community to 0.0000 for respondents whose parity is seven surviving children or above implying that the results can be confidently relied upon. The Pearson chi-square statistic is also 0.0000. Usually, if p-value is less than 0.05, then the model is adequate in explaining the dependent variable.

## 5.3 FACTORS UNDERLYING TOTAL UNMET NEED FOR CONTRACEPTION

The results and discussion of the last multivariate logistic regression analysis are presented in this section. From Table 5.3, several variables were included in the final model viz.: age, the number of living children, ethnicity, educational attainment of mother, husband approval of family planning, exposure to mass media and province of residence. Conspicuously, spousal communication about family planning and type of place of residence did not show any significance with the logit of total unmet need and thus are thus excluded from the model. No further analysis is made of these variables (see Appendix III)[3].

[3] To know how insignificant some variables are in explaining total unmet need appendix III using enter method is given for both the significant and insignificant variables included in the model.

From Table 5.3 below, the relationship between unmet need for contraception and the number of living children is not only additive but also significant (odds Ratio > 1 and "t" test values > 1.96). For instance, as compared to women who have no children at all, those who have 3-4 children are 11.176 times more likely to have total unmet need for contraception. A similar interpretation can also be used for the assessment of the association between unmet need vis-a-vis the rest of the dummies of surviving children.

The positive association between number of living children and the logit of total unmet need is anticipated. Usually, a higher number of living children is accompanied by an increased demand for contraception. The effect of number of living children on unmet need to space or to limit (as is seen in the preceding discussion) is also additive. As McNicoll (1980 cited in Dodoo, 1998) puts it, for a woman who wants no more children, to rule out family planning if practicing it creates serious conflict with her family is perfectly consistent and reasonable. Hence it is not surprising that women with a higher number of surviving children are exposed to an increased likelihood of unmet need to family plan.

An examination of age shows that as compared to women aged 40-49 years, those who are aged below 40 years are more likely to have total unmet need for contraception. The results show that as age increases, total unmet need for contraception tends to decline. Under normal circumstances, this is to be expected. Our preceding analyses show that unmet need for spacing (which is negatively associated with age) constitutes the largest part of the total demand for family planning. Thus on the overall, women at younger ages are bound to experience higher risks of overall unmet need for contraception and the inverse is also true.

It is quite rational that as age increases, the propensity of having unmet need for contraception decreases. This is because women tend to achieve their desired family size as they age. Also, older women tend to have reduced coital frequency as well as fecundity. This leads to their reluctance to use contraception to check on their fertility despite the fact that they concede a

certain risk of becoming pregnant (Njogu, 1991; Robey et al., 1996; Casterline et al., 1997). This could be probably why we have slightly a higher level of unmet need for contraception even among women approaching forty years as compared to the reference category (Table 5.3).

**Table 5.3 Parameters for logistic regression model and associated statistics of selected characteristics that are significantly related with total unmet need for contraception: Kenya, KDHS 1998**

| | Log odds | LRX$^2$ | d.f. | Sig. | Odds Ratio | Cases |
|---|---|---|---|---|---|---|
| **No. OF LIV. CHILDREN** | | **229.4** | **4** | **<. 001** | | |
| 0 (ref) | 0.0000 | | | | 1.0000 | 342 |
| 1-2 | 1.3259 (6.8699)*** | | | | 3.7655 | 1549 |
| 3-4 | 2.0301 (9.7507)*** | | | | 7.6148 | 1336 |
| 5-6 | 2.4779 (11.1768)*** | | | | 11.9165 | 912 |
| 7+ | 3.0514 (12.8318)*** | | | | 12.1444 | 674 |
| **AGE** | | **234.5** | **6** | **<. 001** | | |
| 40-49 (ref) | 0.0000 | | | | 1.0000 | 905 |
| 35-39 | 0.9983 (7.6851)*** | | | | 2.7137 | 828 |
| 25-34 | 1.6099 (11.9873)*** | | | | 5.0023 | 1848 |
| 15-24 | 2.2983 (14.0655)*** | | | | 9.9575 | 1232 |
| **ETHNICITY** | | **31.1** | **6** | **<. 001** | | |
| Kikuyu (ref) | 0.0000 | | | | 1.0000 | 741 |
| Kamba | 0.0508 (0.2148) | | | | 1.0521 | 488 |
| Kalenjin | 0.0764 (0.4447) | | | | 1.0794 | 803 |
| Kisii | -0.4027 (-1.6518) | | | | 0.6685 | 367 |
| Luhya | 0.2782 (1.4022) | | | | 1.3208 | 715 |
| Luo | 0.4164 (1.9586) | | | | 1.5165 | 643 |
| Other | -0.0917 (-0.4434) | | | | 0.9124 | 1056 |
| **EDUCATIONAL ATTAINMENT** | | **22.3** | **4** | **<.001** | | |
| Secondary + (ref) | 0.0000 | | | | 1.0000 | 762 |
| None | 0.3757 (-0.6226) | | | | 1.4560 | 470 |
| Primary incomplete | 0.4117 (1.6157) | | | | 1.5094 | 1199 |
| Primary complete | 0.2052 (3.3255)* | | | | 1.2278 | 1628 |
| Secondary incomplete | -0.0995 (2.5300)** | | | | 0.9053 | 754 |
| **LISTENS TO RADIO DAILY** | | **23.8** | **1** | **<. 001** | | |
| Yes (ref) | 0.0000 | | | | 1.0000 | 2907 |
| No | 0.3579 (4.8893)*** | | | | 1.4303 | 1906 |
| **HUSB' APPROVAL OF FP** | | **33.5** | **2** | **<. 001** | | |
| Approves (ref) | 0.0000 | | | | 1.0000 | 3116 |
| Disapproves | 0.4775 (5.6981)*** | | | | 1.6120 | 1061 |
| Don't know | 0.3035 (2.7666)** | | | | 1.3545 | 636 |
| **PROVINCE** | | **28.2** | **6** | **<. 001** | | |
| Central (ref) | 0.0000 | | | | 1.0000 | 477 |
| Nairobi | 0.9715 (0.6031) | | | | 2.6420 | 221 |
| East | 0.9216 (3.7251)*** | | | | 2.5133 | 740 |
| Eastern | 0.5907 (2.2737)** | | | | 1.8052 | 699 |
| Nyanza | 0.6929 (2.6671)** | | | | 1.9995 | 874 |
| Rift valley | 0.8352 (4.0722)*** | | | | 2.3053 | 1225 |
| Western | 0.1670 (3.9348)*** | | | | 1.1818 | 577 |
| Log likelihood | -4991.9 | | | | | |
| Model chi-square (df) | 611.4 (26) | | | | | |
| % of women correctly predicted | 73.9 % | | | | | |
| Constant = -5.7292 | standard error = 0.2894 | | | | | |

*Note: the figures in the parentheses are the students' t-test. Ref = reference categories. ***p-value<.001, **p-value<.05, *p-value<0.01.*

*Source: Primary analysis of 1998 KDHS Data.*

The observed association between ethnicity and the overall unmet need for family planning is interesting to note. As compared to Kikuyu women, it is only the Kisii who are negatively associated with unmet need for contraception. Otherwise, as compared to our baseline category, the rest are more likely to be associated with unmet need for contraception. Given the higher fertility levels between the Luhya and Luo coupled with low contraceptive prevalence (NCPD 1999), one would expect these communities to exhibit higher levels of unmet need for family planning as compared to the Kikuyu women.

Seemingly, most tribes in Kenya still have the norms that advocate for large family sizes as compared to those of the Kikuyu women. A study done in Kenya, for instance revealed that the Kikuyu, "have adopted, or are seeking to adopt, the complex, specialized culture that is associated with the industrial world" (Dow and Werner, 1983). Thus unlike other ethnic groups, the Kikuyu women are bound to exhibit a lower risk of unmet need for contraception. These findings confirm our hypothesis that ethnicity varies with unmet need for contraception. Despite this, none of the ethnic groups examined under this study shows a significant association with the total unmet need for contraception ("t" < 1.96).

The consistent relationship between the logit of unmet need and educational attainment is also worth to note. It is only women who have incomplete secondary schooling that are less likely to exhibit higher levels of unmet need for contraception as compared to those who have secondary complete level of schooling or higher. Owing to the fact that women who have at least secondary schooling may have similar reproductive preferences with our reference category, no much difference is expected between the two in terms of their level of exhibiting unmet need for contraception.

Most studies reveal that outside sub Saharan Africa, better educated women have somewhat less unmet need than women with little or no education at all (Westoff and Bankole, 1996). This is also true for the Kenyan case. However, in other sub Saharan Africa, the levels of unmet need have been found to be the same regardless of women's educational level (Robey et al., 1996: 18).

Despite the expected negative association between education and unmet need for contraception, it is only after acquiring complete level of primary education or above that we have a significant association between education and unmet need for contraception (see Table 5.3).

Husband approval of family planning is also associated with the overall unmet need for family planning. From the table above, it seems that husbands who disapprove or else are certain about their spouses' use of family planning are more likely to experience total unmet need for contraception. The above results seem to point out the fact that whenever we have disagreement between couples as far as family planning is concerned, it is the husbands' views that prevail. Seemingly, therefore, husbands' approval of family planning is a condition for the wives' adoption of contraception and thus is associated with a lower risk of unmet need as compared to husbands' disapproval (Ngom, 1997).

The observed significant association between husbands' approval of family planning and unmet need for contraception is expected. In sub Saharan Africa where power relations often skew decision-making power in men's favour (Mustafa and Mumford 1984; Frank and McNicoll 1987; Khalifa 1988 cited in Dodoo and Landewijk, 1996:30), the above results are highly anticipated. It is thus conceivable that women with unmet need for contraception, but whose spouses are opposed or are uncertain about their wives' use of family planning, may not be able to "meet" this unmet need by adopting contraception.

Like in the case of unmet need for spacing, province of residence is also associated with total unmet need for contraception. As compared to Central province, the rest of the provinces are more likely to be associated with a higher level of unmet need for contraception (odds ratio > 1). Additionally, apart from Nairobi, the rest of the dummies are significantly associated with unmet need for contraception ("t" > 1.96). The uneven distribution of contraceptive facilities, cultural differences in fertility preferences across the provinces are likely to be the underlying causes of the deviations in the levels of unmet need for contraception by province.

For instance, the high infecundity as well as the high childhood mortality levels in the Coastal region may be responsible for the observed low contraceptive levels and the higher total unmet need for contraception in the Coastal province as compared to the Central province (also Bongaarts et al., 1984; Jensen 1995:62). Generally as pointed out in our bivariate analysis, most people from different provinces would wish to space or limit their childbearing activities and this is why the risk of unmet need is generally high as one shift from central province to any other province included in this analysis.

This analysis also shows that there is a strong association between exposure to mass media (measured by the proportion of those who listen the radio daily) and unmet need for contraception. For instance, as compared to respondents who listen to radio daily, those who do not are 1.4303 times more likely to have unmet need for contraception. These findings support our hypothesis that women who do not listen to radio on a daily basis are much more likely to exhibit unmet need for contraception as compared to those who do. Our findings are also supported by evaluations on media campaigns in parts of Nigeria which indicated large increases in the number of clients at clinics following the implementation of different communication campaigns (Piotrow, et al., 1990 cited in Westoff and Rodriguez 1995:26).

Generally the low standard error (S.E) of the estimates seems to suggest that the model is adequate in explaining the logit of the overall unmet need for contraception. This low value (.12894) indicates that the model is adequate in explaining total unmet need for contraception. Given that 73.9 percent of the respondents sampled in the 1998 KDHS are correctly predicted as having met or not met their need for family planning in this model, we can rightly assess that this model is significant in explaining the logit of unmet need. The low Pearson chi-square statistic (p <0.001) is a further indicator that the model is adequate in explaining our dependent variable.

## CONCLUSION

Multivariate results have been presented and discussed in this chapter. It is clear that the correlates of unmet need for contraception to space are not necessarily the same as those for unmet need for contraception to limit. Age of the woman still remained the most important factor underlying unmet need for contraception to space- a similar finding to the bivariate results in Chapter Four. The other correlates of unmet need for contraception to space in the descending order of importance are the province of residence, the number of living children, husband approval of family planning, education of the woman, the type of place of residence and exposure to radio on a daily basis. Ethnicity of the woman and spousal communication about family planning had no significance at all in explaining unmet need for contraception to space.

Likewise, the number of living children a woman had remained the most significant factor associated with unmet need for contraception to limit while husbands' approval of family planning showed the least. However, type of residence, province of residence and spousal communication about family planning did not show any significant association with unmet need for contraception to limit. Finally, age of the woman had the highest association with total unmet need for contraception while province of residence had the least. The significant association between spousal communication about family planning and type of place of residence on the one hand, and total unmet need for contraception on the other hand, was conspicuously lacking. The total lack of any significance between spousal communication and any of the three aspects of unmet need for contraception could be attributed to the other confounding factors included in the model which interact with spousal communication to cause unmet need for contraception.

# CHAPTER SIX

## SUMMARY, DISCUSSION AND RECOMMENDATION

This study aimed at examining the factors underlying unmet need for family planning among the currently married women in Kenya. A proper understanding and specification of the factors underlying unmet need for contraception is necessary on social and demographic grounds. Data drawn from the 1998 KDHS data was utilized. The Casterline et al., (1997) theoretical framework was used to study the underlying causes of unmet need for contraception. This framework proposes that there are various obstacles (social, cultural, economic, individual and demographic), which may block prospective women who are in need of contraception from actually contracepting. The study used cross tabulations, frequency distributions and logistic regression to analyze the data.

The bivariate findings revealed that age was negatively associated with the component of unmet need to space but positively associated with unmet need to limit. On the overall, however, age had an inverse association with unmet need for contraception. The bivariate association between total unmet need for contraception and age was also negative. Owing to the fact that unmet need for spacing (which constitutes the larger demand for potential contraception) was negatively associated with age, it was likely to bias the association between total unmet need for contraception to similarly have a negative association with age.

Multivariate analysis also revealed that age was inversely associated with unmet need for contraception to space but positively associated with unmet need for contraception to limit reaching the peak at age 35-39 years and declining thereafter. The association between total unmet need for contraception and age was also significant and negative. In Zambia, Lwanga (1999) also found that the association between total unmet need for contraception and age was negative. However, Westoff and Bankole (1995) found that the association between total unmet need for contraception and age was lacking due to the contrasting effect between unmet need for spacing with age and unmet need for limiting with age.

Bivariate analysis found that the association between unmet need for spacing and the number of living children of the woman was significant and positive up to the second child and thereafter decreased with any additional child. On the other hand, unmet need for contraception to limit was significant but negatively associated with the number of living children. Interestingly, the association between total unmet need and the number of living children was also strongly positive.

Multivariate analyses also found that women who had one or more surviving children were more likely to exhibit higher levels of unmet need for contraception as compared to women who were childless. This was true for all the three aspects of unmet need for contraception. Elsewhere, the effect of number of living children on unmet need has also been found to be positive (Dodoo, 1998; Lwanga, 1999).

Type of place of residence also affected unmet need for contraception. Women who resided in urban areas generally had lower levels of unmet need as compared to their rural counterparts. This was found to be true in both our bivariate and multivariate analysis. Studies elsewhere have found similar results (Robey et al., 1996). On another level, province of residence also revealed modest differentials with the various components of unmet need. In cases where province of residence was significantly associated with unmet need for contraception, modest variations also existed among the various provinces with reference to Central province. The above results were expected given the differences in the socio-economic status by province.

Different ethnic groups also exhibited varied levels of unmet need with those having higher contraceptive use levels exhibiting the lowest unmet need for contraception and vice versa. As a result, the level of unmet need ranged from the 14.6 percent among the Kikuyu to 33.4 percent among the Luhya women.

Under multivariate analysis, ethnicity was, not found to be significantly associated with the level of unmet need for contraception to space. This means that although most ethnic groups wished to space their pregnancy as compared to the Kikuyu women, they faced similar barriers like the Kikuyu women in doing so. However ethnicity was found to affect unmet need for contraception to limit births as well as total unmet need for contraception. This confirmed our hypothesis that ethnicity tends to vary with unmet need for contraception.

Recent studies have pointed out that spousal communication is an important underlying cause of unmet need for contraception. Much of these discussions have not only been focused on spousal communication about family planning, but also on the role-played by male/husbands' in women's reproductive decision-making (Ezeh 1993, Dodoo 1998). Findings show that it is only husband's approval about family planning that was significantly associated with unmet need for contraception.

To a large extent, both bivariate and multivariate analyses revealed that women whose husbands approved of their (wives') use of contraception were much less likely to exhibit higher levels of unmet need for contraception as compared to those whose husbands either disapproved or were (i.e., their husbands') uncertain about their wives' use of contraception. This was expected and has also been found to be true in other parts of the world. For instance, it has been found by a number of studies that male family planning members, including spouses, are a major reason for nonuse of contraception among females who would consider contracepting (Dodoo, Luo, and Panayotova 1997; Ezeh 1993; Stash 1999).

It has been argued that unlike the West, there has been the lack of the anticipated consistent association between unmet need and educational attainment (Robey et al., 1996). Normally one would expect unmet need for contraception to be negatively associated with educational attainment. Our findings show that except for unmet need for contraception for limiting further childbearing, education increases with unmet need reaching the peak at primary incomplete level of schooling and then drops afterwards. In the case of limiting further births, unmet need for

contraception, decreases with educational level, a feature common in the west and not in the sub-Saharan Africa (see Robey et al., 1996).

Under the three models of multivariate analyses included in this study, education is also negatively associated with total unmet need for contraception. Findings show those women with secondary complete and above have the lowest levels of unmet need for contraception while those with no education at all have the highest level of total unmet need for contraception. The exception to this is seen in the case of limiting where, as compared to women with secondary education, it is only those with education beyond primary incomplete that are negatively associated with unmet need for contraception. The results appear to imply that as compared to secondary schooling and above, it is primary complete level of schooling that is the threshold level beyond which unmet need for contraception becomes significant and inversely associated with education.

Finally, exposure to mass media has also been found to bear some significance with unmet need for contraception. Using the radio as the most common source of mass media in Kenya, this study found that in both the bivariate and multivariate analyses, women who listened to radio daily were less likely to experience unmet need for contraception as compared to those who did not. This confirmed our hypothesis.

**RECOMMENDATIONS FOR POLICY**

The recognition of serious impediments to contraceptive use among women who want to space or limit their childbearing presumably helps in designing policies to aid in increasing the voluntary use of contraceptives. Findings revealed that in Kenya, unmet need for contraception to space constitutes the largest part of the total potential demand for family planning. Efforts by concerned government departments as well as agencies and non-governmental organizations should therefore be geared towards motivating women with unmet need to space to adopt contraception. Proper emphasis should therefore foster the use of temporary methods of family planning such as the pill, injectibles, IUD, foam/jelly/diaphragm and condom. In doing so, attention should also be focused on women with unmet need for limiting since it has been evidenced elsewhere that a small reduction in unmet need levels can translate into a large

number of births averted.

Future family planning programming should involve men in the implementation of family planning policy. This is necessary given the fact that husband approval of family planning is an important underlying cause of unmet need in Kenya. Excluding men as partners in family planning programming and implementation is thus, an impediment to coming up with solutions on addressing the issue of unmet need for contraception among the currently married women. This can be done through fostering of spousal communication and promotion of Information, Education and Communication (IEC) programs.

Literature review shows that a large proportion of women were not currently using contraceptives and at the same time were not in need of contraception. Future family planning policy ought to explore ways through which most of this subset of women can be motivated to space or limit further childbearing before introducing contraceptives to them. One way of doing this is to increase service delivery points (SDPs) especially in areas where they are scarce. In addition. behaviour change for communication (BCC) strategies which involve IEC programs for awareness creation as well as IEC for behaviour change should be used to empower women on the need for contraception awareness and usage since literature has pointed out that fear of perceived side effects as well as rumours are important factors hindering potential users from actual contracepting.

Further, improving the socio-economic status of women will be a great move towards future reduction in unmet need levels. This is because findings from this study show that unmet need for contraception levels are high among women who are uneducated, residing in rural areas, unexposed to radio, and those, whose husbands are unsure or do not approve of their wives' use of contraception. In particular, efforts should be made by the government in collaboration with non-governmental organizations and donor agencies to provide universal education especially at primary level since it is women with incomplete primary education that exhibit the highest levels of unmet need for contraception. The concerned authorities should also expand family planning media campaigns and enhance husband-wife communication about family planning for instance

through health workers and community based distributors (CBDs).

There is also need to diversify contraceptive methods so that women can have an increased choice especially in provinces where unmet need for contraceptive prevalence levels is high. To this end, there is need for renewed efforts to expand SDPs especially in the Western, Nyanza, and Rift valley provinces where these services are lacking or are far away from a large proportion of the population.

Findings at bivariate and multivariate analyses show that it is younger women who have the highest risk of unmet need for contraception. Therefore, the introduction of Family Life Education (FLE) in schools and enhancement of youth centers should be effected to bridge the knowledge gap between sexual escapades among youth and the dangers of unmet need for contraception. In doing so, the would be young mothers could make informed decisions before entering the reproductive life which most of them seem to enter unwillingly and end up suffering from the consequences of unmet need for contraception. There is also need to improve further on the quality of family planning services offered to the people. Expanding training programs for medical health personnel can do this. Such staff should also be trained on how to handle their clients cautiously in order to minimize discontinuation rates of contraception resulting from poor services offered at family planning clinics.

**RECOMMENDATIONS FOR FURTHER RESEARCH**

Given the significance of husband approval of family planning in determining unmet need for contraception as found in this study, future studies must therefore incorporate men in addressing the problem of unmet need for contraception among women. Regarding men as partners is important since marriage leads to a shift in reproduction decision -making power to the male side and hence little can be achieved in addressing this problem as long as men continue being excluded from studies similar to this (also Dodoo, 1998). Based on the backdrop of these findings, there is therefore the need to adopt the couple measure of unmet need for contraception.

There is need to continue refining the measure of unmet need for contraception. For instance, many women with unmet need for contraception report that they do not intent to use

contraception, while others, not classified as having unmet need, say they do intend to use contraception. Contraceptive outreach programs have not sought out the latter group of women, who constitute a larger reservoir of potential users. Future research ought to address this problem.

Though it is useful for family planning programs, little has been done in Kenya on how individuals move into and out of the group with an unmet need for contraception and the group users. Thus future investigations in this area are quite important. Further, studies elsewhere imply that the 24 -month cut off that is traditionally used to identify women who wish to space their births is problematic. It is evidenced that women who are close to either side of the cut off are not substantially different from each other, and many who wish to use within 23 months or less are genuinely interested in the short term use of contraceptives (Curtis and Westoff, 1996). Attention should thus be given to a modification of the DHS questionnaire to inquire into the motivational levels of women across a wider range.

In a country like Kenya where adolescence fertility is high, there is need for studies to focus on the determinants of unmet need for contraception among this group of women. This is necessary given the fact that most teenagers are sexually active and furthermore their sexual life is spontaneous rather than planned. In addition, evidence shows that a large proportion of adolescence fertility in Kenya constitutes unwanted pregnancy-an important pointer to the existence of high unmet need for contraception levels among this subset of women. More research on unmet need among the once married is also important because it is the measurement of unmet need among all groups of women that can give reliable estimates on the extent of potential demand for contraception.

Some women who are currently contracepting are already infecund despite the fact that they are sexually active. These women are thus overcontracepting. The fact remains that such women do not require family planning services at all in order to control their fertility and thus should be excluded from the users who are fecund and sexually active. Therefore, future research should

investigate the extent of this issue in Kenya so that the potential demand for family planning is not overestimated.

We do not have literature on changes in the underlying factors affecting unmet need for contraception in Kenya. Future research ought to explore trends in the underlying causes of unmet need so that the concerned authorities can prioritize efforts in addressing the problem of high levels of unmet need for contraception in Kenya. Such efforts could entail tackling persistence causes of unmet need for contraception without loosing sight of the minor and emerging ones.

Future measures of unmet need for contraception should also exclude pregnant and amenorrhoeic women who owe their pregnancy or last birth to unintended pregnancy since these women are not necessarily at risk of conception. The truth is that such women have no immediate need for contraception and thus including them in the measure only serves to overstate the actual levels of unmet need for contraception.

The 1998 KDHS dataset upon which, this analysis is based excludes the sparsely populated areas in the north parts of the country yet this region not only constitutes about 5 percent of the total Kenyan population but also has the largest population that is displaced. Future research should investigate the underlying causes of unmet need among the displaced since this population suffers the greatest extent of reproductive health violations yet reproductive health data on the internally displaced and refugees are few. Researches done so far indicate that many people in emergency situations may want to have fewer children and are thus motivated to use contraception.

The measurement of unmet need for contraception should also incorporate time since any estimate of unmet need that does not relate to a particular point in time loses its relevance for planning program goals and measuring program success. Indeed, the periodicity assumption is central in the measure of unmet need for contraception.

## REFERENCES

Ainsworth, M.,
Family Planning Programs: The Clients' Perspective, *World Bank Staff Working Papers,* No. 676, Population and Development Series, No.1.

Alauddin, M., Faruquee R.,
Population and Family Planning in Bangladesh: A Survey of the Research, *World Bank Staff Working Papers* No.557, The World Bank, Washington D.C. USA.

Bankole, A., and Ezeh A.C.,
Unmet Need for Couples: A Conceptual Framework and Evaluation with DHS Data, *Population Council,* No. 12, 1999.

Becker, Marshall H.,
The Health Belief Model and Personal Health Behaviour." *Health Education Monographs* No.2, 1974.

Biddlecom, A.E., Casterline J.B., Perez A.E.,
"Spouses Views of Contraception in the Philippines", *International Family Planning Perspectives, v.23,* No. 3, Sept 1997.

Bongaarts, J.,
"The KAP-Gap and the Unmet Need for Contraception", *Population and Development Review,* Vol.17, No.2, June 1991.

Bongaarts, J and Bruce J.,
"The causes of Unmet Need for Contraception and the Social Context of services", *Studies In Family Planning,* Vol.26, No.2, March 1995.

Boulier, B.,
"Unmet Need for Contraception: Evaluation of Measures and Estimates for Thirty-six Developing Countries." Background paper for the *World Development Report 1984.*

Brackett, J.W.,
"Family Planning In Four Latin American Countries- Knowledge, Use and Unmet Need: Some Findings From The World Fertility Survey", *International Family Planning Perspectives and Digest,* Vol.4, No.4, winter 1978.

Bulatao, R.A.,and Lee,R.D.,
An overview of fertility determinants in developing countries, 1982 (Unpublished).

Caldwell, J., Gaminiratne, K.H.W., Caldwell, P., Soma de Silva, Caldwell B., Weeraratne N., Silva P.,
"The Role of Traditional Fertility Regulation in Sri Lanka", *Studies in Family Planning,* Vol. 18 No. 1, Jan/Feb 1987.

Casterline, J.B. Perez A.E and Biddlecom A.E,
"Factors Underlying Unmet Need For Family Planning In The Philippines", *Studies In Family Planning,* Vol. 28 No. 3, Sept.1997.

Curtis, and Westoff C.,
"Intention to use contraceptives and subsequent contraceptive Behaviour in Morocco," *Studies In Family Planning,* Vol. 27 No. 3, Sept.1996.

DeGraff, D.S., Victor deSilva,
"A New Perspective On The Definition And Measurement Of Unmet Need For Contraception", *International Family Planning Perspectives,* Vol.22, No. 4, Dec.1996.

Dodoo, FF.N.A., Landewijk P.V.,
"Men, Women, and the Fertility Question in Sub-Saharan Africa: An Example from Ghana", *African Studies Review*, Vol. 39, No. 3, Dec. 1996.

Dodoo, F.N.A.,
"Men matter: Additive and Interactive Gendered Preferences and Reproductive Behaviour in Kenya", *Demography,* vol. 35 No. 2, May 1998.

Donovan, P.,
"In Nigeria, Traditions of Male Dominance Favor Large Families, but some Men Report Having Fewer Children", *International Family Planning Perspectives,* Vol.21, No. 1, Dec.1995.

Dow, T.E., Werner L.H.,
"Prospects for fertility Decline in rural Kenya", *Population and Development* Review, Vol. 9 No.1 March 1983

Easterlin, R.,
"An Economic Framework For Fertility Analysis", *Studies In Family Planning,* Vol.6, No.3, 1975.

Ezeh, A.C.,
"The influence of spouses over each other's contraceptive attitudes in Ghana", S*tudies in family planning* 1993 vol. 24, No. 3.

Family Health International,
Adolescent Reproductive Health, vol.17., No.3, Spring 1997.

Ferguson, A.G.,
Fertility and contraceptive adoption and discontinuation in Kenya S*tudies in family planning* vol.23, No.4, July-Aug. 1992.

Fishbein, M.,
Towards understanding of family planning behaviors." *Journal of Applied Social Psychology* vol 2., No.3, 1972.

GoK,
The National Implementation Plan Kenya Family Planning Program 1995-2000, Ministry of Health, September 1995.

Goldberg, H.I, McNeil M., Spitz A.
"Contraceptive Use and Fertility Decline In Chogoria", Kenya, *Studies In Family Planning,* Vol. 20, No.1, Jan/Feb.1989.

Gujarati, N.D.,
Basic Econometrics, third edition, McGraw-Hill Inc., New York.

Hammerslough, C.R.
"Proximity of Contraceptive Services and Fertility Transition In Rural Kenya", *International family Planning Perspectives* Vol.18, No.2, June 1992.

Hornik, R.,
"Alternative Models of Behaviour change." *Working Paper* No.131, Philadelphia: Center for International Health and Development Communication at the Annenberg School for communication, University of Pennsylvania 1990.

Jambao, A.W.,and Lewis G.L.,
"The Kenya Family Planning Studies IE&C Survey", Mimeo, *Center for African Family Studies Research Unit*, Nairobi, 1989.

Jain, A.K,
"Fertility Reduction and The Quality of Family Planning Services", *Studies In Family Planning,* Vol.20, No.1, Jan/Feb.1989.

Janowitz, B., Anderson J.E, Morris L.,Nakamura M.S, and Fonseca J.B,
"Service Availability and The Unmet Need For Contraception and Sterilization Services In Sao Paulo State, Brazil", *International Family Planning Perspectives,* Vol.6, No.1, March 1980.

Jasen, A.M.,
"Prospect of a Decline in Fertility in Sub-Saharan Africa: A Review of the Recent

Debate", in *Acta Sociologica,* Scandinavian Sociological Association, 1995.

"The Status of Women and the Social Context of Reproduction", *Journal of International Development* Vol. 7, No. 1, 61-79 (1995).

Kane. T., Gueye.M., Speizer I, Sara Pacque- margolis, and Baron, D.,
"The Impact of a family planning multimedia campaign in Bamako, Mali", *Studies In Family Planning,* Vol.28, No.1, 1998.

Karanja, S.M,
Unmet Needs For Contraception and Their Demographic Significance In Kenya, *Population Studies and Research Institute, University Of Nairobi*, 1997 (unpublished M.A Thesis).

Kleinbaum, D. G.,
Logistic Regression: A self-Learning Text, Springer-Verlag, New York, 1992.

Kono and Hayase (ed),
"Fertility in the Developing Countries; A Comparative Study of the Demographic and Health Surveys", in A Comparative Analysis of Women's Education and Fertility IDE, *Statistical Data Series,* No. 66, 1994.

Lwanga. K.C..
Determinants of Unmet need for Contraception in Zambia, *Population Studies and Research Institute, University Of Nairobi*, 1999 (unpublished M.A Thesis).

Mensch. B.S., Arends-Kenning, A. Jain and Garate M.R.,
Avoiding unintended pregnancy in Peru: does the quality of family planning services matter?, *International Family_Planning Perspectives,* Vol.23, No.1, March 1997.

Mueller. D., and Germain A.,
"Stalking the elusive "unmet need" for family planning" *Studies In Family Planning,* Vol.23, No.5, 1992.

Mugenda. O. M., and Mugenda A.G.,
Research Methods: Quantitative and Qualitative Approaches, ACTS Press, Nairobi. 1999

[illegible], M.,
Some cultural factors affecting costs of fertility regulation" *Population Bulletin* No. 17. New York. United Nations. 1984.

National Council for Population and Development, 1994.,
Report of the Demographic and Health Survey, 1993 Dissemination Seminar 8th - 9th June 1994, Nairobi Kenya.

National Council for Population and Development (NCPD), Central Bureau of Statistics, and Institute for Resource Development/ Macro systems Inc. 1994.,
Kenya Demographic and Health Survey 1993, Columbia, Maryland: NCPD and IRD/Macro.

————————1999,
Kenya Demographic and Health Survey 1998, Columbia, Maryland: NCPD and IRD/Macro.

National Research Council,
Factors Affecting Contraceptive Use In Sub-Saharan Africa, *National Academy* Washington DC. 1993

Njogu, W.,
"Trends and Determinants of Contraceptive Use in Kenya" *Demography,* 28, 83-99, 1992

Nortman, D.L.,
"Measuring the Unmet Need for Contraceptive to Space and Limit Births", *International Family Planning Perspectives,* Vol.8, No. 4, Dec.1982.

Norusis, M. J.,
SPSS: SPSS for Windows, Base System User's Guide Release 6.0, SPSS Inc. Chicago, 1993.

Perez, A.E., and Palmore J.A.,
"Reevaluating the unmet need for family planning in the Philippines", *Asian Pacific Population Research Reports,* No 10, April 1997. East West Center, Program on Population.

Rutherford, R.D., and Choe M.K.,
Statistical Models for Causal Analysis, John Wiley and Sons Inc., New York, 1993.

Sivey, B., Ross J. and Bhushan I.,
"Meeting Unmet Need: New Strategies", *Population_Reports,* Series J, No. 43, Family planning Programs, Sept.1996.

Thomson, W.C.,
"Kenya Enters the Fertility Transition" *Population Studies* No. 46, p. 445-457.

Rogers, E.M., Vaughan P.W., Sawhehe M. M.A., Rao N, Svenkerud P., and Soods S.,
"A Radio Soap Opera's effects on Family Planning Behaviour in Tanzania", *Studies in Family Planning,* Vol. 30 No.3, Sept. 1999.

Rutenberg, N., and Watkins, S.C.,
The Buzz Outside the Clinic: Conversation and Contraception in Nyanza Province, Kenya, *Studies in Family Planning,* Vol. 28, No.4, 1997.

Salway, S.,
"How Attitudes Toward Family Planning and Discussion Between Wives and Husbands Affect Contraceptive Use in Ghana", *International Family Planning Perspectives,* Vo20, No.2. June 1994.

Schirm, A.L., Trussell J., Menken J.,
"Contraceptive Failure In The United States: The Impact of Social, Economic, & Demographic Factors", *Family Planning Perspectives* Vol.14, No.2, March /April 1982.

Shah. N.M. and Ahmed T.,
"The Unmet Need for Contraception in Pakistan: A Review of Programs Targets", *International Family Planning Perspectives,* Vol.8, No.1, March 1982.

Siding, Steven, Ross A.J., and Rosenfield A.,
"Seeking common ground: Unmet need and demographic goals" *International Family Planning Perspectives,* Vo20, No. 1, Dec.1994.

Singh, S., and Casterline, J.,
"The Socio-economic determinants in fertility". In Cleland, J. and Hobcraft, J.with Dinesen, B (eds). *Oxford University Press* 1985: 199-222.

Nash S.,
"Explanations of unmet need for contraception in Chitwan, Nepal", *Studies In Family Planning,* Vol.30, No.4 Dec.1999.

Ni Poedjastoeti,
"Fertility Decline in Indonesia: An analysis of Fertility Intentions", *Demographic and Health Surveys World Conference Proceedings* V.2, 1991, Washington, D.C.

Westoff C.F.,
"The Potential Demand For Family Planning", *International Family Planning Perspectives,* vol.14, No.2, June 1988a.

"The Unmet Need For Birth Control in Five Asian countries", *Family Planning Perspectives,* Vol.10 No.3, May/June 1978.

"Measuring the Unmet Need for Contraception: comments on Bongaarts", *Population and Development Review,* Vol.18, No.1, August 1992.

"Is the KAP-Gap Real?" *Population and Development Review,* Vol. 14: 225-332, 1988b.

Westoff, C.F., and Pebley A.R.,
"Alternative Measures of Unmet Need For Family Planning In Developing Countries", *International Family Planning Perspectives,* Vol.7, No.4, Dec.1981.

Westoff C.F., and Bankole A., 1995,
Unmet Need 1990-1994, *DHS Comparative Studies,* No. 16, Calverton, Maryland, Macro International Inc.

"The Potential Demographic Significance of unmet Need", *International Family Planning Perspectives,* Vol.22 No. 1, March 1996.

Unmet Need Revisited, A paper prepared for seminar in Costa Rica for the IUSSP volume on *Methods for Evaluating Family Planning Programs*, May 14-16, 1997.

"The Time Dynamics of Unmet Need: An Example from Morocco", *International Family Planning Perspectives,* Vol.24, No.1, March 1998.

Westoff C. F., and Rodriguez G.,
"The mass Media and Family Planning in Kenya", *International Family Planning Perspectives,* Vol. 21, No. 1, March 1995.

**Appendix 1**: Parameters for the logistic regression model and associated statistics of selected characteristics that are significantly related with unmet need for contraception to space: 1998 KDHS data

| Variable name | log odds | Odds Ratio | Cases |
|---|---|---|---|
| **No. of living children** | | | |
| 0 | 0.0000 | 1.0000 | 342 |
| 1-2 | 1.1412 (.1982)*** | 3.1306 | 1549 |
| 3-4 | 1.5895 (.2170)*** | 4.9015 | 1336 |
| 5-6 | 1.5053 (.2409)*** | 4.5057 | 912 |
| 7+ | 1.5906 (.2819)*** | 4.9069 | 674 |
| **Age of mother** | | | |
| 40-49 | 0.0000 | 1.0000 | 905 |
| 35-39 | 1.3592 (.2475)*** | 3.8932 | 828 |
| 25-34 | 2.4098 (.2389)*** | 11.1315 | 1848 |
| 15-24 | 3.2114 (.2588)*** | 24.8130 | 1232 |
| **Province** | | | |
| Central | 0.0000 | 1.0000 | 477 |
| Nairobi | 0.8423 (.3741)** | 2.3218 | 221 |
| Coast | 1.3551 (.3232)*** | 3.8772 | 740 |
| Eastern | 0.7918 (.3345)** | 2.2073 | 699 |
| Nyanza | 0.8334 (.3189)* | 2.3012 | 874 |
| Rift valley | 1.1783 (.2658)*** | 3.2489 | 1225 |
| Western | 1.3964 (.3127)*** | 4.0406 | 577 |
| **Place of residence** | | | |
| Urban | 0.0000 | 1.0000 | 827 |
| Rural | 0.5130 (.1538)*** | 1.6703 | 3986 |
| **Exposure to Mass media** | | | |
| Yes | 0.0000 | 1.0000 | 2907 |
| No | 0.2300 (.0880)* | 1.2585 | 1906 |
| **Ethnicity** | | | |
| Kikuyu | 0.0000 | 1.0000 | 741 |
| Kamba | -0.1883 (.2947) | 0.8284 | 488 |
| Kalenjin | 0.0308 (.2043) | 1.0313 | 803 |
| Kisii | -0.2880 (.2910) | 0.7497 | 367 |
| Luhya | 0.1441 (.2389) | 1.1550 | 715 |
| Luo | 0.2974 (.2519) | 1.3464 | 643 |
| Other | -0.0987 (0.2501) | 0.9060 | 1056 |
| **Educational level** | | | |
| Sec. Comp+ | 0.0000 | 1.0000 | 762 |
| None | 0.2402 (.1929) | 1.1277 | 754 |
| Prim. Incomplete | 0.3933 (.1527) | 1.3254 | 1628 |
| Prim complete | 0.2817 (.1552)** | 1.4819 | 1199 |
| Sec. Incomplete | 0.1202 (.1912) | 1.2715 | 470 |
| **Husband approval of FP.** | | | |
| Approves | 0.0000 | 1.0000 | 3116 |
| Disapproves | 0.4256 (.1074)*** | 1.5305 | 1061 |
| Don't Know | 0.3678 (.1579)** | 1.4445 | 636 |
| **Spousal communication about FP** | | | |
| More often | 0.0000 | 1.0000 | 1592 |
| Once/twice | 0.2057 (0.1052) | 1.2284 | 1825 |
| Never | 0.1492 (0.1366) | 1.1609 | 1396 |
| **Constant = -7.3884** | **Standard error = 0.4095** | | |

*Notes: figs in the parentheses are standard errors. *** means p<0.001, ** means p<0.05 and * means p<0.01.*

**Appendix 11**: Parameters for the logistic regression model and associated statistics of selected characteristics that are significantly related with unmet need for contraception to limit: 1998 KDHS data

| Variable name | log odds | Odds Ratio | Cases |
|---|---|---|---|
| **No. of living children** | | | |
| 0 | 0.0000 | 1.0000 | 342 |
| 1-2 | 2.6434 (.9884)* | 2.0087 | 1549 |
| 3-4 | 3.5860 (.9906)*** | 5.1554 | 1336 |
| 5-6 | 4.3817 (.9941)*** | 11.4230 | 912 |
| 7+ | 5.0104 (.9982)*** | 21.4230 | 674 |
| **Age of mother** | | | |
| 40-49 | 0.0000 | 1.0000 | 905 |
| 35-39 | 0.7278 (.1426)*** | 2.0705 | 828 |
| 25-34 | 0.6892 (.1555)*** | 1.9922 | 1848 |
| 15-24 | 0.4938 (.2399)** | 1.6385 | 1232 |
| **Province** | | | |
| Central | 0.0000 | 1.0000 | 477 |
| Nairobi | -0.2822 (.4478) | 0.7542 | 221 |
| Coast | 0.4492 (.3673) | 1.5671 | 740 |
| Eastern | 0.3424 (.3624) | 1.4084 | 699 |
| Nyanza | 0.2552 (.3684) | 1.4764 | 874 |
| Rift valley | 0.2552 (.2922) | 1.2723 | 1225 |
| Western | | | |
| **Place of residence** | | | |
| Urban | 0.0000 | 1.0000 | 827 |
| Rural | -0.3026 (.1775) | 0.7389 | 3986 |
| **Exposure to Radio** | | | |
| Yes | 0.0000 | 1.0000 | 2907 |
| No | 0.3519 (.1025)*** | 1.4217 | 1906 |
| **Ethnicity** | | | |
| Kikuyu | 0.0000 | 1.0000 | 741 |
| Kamba | 0.2835 (.3444) | 1.3278 | 488 |
| Kalenjin | 0.0889 (.2551) | 1.0930 | 803 |
| Kisii | -0.4216 (.3698) | 0.6560 | 367 |
| Luhya | 0.3615 (.2892) | 1.4354 | 715 |
| Luo | 0.4727 (.3223) | 1.6043 | 643 |
| Other | -0.1584 (.3136) | 0.8535 | 1056 |
| **Educational level** | | | |
| Sec. Comp+ | 0.0000 | 1.0000 | 762 |
| None | 0.2817 (.2091) | 1.3252 | 754 |
| Prim. Incomplete | 0.1981 (.1873) | 1.2191 | 1628 |
| Prim complete | -0.0355 (.1934) | 0.9651 | 1199 |
| Sec. Incomplete | -0.4338 (.2500) | 0.6481 | 470 |
| **Husband approval of FP.** | | | |
| Approves | 0.0000 | 1.0000 | 3116 |
| Disapproves | 0.2831 (.1256)** | 1.3272 | 1061 |
| Don't Know | -0.0244 (.1832) | 0.9759 | 636 |
| **Spousal communication about FP** | | | |
| More often | 0.0000 | 1.0000 | 1592 |
| Once/twice | 0.0230 (.1232) | 1.0232 | 1825 |
| Never | 0.0998 (.1536) | 1.1049 | 1396 |
| **Constant = -6.9077** | **Standard error= 1.0320** | | |

***Notes: figures in the parentheses are standard errors. *** means p<0.001, ** means p<0.05 and * means p<0.01.***

**Appendix 111**: Parameters for the logistic regression model and associated statistics of selected characteristics that are significantly related with total unmet need for contraception: KDHS 1998 data

| Variable name | log odds | Odds Ratio | Cases |
|---|---|---|---|
| **No. of living children** | | | |
| 0 | 0.0000 | 1.0000 | 342 |
| 1-2 | 1.3352 (.1936)*** | 3.8009 | 1549 |
| 3-4 | 2.0309 (.2090)*** | 7.6208 | 1336 |
| 5-6 | 2.4698 (.2227)*** | 11.8201 | 912 |
| 7+ | 3.0476 (.2392)*** | 21.0642 | 674 |
| **Age of mother** | | | |
| 40-49 | 0.0000 | 1.0000 | 905 |
| 35-39 | 1.0117 (.1301)*** | 2.7508 | 828 |
| 25-34 | 1.6271 (.1350)*** | 5.0891 | 1848 |
| 15-24 | 2.3120 (.1641)*** | 10.0942 | 1232 |
| **Province** | | | |
| Central | 0.0000 | 1.0000 | 477 |
| Nairobi | 0.3740 (.2993) | 1.4536 | 221 |
| Coast | 1.0502 (.2561)*** | 2.8582 | 740 |
| Eastern | 0.6297 (.2620)** | 1.8770 | 699 |
| Nyanza | 0.6931 (.2546)* | 1.9999 | 874 |
| Rift valley | 0.8612 (.2060)** | 2.3659 | 1225 |
| Western | 0.9908 (.2480)** | 2.6933 | 577 |
| **Place of residence** | | | |
| Urban | 0.0000 | 1.0000 | 827 |
| Rural | 0.2315 (.1246) | 1.2605 | 3986 |
| **Exposure to Mass media** | | | |
| Yes | 0.0000 | 1.0000 | 2907 |
| No | 0.3447 (.0734)*** | 1.4115 | 1906 |
| **Ethnicity** | | | |
| Kikuyu | 0.0000 | 1.0000 | 741 |
| Kamba | 0.0368 (.2383) | 1.0374 | 488 |
| Kalenjin | 0.0436 (.1727) | 1.0446 | 803 |
| Kisii | -0.4038 (.2447) | 0.6678 | 367 |
| Luhya | 0.2827 (.1995) | 1.3267 | 715 |
| Luo | 0.4378 (.2138)** | 1.5492 | 643 |
| Other | -0.1413 (.2095) | 0.8682 | 1056 |
| **Educational level** | | | |
| Sec. Comp+ | 0.0000 | 1.0000 | 762 |
| None | 0.3155 (.1507) | 1.3709 | 754 |
| Prim. Incomplete | 0.3597 (.1255) | 1.4329 | 1628 |
| Prim complete | 0.1628 (.1281)** | 1.1768 | 1199 |
| Sec. Incomplete | -0.1280 (.1604)** | 0.8799 | 470 |
| **Husband approval of FP.** | | | |
| Approves | 0.0000 | 1.0000 | 3116 |
| Disapproves | 0.4317 (.0903)*** | 1.5399 | 1061 |
| Don't Know | 0.2280 (.1298)** | 1.2560 | 636 |
| **Spousal communication about FP** | | | |
| More often | 0.0000 | 1.0000 | 1592 |
| Once/twice | 0.1512 (.0868) | 1.1632 | 1852 |
| Never | 0.1608 (0.1113) | 1.1745 | 1396 |
| **Constant** | **- 6.0045** | **Standard error = 0.3112** | |

***Notes: figures in the parentheses are standard errors. *** means p<0.001, ** means p<0.05 and * means p<0.01.***