Contraceptive Use Dynamics In Kenya

Further Analysis Of Demographic And Health Survey (DHS) Data

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Contents

Tables

Figures

Preface

The 1998 Kenya Demographic and Health Survey (KDHS) was the third in a series of national DHS surveys conducted in Kenya. These surveys collected detailed information on contraceptive knowledge and use and thus provide a valuable source of information on contraceptive practice in Kenya in the last 10 years. Contraceptive use is a dynamic process; women initiate and stop contraceptive practice in response to changes in their own circumstances and in their social and health environment, and they choose different methods at different points in their lives. Thus, the contraceptive prevalence and method mix at any given point in time is the result of a whole series of decisions made by individual women to start contraceptive use, stop use, restart use, and to choose one method over another one. This report contains a series of further analyses of the Kenya DHS data to examine the dynamics of contraceptive use, starting with an examination of the trends in the characteristics of non-users of contraception at the time of each survey. The analyses then examine different stages in the contraceptive use cycle of women; contraceptive adoption, contraceptive method choice, and contraceptive discontinuation and switching.

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Executive Summary

Despite substantial declines in fertility and increases in contraceptive adoption over the past two decades, unmet need for family planning remains high in Kenya with about one in four married women having an unmet need for family planning. This represents a major reproductive health challenge given the government's commitment to "make available quality and sustainable family planning services to all who need them, in order to reduce the unmet needs for family planning". It also suggests a large potential for further increases in contraceptive use. *Further Analysis of Contraceptive Use Dynamics in Kenya* is an effort to provide information base for future family planning programming in Kenya through a comprehensive analysis of trends in, and determinants of, contraceptive behavior in the country. The study utilizes the three waves of the Kenya Demographic and Health Surveys (KDHS) conducted in 1989, 1993, and 1998. Focusing on program relevant issues, the study examines:

- the evolution of family planning programs in Kenya
- the quality of data on contraceptive use in the three KDHS surveys
- non-users of family planning in Kenya
- first use of contraception
- trends and determinants of current method choice, and
- contraceptive discontinuation, switching, and method failure.

Evolution of Family Planning Programs in Kenya

The introductory chapter reviews the evolution of family planning programs in Kenya. Kenya, the first African country to adopt a national population policy, has maintained a positive national family planning program within the Ministry of Health. Two key documents – Sessional Paper No. 4 of 1984 titled *Population Policy Guidelines* and Sessional Paper No. 1 of 2000 titled *National Population Policy for Sustainable Development* provide the basis and general framework of the Government's position on population issues in general, and family planning programs in particular. More detailed guidelines on the delivery of family planning services in the country are contained in the 1991 *Family Planning Policy Guidelines and Standards for Service Providers* and the 1997 revised version titled *Reproductive Health/Family Planning Policy Guidelines and Standards for Service Providers.* The 1997 guidelines integrated reproductive health concerns into family planning programs and provided guidelines for service delivery on a number of reproductive health concerns, including post-abortion care, contraception for the adolescents/youth, STI/HIV/AIDS prevention and screening, and maternal health/safe motherhood.

In addition to efforts on the part of the government to make family planning services readily available to those who need it, the private sector and non-governmental organizations have played a significant role in the provision of services in Kenya. Notable among these are the Family Planning Association of Kenya (FPAK), Family Planning Private Sector (FPPS), Christian Health Association of Kenya (CHAK), and Maendeleo ya Wanawake Organization (MYWO). The National Council for Population and Development (NCPD) coordinates the

various efforts of public and private agencies in family planning promotion and provision and formulates national policies/strategies to guide activities in these areas. The combined efforts of public and private agencies have resulted in a steady increase in contraceptive use in Kenya over the past two decades, which has facilitated the country's transformation from having the highest fertility level in the world in the late 1970s to one that has experienced one of the most exceptional fertility transitions in human history. Kenya's contraceptive prevalence rate (CPR) is one of the highest in sub-Saharan Africa.

Quality of Contraceptive Use Dynamics Data in Kenya

Quality of the KDHS data on contraceptive use dynamics was evaluated by examining the deviation of reported contraceptive behavior from what would be expected based on prevailing fertility rates and the reliability of contraceptive use data in the calendar implemented in the 1998 survey. The relationship between the level of contraceptive prevalence in a population and its current fertility is generally believed to be linear, with a one child decline in total fertility rate (TFR) corresponding to a 15 percentage point increase in contraceptive prevalence. Earlier rounds of the KDHS show that Kenya deviates considerably from this expected universal pattern, with fertility declining by larger amounts than would be expected given the increase in contraceptive use. The 1998 survey, however, shows that the reported contraceptive prevalence of 39 percent is very close to the level of 37 percent that would be expected to yield the observed TFR of 4.7 children per woman. The narrowing of the gap in the deviation of CPR/TFR relationship from the established universal pattern over time in Kenya is consistent with a lag-effect explanation. This explanation refers to the time lag between contraceptive adoption and its effect on fertility. It is also possible that this narrowing trend may reflect an increasing propensity to adopt modern and more effective methods among Kenyan women.

Another measure of quality of data on contraceptive use dynamics looks at digit preference in reporting of durations of contraceptive use in the calendar and the overall consistency of reporting of contraceptive use at the aggregate level between retrospective calendar data in 1998 and current status reports in 1993 for the same cohort of women. These analyses show no major signs of data quality problems. For instance, the CPR of 32.3 percent based on the 1993 current status data is quite consistent with the 1998 retrospective calendar data CPR of 32.1 percent for 1993. Overall, therefore, these analyses confirm that the reported data on contraceptive use in Kenya are fairly reliable.

Non-Users of Family Planning in Kenya

The high level of unmet need for family planning among currently married women in Kenya provides the rationale for the analysis of non-use of family planning. The focus of this chapter is to provide a comprehensive understanding of who the non-users are and factors associated with non-use, the reasons for non-use of contraceptives, and future family planning intentions of non-users. These analyses would help program managers identify the appropriate target groups, to effectively address the barriers to use, and to develop effective strategies for meeting future demand of family planning through the provision of appropriate method mix to meet the need of current and future users.

The results indicate that the vast majority of non-users of family planning in Kenya across the three KDHS surveys live in rural areas, are currently married, and have never used any family planning methods. Almost half of non-users in the 1998 KDHS come from Nyanza and Rift Valley provinces. Trends in the profile of non-users between 1989 and 1998 suggest that non-users are increasingly more urban, more educated, desire fewer children, and have previously used a modern family planning method. These patterns, however, partly reflect the general trends on these indicators in the overall population. In examining factors associated with non-use of family planning, non-users with unmet need for family planning are distinguished from those with no unmet need and these are compared to current users. The results show that non-use of family planning with or without unmet need declines with education but increases with partner disapproval of family planning. However, while non-use with unmet need declines with age and increases with parity, the reverse is true for non-use with no unmet need for these two indicators.

Among the reasons given for non-use of family planning, low/no risk of pregnancy accounts for about 40 percent while desire to have a child accounts for another 14 percent. Health-related reasons and disapproval of use account for 20 and 14 percent of the reasons for non-use respectively. Urban women and women with past experience of use of modern methods are more likely to give health-related reasons for their current non-use while those with more living children and those who have never used a method are more likely to give disapproval-related reasons for their non-use.

Across the three survey years, the percent of nonusers who do not intend to practice family planning in the future has remained constant at about 31.5 percent. Older women and those with higher achieved or desired family size are less likely to express an intention to use a method in future while more educated women are more likely to intend to use. Among women intending to use a method in future, injectables is by far the most preferred method and the proportion of women preferring injectables has increased over time from 33 percent in 1988 to 40 percent in 1998. Also, the proportion preferring the pill has declined consistently from 31 percent in 1989 to 21 percent in 1998. Preference for the other methods has not changed much over the years.

First Use of Family Planning

Following from the observation in the analysis of non-use that the majority of non-users have never used a method, the analysis of first use of contraception focuses on the transition from non-use to use and examines trends in the initiation of use among all ever-users in the three KDHS surveys as well as first method choice and its determinants based on the 1998 KDHS. Understanding at what stage in women's family-building process they make the transition to first use is essential in clearly identifying how best to target the core of never users.

Results from the analysis of first use show that women are increasingly initiating use at lower parities. The mean number of living children at first use has dropped by more than half a child between 1989 and 1998. While most of the contraceptive adoption at lower parities is by women who still desire additional children, increasingly, more women are initiating contraceptive use at lower parities for limiting purposes. Over the past decade, the proportion of women initiating use of contraception for limiting purposes before reaching parity 2 increased consistently from 10 percent in 1989 to 21 percent in 1998. Women who initiate use at lower

parities generally desire fewer children, are more urban and more educated compared to those who initiate use at higher parities. For instance, while less than 10 percent of women with no formal education have adopted contraception by parity one, 43 percent of those with secondary or higher education have done so at the same parity. Having a community based distributor in a community increases overall contraceptive adoption, but only after women have had at least two living children.

Analysis of first method choice reveals that the pill is by far the method of choice at first use, chosen by two out of every five initiators. Choice of rhythm and injections are also high, reported by 23 and 18 percent of the women respectively. Only 7 percent of the women reported use of condoms at first use. Women who initiated use more recently show greater propensity to adopt pills, condoms and rhythm methods and greater averse to adoption of injections. This is contrasted with evidence from the recent Kenya Service Provision Assessment (KSPA) study that shows injectables as the most widely available method in health facilities offering family planning in Kenya. Further examination of first method choice by background characteristics generally suggest that when Kenyan women make the transition to use contraception, they adopt methods best suited for their needs. Older and high parity women and those who have reached or exceeded their ideal family size generally rely on sterilization and long-term methods at first use, while younger, low parity, women and those who have not reached their ideal family size tend to rely on traditional or short-term methods. Variations in method choice by education and region of residence, however, raise questions regarding the role of knowledge base individuals have when making the transition and differential availability of methods in different regions on first method choice.

Contraceptive Method Choice in Kenya

The significant relationship between method choice and quality of family planning services and between method–mix and the fertility impact of contraceptive use provide dual rationale for analysis of method choice in Kenya. This chapter examines the factors influencing contraceptive method choice and whether patterns of method mix suggest family planning users are choosing methods most suitable for their reproductive preferences.

Analysis of trends in method choice in Kenya shows that use of injectables has increased dramatically from less then 1 percent in 1984 to 12 percent in 1998. Pills and IUDs increased steadily up to 1993, but declined in 1998. The proportion of women using sterilization has more than doubled since 1984, but the rate of increase appear to have slowed down in the 1990s compared to the 1980s. Analysis of trends in the profile of women using specific methods shows that the proportion of adolescents among injectable users is increasing. Adolescents aged 15-24 constituted only 10 percent of injectable users in 1989, but this proportion more than doubled to 22 percent in 1998. Injectable users are also becoming more educated and are having fewer children. These trends also apply more or less to the other methods. One notable exception is IUD/implants users who are substantially more urban, reflecting the greater availability of service delivery points offering these methods in urban areas.

Analysis of the determinants of method choice reveal that, while use of injectables is significantly associated with rural residence, use of IUD/implants is significantly associated with urban residence. High parity women are more likely to choose injectables but less likely to choose pills. Choice of both methods declines with age. Less educated women are more likely

to use injectables, and so are women whose husbands disapprove of family planning. In contrast, more educated women and women whose husbands approve of contraceptive use are more likely to use barrier methods, compared to their counterparts who are less educated or whose partners did not approve of family planning. Barrier methods are also popular among women who have not begun childbearing.

Results from the contraceptive method mix analysis show that older limiters generally adopt sterilization while younger limiters prefer the pill. More recently, however, younger limiters have shown equal preference for injectables. Married spacers rely on pills and have increasingly shifted from an equal reliance on traditional methods to reliance on injectables. Unmarried women generally adopt traditional methods although this has declined substantially from 43 percent in 1989 to 28 percent in 1998. These patterns of contraceptive method mix suggest that most family planning users in Kenya are using methods that are suitable for their family planning needs. One notable exception is the relatively low use of barrier methods among unmarried women and their high use of IUD/Implants. Non-clinical supply methods such as condoms, which are simple to use and provide protection against sexually transmitted diseases, may be more ideal for this group of women, especially if their sexual activities involve multiple partners.

Contraceptive Failure, Switching and Discontinuation

The analysis of contraceptive failure, switching and discontinuation examines the overall effectiveness of Kenya's family planning program in enabling clients to fulfill their reproductive goals. It looks specifically at the experiences and behavior of women who have ever used contraception. The chapter examines rates of contraceptive discontinuation and failure, reasons for discontinuation, and factors associated with different reasons for discontinuation. Issues relating to continuation are important because, as the level of current use of contraception increases, continuity of use becomes an important measure of overall program effectiveness in meeting the needs of contraceptive users since program efforts generally shift from recruiting new users to satisfying current users and encouraging re-adoption among those who discontinued use. To achieve these new program goals, issues relating to service quality increasingly become an integral part of family planning programming.

In Kenya, about one-third, one-half, and two-thirds of women who initiate use of contraception discontinue within 12, 24, and 36 months of initiation, respectively. Analysis of method-specific discontinuation rates shows that condom users have the shortest durations of continuous use while norplant and IUD users exhibit the longest durations of continuous use. Compared to injectable and IUD users, pill users have much higher discontinuation rates. Contraceptive discontinuation rates are higher among women who use contraception for spacing purposes and discontinuation rates decline with both increasing age and parity of women. Although women with no formal education are less likely to adopt use, they are more likely to use for longer durations. Examination of the reasons for discontinuation reveal that about 30 percent of all discontinuations are due to desire to have another child or reduced exposure to sex or the risk of conception, 47% due to side effects/health concerns and other method-related reasons, 18 percent due to method failure, while 5 percent are due to unspecified reasons. Thus, abandonment of contraceptive use while still in need of contraception and contraceptive failure account for about 65% of all discontinuations, and about 60% of discontinuations occur during

the first 36 months of use. The group of women who discontinue for these involuntary factors represents the potential impact that family planning programs could have on CPRs by maintaining a pool of satisfied clients and ensuring women attain their reproductive goals.

Analysis of switching behavior following a discontinuation generally focuses on whether the switch resulted in the adoption of an equally, more, or less effective method than the one discontinued. Switching to less effective methods may expose women to a greater risk of unwanted pregnancies. The results show that pill users constitute the largest proportion of contraceptive switchers and 60% of the pill users who switch methods switch to injectables. The patterns of switching suggest that women generally switch to methods similar to what they discontinued. Users of short-term methods tend to switch to other short-term methods, while users of coitus-dependent methods tend to switch to other coitus-dependent methods. Injectables appear to operate as a transitional stage to sterilization, as users of injectables exhibit the highest likelihood of switching to sterilization. The switch from pills to injectables represents the transformation of the method mix/preference in Kenya whereby pills have been replaced by injectables as the most popular contraceptives in the country

Results from the analysis of determinants of method failure, switching, and abandonment show that each of these contraceptive use dynamics are associated with different sets of factors and each has different implications for family planning programs. Exposure to sex and type of method used are the only significant predictors of method failure. Unmarried women are less likely to experience a method failure while those with a recent change in marital status and users of the pill and traditional methods are more likely to experience a method failure. Switching behavior is less common among women who use contraceptives for spacing purposes and those with no living child. While users of pills are more likely to switch, users of traditional methods are less likely to do so. Furthermore, past switching experience increases switching behavior. Women who discontinue while having no need for family planning are distinguished from those who discontinue while in need. These two are substantially different and their behaviors are influenced by the same sets of factors but in opposite directions. Parity, exposure to sex, method used, and socio-economic status are all important determinants of abandonment, but these have opposite effects for women who abandoned use while in need and those who did so while having no need for family planning. However, use of contraceptives for spacing purposes increases abandonment for both groups of women.

Conclusions

The concluding chapter draws a number of general themes and patterns that emerge from the different chapters and their program and policies implications for the organization and delivery of family planning services in Kenya. First, the differentials in contraceptive use dynamics between urban and rural areas suggest different approaches to meeting the contraceptive needs of urban and rural residents. Contraceptive use remains higher in urban areas and the gap appears to be widening primarily because non-use associated with unmet need for contraception has declined much faster in urban areas than rural areas. Despite higher levels of contraceptive use in urban areas, rapid urbanization in Kenya has meant that non-users of contraception are becoming increasingly urban. Urban residents are more likely to cite health concerns as their main reasons for non-use of contraception and urban non-users are becoming increasingly more likely to report not intending to practice contraception in the future. These patterns indicate that while reducing non-use among women with an unmet need for family

planning remains a challenge in the organization of family planning programs in rural areas, countering the increasing lack of interest in future use among urban non-users and addressing the health concerns of users are major challenges for program managers in urban settings.

Another general theme relates to the contraceptive use dynamics of unmarried adolescents in Kenya. The proportion of unmarried and sexually active non-users aged 15-24 is increasing and their reproductive health needs are different from those of older married women who have been the traditional focus of family planning activities in Kenya. Results in this report presents a mixed picture of how well the needs of young unmarried women are being met. On the one hand, young and unmarried women's main reason for non-use is low pregnancy risk, reflecting sporadic sexual activity in these groups, and they are more likely to rely on short-term modern methods, particularly pills and injectables. However, lack of knowledge of family planning methods and sources is a more significant barrier to use for younger women than for older women. Discontinuation rates are much higher among younger women than among older women and younger women are significantly more likely than older women to discontinue use while having need for contraception. Young and unmarried women who use contraception are most likely to choose traditional methods at first use. Condom use among young women and unmarried women is rising, but remains low. Low rates of contraceptive initiation, high discontinuation rates, and relatively high levels of use of traditional methods among young, unmarried sexually active women combine to provide high potential for unintended pregnancy. These findings lend further support for the inclusion of adolescent reproductive health in the most recent population policy.

Another general theme that emerged from these studies relates to the sustained increase in contraceptive use in Kenya. Although the majority of non-users in Kenya have never used contraception, the proportion of all women who have previous contraceptive experience has increased substantially during the 1990s, reflecting higher levels of contraceptive use in general. Not only are past users more likely to intend to use in the future, they are also less likely to cite disapproval of family planning as their reason for not currently using a contraceptive method. Many past users are not current users because of current reduced need for family planning, so they may readopt family planning when their situation changes These factors point to the potential for continued uptake in contraceptive prevalence in Kenya. One challenge, however, is how to maintain use among users while providing appropriate services for past users who want to reinitiate use. Past users of contraceptives, particularly of modern methods, are more likely than never users to cite health concerns as their reason for not currently using a method. Also, discontinuation of modern methods for side effects and health concerns is high, being the most commonly cited reason for pills, IUD and injectable discontinuations.

The final general theme relates to the rise in the use of injectables in Kenya. While initial increases in injectable use was primarily at the expense of traditional methods, more recent increases have been primarily at the expense of the pill and long-term modern methods. There is no sign of the popularity of injectables declining as the method remains most commonly cited as the preferred method among non-users who intend to use contraception in the future. Although pills remain more popular than injectables as a first method, a lot of women who started with the pill had switched to injectables by the time of the survey. Injectables are growing in popularity with all types of users, but are particularly popular among married spacers and young married limiters. The method also has the lowest discontinuation rate during the first 12 months of use, with only 22 percent discontinuing compared to discontinuation rates of 33-62 percent observed

for the other methods. However, given that most switches from injectables are to pills and most first users initiate use with pills, the two methods will continue to be the dominant methods of choice among Kenyan women, which highlights the need for provision of a wide range of method choice for prospective and current clients of the Kenyan family planning program.

CHAPTER 1

INTRODUCTION

1.1 Kenyan Family Planning Program

1.1.1 Background

Kenya has experienced a phenomenal demographic transition over the last few decades. The census figures show that the total national population grew from 5.4 million in 1948 to 28.7 million in 1999. Census results also indicate that Kenya's population growth rate increased from 2.5 percent in 1948 to a peak of 3.8 percent in 1979, before decreasing to 2.8 percent by 1999. While the increase in the national population growth rate in the earlier decades is attributed to increase in fertility levels and decrease in mortality as a result of improved health and socio-economic status, the decline in the growth rate in the last two decades is mainly due to fertility decline. Total fertility rate declined from 8.1 children per woman in 1979 to 4.7 in 1998.

Kenya was the first country in sub-Saharan Africa to adopt a national population policy in 1967. This was as a result of the government's recognition of the detrimental effects of high population growth on the country's development process. A national family planning program is structured within the Ministry of Health, under the Division of Primary Health Care. Within the private sector, the Family Planning Association of Kenya (FPAK), which was registered as a non-governmental organization in 1962, is the lead family planning service provider. Other major NGOs include Family Planning Private Sector (FPPS), Christian Health Association of Kenya (CHAK), and Maendeleo ya Wanawake Organization (MYWO). The National Council for Population and Development (NCPD) was established in 1982 as the governmental agency to formulate population policies/strategies, and co-ordinate the diverse and growing range of public and private sector efforts in family planning promotion and provision.

The combined family planning program efforts in Kenya have produced significant achievements in contraceptive knowledge and practice in the country. General awareness of family planning is almost universal, at 97-98 percent of men and women of reproductive age (NCPD, CBS and MI 1999). Kenya's contraceptive prevalence rate (CPR) increased from 27 percent in 1989 to 33 percent in 1993 and 39 percent in 1998. Consequently, the proportion of married women with an unmet need for family planning declined from 38 percent in 1989 to 36 percent in 1993 and 24 percent in 1998. Kenya's contraceptive prevalence is among the highest in sub-Saharan Africa.

1.1.2 Family Planning Policy/Program Guidelines in Kenya

Although the government adopted a national family planning program in 1967, it was not until 1984 that the country issued the Sessional Paper No. 4 of 1984, *Population Policy Guidelines,* and later the Sessional Paper No. 1 of 2000, *National Population Policy for Sustainable Development* to guide the implementation of the population program. The aim of the population policy is broad-based, the overall aim being to attain a balance between Kenya's population growth rate and sustainable development. More specifically, the policy recognizes regional variations with regard to population issues, respects fundamental human rights and freedoms, recognizes the family as the basic unit of the society, seeks to advance gender equity and equality, and encourages the empowerment of women and the elimination of all forms of violence against women. With regard to the specific objectives of the population policy, the Sessional Paper No. 1 of 2000 seeks to address the following emerging issues on population and the environment:

- unmet need for family planning;
- quality of family planning services;
- regional and rural-urban disparities in fertility and mortality levels;
- family planning knowledge and use;
- high prevalence of STDs including HIV/AIDS; and
- high levels of adolescent fertility.

Some of the specific objectives include reducing the health and socio-economic burdens due to STDs/HIV/AIDS and their sequelae, and enhancing the health and well being of adolescents and youth. These are within the broad national reproductive health program (1997-2010) goal towards:

> *"Provision of a comprehensive and integrated system of reproductive health care, that offers a full range of services by the government, NGOs and the private sector, as outlined by the national population policy for sustainable development and the Kenya Health Policy Framework of 1994" (MOH 1996).*

The family planning program in Kenya has been very successful in providing contraceptive services, establishing Service Delivery Points (SDPs) in all the districts and offering an array of methods from which clients can choose. The provision of family planning services to clients has evolved over a long period, with the introduction of new methods and revised policy/program guidelines to help couples make appropriate and effective choices and to help family planning providers give high quality services, in terms of accessibility and availability. The first version of *Family Planning Policy Guidelines and Standards for Service Providers* was published in 1991, and was used to guide family planning activities until 1997, when it was revised and renamed *Reproductive Health/Family Planning Policy Guidelines and Standards for Service Providers*, in view of the need to integrate reproductive health concerns in family planning programs, as highlighted at the 1994 International Conference on Population and Development (ICPD) in Cairo. The broader reproductive health issues integrated in the 1997 guidelines include post-abortion care, contraception for the adolescents/youth, STI/HIV/AIDS prevention

and screening, STI diagnosis and treatment, maternal health/safe motherhood, infertility, cervical cancer screening, pap smears and breastfeeding. In addition to the above issues, NGOs providing family planning services, such as the Family Planning Association of Kenya have integrated gender-oriented services aimed at reducing harmful traditional practices (such as female genital mutilation (FGM), wife inheritance and early marriages) or neglected reproductive health concerns (such as menopausal care and reproductive health services for men aimed at encouraging men to give support to their partners and also to volunteer for surgical contraception) (FPAK 1997).

The need to revise the initial guidelines had also been necessitated by the increasing experience in the delivery of family planning services and recent research findings about women's experiences with various family planning methods (Government of Kenya 1997). In an effort to provide quality services to clients, the revised guidelines emphasize the need to counsel and assess all clients before providing any method and on every revisit that the client makes and observe cleanliness and infection prevention guidelines. The recent changes in contraceptive technology have influenced how, where and who should receive or provide family planning methods and the management of common side effects (Government of Kenya 1997). It has also facilitated the introduction of new methods such as emergency contraception, the female condom and symptothermal (Natural Family Planning) methods into the program. The following sub-section highlights the evolution of the current method mix and policy guidelines given for specific methods.

Policy guidelines for specific contraceptive methods

Modern methods of contraceptives have been available in Kenya since 1957 through MOH facilities and private/NGO sector. The main contraceptive methods currently available include the pill, injectables, Intra-uterine device (IUD), hormonal implants, barrier methods (condom, diaphragm, cervical cap, spermicides and sponge), voluntary surgical contraception (VSC) or sterilization, and natural family planning (NFP).

The contraceptive pill is one of the oldest family planning methods and has existed in the Kenyan Family Planning Program since 1962. There are two types of pills offered: the Combined Oral Contraceptive pill (COC), commonly referred to as the combined pill, and the Progestine-Only Pill (POP) or the mini-pill. The combined pill was initially recommended for women under 40, with established menses, a history of ectopic pregnancy, severe menstrual pains, breastfeeding mothers more than 6 months postpartum and anaemic women, and use of COCs was also recommended for post-abortion clients.. However, the revised policy guidelines and standards of 1997 removed the restriction and allowed all women of reproductive age to use pills, but with a caution for specific clients, such as women aged over 40. The revised guidelines recommend that pills may be provided by physicians, nurses /midwives, clinical officers, trained Community Health Workers (CHWs), Community-Based Distributors (CBDs) and pharmacists/ pharmaceutical technologists. The recommended outlets for pills include hospitals, health centers, dispensaries, outreach/mobile services, pharmacies and private clinics. It is recommended that initiation of pill-use be done using Ministry of Health (MOH) checklist and after a comprehensive review by a clinical provider. However, non-medical providers such as

CBDs and pharmacists can supply up to three cycles (approximately 3 months) before evaluation by a clinical provider, and six cycles per visit after review.

Another form of contraceptive pill, emergency contraception, was introduced in Kenya after the Bellagio Conference on Emergency Contraception in 1995, when emergency contraceptive methods were added to the WHO list of essential drugs (Bellagio Meeting on Emergency Contraception 1995). Emergency contraception is administered in the form of a double dose of the combined pill, taken within 72 hours of unprotected sex, followed by another dose after twelve hours, or Postinor®, which is also taken within 72 hours of unprotected sex. Emergency contraception is recommended for any woman in need of emergency protection and can be provided by all health workers at any appropriate site with a qualified staff person. However, the guidelines caution against using emergency contraceptives as a regular method.

Injectable methods are also among the oldest family planning methods in Kenya, with the original ones being Depo-Provera® and Noristerat®. Megestron was introduced in the mid-90s. Earlier guidelines (1991) recommended the methods for women with proven fertility but this was later revised (1997) to include all women of reproductive age, irrespective of parity. These methods are not recommended for breastfeeding women, unless after 6 weeks postpartum. Also, women with a history of breast cancer, liver disease, heart disease, abnormal vaginal bleeding and high blood pressure should not use injectables. The 1997 guidelines recommend that only physicians, clinical officers and nurses/midwives should provide injectables from hospitals, health centers, dispensaries, outreach/mobile services, pharmacies and private clinics. The injectables are administered every 2-3 months.

The IUDs available in Kenya are Copper T 380A, which lasts for 10 years, NOVA T - 5 years, Multiload-375 – 5 years, Multiload-250 – 5 years, Lippes Loop – indefinite, and Copper T 220 – 3 years. The IUDs were initially (1991) recommended for women with proven fertility but was later revised to include all women of reproductive age, provided that they do not have multiple sexual partners or their partners do not have multiple sexual partners (except for stable polygamous marriages), are not anemic, and do not have abnormal uterine bleeding or a recent septic abortion (past three months). Initial family planning policy guidelines (1991) did not specify who should give IUDs but the 1997 guidelines specified only physicians, nurses/midwives and clinical officers in hospitals, health centers and private clinics should administer IUDs.

The only available hormonal implant in Kenya is Norplant®. It was introduced in the country in 1986 and was initially recommended for women with two or more children, but it is now recommended for all women of reproductive age, provided that they are not pregnant, do not suffer from liver disease, abnormal vaginal bleeding, breast cancer or have a history of breast cancer and breastfeeding before six weeks postpartum. Norplant® is supposed to be given by trained providers in hospitals, health centers, private clinics and outreach/mobile services. Facilities that offer Norplant® should have removal facilities and should offer counseling services.

The male condom is the only barrier method available for men, while barrier methods for women include diaphragm, cervical cap, spermicides, sponge and the female condom. The

female condom was only recently introduced in the program in the mid-90s and is not readily available in all the health facilities in the country. Barrier methods are recommended for all couples, especially those who need temporary family planning methods, either because they do not have regular sex with their partners, they are awaiting the use of another method, or as a back-up for another method. Condoms are also recommended for protection against STIs/HIV. The 1997 guidelines specify that physicians, nurses/midwives and clinical officers may provide the diaphragm and the cervical cap, and all trained providers, including CBDs, may provide condoms, spermicides and sponge. The guidelines indicate that all SDPs may offer the diaphragm and the cervical cap, and any appropriate site may offer condoms, spermicides and sponge.

Voluntary surgical contraception (VSC) includes tubal ligation for women and vasectomy for men. Since the procedures are permanent, the guidelines recommend that providers should counsel the clients about the limitations before they can perform the procedure. The methods are recommended for clients who have attained their desired family size. In the earlier guidelines, it was mandatory to obtain consent from the partner, but this was revised to obtain informed consent only from the client. The 1997 guidelines recommend that surgical contraception only be performed by trained physicians in health facilities with a minor theatre, appropriate equipment and the ability to provide infection prevention measures and handle emergencies.

Natural family planning is the oldest method used in Kenya. The methods used are calendar (rhythm), basal body temperature, Billings ovulation and, most recently, symptothermal method. These methods are recommended for all women of reproductive age with regular menses. The methods are given by all trained health professionals and lay persons at any appropriate site with a qualified staff member.

1.2 Kenya's National Family Planning Strategy 1997-2010

Family planning is included as one of the major components of Kenya's national reproductive health strategy on the basis that there remains a substantial unmet need for family planning in the country. The recent 1998 KDHS showed that about a quarter of married women have an unmet need for family planning, and that almost half (48%) of all births in the country are unintended (NCPD, CBS, and MI 1999). Furthermore, the number of unmarried individuals of reproductive age wanting and in need of family planning services is growing, thus increasing the proportion of couples and individuals requiring services. In order to meet this challenge, more efforts need to be placed on increasing availability of contraceptive supplies and improving the quality of family planning services over the next two decades. The Government of Kenya in its 1997 National Population Policy for Sustainable Development has set specific targets to increase contraceptive prevalence to 43 percent by the year 2000, 53 percent by 2005, and 62 percent by the year 2010. The TFR was targeted to decrease from 5.0 in 1995 to 4.0 by the year 2005 and 2.5 by 2010, while the population growth rate was targeted to be reduced to 2.0 percent per annum (MOH 1996).

The Ministry of Health (1996) recognizes that the quality of family planning services is often directly related to the level and continuity of contraceptive use to the growth in demand for a wide range of services. The need to improve the quality of care is, thus, important in the

efforts to satisfy the unmet need for family planning. Family planning services in Kenya are offered by the MOH, NGOs and the private sectors, through static, mobile and CBD programs. The MOH (1996) noted that the 2,700 health facilities in Kenya designated as SDP for family planning services are not equitably distributed throughout the country. Making services readily accessible is therefore an immediate concern for family planning service providers in the country. In planning for this, consideration should be made of geographical, cultural and socio-economic disparities. The national family planning strategy goal is to:

> "*Make available quality and sustainable family planning services to all who need them, in order to reduce the unmet needs for family planning".*

1.3 Outline of the Report

The analysis presented in this report examines contraceptive use dynamics in Kenya based on the Kenya Demographic and Health Survey (KDHS) datasets. The overall objective of the study is to conduct a comprehensive analysis of recent trends and socio-economic determinants of contraceptive behavior in Kenya in order to provide an information base for future policy decisions. The 1998 KDHS collected (for the first time in Kenya) family planning information in calendar format, which makes it possible to examine factors relating to contraceptive discontinuation, switching and failure. Furthermore, the CPR in Kenya has increased to a considerable level that makes better understanding of factors associated with contraceptive use dynamics such as method choice, discontinuation, switching and failure crucial for service providers. The results of such analysis are important for the national family planning program efforts towards achieving the overall goal of reducing unmet need for family planning by making quality and sustainable family planning services available to all who need them.

The analysis of contraceptive use dynamics in Kenya is presented in five chapters (chapters 2 – 6), while the final chapter draws overall conclusions and program/policy implications from the results across the analysis chapters. Chapter 2 assesses the quality of data on contraceptive use in Kenya, reported in the 1998 and earlier DHS surveys. The analysis has two components: an examination of the deviation of reported contraceptive behavior from what would be expected, based on prevailing fertility levels; and an assessment of the reliability of the calendar data. This chapter is essential to inform subsequent substantive analysis of contraceptive use dynamics in the country and establish whether the patterns observed are real or likely to be an artifact of data quality problems.

Chapter 3 seeks to better understand factors associated with non-use of family planning in Kenya. The chapter analyzes trends in the profile of non-users of family planning, factors associated with non-use, reasons for non-use, and factors associated with future family planning intentions of non-users. Better understanding of factors associated with non-use of family planning is vital for reducing levels of unmet need, and for further increasing contraceptive use in the country.

Chapter 4 examines first use of contraception. Specifically, the chapter examines at what point in women's reproductive cycle they initiate contraceptive use, what methods they choose to

start with, and factors associated with first method choice. Understanding factors associated with the transition from non-use to first use of contraceptives provides useful information to program managers in the design of appropriate strategies to encourage adoption of contraceptive use among people with no prior contraceptive experience.

The analysis of first use is followed with an analysis of the trends and determinants of current method choice, presented in Chapter 5. The specific components of this analysis include trends in the profile of users of specific methods over time, individual socio-demographic and community factors influencing contraceptive method choice, and an examination of whether patterns in method mix suggest family planning users in Kenya are choosing types of methods that are most suitable for them. Contraceptive method choice has been recognized as a central element of quality of care in the provision of family planning services, while method mix has been recognized as a key determinant of the fertility impact of contraceptive practice.

The final analysis Chapter (Chapter 6) uses the 1998 KDHS calendar data to better understand factors associated with contraceptive discontinuation (failure, switching or abandoning use). The analysis includes an examination of overall and method specific rates of contraceptive discontinuation, overall and method-specific reasons for discontinuation, and factors associated with contraceptive discontinuation. Contraceptive discontinuation is an important indicator of overall program effectiveness in meeting the needs of contraceptive users.

CHAPTER 2

QUALITY OF CONTRACEPTIVE USE DYNAMICS DATA IN KENYA

2.1 Introduction

The overall objective of this chapter is to assess the quality of data on contraceptive use in Kenya reported in the three KDHS surveys. This analysis is essential to inform subsequent substantive analysis on contraceptive use dynamics in the country, and will help determine whether the patterns of contraceptive use observed are real or possible artefact of data quality problems. The specific objectives include examining the deviation of reported contraceptive behaviour from what would be expected based on prevailing fertility rates and examining reliability of the calendar data.

The analysis is divided into two distinct sections addressing the aforementioned objectives . The first section focuses on the relationship between contraceptive prevalence and fertility levels and examines the deviations in reported versus expected contraceptive use (based on observed fertility levels) for different sub-groups of the Kenyan population. The trends in these deviations are examined based on the 1989-93 and 1993-98 time periods. The second section assesses the reliability of the calendar data by first examining the extent of digit preference or heaping in reported duration of contraceptive use, then examining the consistency between calendar data in 1998 and current status data obtained in 1993.

2.2 Relationship Between Contraceptive Prevalence and Fertility Rates

There is an established, near-universal linear relationship between the level of contraceptive prevalence in a population and its current fertility. An increase of 15 percentage points in contraceptive prevalence is expected to yield a decline of about one child in the total fertility rate (Ross and Frankenberg 1993). Deviations from this expected pattern have increasingly attracted the attention of social scientists (Curtis and Diamond 1995; Thomas and Mercer 1995; Blanc and Poukouta 1997). Evidence from earlier rounds of the Demographic and Health Surveys suggest that Kenya is one of the countries in sub-Saharan Africa that appears to deviate considerably from this expected universal pattern. Fertility in Kenya in the late 1980s and early 1990s seemed to have declined by a greater amount than would be expected, based on the increase in contraceptive use. Blanc and Poukouta (1997) noted that deficiencies in the data were among the factors that could be responsible for the inconsistency between contraceptive increase and fertility decline observed in Kenya and other countries in sub-Saharan Africa. They suggested that an understatement of the increase in contraceptive use is a possible source of error, suggesting either that the contraceptive use in the later periods may have been understated or earlier use was overstated. One explanation for possible understatement of contraceptive use may be reluctance by women to report using a contraceptive due to factors such as social pressure (partners or religious opposition), or mere embarrassment. Several studies have

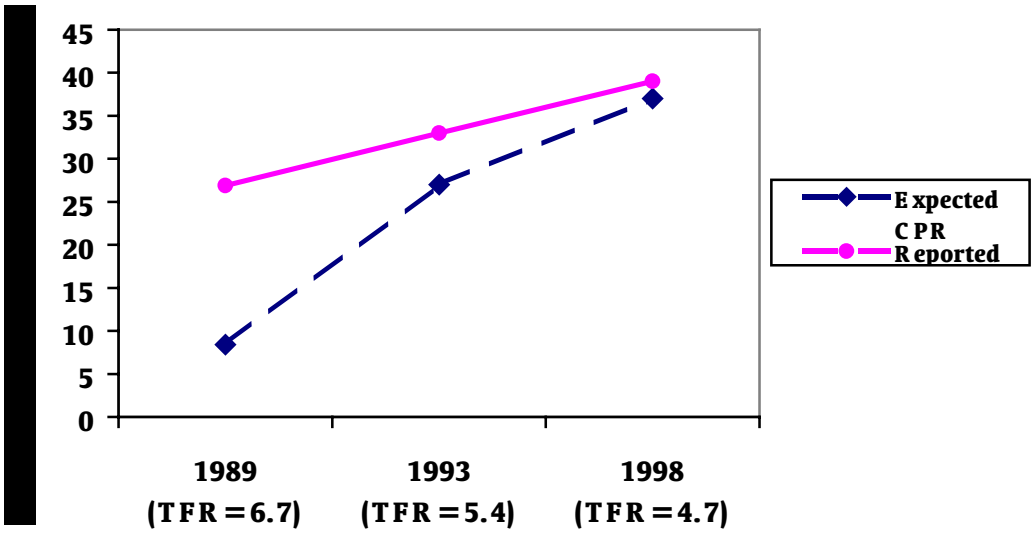
uncovered the existence and extent of covert contraceptive use among women, which may account for about 6% to 20% of total contraceptive use (Biddlecom and Fapohunda 1998; for reasons of secret use of contraception, see Bawah et al. 1999; Castle et al. 1999; Rutenberg and Watkins 1997). On the other hand, the fact that the TFR in Kenya was much higher than expected in the past, whereas now it is in line with expectation, may suggest that past overstatement could be an issue in the understatement of the increase in contraceptive use. It is also possible that earlier use was not necessarily overstated, but may have comprised a relatively high proportion of less effective contraceptive methods whose effect on fertility would be lower than expected.

The analysis by Blanc and Poukouta (1997) further noted that the contraceptive prevalence/fertility discrepancy is largely a rural phenomenon in Kenya (as well as Senegal and Zimbabwe). In Kenya, the decline in rural fertility was one child more than expected, while the decline in urban fertility was only 0.1 children more than expected. This implies that if data deficiencies are indeed responsible for the observed contraceptive prevalence/fertility discrepancy, then such errors do vary considerably by rural/urban residence and possibly other background characteristics, such as education, religion and ethnicity/region. For example, covert use of contraceptives may be more prevalent among members of religious denominations strongly opposed to contraceptives or pronatalist communities.

2.2.1 Reported Versus Expected Contraceptive Prevalence in Kenya

Figure 2.1 shows the trends in the reported versus expected contraceptive prevalence in Kenya during the 1989 – 1998 period.

Figure 2.1
Trends in Reported versus Expected Contraceptive Prevalence in Kenya
1989-98



In the earlier periods, the KDHS data showed that the reported CPR was considerably higher than the level that would be expected to yield the observed fertility levels. However, this

discrepancy is minimal in the 1998 KDHS. At the aggregate level, the reported contraceptive prevalence in 1998 of 39 percent is very close to the level of 37 percent that would be expected to yield the observed TFR of 4.7 children per woman.

Table 2.1 Deviations in observed versus expected contraceptive prevalence (based on current fertility) by background characteristics, 1998 KDHS

Background Characteristic	Contraceptive Prevalence[1]			TFR	Number of Cases[2]
	Reported	Expected	Deviation		
Residence					
Urban	49.6	59.6	-10.0	3.12	1,466
Rural	36.2	30.5	5.7	5.16	6,415
Region					
Nairobi	56.3	66.9	-10.6	2.61	419
Central	61.1	51.9	9.2	3.66	787
Coast	22.1	32.2	-10.1	5.04	1,226
Eastern	45.6	37.3	8.3	4.68	1,186
Nyanza	28.2	33.0	-4.8	4.98	1,390
Rift Valley	37.7	28.3	9.4	5.31	1,977
Western	30.2	23.7	6.5	5.63	896
Education level					
No education	22.8	21.3	1.5	5.80	1,010
Primary incomplete	27.9	29.3	-1.4	5.24	2,903
Primary complete	43.7	35.8	7.9	4.79	1,816
Secondary+	56.7	53.8	2.9	3.53	2,152
Religion					
Catholic	41.1	38.3	2.8	4.61	2,128
Protestant	39.2	36.9	2.3	4.71	5,026
Muslim	32.0	38.6	-6.6	4.59	444
Others	28.0	26.9	1.1	5.41	283
Total	39.0	37.1	1.9	4.70	7,881

[1] – Contraceptive prevalence based on women currently in union
[2] – Unweighted total number of women of reproductive age, on which TFR is based

An examination of the reported versus expected contraceptive prevalence in 1998 by background characteristics (Table 2.1) shows considerable variation between different sub-groups. It is interesting to note that reported contraceptive use in urban areas is lower than expected, while in rural areas it is slightly higher than expected. This contradicts the observation

from earlier KDHS surveys that suggested that the CPR versus TFR discrepancy in Kenya was largely a rural phenomenon.

The regional differentials are consistent with the urban/rural patterns, indicating lower reported than expected contraceptive use in Nairobi and Coast, the provinces which host the two Kenyan cities: Nairobi and Mombasa. It is possible that city residents are using relatively more effective contraceptive methods. An examination of the distribution of method choice by residence (not shown) confirms that rural residents are more likely to use traditional contraceptive methods (mainly the rhythm method) than their urban counterparts. Bongaarts' (1984) estimates of contraceptive use-effectiveness shows that the rhythm has a relatively lower use-effectiveness compared to modern contraceptive methods. Other possible explanations for the observed urban/rural differentials may be in terms of the other proximate determinants of fertility such as marriage patterns and abortion, which may also play a significant role. For example, urban areas may have a higher proportion of unmarried women and the incidence of abortion may be higher than in rural areas, resulting in the observed pattern.

There is little variation in the deviation of reported versus expected CPR by education level or religion, which increases our confidence in quality of the data. In particular, the lack of a systematic deviation pattern by educational attainment suggests that the data quality is unlikely to be a major issue. Although one might expect covert contraceptive use to be more prevalent among Catholics since the church is strongly opposed to modern contraceptive methods, the data show no evidence of this. However, the observed pattern suggests that contraceptive use among Muslims may be under-reported among this strict religious community, possibly due to covert use.

2.2.2 Consistency in Contraceptive Use/Fertility Relationship over Time

It is important to examine whether the relationship between contraceptive prevalence and fertility rates observed in Kenya in the 1980s and early 1990s still persist in the mid and late 1990s. Such an analysis would help assess potential under/over-reporting of contraceptive use that would inform subsequent substantive analysis of contraceptive use dynamics in the country. Table 2.2 compares observed versus expected increases in contraceptive use for the 1989-93 and 1993-98 periods according to selected background characteristics.

As noted earlier, the overall fertility decline in the period 1989-1993 was far larger than would be expected, given the observed increase in CPR during this period. While an increase of 18 percentage points in CPR would be expected to yield the observed fertility decline of 1.3 children, the CPR increased by only 6 percentage points. This pattern is maintained during the 1993-98 period, but to a lesser extent. The observed increase in CPR of 6 percentage points is lower than the expected level of 10 percentage points that would yield the observed fertility decline of 0.7 children during this period.

Table 2.2 Comparison between observed changes in contraceptive prevalence and expected changes based on fertility levels for the 1989-93 and 1993-98 periods, by background characteristics.

Background Characteristic	Period 1989 - 1993			Period 1993 - 1998		
	Increase in CPR		Change in TFR	Increase in CPR		Change in TFR
	Observed	Expected		Observed	Expected	
Residence						
Urban	12.9	14.7	-1.0	6.2	4.6	-0.3
Rural	4.7	18.2	-1.3	5.3	9.2	-0.6
Region						
Nairobi	11.9	11.4	-0.8	10.9	11.3	-0.8
Central	16.5	29.2	-2.0	5.1	3.9	-0.3
Coast	2.1	1.4	-0.1	1.9	3.0	-0.2
Eastern	-1.8	18.2	-1.3	7.2	17.3	-1.2
Nyanza	10.0	15.7	-1.1	4.4	11.7	-0.8
Rift Valley	-1.8	18.0	-1.3	9.9	5.6	-0.4
Western	11.4	24.5	-1.7	5.1	10.3	-0.7
Education level						
No education	1.2	20.5	-1.4	3.3	3.3	-0.2
Primary incomplete	1.3	18.9	-1.3	0.5	11.7	-0.8
Primary complete	8.0	21.2	-1.5	5.3	0.4	-0.0
Secondary+	11.2	12.0	-0.8	5.1	7.2	-0.5
Religion						
Catholic	6.9	17.2	-1.2	8.4	15.2	-1.1
Protestant	5.3	20.5	-1.4	4.6	7.4	-0.5
Muslim	11.4	14.2	-1.0	3.9	-5.0	0.4
Others	0.7	-12.0	0.8	13.7	22.9	-1.6
Total	5.9	18.2	-1.3	6.2	10.0	-0.7

The observed versus expected CPR patterns vary considerably for different sub-groups of the population. The urban residents show reasonable consistency between the observed and the expected CPR in the two time periods. This does not hold for the rural residents where the reported increase in CPR is significantly lower than expected, especially for the 1989-93 period.

For the 1989-93 period, all regions, except Nairobi and Coast provinces, observed substantially lower increases in CPR than expected. This is particularly so for Eastern and Rift Valley provinces which, despite having a decline in TFR of more than one child, observed no increase at all in CPR over this period. The discrepancies between observed and expected

increase in contraceptive use by region are less pronounced in the 1993-98 period. In fact, in Rift Valley, the pattern is reversed and the observed increase in CPR is higher than expected. For three of the regions (Eastern, Nyanza and Western), the observed increase in CPR is still notably lower than expected.

Except for those with at least secondary level education, observed increase in CPR during the period 1989-93 is far lower than expected, with the greatest deviation among those with no education. Greater consistency is observed for the 1993-98 period, particularly for those with no education, but women with incomplete primary education still show significantly lower observed than expected change in CPR.

The deviations between observed and expected increase in CPR also show variation by religious groups. The observed increase in CPR for both Catholics and Protestants are lower than expected for the two time periods, but the difference is less pronounced for the Protestants during the 1993-98 period.

2.3 Reliability of Calendar Data

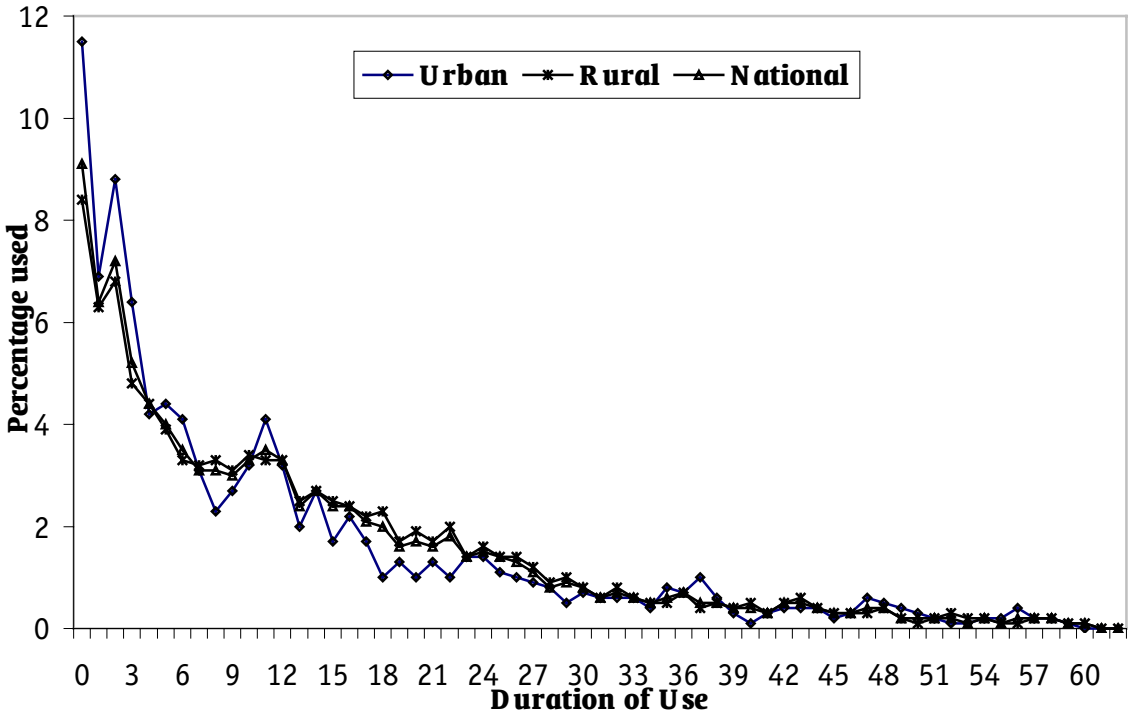
Calendar data have proved very valuable in analysing contraceptive use dynamics in the absence of expensive continuous surveillance data. The quality of these data, however, can be compromised by respondents' capacity and willingness to report all events correctly, and interviewer incompetence. For instance, discontinuation rates would be underestimated if some episodes are forgotten, and failure rates would be underestimated if unintended and brief pregnancies are underreported. The respondent who terminated a pregnancy through induced abortion may not report the pregnancy in the calendar table because abortion is legally or morally unacceptable. Such omission would lead to underestimation of failure rates if pregnancies resulting from contraceptive failure are often aborted.

2.3.1 Digit Preference /Heaping in Reported Duration of Contraceptive Use

A potentially common problem in time/duration specific data of the nature collected in the contraceptive use calendar is the tendency for respondents to report certain digits/durations more often than they report others (e.g. 3, 6, 12 months). This problem is more prevalent in societies where there is a lack of date keeping and where citizens are not required to keep legal documents on various demographic events like births and deaths. Figure 2.2 shows the extent of heaping in reported durations of use at national level, and for rural and urban areas. The national curve exhibits minor heaping at 3 months and 12 months. The urban data show greater heaping than the rural data, probably because of the small number of cases in urban areas. These data compare favorably with patterns from other countries, including Zimbabwe (Curtis and Blanc 1997). The indices of heaping of 1.0092, 1.0184 and 1.0334 for national, rural and urban areas respectively show that the level of heaping in the data is not worrisome.[1]

[1] The index of heaping is computed as: $4N_x/(N_{x-2}+N_{x-1}+N_{x+1}+N_{X+2})$, where N_x is the number of episodes of use of x months duration reported in the calendar (Curtis, 1997). An index of one indicates no heaping while an index greater than one indicates heaping.

Figure 2.2
Distribution of Reported Durations of Episodes of Contraceptive Use by Place of Residence KDHS 1998.



2.3.2 Consistency between Calendar and Current Status Data

The quality of the calendar data can also be examined by comparing the contraceptive prevalence rate generated from the calendar data with the contraceptive prevalence rate computed from the same cohort of women reported in the 1993 survey. These two rates should be the same if respondents are reporting all episodes of contraceptive use in the calendar schedule. With a CPR of 32.3% based on the 1993 current status data and 32.1% based on the 1998 contraceptive calendar data, the results (Table 2.3) show that, on the aggregate, the 1998 retrospective calendar data are remarkably consistent with the current status data collected in 1993. The same high level of consistency is observed for each of the specific methods, except injectables, IUDs, and condoms where slight differences are observed. A similar comparison using other DHS studies have shown remarkably close results (Curtis and Blanc 1997).

Table 2.3 Consistency between calendar and current status data on contraceptive prevalence

Method	Contraceptive Prevalence Rates				
	KDHS 1993 (Currently married women aged 15-44)		Contraceptive Use Calendar, 1998 (Currently married women aged 20-49)		
	Percent	Number	Percent	Number	Difference
All Methods	32.3	1,479	32.1	1,327	0.2
Pill	8.6	394	8.7	359	-0.1
IUD	3.9	180	2.6	106	1.3
Injectables	8.1	370	9.7	400	-1.6
Condom	1.1	49	0.5	22	0.6
Sterilization	5.7	261	5.3	221	0.4
Other modern	0.1	4	0.3	15	-0.2
Rhythm	4.0	184	4.1	169	-0.1
Withdrawal	0.3	14	0.3	12	0.0
Other traditional	0.5	23	0.8	27	-0.3

A careful evaluation of the quality of calendar data from the 1995 Morocco DHS has shown that reporting of contraceptive behaviour at the aggregate level was fairly reliable, but there was considerable unreliability in individual-level responses, particularly for complex histories (Stickler et al. 1997). The study showed that aggregate estimates of contraceptive prevalence were fairly robust to reporting errors, but that estimates of failure, switching and discontinuation rates were more sensitive to reporting errors. Since the Kenya data are not longitudinal, we cannot assess the reliability of individual-level responses. Our evaluation of the data quality, therefore, is restricted to the analysis of digit preference in reporting of durations of contraceptive use and the overall reporting of contraceptive use at the aggregate level.

2.4 Discussions and Conclusions

This analysis was aimed at assessing the quality of contraceptive data obtained in the KDHS in order to inform subsequent analysis of contraceptive use dynamics in the country. The first analysis examined the deviations between the observed and expected contraceptive use, with the aim of identifying any data quality issues that could possibly contribute to the observed deviations. The proposed explanations relating to quality of contraceptive data are based on three underlying assumptions: that fertility data are fairly accurate; that the relationship between fertility levels and contraceptive use in Kenya does not deviate significantly from the established universal pattern; and that the relationship between contraceptive use and fertility has not changed over time in Kenya.

The validity of the above assumptions has great relevance to the interpretations of the results of this analysis. Although the first assumption is likely to be reasonably valid, deviations from the expected CPR/TFR relationship could be attributed to a number of factors (which may have varied over time), besides possible problems with quality of contraceptive use data. In this analysis, explanations of deviations of observed from expected contraceptive use focused on possible misreporting (under-reporting or over-reporting) of contraceptive use, or effectiveness of contraceptive methods used, which are of particular relevance to the analysis of contraceptive use dynamics in the country. However, attributing the observed patterns specifically to data quality requires a much more detailed look at why fertility was higher than expected in the past, which is beyond the scope of this analysis.

We recognize that there are other factors that are probably even more important in explaining the observed deviations. For example, the observed trends in the CPR/TFR relationship may suggest that the explanation that a time lag between contraceptive adoption and the effect on fertility could have been responsible for the higher-than-expected fertility observed in earlier KDHS surveys, is probably valid. It is logical to expect such time lag effect to diminish with time, and indeed the overall CPR/TFR relationship in 1998 conforms to the universal pattern, at least at the aggregate level. The time lag explanation is also consistent with the general observed pattern of faster than expected fertility decline, as the impact of prior contraceptive use takes effect. On the other hand, it is important to note that the lag effect will only fully disappear when contraceptive use stabilizes. If contraceptive use continues to rise rapidly, there will still be some lag effects from the recent increases. Contraceptive use increased by almost as many percentage points between 1993 and 1998 as it did between 1989 and 1998 so it is unlikely that the disappearance of the excess fertility in Kenya can be solely attributed to lag effect, unless most of the recent increase was in the early part of the period. Changes in the other proximate determinants of fertility such as postpartum amenorrhea (breastfeeding), marriage patterns, and abortion could also play a role. For example, the regression equation on which this analysis is based essentially assumes certain breastfeeding and marriage patterns at a given level of contraceptive use (see Bongaarts 1984).

The observed deviations in expected CPR/TFR relationship for specific sub-groups may also be due to the time lag effect, since some of these sub-groups may have initiated contraceptive use later than others. Furthermore, other factors, such as differences in the other proximate determinants of fertility (e.g. marriage, breastfeeding or abortion patterns) between specific sub-groups may affect the actual CPR/TFR relationship. However, it is also possible that part of the observed deviations for specific subgroups may be due to under-reporting /over-reporting of contraceptive use, or effectiveness of contraceptive methods prevalent among specific groups. For example, the observed CPR among urban residents, which was lower than expected, is possibly an indication of use of more effective contraceptive methods (less traditional methods) by urban women. On the other hand, this same pattern for the fairly strict religious group (i.e. Muslim), may suggest under-reporting of contraceptive use, probably due to covert contraceptive use among this group. Observed contraceptive prevalence for specific sub-groups (e.g. Rift Valley and Central provinces) that were higher than expected may be partly due to use of less effective methods, or possible over-reporting of contraceptive use. The

explanations, relating to contraceptive use effectiveness for different sub-groups, would be re-enforced by the analysis of contraceptive method choice.

The evaluation of the calendar data shows that the extent of heaping of the durations of contraceptive use is quite mild, and not worrisome for the duration-based analyses. These data compare favorably with patterns in similar data from other countries (Curtis and Blanc 1997). The comparison of the CPRs for 1993 based on the 1998 calendar data and the 1993 KDHS, also demonstrates a high level of consistency of reporting of current use status for all methods, as well as the specific methods used. This level of consistency, which has also been observed in other DHS data sets, provides a basis for confidence in the quality of the contraceptive calendar data. However, the fact that the 1998 data are cross-sectional, does not allow us to do internal and individual-level consistency checks of the calendar data, especially on durations of use. The finding in the Morocco study (Stickler et al. 1997) that reporting of contraceptive behaviour at the aggregate level is fairly reliable but that there is considerable unreliability in individual-level responses, raises the need for caution in interpreting analyses that are more sensitive to reporting errors in duration of contraceptive use (such as those on contraceptive failure, switching and discontinuation) and for discontinuation.

Overall, the analyses in this chapter confirm that the reported data on contraceptive use in Kenya are fairly reliable at the aggregate level. The fact that the 1998 calendar data are very consistent with the 1993 current status data suggest that not only are the 1998 calendar data likely to be reliable, but so are the 1993 current status data, which invalidates the earlier advanced theory that contraceptive use was probably over-reported in the past. It would require very consistent over-reporting or under-reporting patterns over time to get such consistency, if there were strong systematic errors in either survey. This finding is consistent with the analysis of the consistency between CPR and TFR, which showed no evidence of systematic reporting errors.

CHAPTER 3

NON-USERS OF FAMILY PLANNING IN KENYA.

3.1 Introduction

3.1.1 Rationale

Despite the increase in contraceptive use in Kenya over the years, a substantial proportion of women still have an unmet need for family planning. According to the 1998 Kenya Demographic and Health Survey (KDHS), 24 percent of currently married women have an apparent unmet need for family planning, and the total wanted fertility rate of 3.5 births is significantly lower than the current total fertility of 4.7 births per woman. Hence, there is room for improvement in meeting women's family planning needs and considerable potential for further increases in contraceptive use. Better understanding of factors associated with non-use of family planning in the country is vital for realizing this potential.

Previous studies have identified a number of socio-economic and demographic factors such as educational attainment, socio-economic status, place of residence, age, number of living children, and availability/accessibility of services as important in the use or non-use of contraceptives in sub-Saharan Africa (Kiragu and Zabin 1995; Kyalo 1996; Tuoane 1999). In a study of the determinants of contraceptive non-use in Kenya based on the 1989 KDHS, Kyalo (1996) noted that socio-economic factors, such as education, are very influential in determining contraceptive non-use. These factors have been confirmed to play an important role in contraceptive practice in other regions of the world as well. For instance, Nazar-Beutelspacher et al. (1999) observed that although availability of family planning services regulated the direct effect of schooling on contraceptive practice, lack of education remained an important predictor of non-use of contraceptives among women in the broader region of Chiapas in Mexico. A comprehensive understanding of who the non-users in specific settings are and factors associated with non-use is important in helping family planning programs identify the appropriate target groups.

Secondly, it is important to understand the reasons for non-use of contraceptives for programs to effectively address the barriers to use. In a comparative study of reasons for non-use of contraceptives in three Asian and three Latin American countries, the desire for a child, side effects or health reasons, and temporary infecundity were the most commonly given reasons for current non-use (Nair and Smith 1984). Disapproval of contraceptives was minimal in some countries, but appreciable in others. Among the socio-economic and demographic characteristics examined, age of the women, number of living children, and ever use of family planning methods were identified as the most powerful discriminators of the main reason for non-use.

Few studies have examined factors associated with specific reasons for non-use of family planning in sub-Saharan Africa. An important contribution in this area comes from a study of patterns of contraceptive behaviour in Lesotho, which identified health reasons as more common

among young women, those with high educational attainment and those who were previously married. Lack of information was cited most commonly by never married women and those whose partners were not working or had received no education, while social pressures were cited commonly by currently married women and those whose partners had no education (Touane 1999).

The analysis of unmet need in Morocco revealed that the most intractable reason for non-use was either for religious reasons or because of a husband's objections. In contrast, fear of side effects and lack of information were the most easily surmounted obstacles, as women citing these reasons were the most likely to be persuaded to adopt family planning (Westoff and Bankole 1998). A recent study in Siaya District in Kenya showed that fear of side effects or sterility was the objection most easily overcome by good communications and information, particularly through the community based distribution (CBD) program (Omondi-Odhiambo 1999).

3.1.2 Objectives

The overall aim of this analysis is to understand factors associated with non-use of family planning in Kenya. The specific objectives of this analysis are

- to examine the trends in profile of non-users of family planning in Kenya
- to identify factors associated with non-use of family planning
- to investigate reasons for non-use of family planning in Kenya
- to examine factors associated with future family planning intentions of non-users

3.2 Data and Methods

3.2.1 The Data

The analysis of non-users of family planning is based on the three sets of KDHS data collected in 1989, 1993 and 1998. A total of 22,571 women aged 15-49 were interviewed in the three KDHS surveys. This analysis has particular focus on those women who were not using a contraceptive method at the time of the survey. Although the analysis of the determinants of non-use includes current users for comparison, the rest of the analyses (i.e. on profile of non-users, reasons for non-use, and future family planning intentions) are based on current non-users.

Special focus is made on the variables which have program relevance, including the community level factors which may influence the decision to adopt family planning. The analysis largely utilises information obtained in the individual women's questionnaire, which provides data on the socio-demographic characteristics of the women, as well as information used to construct contextual community factors (e.g. percent of women reached by information campaigns through mass media, etc.).

3.2.2 Analytical Methods.

The analysis of the profile of non-users is based on simple bivariate analysis, while the determinants of non-use and reasons for non-use is based on multilevel multinomial models. For non-use, the response variable has three distinct categories: current users, non-users with no unmet need and non-users with an unmet need, with current users being the reference category. The reasons for non-use have five categories in the multivariate analysis: want children, low or no pregnancy risk, disapproval of family planning, health concerns, and other reasons, with those who want children being the reference category. The analysis of factors associated with future family planning intentions is based on a multilevel logistic model.

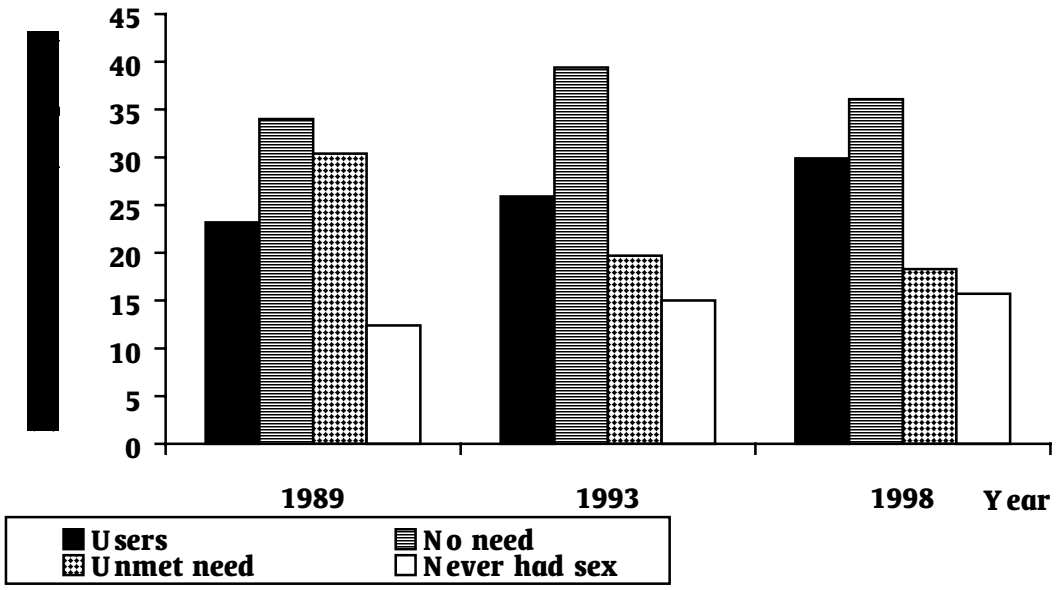
Multilevel modeling technique is employed to deal with the hierarchical data structure. Contraceptive behavior among women of specific communities may be correlated due to factors relating to availability and accessibility of family planning services within communities, or communities' perceptions on family planning. Ignoring the data structure may lead to biased results since the traditional single-level regression techniques assume independence of observations (Goldstein 1995). The analyses are based on two-level models that take into account the woman-level and the community-level effects. The model specifications are given in Appendix I.

3.3 Socio-demographic profile of Non-users of Family Planning

Although the proportion of women of reproductive age in Kenya using contraceptives has consistently increased over the years resulting in a gradual decline of the level of unmet need for family planning (see Figure 3.1), the absolute number of women of reproductive age with an unmet need has remained more or less constant. In 1989, 1.4 million women of reproductive age (i.e. 30.4% of 4.75 million) had an unmet need for family planning, compared to 1.3 million (i.e.18.3% of 6.9 million) in 1998/9.

This section focuses on the profile of non-users and an examination of whether the profile has changed over time. The profile reflects both the propensity of women with a given characteristic to use a method and the size of the population with that given characteristic (e.g. age), and therefore, has important program implications. The key program question that this section addresses is, who are the non-users of family planning in Kenya, and has this changed over time?

Figure 3.1
Background Trends in Use and Non-use (With or Without Unmet Need) of Family Planning Among Women of Reproductive Age Kenya: 1989-1998.



Of the 7150 women of reproductive age interviewed by KDHS in 1989, 7540 in 1993, and 7881 in 1998, 12.1%, 15.5% and 16.1%, respectively, had never had sex, and hence, are excluded from the following analysis. Table 3.1 gives the socio-demographic profile of sexually active (ever had sex) non-users in 1989, 1993 and 1998. The corresponding profile of all sexually active women is given in Appendix II for comparative purposes.

In general, the vast majority of non-users of family planning in Kenya across the three time periods are women who live in rural areas (80-85%), who are currently married (69-76%), and who have never used any family planning methods (61-76%). Across the years, a substantial proportion of non-users have been from Nyanza and Rift Valley provinces, with almost half of non-users in 1998 coming from these two regions.

There has been a general increase in the proportion of non-users who live in urban areas, those who are not married, and those who had previously used modern family planning methods. These patterns are consistent with the general trends of increasing urbanization, rising age at marriage and increasing contraceptive prevalence in Kenya. However, the pronounced increase in the proportion of non-users who had previously used modern family planning methods may also suggest high discontinuation rates of family planning methods in Kenya, for whatever reason.

Table 3.1 Trends in socio-demographic profile of sexually active non-users (1989-98)

Who are the non-users of FP in Kenya and has this changed over time?

Socio-demographic Characteristic	Percent of Non-users (Weighted)		
	1989	1993	1998
Residence			
Urban	16.5	15.1	20.3
Rural	83.5	84.9	79.7
Region			
Nairobi	7.2	5.5	7.7
Central	13.1	10.8	7.7
Coast	7.6	10.4	9.2
Eastern	14.8	18.1	15.2
Nyanza	20.9	18.4	24.8
Rift Valley	20.9	21.5	22.8
Western	15.5	15.4	12.6
Age group			
15-24	33.8	40.5	38.0
25-34	35.4	31.8	31.9
35 +	30.8	27.7	30.1
Marital Status			
Never married	15.7	19.6	19.2
Currently married	75.6	69.9	68.8
Previously married	8.7	10.6	11.9
Number of living children			
0	14.7	20.4	19.6
1-2	28.1	30.2	33.6
3-4	22.4	21.3	22.2
5+	34.8	28.2	24.5
Education level			
None	31.4	24.1	16.2
Primary incomplete	29.1	30.5	29.6
Primary complete	23.3	26.7	31.9
Secondary +	16.3	18.7	22.3
Past contraceptive behaviour			
Never used any	75.6	66.9	60.6
Used only traditional	11.7	12.5	8.9
Ever used any modern	12.8	20.6	30.5
Ideal family size			
3 or less	19.2	36.8	34.1
4	40.0	35.2	33.9
5+	36.0	20.9	25.6
Non-numeric	4.8	7.1	6.4
Future fertility desire			
Want later	21.2	19.8	25.8
Want no more	33.0	30.1	43.0
Other (want soon, undecided, infecund, etc)	45.8	50.2	31.2
Recent experience of an unplanned birth			
No	65.8	67.5	75.7
Yes	34.2	32.5	24.3
No. of cases	4610	4456	4286

Base population: Current non-users who have ever had sex.

Significant shifts are observed in the distribution of non-users of family planning by educational attainment and family size. Over the years, non-users of family planning are becoming more educated and desiring/having fewer children. For instance, a typical non-user of family planning has shifted from a woman with five or more living children (modal category) in 1989, to one with 1-2 living children in 1998. With respect to education level, the proportion of non-users who had no education declined by about half from 31 percent to 16 percent, while the proportion with at least secondary level education increased from 16 percent to 22 percent between 1989 and 1998. These patterns partly reflect the general trends in the overall population, since there has been a general increase in educational attainment and reduction in fertility in Kenya over the recent years.

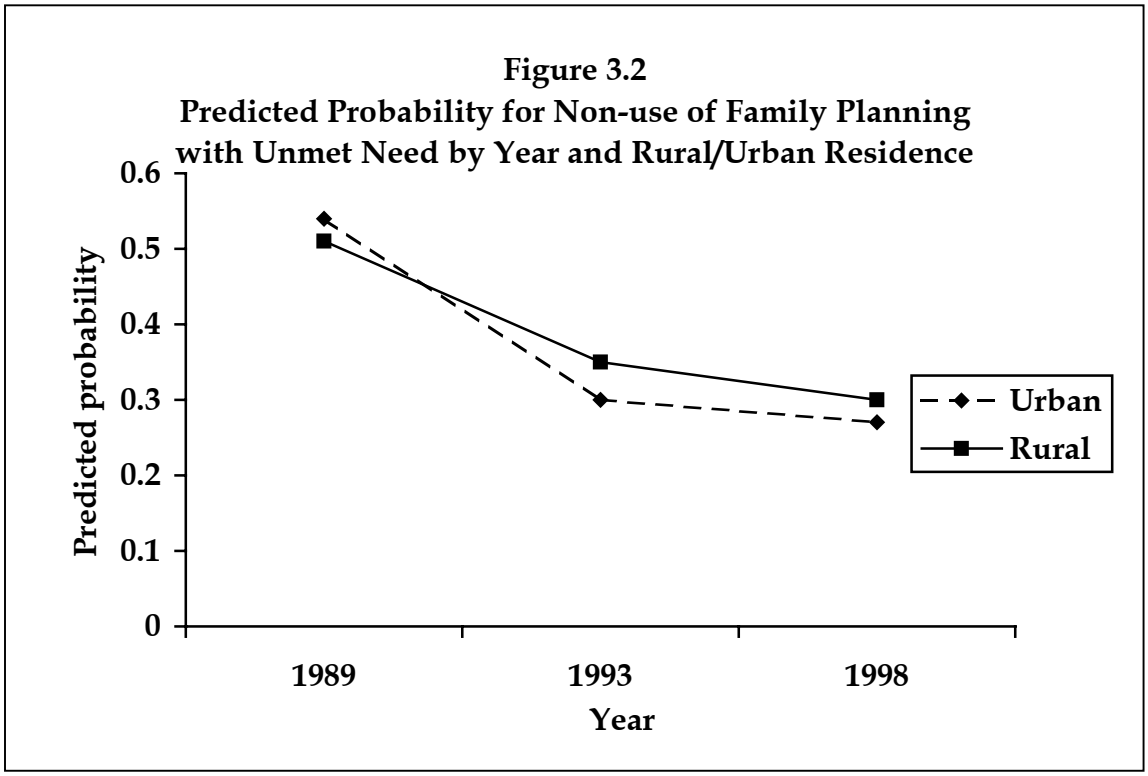
It is encouraging to note that there has been a considerable decline in the proportion of non-users whose last birth resulted from an unplanned pregnancy, from 34 percent in 1989 to 24 percent in 1998. This may suggest an increasing tendency for non-users of family planning to start use after an unplanned birth, or a general decline in the incidence of unplanned pregnancies in the country (see Appendix II). Nevertheless, the proportion of non-users who had a recent experience of an unplanned birth is still appreciable at more than 20 percent, warranting continued attention.

3.4 Determinants of Non-use of Family Planning

This section of the analysis seeks to identify the individual and contextual community factors associated with non-use of family planning in Kenya. The focus is on variables that are likely to be more programmatically relevant, while controlling for other variables as necessary. The response variable (non-use by unmet need status) is classified into three categories: non-use with no unmet need; non-use with an unmet need; and current users, which is used as the reference category. Contextual community variables relating to exposure to mass media, e.g. proportion of women in community who had heard family planning messages on radio, are constructed and included in the analysis of determinants of non-use.

The analysis of determinants of non-use is based on pooled data from the three KDHS surveys, and the distribution of the sample is given in Appendix III. Interactions of various covariates with year are included in the model to detect differences in the determinants across years, and control for possible variations in the three sets of the KDHS surveys. The predicted probabilities for contraceptive unmet need status are presented in Table 3.2, while the parameter estimates for the final model are given in Appendix IV.

The predicted probabilities for non-use with an unmet need for family planning shows a declining trend, with a more rapid decline in the 1989-93 period as illustrated in Figure 3.2. There is some variation in the rural/urban effect by year. While in 1989 there was some indication that rural residents had a marginally lower probability of non-use of family planning with unmet need than their urban counterparts, this pattern was reversed in the 1990s.



Women in Central Province have the lowest probability of non-use with unmet need, while those in Western Province have the highest probability. On the other hand, Nyanza has the highest probability of non-use with no unmet need of family planning.

The probability of non-use with an unmet need for family planning consistently declines with age, but rises with increasing number of living children, despite the steady increase in current use with increasing number of living children. In particular, adolescents aged 15-24 are associated with a considerably high chance of non-use with unmet need of family planning. Conversely, non-use with no unmet need rises with age, but sharply declines with increasing number of living children. The pattern by age is not surprising given the expected reduced exposure to risk of a pregnancy among older women, some of whom may have reached menopause. Similarly, the high probability of non-use with no unmet need linked to fewer living children is not surprising, given the expected greater desire for children among this group.

Non-use of family planning, with or without an unmet need, steadily declines with increasing educational attainment. This could be attributed to the lower fertility preference and the greater ability of the more educated women to realize their desired reproductive goal.

Table 3.2: Predicted probabilities for contraceptive/ unmet need status

What factors are associated with non-use/ unmet need status?

	Predicted Probability		
Factor	Current use	Nonuse/no unmet need	Nonuse/unmet need
Year*Residence interaction			
1989 – Urban	0.19	0.26	0.54
– Rural	0.14	0.34	0.51
1993 – Urban	0.33	0.37	0.30
– Rural	0.21	0.44	0.35
1998 – Urban	0.35	0.37	0.27
– Rural	0.24	0.46	0.30
Region			
Nairobi	0.28	0.34	0.38
Central	0.40	0.28	0.32
Coast	0.21	0.41	0.38
Eastern	0.32	0.32	0.36
Nyanza	0.17	0.42	0.40
Rift Valley	0.23	0.35	0.41
Western	0.16	0.40	0.44
Age group			
15-24	0.20	0.31	0.50
25-34	0.24	0.38	0.38
35+	0.26	0.40	0.34
Living children			
None	0.03	0.81	0.16
1-2	0.17	0.49	0.34
3-4	0.26	0.35	0.39
5 +	0.34	0.22	0.44
Education level			
None	0.14	0.44	0.42
Primary incomplete	0.20	0.39	0.41
Primary complete	0.26	0.34	0.40
Secondary +	0.38	0.29	0.32
Partner's attitude on FP			
Approves	0.35	0.31	0.33
Disapproves	0.16	0.38	0.46
Unsure /missing	0.21	0.43	0.36
Ideal family size			
3 or less	0.31	0.30	0.39
4	0.25	0.35	0.41
5+	0.19	0.43	0.38
non-numeric	0.15	0.49	0.36
A recent unplanned birth			
No	0.24	0.44	0.33
Yes	0.22	0.23	0.55
Prop. Heard FP on radio			
0	0.15	0.41	0.44
1	0.32	0.33	0.35
Overall / mean	0.24	0.37	0.39

Base population: Currently married women in 1989, 1993 and 1998 KDHS

Partner's approval is an important factor in contraceptive use in Kenya. Partner's disapproval of family planning is associated with a reduced probability of current use, and consequently higher probability of non-use with or without an unmet need for family planning. Although contraceptive use steadily declines, while non-use without unmet need increases with increasing ideal family size, there is little variation in non-use with unmet need for family planning by ideal family size. A recent experience of an unplanned pregnancy is associated with an increased probability of non-use with an unmet need, suggesting a tendency of exposure to repeat incidence of unplanned pregnancies.

Finally, the results suggest that community factors have an important effect on family planning practice. A contextual community factor, based on the proportion of women in the community who had heard family planning messages over the radio, suggest that media exposure plays an important role in family planning practice. Taking the extreme cases of communities where no woman and all women interviewed had heard family planning messages on radio, the estimated probabilities clearly show that media exposure reduces significantly the probability of non-use of family planning, with or without an unmet need.

Unobserved community factors also play an important role in non-use versus use of family planning, as suggested by the significant community effects shown in Appendix IV. The estimated community effects suggest that 6-7 percent of the total unexplained variation in non-use (with or without unmet need) versus use of family planning is attributable to unobserved community factors. Such factors could range from service factors (e.g. availability, accessibility, and quality of services), to cultural factors influencing fertility preferences and acceptance of family planning services.

3.5 Reasons for Non-use

This section addresses two main issues: what are the reasons why women do not use family planning; and what factors are associated with the different reasons. This analysis will inform the design of appropriate programs to address barriers to contraceptive use in the country. A descriptive analysis of reported reasons for non-use is followed with a multivariate analysis of factors associated with specific reasons. The analysis uses data from the 1998 KDHS, which sought reasons for non-use of contraceptives among the current non-users.

One of the major limitations of the data on reasons for non-use from the DHS surveys is the restriction in obtaining only a single reason, considered as the major reason. For a number of women, non-use could be a result of multiple reasons, and the survey did not solicit other reasons which may be secondary, but perhaps equally important in contributing to contraceptive non-use.

3.5.1 Reported Reasons for Non-use of Family Planning

The reported reasons for non-use are presented in Table 3.3. The most commonly reported reasons for non-use of family planning were related to low or no risk of pregnancy,

including infrequency of sex, sub or infecundability and pregnancy. Such reasons were reported by 40 percent of nonusers, and another notable proportion (14%) were not using contraceptives because they want to have children.

Of particular relevance to family planning programs is the observation that 45% of women who reported not using contraception gave reasons for not using it other than having no risk or a low risk of pregnancy. Health-related reasons are appreciable, reported by 20 percent of nonusers. Fourteen percent of nonusers stated disapproval of family planning by self, partner, and, to a lesser extent, religious prohibition as the main reason for non-use. Among the other reasons reported, lack of knowledge of family planning methods or source of services seemed to be a small factor, while accessibility and affordability was rarely reported as the main factors hindering use.

Table 3.3: Reported reasons for non-use of family planning.
Why are women not using family planning?

Reason for non-use	Percent (weighted)
Want children	**14.3**
No/low pregnancy risk	**40.4**
Not married, does not intend to marry	8.4
Not having sex, Infrequent sex	10.0
Menopausal, sub/infecund, sterile	8.7
Postpartum amenorrhea	5.8
Pregnant	7.6
Disapproval	**13.9**
Respondent opposed	7.0
Spouse opposed	4.0
Others opposed	0.4
Religious prohibition	2.5
Health related	**19.5**
Health concerns	7.2
Fear side effects	10.8
Interfere with body processes	1.5
Other	**11.9**
Knows no method or source	4.3
Lack of access, cost too much	1.1
Inconvenient to use	0.6
Other reasons	3.2
Don't know / missing	2.7
Total percent	100
Number of cases	4286

Base population: current non-users in 1998 who have ever had sex

The fact that health-related reasons are the main reason among non-users who are at risk of an unwanted pregnancy is encouraging to programs, since previous literature had noted that this is one of the most easily surmounted obstacles. It is important to note that although service factors were rarely mentioned as the main reason hindering use, it could be an important secondary factor.

3.5.2 Factors Associated with Different Reasons for Non-use

The predicted probabilities for different reasons for non-use are presented in Table 3.4, while the parameter estimates are presented in Appendix V.

The estimated probabilities suggest that women in Coast Province, those who are currently married, and those with no living children have an increased chance of reporting the desire for a child as the main reason for non-use. On the other hand, women in Eastern Province, those who are older (aged 35+), those not currently married, those with no living child, and those who have ever used a contraceptive method (especially traditional methods) are associated with increased probability of reporting low or no pregnancy risk as the reason for non-use.

Perhaps of greatest program relevance is non-use of contraceptives due to disapproval of family planning or health concerns, as well as other reasons relating to access and knowledge issues. Women in urban areas, and consequently from Coast and Nairobi, are relatively more likely to state disapproval as the reason for non-use, compared to other regions. It is interesting to note that older women, aged 35 and above, are less likely to mention disapproval as the main reason for non-use of contraception, compared to the younger women. This is possibly an effect of low pregnancy risk among older women. An increase in the number of living children is associated with increased probability of disapproval as the reason for non-use. Non-use of family planning due to disapproval does not vary much by marital status or educational attainment. However, past contraceptive behaviour shows a strong association with disapproval as the reason for non-use of family planning, with those who have never used any family planning method being highly likely to report this reason. This is partly explained by possible selection since those who do not approve of family planning are unlikely to have ever used contraceptives in the past. A recent experience of unwanted pregnancies is also associated with family planning disapproval.

Health concerns appear to be more of an issue in the urban than rural areas. However, there is little variation by region or age of women. Health-related reasons are less often reported by formerly married women, but there is a tendency for this to increase with increasing number of living children, and increasing educational attainment. Past use of modern family planning methods is associated with increased probability of health related reasons.

The other reasons for non-use, which include lack of knowledge of family planning methods and source, are noticeably more likely to be reported by younger women (adolescents aged 15-24), and those with no formal education.

In addition to the factors discussed above, it is important to note that the probability of reporting low/no pregnancy risk, disapproval of family planning, or health concerns, versus reporting the desire to have a child as the main reason for non-use varies significantly between communities. This suggests existence of some unobserved community factors which influence reported reasons for non-use relating to low/no pregnancy risk, disapproval, or health concerns

Table 3.4 Predicted probabilities of reasons for non-use (from multinomial model)
What factors are associated with specific reasons for non-use?

Factor	Want children	Low/no pregnancy. risk	Disapproval of FP	Health concerns	Other reasons
Residence					
Urban	0.05	0.39	0.17	0.27	0.12
Rural	0.10	0.43	0.14	0.20	0.13
Province					
Nairobi	0.09	0.45	0.16	0.18	0.12
Central	0.08	0.41	0.14	0.22	0.15
Coast	0.14	0.34	0.21	0.21	0.10
Eastern	0.06	0.51	0.12	0.23	0.09
Nyanza	0.10	0.42	0.13	0.22	0.14
Rift Valley	0.09	0.40	0.14	0.20	0.17
Western	0.07	0.48	0.12	0.21	0.12
Age group					
15-24	0.10	0.37	0.14	0.20	0.19
25-34	0.13	0.38	0.16	0.22	0.11
35 +	0.05	0.51	0.13	0.22	0.09
Marital status					
Never married	0.01	0.57	0.11	0.20	0.11
Currently married	0.17	0.34	0.15	0.21	0.13
Previously married	0.05	0.56	0.11	0.16	0.12
Number of living children					
0	0.25	0.50	0.06	0.10	0.09
1-2	0.13	0.40	0.15	0.20	0.12
3-4	0.06	0.37	0.17	0.23	0.16
5 +	0.03	0.35	0.19	0.31	0.12
Education level					
None	0.11	0.38	0.14	0.18	0.20
Primary incomplete	0.09	0.42	0.15	0.20	0.14
Primary complete	0.07	0.43	0.16	0.22	0.11
Secondary +	0.10	0.44	0.12	0.24	0.11
Past contraceptive behaviour					
Never used any method	0.11	0.33	0.21	0.20	0.15
Used only traditional	0.04	0.65	0.07	0.12	0.12
Ever used modern	0.06	0.53	0.06	0.26	0.08
Ideal family size					
3 or less	0.08	0.44	0.14	0.21	0.13
4	0.09	0.40	0.16	0.24	0.12
5 +	0.11	0.41	0.12	0.20	0.15
Non-numeric	0.07	0.42	0.19	0.20	0.12
A recent unplanned birth?					
No	0.11	0.43	0.14	0.21	0.12
Yes	0.05	0.39	0.17	0.24	0.16

Base population: current non-users in 1998 who have ever had sex

versus reported desire to have a child. Although significant, the intra-community correlations with respect to the reasons for non-use is fairly low, with no more than 5 percent of the total unexplained variation in the reported reasons being attributable to the unobserved community factors.

3.6 Future family planning intention

Whether non-users of family planning intend to use a method in the future or not is of significance to family planning programs. This is particularly so since previous research indicates that reported contraceptive intentions have a strong predictive effect on subsequent contraceptive use (Curtis and Westoff 1996), and that a high proportion of women with unmet need do not intend to practice contraception (Westoff and Bankole 1998).

3.6.1 Factors associated with intention not to use family planning in future

The trend in the proportion of nonusers who specifically stated that they do not intend to practice family planning in the future is given in Table 3.5. The overall percent of nonusers who do not intend to practice family planning in the future has remained constant across the years at about 31.5 percent, but there is significant variation by background characteristics. For instance, while nonusers in rural areas were more likely to state non-intention to use in 1989 than their urban counterparts, this pattern had reversed in 1998. Similarly, some regions show rather erratic trends in family planning intention. Central Province, for instance, had by far the highest proportion of nonusers who intended to practice family planning in 1993, but in 1998, the province reported one of the lowest proportions.

In all the surveys, non-intention to practice family planning tends to increase with age, number of living children, and ideal family size, but declines with increased educational attainment. Women who are formerly married, and those whose partners do not approve of family planning consistently indicate non-intention to practice family planning across the years. On the other hand, those whose last birth was unplanned are consistently less likely to indicate non-intention to use family planning. A notable factor in the trend across years is that older non-users, who also are likely to have more children and lower educational attainment, are less likely to intend to use contraceptives now than in the past.

A further examination of intention to use family planning by reason for non-use reported in the 1998 KDHS (table not shown) reveals that disapproval is associated with the highest proportion of non-intention to use (43%), while other reasons (26.5) and low pregnancy risk (26.8%) had the lowest proportion of non-intention to use family planning. The proportion not intending to use family planning among nonusers who reported health

Table 3.5 Percent of non-users who do not intend to use contraceptive methods according to background characteristics and year of survey.

What factors are associated with non-intention to use family planning in future?

Characteristic	1989	1993	1998
Residence			
Urban	29.4	31.0	36.5
Rural	32.2	31.5	30.7
Region			
Nairobi	31.3	29.5	25.3
Central	33.4	47.6	25.4
Coast	39.5	36.1	41.2
Eastern	28.5	28.2	27.4
Nyanza	33.0	31.8	30.6
Rift Valley	28.7	29.2	33.5
Western	27.2	19.4	26.7
Education level			
None	47.3	54.0	59.5
Primary incomplete	32.5	31.3	32.1
Primary complete	23.7	25.0	25.8
Secondary +	20.1	19.8	21.7
Age			
15-24	20.2	21.0	19.2
25-34	27.3	25.5	25.3
35 +	57.6	63.0	64.4
Marital Status			
Never married	22.7	24.5	21.7
Currently married	33.5	32.8	34.6
Previously married	49.9	51.3	55.3
Number of living children			
0	26.0	27.7	23.4
1-2	27.9	26.2	26.7
3-4	32.0	30.9	37.5
5 +	40.3	43.6	48.4
Future fertility desire			
Want child soon	25.1	18.3	14.9
Want child later	33.7	32.4	40.0
Want no more children	32.6	34.5	32.8
Past contraceptive behaviour			
Never used any	33.0	33.9	34.8
Used only traditional	25.6	24.1	20.3
Ever used any modern	26.4	24.1	24.6
Ideal family size			
3 or less	26.3	26.1	24.3
4	27.4	28.2	27.3
5 +	37.7	42.8	42.8
non-numeric	48.4	52.1	55.2
Recent experience of unplanned birth			
No	36.8	37.6	35.5
Yes	17.3	14.2	15.6
Partner's attitude on FP			
Approves	24.1	22.6	23.6
Disapproves,	45.7	44.4	47.0
Unsure/ missing	40.4	45.1	47.3
No partner	28.0	29.7	28.1
Total percent	31.5	31.4	31.6
No. of cases	5557	5614	5653

Base population: All non-users of family planning

related reasons or desire to have (more) children were 34.2 percent and 30.8 percent respectively.

It is important to note that the trends in the bivariate analysis may not identify the specific important factors due to confounding effects. For example, age, living children and education level are correlated and it is not possible to single out the important factors, without controlling for the effects of other related factors. Table 3.6 gives the parameter estimates for non-intention to practice family planning, from a multivariate model that simultaneously takes into account the effects of the other important factors.

The results from the multivariate analysis show some evidence of an increasing trend in non-intention to practice family planning, especially in the 1989-93 period. Compared to 1989, the average odds of non-intention to practice family planning in 1993 is about 1.2 times higher. This result contradicts the bivariate analysis, which had showed a fairly steady level in the proportion of women who do not intend to use family planning across years. This may be attributed to the fact that multivariate analysis controls for the effects of factors such as increasing education, desire for smaller families, and increased proportion of women who have ever used contraceptives, all of which are associated with increased intention to use family planning. The lower odds observed for 1998 compared to 1993 is possibly due to the fact that urban residence is controlled for (a significantly higher proportion of non-users in 1998 than in1993 were urban residents, who are associated with reduced intention to use family planning).

Demographic factors do have a significant association with non-intention to use family planning. The association with age is particularly strong, showing an increasing tendency of non-intention to use family planning with increasing age. Compared to the adolescent women aged 15-24, women aged 35 or older have average odds of not intending to use family planning about 10 times higher. This is not surprising given that the older women are more likely to be sub-infecund or menopausal. The unmarried women have higher odds of not intending to use family planning, compared to married women whose partners approve of family planning. In general, partner's disapproval of family planning reduces intention to use contraception. There is a tendency for women with large families to intend to use family planning, while those who desire large families are less likely to intend to use family planning.

Past contraceptive behavior and experience of unwanted pregnancies have a significant association with family planning intention. Women who had previously used family planning (modern or traditional), or recently experienced an unplanned birth have reduced odds of non-intention to practice family planning.

Again, there is a significant community effect, suggesting some consistency in future family planning intention among women within communities. The intra-community correlation coefficient suggests that about 5 percent of the total unexplained variation in family planning intention is attributable to unobserved community factors.

Table 3.6 Parameter estimates and odds ratios for not intending to use family planning

What factors are associated with non-intention to use family planning in future?

Parameter	Estimate (s.e.)	Average Odds Ratio
Constant	-0.77 (0.134)	
Year		
1989[1]	-	1.00
1993	0.19 (0.057)*	1.21
1998	0.05 (0.058)	1.05
Residence		
Urban[1]	-	1.00
Rural	-0.29 (0.072)*	0.75
Region		
Nairobi	-0.49 (0.134)*	0.61
Central[1]	-	1.00
Coast	-0.49 (0.088)*	0.61
Eastern	-0.53 (0.101)*	0.59
Nyanza	-0.57 (0.085)*	0.57
Rift Valley	-0.48 (0.077)*	0.62
Western	-0.86 (0.094)*	0.42
Education level		
None[1]	-	1.00
Primary incomplete	-0.17 (0.061)*	0.84
Primary complete	-0.29 (0.065)*	0.75
Secondary +	-0.59 (0.074)*	0.55
Age		
15-24[1]	-	1.00
25-34	0.75 (0.065)*	2.12
35 +	2.32 (0.081)*	10.18
Marital Status		
Never married	0.44 (0.076)*	1.55
Currently married[1]	-	1.00
Previously married	0.86 (0.079)*	2.36
Number of living children		
0[1]	-	1.00
1-2	0.07 (0.071)	1.07
3-4	-0.30 (0.086)*	0.74
5 +	-0.57 (0.096)*	0.57
Past contraceptive behavior		
Never used any[1]	-	1.00
Used only traditional	-0.40 (0.083)*	0.67
Ever used any modern	-0.52 (0.059)*	0.59
Ideal family size		
3 or less[1]	-	1.00
4	0.02 (0.049)	1.02
5 +	0.31 (0.057)*	1.36
non-numeric	0.49 (0.096)*	1.63
Recent experience of unplanned birth		
No[1]	-	1.00
Yes	-1.23 (0.055)*	0.29
Partner's attitude on FP		
Approves[1]	-	1.00
Disapproves	1.03 (0.059)*	2.80
Unsure /missing	0.60 (0.065)*	1.82
Community effect (standard deviation)	0.40 (0.034)*	

[1] – reference category.

* $p<0.05$.

Base population: All non-users of family planning (1989, 1993 and 1998).

1

3.6.2 Reasons for not intending to use family planning

The 1993 and 1998 KDHS sought information on reasons for not intending to use family planning, which are presented in Table 3.7. There is significant variation in the reasons given

between the two years. Reasons relating to low or no pregnancy risk were the most common in the two surveys, reported by 31 percent of nonusers in 1993 and 39 percent of nonusers in 1998. The specific reasons given under this category varied considerably between the two years. While only 8 percent of non-users reported infrequent or no sex or not in union as the main reason for non-use in 1993, these reasons were reported by 22 percent of nonusers in 1993. In addition, the proportion reporting menopause or sterility increased from 9 percent in 1993 to 13 percent in 1998. On the other hand, those reporting reasons relating to sub/infecundity or difficulty to conceive reduced from 15 percent in 1993 to 5 percent in 1998. These differences may be partly due to differences in the coding of responses in the two surveys.

Table 3.7 Reported reasons for not intending to use family planning

Why don't women intend to use family planning, and are reasons changing over time?

Reason for not intending to use contraceptives	Percent (weighted)	
	1993	1998
Want children	**15.7**	**9.4**
No/low pregnancy risk	**31.2**	**39.3**
Not married, not having sex, Infrequent sex	7.5	21.7
Menopausal, sterilized	8.9	12.6
Sub/infecund, difficult to get pregnant	14.8	5.0
Disapproval	**13.7**	**17.9**
Respondent opposed, fatalistic	4.1	8.7
Spouse opposed	2.4	3.0
Others opposed	0.4	0.3
Religious prohibition	6.8	5.9
Health related	**17.1**	**17.7**
Health concerns, fears sterility, interferes…	6.9	7.1
Fear side effects	10.2	10.6
Other	**22.3**	**15.6**
Knows no method or source, lack of knowledge	8.9	5.8
Lack of access, cost too much	0.4	0.2
Inconvenient to use	2.7	0.9
Other reasons	4.2	3.2
Don't know / missing	6.1	5.5
Total percent	100	100
Number of cases	1827	2115

Base population: non-users who do not intend to use family planning

Another important reason for not intending to use family planning relates to health concerns. The proportion of nonusers indicating health related reasons, including fear of side effects, is constant at 17-18 percent in the two surveys.

Reasons relating to disapproval of family planning increased from 14 percent in 1993 to 18 percent in 1998. This increase is largely due to the respondent's own opposition which more than doubled from 4 percent in 1993 to 9 percent in 1998. Religious prohibition, however, hardly showed any change during this period.

The proportion of nonusers stating "wanting more children" as the main reason for not intending to use declined from 16 percent in 1993 to 9 percent in 1998. This is most likely due to the general decline in ideal fertility in Kenya over the recent years. The proportion reporting other reasons has generally reduced. It is particularly encouraging to note some reduction in the proportion of nonusers reporting lack of knowledge of family planning methods or source, which suggests general improvements in family planning knowledge. The notable reduction in the proportion reporting inconvenience of use may also suggest better understanding of how to use specific methods or wider contraceptive choice, which would encourage choice of more convenient methods.

3.6.3 Preferred Future Method

This final section examines the preferred future family planning methods among nonusers who intend to practice family planning. The analysis is relevant for program planning

and provides some background for the analysis of contraceptive method choice. Table 3.8 gives the trends and distribution of preferred future methods by selected background characteristics.

The most preferred future contraceptive method is the injectable, which is also getting more popular with time. In 1989, 33 percent of nonusers who intended to practice family planning mentioned the injectable as the preferred future method. This proportion increased from 33 percent to 37 percent in 1993, and to 40 percent in 1998. On the other hand, the pill and female sterilization appear to be getting less popular with time. While 31 percent of nonusers who intended to use family planning in 1989 mentioned pill as the preferred future method, only 21 percent of their counterparts in 1998 did so. The apparent decline in preference for tubal ligation could be due to changing age profile of nonusers who intend to use, with the older nonusers becoming less likely to intend to use (see Table 6). Nonusers who intend to practice family planning also seem to be getting less certain about the methods they intend to use as suggested by the increasing trend in the proportion who do not know the method they would prefer to use.

The injectable is particularly popular among rural residents, who also show a higher preference for tubal ligation than their urban counterparts across years. On the other hand, urban women have a higher preference for the pill and in general are less certain about preferred future method than rural women.

Table 3.8 Preferred future contraceptive methods by selected background characteristics by year.

Characteristic	Type of method					
	Pill	Injectables	Female sterilization	Other methods	Don't know	No. of Cases
1989	**30.8**	**33.4**	**8.7**	**14.7**	**12.4**	**3,038**
Residence						
Urban	32.6	28.8	5.5	17.1	16.0	780
Rural	30.2	35.0	9.8	13.8	11.1	2,258
Age group						
15-24	38.1	30.3	3.4	14.6	13.7	1,601
25-34	24.4	36.7	12.3	15.4	11.2	1,017
35 +	18.6	37.4	20.5	13.3	10.2	420
Number of living children						
0	39.3	24.1	2.1	17.0	17.5	872
1-2	34.8	35.1	4.7	14.4	11.0	846
3-4	30.6	35.6	10.1	12.6	11.1	585
5 +	16.3	40.8	20.1	13.9	8.8	735
Education level						
None	25.7	38.5	14.7	8.6	12.6	525
Primary incomplete	29.1	39.2	10.7	10.2	10.9	807
Primary complete	34.5	31.9	6.2	15.5	11.9	972
Secondary +	31.5	25.5	5.7	22.9	14.4	734
1993	**26.3**	**36.7**	**8.0**	**13.5**	**15.4**	**3,206**
Residence						
Urban	31.8	27.0	5.0	15.4	20.9	422
Rural	25.5	38.2	8.5	13.3	14.6	2,784
Age group						
15-24	32.2	33.8	2.7	14.0	17.3	1,894
25-34	18.8	42.8	12.2	13.5	12.7	942
35 +	15.4	36.2	24.6	11.1	12.7	370
Number of living children						
0	31.5	27.1	1.8	17.2	22.4	1,113
1-2	32.3	37.8	4.0	12.7	13.2	904
3-4	22.0	46.9	11.3	10.8	9.0	576
5 +	11.9	42.9	22.2	10.8	12.2	613
Education level						
None	19.9	42.3	15.2	8.3	14.4	362
Primary incomplete	24.2	40.3	8.9	8.9	17.7	982
Primary complete	27.7	37.3	6.2	13.8	15.0	1,073
Secondary +	29.9	28.9	6.1	21.4	13.7	789
1998	**21.1**	**39.7**	**6.6**	**15.6**	**17.0**	**3,388**
Residence						
Urban	25.7	32.4	3.9	19.1	18.9	534
Rural	20.3	41.1	7.1	14.9	16.6	2,854
Age group						
15-24	24.5	38.7	1.8	14.3	20.6	1,963
25-34	18.8	43.0	10.2	16.3	11.7	985
35 +	11.1	36.8	20.2	19.3	12.5	440
Number of living children						
0	25.6	30.5	1.6	15.8	26.4	1,275
1-2	24.3	46.4	2.6	15.3	11.5	1,002
3-4	17.9	46.3	11.1	13.8	10.9	559
5 +	8.2	42.2	21.0	17.2	11.4	552
Education level						
None	17.2	40.7	15.4	14.4	12.3	285
Primary incomplete	19.9	42.2	6.7	12.4	18.8	969
Primary complete	22.4	43.2	5.5	13.2	15.8	1,207
Secondary +	21.9	32.4	5.4	22.3	18.0	927

Base population: non-users who intend to use family planning

Across years, preference for the pill consistently declines with age and number of living children, while female sterilization preference sharply rises with increasing age and number of living children. Female sterilization is particularly popular among older women (aged 35 +) and those with at least five living children, with at least one in five citing it as the preferred future method. Preference for injectables by age or number of living children is less consistent, but there is some indication that the method is less popular among the young women or those with no living children. An appreciable and increasing proportion of the young women, or those with no living child, who intend to use a method do not know the preferred method.

In general, higher educational attainment is associated with increased preference for the pill and other methods, while low education is associated with increased preference for female sterilization, and to some extent, the injectables. About fifteen percent of nonusers with no education who intend to use a method mentioned sterilization as the preferred method across years, compared to 6 percent or less for those with at least secondary level education. It is, however, important to note that these education effects are possibly confounded with age since, for example, older women who are more likely to have low or no education are also more likely to mention sterilization as the preferred future method.

3.6 Recommendations and Policy/Program Implications

This chapter has identified a number of issues that are of direct relevance to the Kenyan family planning policies and programs. The analysis of the profile of non-users of family planning indicate that the majority of non-users live in rural areas, are currently married and have never used family planning methods. However, with the current trends of rapid urbanization, rising age at marriage, and increasing contraceptive prevalence, the proportion of non-users living in urban areas, those who are unmarried, and those who had previously used modern family planning methods is on the rise. Similarly, non-users of family planning are becoming more educated and desiring smaller families, which is in line with the general trends among the Kenyan population. It is important for the Kenyan family planning programs to recognize and appropriately respond to these notable shifts. For example, while past family planning program efforts may have rightly targeted rural, married women, there is increasing need to also adequately address the family planning needs of the urban and unmarried.

The need to target unmarried women is further supported by the fact that adolescence is associated with a particularly high probability of non-use with an unmet need of family planning. In addition, non-use among adolescents due to reasons relating to lack of knowledge or access of services is relatively high, compared to older women. These reasons for non-use deserve particular program attention.

With respect to residence, urban women are associated with relatively high probabilities of disapproval and health concerns as reasons for non-use, compared to their rural counterparts. Furthermore, the emerging trend in family planning intention is a challenge to the family planning programs in Kenya in terms of sustained future increase in contraceptive prevalence in the country. With the on-going rapid urbanization in Kenya (note that urban residence is associated with reduced intention to practice family planning among non-users), the actual proportion of nonusers who do not intend to practice family planning will probably remain

appreciable. It is possible that as contraceptive use rises faster in urban areas, nonusers are a more select, resistant group. It would be important to carry out an in-depth study of urban nonuse, in light of the increasing urbanization in the country.

Despite the general declining trend in the proportion of non-users who had recently experienced an unplanned birth, the results reveal a strong association between a recent experience of an unplanned birth and non-use with an unmet need, suggesting a high tendency of exposure to repeat incidences of unplanned pregnancies. Although this group tends to report health concerns, disapproval and other reasons for non-use, they are much more likely to intend to use contraceptives in the future. The challenge for family planning programs is to move them quickly to use in order to avoid further unplanned pregnancies. This has particular relevance to the integration of reproductive health services in the country. With efficient integration of MCH-FP services, women who have experienced unplanned births should receive timely FP advice and services to minimize chances of repeat incidents.

Even though the above discussion on program implications has mainly focused on findings that present particular challenges to FP programs, there are some positive aspects of specific findings that are worth mentioning. The fact that factors associated with increased intention to use contraception such as educational attainment or desire for smaller families are on the rise is encouraging. Furthermore, the key barriers to contraceptive use are largely the more easily surmounted ones such as health concerns, suggesting that well designed programs have a high chance of being successful.

Some program-relevant findings from this chapter will require reinforcement from additional analysis in subsequent chapters before conclusive program implications can be derived. The finding that past use of modern contraceptives is associated with an increased probability of non-use for health-related reasons suggests that past bad experiences discourage women from adopting contraceptives in the future. Furthermore, the rapid increase in the proportion of nonusers who had ever used modern contraceptives, implies that a substantial proportion of nonusers have discontinued use for whatever reason. The analysis of contraceptive discontinuation will reinforce these findings to be able to inform programs aimed at addressing the need to retain FP users.

For non-users who intend to practice family planning, the most preferred future method is the injectables, which is also getting more popular with time, while the pill and TL are getting less popular. The analysis of current method choice will help determine whether women end up actually using the preferred methods.

CHAPTER 4

FIRST USE OF CONTRACEPTION

4.1 Introduction

4.1.1 Rationale for studying first use of contraception

The initiation of reproductive-related activities – sexual intercourse, marriage, childbearing, contraceptive use, etc., has serious implications for reproductive health status. Understanding the factors associated with each of these transitions, therefore, is critical for the design and implementation of programs aimed at improving these outcomes. While early initiation of sexual and reproductive activities are associated with poor reproductive health outcomes, early initiation of contraceptive use is associated with improved outcomes such as reduction in levels of unplanned pregnancies (Chewning and Koningsveld 1998; Finer and Zabin 1998). The improved reproductive health outcomes associated with early initiation of contraceptive use are maximized when contraceptive initiation coincides with, or precedes, initiation of sexual activity. However, a number of studies have shown that there exists a gap between the initiation of sexual activity and the initiation of contraceptive use, with the latter lagging behind, especially among young adults. This lag has also been linked to poor reproductive health outcomes among adolescents, such as higher incidences of sexually transmitted infections including HIV/AIDS, higher prevalence of unplanned pregnancies and their attendant higher risks of clandestine abortions, and higher rates of maternal and child morbidity and mortality compared to adults (Gupta 2000; Rogo et al. 1999; Aggarwal and Mati 1980). As chapter 2 shows, the majority of non-users of contraception (61-76%) have never used any method; so understanding the factors associated with the transition from non-use to use may provide useful information to program managers in the design of appropriate programs to encourage greater adoption of contraception use among sexually active women, especially adolescents.

Research on the timing, context, determinants, and method choice at first use are scarce, especially for the developing world. Available data mainly come from the DHS studies, which only ask about parity at first use (El-Zanaty and Kemprecos 1998; Macro International 1994; Olaleye and Bankole 1994). Consequently, it has been difficult to evaluate other factors associated with the transition to first use of contraception as well as the determinants of this transition. Early studies in the US generally focused on factors associated with the initiation of contraception prior to first pregnancy (Westoff and Ryder 1977; Rindfuss and Westoff 1974). More recently, family structure, socio-economic variables, and self-esteem have been observed to significantly predict the adoption of contraceptive use among adolescents in the United States (Chewning and Van Koningsveld 1998).

In the developing world, age, parity, marital status, and education have been found to be important factors in the initiation of contraceptive use (Lema et al. 1998; Ramesh et al. 1996;

Karim and Begum 1980). For instance, Ramesh et al. (1996) observed that only 7% of Indian women initiated contraceptive use before the birth of their first child and that first use occurred after a mean number of 2.8 children. The mean number of children at first use, however, has also been noted to decline over time. Karim and Begum (1980) observed for Bangladesh that the mean number of children at the time of first use declined from 3.93 during the 1960s to 3.56 during the 1970s. Similar patterns have also been found in Kenya and Turkey, (Macro International 1994; Dervisoglu and Ergor 1994). An examination of the effect of women's experience of child mortality on the initiation of contraceptive use among Taiwanese women found that, although child mortality experience was not related to current use of contraception, it was significantly associated with delayed initiation of use (Rutstein 1974).

Studies on method choice at first use are also scarce. A study of contraceptive use dynamics among New Zealand women suggests that age, parity, ethnicity, and socio-economic status are important determinants of both first method used and discontinuation rates for first method choice (Paul et al. 1997). Haque et al. (1997) also observed that in Bangladesh, the majority of women who are users of a permanent method relied on the same method at first use. While this may indicate lack of use for spacing among these women, it may also reflect the method mix available to family planning clients in the country. Indeed, differences between first and current method choices may be a positive indicator of quality of care. Bruce (1990) has argued that the appropriate constellation of services is a fundamental element of quality of care and high levels of switching behavior may simply reflect the exercise of choice among clients.

One aspect of the transitions to first use that is of particular relevance to program implementation, but which has received little research attention, regards the motivations and determinants of the transition to first use – due largely to the unavailability of data on circumstances of first use. However, with the contraceptive use calendar information collected in a number of countries with high contraceptive prevalence rates (about 40%), including the 1998 KDHS, it is possible to examine some of these issues for a section of the sample that initiated their contraceptive use within the five-year period covered in the calendar. For these women, it is possible to examine a number of other characteristics that may be related to the transition to use, such as marital status, residence, and planning status of the pregnancy preceding the initiation of use. These indicators will provide useful information regarding the design of programs aimed at improving contraceptive use, especially among core groups of non-users.

The next section examines trends in the initiation of use among all ever-users in the three waves of KDHS. This is followed by a brief description of trends in the fertility intentions of ever users at first use. Since women initiate use at different stages in their reproductive experience, the chapter then examines the profile of women who initiated use at very low parities compared to those who did so at high parities and those who have not yet initiated use. The final section looks at first method choice and its determinants using both bivariate and multivariate techniques. Since data on first method choice were collected only in 1998, this section will use the 1998 KDHS data to assess the determinants of first method choice in Kenya.

4.2 Data Sources and Methods

4.2.1 Data Sources

Data from the three waves of the KDHS are used to examine trends in the initiation of contraceptive use and fertility intentions of initiators at first use, while only the 1998 KDHS is used in the analysis of first method choice. Between 7150 and 7881 women were interviewed in the DHS surveys in Kenya. The proportion of all women who have ever used any form of contraception rose from 39 percent in 1989 to 51 percent in 1998, while current use increased from 23 to 30 percent during the same period.

The 1998 KDHS contraceptive use calendar documents contraceptive, reproductive, marital, and residence histories of women over the five-year period preceding the survey. This data is used to analyze factors associated with the transition to first use for all women who initiated their contraceptive use during the five-year period preceding the survey. In particular, data on duration of first use, marital history, pregnancy history and wantedness, residence, etc. are all available from the calendar and will be used in assessing the context and determinants of first use of contraception.

4.2.2 Method of Analysis

The analysis utilizes bivariate and trivariate distributions, except for determinants of first method choice where a multinomial logit model is used. The main limitation in applying more complex models that rely on current status data either at the individual or community level as explanatory variables is the fact that the key outcome – first use of contraception – could have occurred several years before the survey. In choosing the set of explanatory variables in the analysis, care is taken to focus on variables that are less time-dependent and those that could be measured at the time of first use.

4.3 Results

4.3.1 Trends in Initiation of First Use

Understanding at what stage in women's family-building process they make the transition to first use is essential in clearly identifying how best to meet the needs of women who have never used family planning. Table 4.1 presents data on trends in the timing of first contraceptive use with particular focus on parity at first use, the woman's age at the birth of the child preceding her first use, and her marital status at first use.[2]

The proportion of women initiating use of contraception before reaching parity 2 has increased consistently from 43 percent in 1989 to 52 percent in 1998. Substantial proportions,

[2] Age and marital status at first use are proxies. These were calculated by comparing the woman's age at the birth of the child corresponding to her reported parity at first use and the date of first marriage to the date of birth of the index child preceding first use. One problem with this approach is that the proxy data on her age at first use is probably too low because women may not initiate use immediately after the birth of a child. Also, some women may have more than one interval in their life in which they had the same number of living children as at their first use and it is not possible to determine in which interval they initiated use. Notwithstanding these limitations, in the absence of information on age at first use, this gives a close approximation of age at first use.

especially in the recent survey years, also initiated use before their first child. The proportion of women initiating first use after parity 4 declined from 30 percent in 1989 to 21 percent in 1998. The mean parity at first use has also declined by half a child between 1989 and 1998. This may reflect both the overall declining fertility in Kenya as well as increasing initiation of use among women wishing to delay childbearing at parities zero and one. Although the median age at first birth has been increasing in Kenya, the mean and median ages at birth of the index child preceding first use did not change much over the ten-year period. However, the proportion initiating use under age 20 has declined consistently since 1989 due primarily to increasing age at first birth. Also, the proportion for whom age at birth of the child preceding first use is undetermined has increased over time due to increased proportion of women adopting use at parity zero. There was also no substantial change in women's marital status at first use. Across the three surveys, about two-thirds of women who made the transition to use contraceptives did so when they were married.

Results in Table 4.1 show clearly that women are increasingly initiating use of contraception at lower parities. To investigate whether the initiation of use at lower parities is associated more with an increasing use of contraception for spacing purposes or an increasing desire for limiting at lower parities, Table 4.2 examines trends in parity at first use by the contraceptive intent (spacing versus limiting) of women across the three surveys. Spacing/ limiting intent was estimated by comparing number of living children at first use with the woman's stated ideal family size at the time of each survey[3]. Results in Table 4.2 suggest that decreasing parities at initiation of use is associated with increasing use for both spacing and limiting at lower parities. Increasing initiation of use for limiting, however, appears to be more important. Between 1989 and 1993, the proportion of women initiating use of contraception for spacing purposes before attaining parity two increased from 61 to 71 percent, but no major shifts were observed between 1993 and 1998. The proportion of women initiating use for limiting purposes before attaining parity two more than tripled between 1988 and 1998. Spacing, however, remains the dominant reason for initiation of use at lower parities, while limiting is most important for initiation at higher parities.

[3] Women who gave non-numeric responses to the question on ideal family size were excluded. This group, however, accounts for 4 to 6 percent of all sexually active women across the three survey years.

Table 4.1 Trends in the distribution of ever-users by background characteristics, at first use, Kenya Demographic and Health Survey 1989 – 1998

Background Characteristic	1989	1993	1998
Living Children at 1st use			
0	18.2	22.4	21.9
1	25.0	25.3	30.2
2	15.8	15.8	16.0
3	11.4	10.0	9.5
4	9.2	7.8	7.4
5-6	10.5	10.2	9.0
7+	9.9	8.5	6.0
Mean Number of living children at 1st use	2.69	2.44	2.18
Number of cases	2737	3401	4034
Age at Birth of Parity Child at first use			
Less than 20	29.2	27.0	26.2
20 – 24 years	31.7	30.0	30.9
25 – 29 years	15.0	17.2	17.2
30+	13.8	12.4	11.0
Age at birth undetermined	10.3	13. 4	14.7
Number of observations	2679	3292	3904
Mean Age at 1st use[1]	23.06	22.94	22.91
Median age at 1st use	21.84	21.55	22.19
Marital status at 1st use			
Married	69.1	64.8	67.1
Not married	12.8	12.8	11.1
Undetermined (no children & missing data)	18.1	22.3	21.8
Number of cases	2793	3440	4045

Table 4.2 Trends in the initiation of use by parity at first use and fertility intentions, Kenya Demographic and Health Surveys, 1989 – 1998

	Intent of use					
Parity at 1st Use	Spacing			Limiting		
	1989	1993	1998	1989	1993	1998
0	25.9	34.4	30.1	0.3	0.3	0.0
1	34.7	36.9	39.1	1.7	3.4	6.4
2	19.4	16.9	16.8	7.6	14.1	14.3
3-4	16.4	10.4	11.2	30.5	32.1	32.1
5+	3.6	1.5	2.8	59.9	50.2	47.2
Total percent	100	100	100	100	100	100
No. of cases	1906	2165	2880	744	1134	1013

4.3.2 Correlates of Timing of First Use

We examine the correlates of timing of first use by looking at the reproductive experiences and service environment of women who made the transition at lower parities versus those who made the transition at higher parities. The results, presented in Table 4.3, show that the proportion of never-users increases with increasing family size desires. While less than a third of the women who desire less than four children have never used any contraceptive method, more than half of those who desire five or more children reported having never used any method. About 47 percent of women who desire fewer than four children had initiated use by parity one compared to only 13 percent of those who desire five or more children. The mean desired family size increased from 3.1 children for women who initiated use at parity 0 to 4.7 for women who initiated use at parity 5 or more. Women giving non-numeric responses to the question on ideal family size behave similarly to those who desire five or more children.

The presence of a CBD agent in the community appears to encourage overall use of contraception but only after a woman has had at least one living child. This may indicate the lack of willingness among CBD agents to provide contraceptive services to non-mothers or non-married women. In an assessment of community based family planning programs in Kenya, Chege and Askew (1997) noted that 81 percent of CBD agents interviewed in their study reported that "they would provide contraceptives to an unmarried boy with no children, while only 26 percent said they would provide contraceptives to an unmarried girl who has not yet had a child or become pregnant" (P. 17).

Residence in urban areas increases overall adoption of contraceptive use, especially at lower parities. By parity one, 42 percent of urban natives and migrants from rural areas have initiated use of contraception compared to only 22 percent of rural natives and 24 percent of rural residents who grew up in cities or towns. Overall, more educated women make the transition to first use and they do so at much lower parities. Women with secondary or higher education are

about four and half times as likely to initiate use by parity one as women with no formal education.

Table 4.3 Percent of women initiating use at different parities by Fertility desires, outcomes and Service delivery factors, KDHS 1998.

Background characteristic	Living children at 1st use (All Ever Users)					Sexually Active Never Users	No. of cases
	0	1	2	3 – 4	5+		
Ideal family size							
0 – 3	20.6	26.0	10.0	7.4	4.3	31.7	2,559
4	11.6	18.0	11.5	12.5	9.9	36.5	2,257
5+	5.3	8.1	7.6	11.9	15.1	52.0	1,482
Non-numeric	4.9	7.6	5.5	10.6	14.0	57.4	329
Mean Ideal family Size	3.11	3.27	3.69	4.13	4.72	4.31	6,627
CBD present							
No	14.0	19.2	9.2	9.3	8 1	40.2	4,849
Yes	10.1	16.4	12.1	14.5	13.0	33.9	1,550
Don't know	19.4	14.1	6.2	4.4	4.4	51.5	227
Residence							
Urban native	21.2	21.2	7.3	7.0	2.3	41.1	742
Urban migrant	16.1	25.3	10.5	7.2	3.7	37.3	1,084
Rural returnee from urban area	11.3	12.5	10.9	9.1	10.8	45.3	558
Rural native	8.8	13.0	7.6	9.2	8.9	52.5	5,469
Education							
No formal education	1.8	7.8	6.2	8.9	16.0	59.4	908
Primary incomplete	7.8	10.0	6.6	6.6	8.2	60.7	2,890
Primary complete	11.4	17.2	10.0	11.8	8.3	41.2	1,773
Secondary+	19.0	24.0	9.6	8.8	3.3	35.3	2,299
Number of cases	881	1,218	646	683	605	2,593	6,626

4.3.3. First Method Choice

Understanding which methods women choose for the first time enables program managers to provide the appropriate constellation of services and range of methods needed to meet women's needs as they make the transition to using contraception. As noted earlier, data on first method choice were only collected in the 1998 KDHS. The 1998 data also allow us to examine trends in method choice by comparing recent (within the past five years) and past (more than five years) initiators of contraceptive use. For recent initiators, their first use was identified in the calendar.

Table 4.4 shows the distribution of first method choice for all women who reported ever use of contraception in the 1998 KDHS, those who initiated use within the five year period

preceding the survey, and those who initiated use much earlier. Among all ever users, the pill is by far the method of choice at first use, being reported by two-fifths of the women. Rhythm and injections were next, being reported by 23 and 18 percent of the women, respectively. Only 7 percent of the women reported condoms as their first contraceptive method. Pills remain the method of choice at first use among recent and past initiators. However, recent and past initiators differ substantially on the propensity to which they adopted the other methods at first use. While use of injections has been increasing in Kenya, recent initiators are 63 percent less likely to adopt this method at first use compared to past initiators. However, recent initiators are substantially more likely than past initiators to adopt condoms at first use. They are also more likely to adopt rhythm at first use compared to past initiators. Sterilization and IUDs were substantially more popular among past initiators than among the recent initiators probably because many pioneers of contraceptive use in Kenya started using after attaining their desired family sizes. There are no substantial differences between recent and past initiators on the choice of withdrawal, other traditional, and other modern methods and these methods, combined, account for less than 5 percent of all first methods. The increasing departure from long-term and permanent methods at first use is consistent with the earlier observation of increasing initiation of use at lower parities and principally for spacing purposes.

Table 4.4 Percent distribution of first method choice, past, and recent initiators, among ever-users, KDHS 1998.

Type of Method	First Method Choice		
	All Ever Users	Past Initiators	Recent Initiators
Pill	39.4	38.8	41.8
IUD	5.9	6.4	5.2
Injections	17.6	20.6	12.9
Condoms	6.8	5.3	9.0
Sterilization	3.6	5.6	0.1
Other Modern	0.9	0.8	1.2
Rhythm	22.7	19.5	26.5
Withdrawal	1.1	1.0	1.5
Other Traditional	1.9	1.8	2.0
No. of cases	**4035**	**2642**	**1353**

Although recent initiators are 3.2 and 4.6 times as likely to choose the pill at first use as they are to choose injections and condoms, respectively, results from the 1999 Kenya Service Provision Assessment (NCPD, MOH, and ORC Macro 2000) study show that injections and condoms are the most widely available methods in health facilities offering family planning services in Kenya followed by the pill. To the extent that preference for the pill at first use indicates the preferred method choice of never-users, and to the extent that service providers will promote the most available methods to their clients, the current method mix in health facilities

providing family planning services may be optimal for meeting the needs of users but inadequate for meeting the needs of the core group of never-users.

4.3.4 First Method Choice by Background Characteristics

Understanding which women choose which methods at first use will be useful in market segmentation of family planning programs aimed at reaching different groups of never users. Table 4.5 looks at the background characteristics of women choosing different method groups at first use. Long-term methods include IUD and Norplant, while short-term methods include condoms, pills, injections, and vaginal methods (diaphragm, foam, and jelly). Traditional methods comprise withdrawal, periodic abstinence, and other traditional or folkloric methods. Because choice of condoms may be influenced by reasons other than contraceptive, we also show, in the last column, the background characteristics of women adopting condoms at first use.[4] For each row, the percentages for sterilization, long-term, short-term, and traditional methods sum up to 100 percent.[5]

Table 4.5: First Method Choice: Percentage of women choosing use of method type at first use by background characteristics, KDHS 1998.

	Sterilization	Long-Term	Short-Term	Traditional	Number of Cases	Condom
Children at first use						
0 children	0.0	1.6	44.5	53.9	873	52.7
1 children	0.2	8.5	71.1	20.2	1214	22.1
2 children	0.5	5.9	75.8	17.8	644	12.6
3-4 children	4.7	10.2	74.1	11.0	682	3.8
5+ children	18.0	7.3	66.1	8.6	602	6.8
Mean children at 1st use	5.0	2.6	2.3	1.1	4015	1.1
Age at first use						
< 20 years	0.2	6.4	82.8	10.5	652	47.0
20 – 24 years	1.3	7.5	77.7	13.5	1239	35.5
25 – 29 years	4.7	9.7	65.0	20.6	786	9.8
30+ years	19.7	9.2	51.9	19.1	476	7.7
Mean Age	31.9	24.6	23.0	25.4	3153	20.7
Current Marital status						
Never Married	0.4	2.7	57.1	39.8	558	35.4
Currently married	4.3	7.3	66.3	22.1	3090	57.4
Formerly Married	3.1	7.2	74.9	14.7	387	7.2
Ideal family size						
0-3 children	2.5	7.9	67.0	22.6	1750	58.6
4 children	3.8	5.9	64.7	25.5	1435	31.4
5+ children	6.5	27.8	41.3	24.4	710	7.8
Non numeric	2.1	4.0	70.7	19.3	140	2.2
Mean Ideal Family Size	4.6	3.4	3.6	3.7	4035	3.2
Desire for children						
Ifs>parity at 1st use	0.7	5.6	64.2	29.5	2876	86.2
Ifs=parity at 1st use	9.4	10.2	72.7	7.7	469	5.6
Ifs<parity at 1st use	14.5	9.2	66.9	9.2	544	8.2

[4] The column for condoms sums up to 100 percent for each background variable.
[5] For women adopting sterilization at first use, information was available on age at sterilization and this was used in calculating the proportions sterilized by age at first use and mean age at sterilization

	Sterilization	Long-Term	Short-Term	Traditional	Number of Cases	Condom
No of cases					**3889**	**269**
Education						
None	8.2	3.2	66.8	21.9	370	4.8
Primary Incomplete	3.9	4.1	66.8	25.2	1136	27.2
Primary complete	4.1	4.3	68.7	22.8	1042	20.7
Secondary+	2.0	11.1	62.9	24.0	1487	47.2
No. of cases					**4035**	**274**
Residence						
Urban	2.3	9.7	68.5	19.4	1116	33.8
Rural	4.1	5.5	64.9	25.5	2916	66.2
No. of cases					**4032**	**274**
Religion						
Catholic	4.0	4.5	63.8	27.7	1170	28.5
Protestant	3.6	7.5	66.1	22.8	2608	67.3
Muslim	1.1	9.6	78.7	10.6	188	2.4
No Religion/Other	3.1	4.7	57.8	34.4	64	1.8
No. of cases					**4030**	**274**
Ethnicity						
Kalenjin	3.4	3.7	56.9	36.0	383	8.5
Kamba	3.2	3.6	47.8	45.5	563	13.4
Kikuyu	2.9	10.6	69.9	16.6	935	15.6
Kisii	6.7	3.4	74.9	15.0	446	8.7
Luhya	3.5	6.6	68.6	21.4	579	13.4
Luo	5.1	6.9	65.7	22.4	434	14.1
Meru/Embu	1.7	8.9	74.9	14.6	350	14.8
Mijikenda/Swahili	2.6	1.8	91.2	4.4	114	1.9
Others	3.5	7.5	59.3	29.6	226	9.7
					4030	**274**
Region						
Nairobi	2.2	11.4	63.3	23.1	502	18.1
Central	2.7	9.6	72.1	15.6	552	5.9
Coast	4.1	5.4	83.8	6.8	222	5.5
Eastern	2.6	5.4	57.0	34.9	810	24.6
Nyanza	7.0	4.2	71.4	17.5	733	17.2
Rift Valley	3.0	6.2	62.6	28.2	792	16.7
Western	3.8	5.4	64.7	26.1	425	11.9
Total	**3.6**	**6.7**	**64.0**	**25.7**	**4035**	**274**

Almost two-thirds of women who have ever used a contraceptive chose a short-term method at first use and another quarter adopted traditional methods at first use. Sterilization and long-term methods account for only 4 and 7 percent of first method choice respectively. Choice of sterilization as first contraceptive method increases with parity and age at first use. While less than one percent of women under age 20 or with fewer than three children at first use chose sterilization at first use, 20 percent of those aged 30 or older and 18 percent of those with five or more children adopted sterilization at first use. Choice of sterilization at first use is also high among women who have reached or exceeded their desired family size, those with no formal education, and those in Nyanza province, especially among Kisii women. Women who adopted sterilization at first use have, on average, 2.3, 2.7, and 3.9 children more than those who adopted

long-term, short-term, and traditional methods at first use, respectively. They are also seven to nine years older than those who adopted other methods at first use[6].

The profile of women adopting long-term methods at first use is similar to those of women who adopted sterilization at first use, especially with respect to their fertility intentions and stage in their reproductive cycle. High parity, older, ever married women, those with high desired family size, and those who have reached or exceeded their desired family size at first use are more likely to adopt long-term methods at first use. Contrary to non-educated women who are more likely to adopt sterilization at first use, women with secondary or higher education are more likely to choose long-term methods at first use. Also, Moslem women, Kikuyu women, and women in Central and Nairobi provinces show greater inclination to adopting long-term methods at first use.

As noted earlier, most Kenyan women choose short-term methods at first use. About three quarters of mothers with between 1 and 4 living children at first use chose a short-term method compared to only 45 and 66 percent of those with no living child and those with five or more children, respectively. As high as 83 percent of women under age 20 and 78 percent of those aged 20-24 at first use relied on short term methods compared to only 52 percent of those aged 30 or older. Formerly married women, Moslem women, and women in Coast province (especially the Mijikenda/Swahili ethnic group) are more likely to adopt short-term methods at first use. For instance, while less than half of Kamba women relied on short-term methods at first use, more than 91 percent of Mijikenda/Swahili women adopted short-term methods at first use.

Choice of traditional methods at first use declines substantially with increasing parity at first use but increases with age at first use. Never married women, those who have not reached their desired family size, Catholics and women with no religious belief or traditional religious affiliation are more likely to rely on traditional methods at first use. There are also substantial ethnic differences in choice of traditional methods for first use; while less than 5 percent of Mijikenda/Swahili women adopted traditional methods at first use, 36 and 46 percent of Kalenjin and Kamba women, respectively, relied on these methods.

More than half of the women relying on condoms at first use have no living children at first use and 47 percent were under age 20 at first use. The majority of women (59%) reporting choice of condoms at first use desire very few (0-3) children and have not attained their desired family size (86%). Almost half have secondary or higher education and two-thirds live in rural areas. These patterns suggest that condom promotion in the HIV/AIDS fight may be reaching or having more impact on educated, younger, and unmarried women. The regional and ethnic variations in first method choice appear to be related to the service environment and method mix available in each province. As the results in Table 4.5 show, Nyanza women are most likely to adopt sterilization at first use, while women in Nairobi and Eastern provinces are least likely to adopt this method at first use. Interestingly, the 2000 KSPA report shows that 20 and 7 percent

[6] The differences in age between sterilized women and those who adopted other methods at first use may be exaggerated. While age at sterilization is more precise, age at initiation of use for other methods was derived from the woman's age at the birth of the child corresponding to her parity at first use. For some women, the gap between their age at first use and age at the birth of the child corresponding to her parity at first use can be quite large.

of facilities offering family planning services in Nyanza offered female and male sterilization respectively, while only 6 and 2 percent of those in Eastern Province offered these services. In addition, results in Table 4.5 show that long-term methods are more commonly adopted at first use in Nairobi and Central provinces, but least adopted in Nyanza and Coast provinces. The KSPA reports also shows that, while IUCD are available in 60 and 77 percent of the facilities providing family planning services in Central and Nairobi provinces, respectively, only 33 and 35 percent of the facilities offering family planning services in Coast and Nyanza provinces had IUDs available during the 2000 KSPA survey. Finally, while 90-100 percent of the facilities in Coast, Central, and Nyanza provinces had pills, injections, and condoms available during the KSPA survey, only 78-82 percent of the health facilities offering family planning services in Rift Valley Province had these methods available (NCPD, MOH, and ORC Macro 2000).

With the exception of these regional and ethnic differences, results from looking at women's fertility intentions and reproductive life stage generally suggest that when Kenyan women make the transition to use of contraception, they adopt methods best suited for their needs. Older and high parity women and women who have exceeded their ideal family size generally rely more on sterilization and long-term methods at first use, while younger, low parity, and women who have not reached their ideal family size tend to rely more on traditional or short-term methods. The same is true for never married women. Variations in first method choice by region of residence and ethnicity, however, raise questions regarding the role of differential availability of methods in different regions on first method choice.

Table 4.6 Predicted Probability of First Method Choice by Background Characteristics, fertility intentions and Reproductive Cycle Stage: KDHS 1998

	Model 1			Model 2		
	Sterilization/ Long-term	Traditional Methods	Short-term method	Sterilization/ Long-term	Traditional Methods	Short-term method
Parity at Initialization						
0	0.02**	0.56***	0.42	0.01**	0.64***	0.35
1(ref)	0.08	0.20	0.71	0.04	0.25	0.71
2	.055*	0.18***	0.77	0.03	0.17**	0.80
3-4	0.11	0.11***	0.78	0.08**	0.11***	0.82
5+	0.18***	0.08***	0.74	0.18***	0.06***	0.76
Current age						
< 25 yrs (ref)	0.03	0.25	0.72	0.01	0.22	0.77
25 – 34 yrs	0.07***	0.21	0.72	0.05***	0.21	0.74
35+ yrs	0.15***	0.18	0.67	0.09***	0.19	0.72
Marital status						
Never married	0.07	0.16***	0.77	0.04	0.18	0.76
Married (ref)	0.08	0.23	0.70	0.04	0.23	0.73
Formerly married	0.06	0.16**	0.78	0.03	0.14***	0.83
Desire for children						
Parity < ifs	0.06	0.29***	0.65	0.03*	0.28**	0.69
Parity = ifs	0.09	0.15**	0.77	0.04	0.14*	0.82
Parity > ifs(ref)	0.08	0.20	0.72	0.05	0.20	0.75
Education level						
No education				0.03	0.31**	0.66
Prim. incomplete(ref)				0.04	0.21	0.75
Prim. complete				0.04**	0.20	0.76
Secondary+				0.07	0.17*	0.77
Place of Residence						
Urban				0.06	0.12***	0.83
Rural(ref)				0.04	0.25	0.72
Religion						
Catholic				0.03	0.21**	0.76
Protestant(ref)				0.05	0.16	0.79
Muslim/other				0.04	0.22	0.74
Ethnicity						
Kalenjin				0.03*	0.39***	0.58
Kamba				0.02*	0.49***	0.49
Kikuyu(ref)				0.07	0.13	0.80
Kisii				0.04**	0.10	0.86
Luhya				0.03***	0.24***	0.73
Luo				0.03***	0.26***	0.71
Meru/Embu				0.05	0.10	0.84
Mijikenda/Swahili				0.02**	0.03**	0.95
Other				0.05	0.26***	0.69

* Significant at p<0.05 ** Significant at p<0.01 *** Significant at p<0.001

4.4.3 Determinants of First Method Choice

Using multinomial logistic models, table 4.6 further explores the determinants of first method choice . The estimated coefficients are in Appendix VI while the predicted probabilities are reported in Table 4.6.

Since the profile of women adopting sterilization and long-term methods at first use are similar, we combined sterilization with long-term methods for the multivariate analysis.[7] As we noted above, the individual characteristics examined in Table 4.5 suggest that Kenyan women generally adopt methods best suited to their needs at first use. Model 1 of Table 4.6 examines factors that define a woman's stage in her reproductive cycle while model two includes her individual and social group characteristics. If the hypothesis that Kenyan women adopt methods that are most suitable for their contraceptive needs is correct, then we would expect that the factors associated with their life-cycle stage in model 1 will remain strong and largely unaffected by the other characteristics.

Results in model 1 show that women are generally more likely to adopt short-term methods at first use than traditional or long-term/sterilization methods. The results are also consistent with the bivariate results in Table 4.5. The adoption of sterilization/long-term methods at first use increases with parity and age, but has very little association with marital status and fertility intentions. Choice of traditional methods at first use decreases with parity and age, and women who have not reached their ideal family size are more likely to adopt traditional methods at first use than others who have either exceeded or are at their ideal family size. Women at parity zero are more likely to adopt traditional methods at first use than any other method. Compared to women whose ideal family size equals their family size at first use, those who have not reached their ideal family size at initiation of use are about two times as likely to adopt traditional methods at first use. Currently married women are also more likely than never and formerly married women to adopt traditional methods. The probability of adopting short-term methods at first use increases with parity at first use but drops off at the highest parities as women at such parities increase their adoption of long-term and permanent methods.

The patterns observed in model 1 remain essentially similar to those in model 2 suggesting that women's stage in their reproductive cycle maintain a strong effect on their contraceptive choice. In particular, individual socio-economic characteristics such as religion and education are largely unimportant in first method choice while factors that relate to the service environment or availability or accessibility of methods such as rural-urban residence and ethnicity/region of residence are significantly related to first method choice. Ethnic groups from Western Kenya (Kisii, Luhya and Luo) are significantly more likely to adopt sterilization at first use than those from Central Province (Kikuyu), and, in this region, Engenderhealth (formerly AVSC) has had a large sterilization program based at Kisii district hospital.

4.3.5 Switching Behavior from First Method

[7] Due to the small number of women adopting sterilization at first use, retaining sterilization as a separate category causes the parameter estimates to be unstable.

Table 4.7a shows switching behavior from first method choice by comparing first method choice among all ever-users to the current method being used at the time of the survey. This switching behavior does not capture all episodes of switching but simply compares first method used by current method being used. In particular, this analysis is important in documenting whether first use of less effective methods is a step towards later use of more effective methods. Overall, between 23 and 52 percent of the women still rely on the same method they first used. Pills and condoms have the lowest reliance rates at about 23 percent each, while injections have high "continuation" rates at 43 percent. About a third of the women who reported use of IUD or rhythm methods at first use still use these methods. Women who reported use of long-term methods such as IUD are more likely to be current users of any method, while those who reported use of short-term and traditional methods are less likely to be using any method. About half of the women who reported condoms and rhythm as their first method are currently not using any method. These women are also 3.5 times as likely to be currently pregnant as those who chose IUD as their first method. Women who choose traditional methods and condoms tend to be at lower parity and therefore may be more likely to have discontinued use in order to get pregnant. However, it is also plausible that women who initiate use by adopting rhythm method or condoms (especially when it is not used consistently) will be more likely to experience a method failure.[8] The relatively high level of use of traditional methods and condoms at first use among zero parity women raises important program questions, especially if condoms, which may also be used for protection against STIs and HIV/AIDS, are not used consistently at every sexual act.

Table 4.7a: Method switching from first method choice: Percent distribution of first method choice by current contraceptive status and method use among all ever users, KDHS, 1998

	Current method										
First method used	Not using (Not Pregnant)	Not using (Pregnant)	Pill	IUD	Injec-tions	Condom	Steriliz-ation	Rhythm	Other	Total	No. of cases
Pill	35.0	7.2	**23.6**	3.2	18.3	1.4	6.7	3.0	1.5	100	1589
IUD	24.9	3.4	8.9	**31.6**	12.2	2.1	10.5	4.6	1.7	100	237
Injections	35.5	5.4	7.1	1.3	**42.7**	1.4	3.7	2.1	0.8	100	709
Condoms	43.3	11.2	5.8	1.4	6.5	**23.1**	2.5	3.2	2.9	100	277
Sterilization	0.0	0.0	0.0	0.0	0.0	0.0	**100.0**	0.0	0.0	100	147
Rhythm	37.1	11.5	4.6	0.9	5.1	1.9	2.3	**35.3**	1.4	100	917
Other	32.5	5.7	3.2	0.0	3.2	0.0	0.0	3.8	**51.6**	100	157
Total	**1378**	**305**	**509**	**147**	**693**	**119**	**333**	**413**	**136**	**100**	**4033**

[8] In the 1998 KDHS about 42 percent of the five-year discontinuation rate for rhythm method was due to method failure. Although condoms had the highest discontinuation rates, infrequent sex, husband disapproval, and access/cost were more important reasons. Desire to get pregnant and method failure, however, account for almost 20 percent of condom discontinuation rates (NCPD, CBS and MI 1999). More detailed analysis of these issues is presented in Chapter 6.

Table 4.7b Method switching from first method choice: Percent distribution of first method choice by current contraceptive status and method use among all recent initiators, KDHS, 1998

	Current method										
First method used	Not using (Not Pregnant)	Not using (Pregnant)	Pill	IUD	Injec-tions	Condom	Steriliz-ation	Rhythm	Other	Total	No. of cases
Pill	31.2	9.9	**29.3**	2.7	20.6	0.7	2.0	2.3	1.4	100	564
IUD	14.5	4.3	15.9	**33.3**	15.9	1.4	5.8	5.8	2.9	100	69
Injections	28.5	5.2	9.9	1.7	**51.7**	1.7	0.0	1.2	0.0	100	172
Condoms	41.3	10.7	2.5	1.7	5.8	**29.8**	3.3	2.5	2.5	100	121
Sterilization	0.0	0.0	0.0	0.0	0.0	0.0	**100.0**	0.0	0.0	100	1
Rhythm	36.2	15.0	5.3	0.3	4.2	1.4	0.6	**35.1**	1.9	100	359
Other	22.6	9.7	6.5	0.0	3.2	0.0	0.0	1.8	**53.2**	100	62
Total	**429**	**141**	**219**	**44**	**240**	**49**	**22**	**151**	**53**	**100**	**1348**

Among women who chose pills at first use, 18 percent switched to current use of injections and another 7 percent got sterilized. Only 7 percent of the women who started with injections switched to the pill. As noted earlier, IUD retains high continuation rate with a little under a third reporting use of the same method and 12, 11, and 9 percent switching to injections, sterilization, and pills, respectively. Women who initiated contraceptive use by using rhythm and other traditional methods are highly unlikely to switch to use of modern methods. Among women who started on the rhythm method, less than 15 percent switched to a modern method. The pattern is worse for women who started on other traditional methods with less than 10 percent switching to any modern method. The results in Table 4.7b, which are restricted to only recent initiators, give the same patterns.

4.4 Conclusions and Policy/Program Implications

This chapter has explored the timing of first method use in Kenya and the methods Kenyan women choose at first use. Due to lack of data, we have not been able to explore the circumstances of first method choice, reasons for choice of specific methods at first use, etc. However, using the available data, the chapter focused on when in their reproductive cycle Kenyan women make the transition to start using contraception, the profile of women making the transition to first use at lower versus higher parities and how these differ from the profile of sexually active never users, the methods women choose at first use, and factors influencing their first method choice.

The results show that Kenyan women are increasingly initiating use of contraception at lower parities. While use for spacing purposes accounts for most of the contraceptive initiation at lower parities, use for limiting purposes is increasingly becoming very important. Between 1988 and 1998, the proportion of ever-married women who desire no additional children and who adopted use of contraception at parities 1 and 2 increased by almost two and half times. Analysis of the correlates of timing of first use shows that women who desire fewer children are more likely to initiate use of contraception and to do so at lower parities than those who desire

more children, probably because they are able to quickly satisfy their small family size desires. Women who initiate use before their first child or after having only one child desire about one and half children less than those who initiated use after having five or more children. The presence of a CBD agent in a community increases overall initiation of use, but is associated with delays in initiating use until a woman has had at least one living child. This is consistent with other observations in Kenya that show general reluctance of CBD agents to provide services to adolescent girls who have not yet had a child.

The pill is by far the preferred method of choice at first use. Despite overwhelming preference for the pill and short-term methods in general, Kenyan women tend to adopt methods that best suit their needs at first use. Younger, unmarried, low parity women who have not reached their desired family size adopt short-term or traditional methods while older, married, higher parity women who have reached or exceeded their desired family size tend to rely more on long-term or permanent methods at first use. These measures of a woman's reproductive stage maintain significant effects on first method choice even after controlling for individual socio-economic and socio-cultural factors. Strong ethnic and rural/urban differences in first method choice may reflect unobserved service factors, particularly the differential availability of family planning services and method mix in different provinces of Kenya. However, to fully understand why women choose specific methods at first use, we need more detailed information on the circumstances of first use and reasons for first method choice. Such data may be best obtained through in-depth interviews with new initiators. Results on switching behavior from the first method show that women who adopt traditional methods at first use are least likely to switch to a modern method, while those who adopt long-term methods at first use are more likely to continue using any method and to switch to other modern methods.

There are a number of program implications from these results. Given the strong role women's fertility intentions and stage in the reproductive cycle play on first method choice, there is a need to ensure that programs aimed at encouraging use among the core of non-users be broad enough to include methods that will meet the needs of different women. It is evident that while short-term methods like pills, injections, and condoms may meet the needs of current users, they are likely to be ineffective in attracting never-users who are older and at higher parities. For these women, their preferences are for long-term and permanent methods. To underscore the importance of this point, the results show that the majority of women do not always continue with their first method choice, even among those who started using contraception for the first time within the five-year period preceding the 1998 KDHS survey. Therefore, making available the methods that will attract women to make the transition is crucial to reaching the core of never users. In this regard, the current trend in Kenya toward greater use and availability of injections may limit the proportion of women making the transition to first use, especially if the increasingly availability of injections is at the expense of pills.

The results presented here suggest that women who initiate use by adopting traditional methods may be substantially different from those who adopt modern methods at first use. Not only are women choosing traditional methods at first use more likely to discontinue use, they are also least likely to switch to any modern method. The increasing reliance on rhythm method at first use therefore raises concerns regarding how well the contraceptive needs of women choosing this method at first use are being met. In particular, further research is needed on why

some women, especially never married women and those with no living children are relying more of this method at first use. With more than half of the women at parity zero relying on traditional methods at first use, there is the need to examine further whether there are obstacles to women with no living children accessing modern contraceptives. While it is true that most young women are not married and so may prefer coitus-dependent methods, their preference for traditional methods over condoms and other coitus-dependent modern methods underscores this problem. The data suggest that this is likely to be the case in communities served by CBD agents where the presence of an agent increases overall adoption of contraceptive use but only after a woman has had more than one surviving child. Other questions deserving further attention include whether women at parity zero are more concerned about the potential for side effects of modern methods affecting their unproven future fertility. Are such women less motivated to avoid pregnancy and therefore more willing to risk a contraceptive failure? These questions are beyond the scope of the present study but they have strong relevance to family planning programs.

Perhaps the most important program-relevant implication from this analysis of first use of contraception in Kenya is the strong regional variations in first method choice and the close association between this finding and the availability (or lack) of specific methods in some regions. Overall, results on first method choice by region of residence match the profile of availability of specific methods in health facilities providing family planning services in each region. Given this close association, regional variations in overall contraceptive prevalence and in the initiation of use may be due to regional variations in the availability of methods in family planning clinics. Improving availability of services, especially of pills which is the preferred method at first use, in areas with low prevalence rates may hold the key to improving overall use of contraception in these areas as this would more likely reach the core of never users who constitute the bulk of non-users.

CHAPTER 5

CONTRACEPTIVE METHOD CHOICE IN KENYA: TRENDS AND DETERMINANTS

5.1 Introduction

Contraceptive choice is a central element of quality of care in the provision of family planning services and an important dimension of women's reproductive rights (Diaz et al. 1999). It is recommended that family planning programs offer a variety of safe, effective, acceptable and affordable contraceptive methods to help women prevent unwanted pregnancies and STDs and to help them achieve their childbearing goals. Secondly, method-mix is a key determinant of the fertility impact of contraceptive practices, since the use of more effective methods even by a smaller proportion of eligible couples is likely to produce a greater decline in fertility than use of less effective methods by a larger proportion of couples (Shah 1991). Hence, proper understanding of key factors in contraceptive method choice is not only important for improvements in quality of care and program planning and management (e.g. logistics, training needs, financial planning) to enable women to meet their reproductive goals, but also to enable the country to realize its desired fertility impact of contraceptive practices.

Existing literature has suggested a general expected trend in contraceptive method choice from less effective to more effective methods (see Robey 1988). However, evidence from some studies (e.g. Matteson and Hawkins 1997) do not support this expected trend. It would be important to understand what the trend in Kenya is and what implications this has on the fertility impact of contraceptive practice in the country as well as sustainability of the Kenyan family planning program. Furthermore, analysis of the trends in profile of use of specific methods can provide insights on future contraceptive needs in the country (see Johnson and Macke 1996). Such information will help family planning programs operate optimally by enabling them to procure and distribute adequate quantities of desired and appropriate methods to meet the increasing demand of specific contraceptive methods.

Studies on contraceptive method choice in countries of sub-Saharan Africa are few, probably due to the generally low contraceptive prevalence. However, as family planning programs become more and more established and contraceptive prevalence increases to considerable levels in specific countries such as Kenya, issues of contraceptive dynamics, including method choice, become increasingly important.

The overall aim of the analysis presented in this chapter is to understand factors that influence contraceptive method choice in Kenya. Specifically, the chapter

- examines trends in the profile of users of specific methods over time;
- identifies the socio-demographic and community factors influencing contraceptive method choice in Kenya, and establishes whether patterns of method mix suggest that family planning users are choosing types of methods that are most suitable for them.

5.2 Data and Methods

5.2.1 Data

The analysis of the trends in contraceptive method choice, the profile of users, and determinants of method choice is based on the three sets of KDHS data collected in 1989, 1993 and 1998. A total of 22,571 women aged 15-49 were interviewed in the three KDHS surveys. This analysis is based on women who were using a contraceptive method at the time of the survey.

Information obtained in the individual women's questionnaire is used to provide data on the socio-economic, cultural and demographic characteristics of users of different contraceptive methods. Special emphasis is placed on the variables that have more program relevance, including the community-level factors, which may influence the choice of specific contraceptive methods. In addition, the KDHS data provide information for constructing contextual community factors (e.g. percent of women reached by information campaigns through mass media such as radio, etc.) that are also included in the analysis.

5.2.2 Analytical Methods.

The examination of trends in the profile of users of different contraceptive methods is based on simple bivariate analysis, while the analysis of the determinants of method choice is based on multilevel multinomial models. The analysis of contraceptive method choice is based on current users of contraceptive methods, and is carried out in two stages. In the first case, the response variable, method type, is classified into four categories: short-term modern[9], long-term modern,[10] terminal, and traditional. The second stage focuses on users of specific modern methods, where the response variable is classified into five distinct categories: pill, injectable, IUD/implants, sterilization, and barrier methods (comprising mainly male condoms).

The multilevel modeling technique is employed to deal with the hierarchical data structure. Contraceptive method choice among women of specific communities is likely to be correlated due to factors relating to availability of specific methods at the existing facilities, or

[9] Short-term modern methods comprise injectables, pills and barrier methods (including male and female condoms, diaphragm, cervical cap, spermicide and sponge).
[10] Long-term modern methods include intra-uterine device (IUD) and hormonal implants.

communities' perceptions on specific methods. The analysis is based on two-level models that take into account the woman-level and the community-level effects.

Model specification

The general form for the two-level multilevel multinomial model may be expressed as:

$$\log\left(\frac{\pi_{(s)ij}}{\pi_{(1)ij}}\right) = X'_{(s)ij}\beta_{(s)} + u_{(s)j}, \quad s = 2,3,\ldots,k \quad [1]$$

Where:

π_j is the probability of an individual woman i in community j choosing a particular contraceptive method.

X'_{ij} is a vector of observed (fixed) covariates which may be defined at woman level or community level;

β is associated vector of fixed parameter estimates;

$u_{(s)j}$ is a vector of community level random effects, $u_{(s)j} \sim N(0, \sigma^2_{(s)u})$.

There are k response categories and one of the categories (e.g. the first category) is taken as the reference category. The subscript (s) represents the other categories of contraceptive method choice.

A consideration in the use of multinomial model for the analysis of contraceptive choice is whether "no method" should be treated as one of the choices. In this particular analysis, focus is on current users only since the "no method" category is dealt with in a separate analysis of non-use. Another difficult question is whether it is appropriate to consider couples who chose sterilization in the past as still having a choice about current use (Choe 1989). Given the uniqueness of this category, it is treated as a distinct category in the analysis, even though it comprises a relatively small proportion of cases.

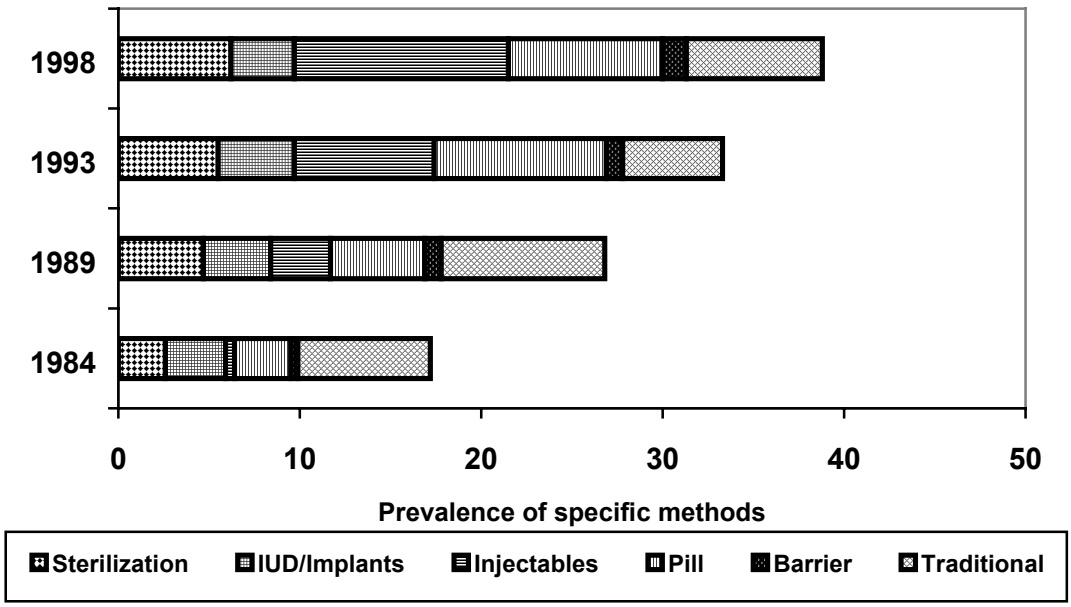
Another concern in the analysis of the determinants of contraceptive method choice relates to the cause and effect issue. Choe (1989) notes that some of the independent variables may both influence the contraceptive method chosen and be affected by the method itself. For example, the number of children a couple has may affect the use and choice of contraceptives, and the use of contraception also affects the number of children by preventing unwanted pregnancies. However, we note that the current number of children is influenced by past contraceptive practice and not so much by current use which influences future children.

5.3 Trends in Contraceptive Method Choice in Kenya

5.3.1 Trends in Method Choice

Figure 5.1 gives the background trends in contraceptive method choice among currently married women in Kenya. The proportion of women using sterilization has more than doubled since 1984, but the rate of increase has slowed down in the 1990s compared to the 1980s. The use of long-term methods (IUD and implants) rose steadily up to 1993, but declined in 1998. The same pattern is shown by pill use, which had increased sharply from 3 percent in 1984 to almost 10 percent in 1993, but dropped slightly in 1998. Injectables have recorded the most dramatic and consistent increase over the years, from less then 1 percent in 1984 to 12 percent in 1998. The use of barrier methods has shown a general increase over the years; but the levels are still relatively low, with just about 1 percent of married women reporting use of these methods. The trend in the use of traditional methods has not been consistent over the years, showing the highest level of 9 percent in 1989, and the lowest level of 6 percent in 1993.

Figure 5.1
Background Trends in Contraceptive Method Choice (Current Use) among Married Women Aged 15-49 years in Kenya (1984-98)
What are the general trends in the choice of specific contraceptive methods?



5.3.2 Trends in Profile of Users of Different Types of Methods

It is important for family planning programs to understand who the users of specific methods are, where they are, and whether these profiles are changing over time to enable them identify appropriate targets for their programs. The socio-demographic profiles of users of different types of methods are presented in Tables 5.1a, b, and c, and the corresponding profile of all users is given in Appendix VII for comparison.

The vast majority of injectable users (84% in 1989 and 1993) were living in the rural areas, but there was a notable increase in the proportion of users in urban areas to about one-quarter in 1998. Rift Valley has the highest proportion of injectable users, constituting 22-31 percent of the users. However, while the proportion of users from Rift Valley declined in the 1990s, the proportion of users from Nyanza increased steadily from 12% in 1989 to 18% in 1998. The age profile of injectable users show that the method is getting more popular among adolescents. Adolescents aged 15-24 constituted only 10 percent of injectable users in 1989, but this proportion more than doubled in 1998 to 22 percent. On the contrary, the proportion of injectable users who are never married has remained low at no more than 10 percent (even though adolescents are more likely to be single), and married women have continued to comprise the vast majority of users (80-83%). Notable shifts are observed among injectable users with respect to number of living children and educational attainment. The users are becoming more educated and having fewer children, in consistence with the overall trends in the Kenyan population.

About one-third of pill users live in urban areas, and Central and Eastern provinces constitute a considerable proportion of pill users (43-52%). The age profile of pill users has not changed much across years, with women aged 25-34 constituting about half of the users, while adolescents aged 15-24 comprise about one-third of the users. As in the case of injectables, pill users are becoming more educated and having fewer children. In 1998, half of pill users had 1-2 children and more that 40 percent had attained at least secondary level education. The ideal family size among pill users has also drastically declined. The proportion of users desiring no more than 3 children increased from 37 percent in 1989 to 62 percent in 1998, while the proportion desiring 5 children or more declined from 22 percent to 9 percent during the same period.

More or less similar trends are observed in the profile of users of barrier methods as with the other methods, with respect to ideal family size, reflecting the general declining trend in ideal fertility in Kenya. The proportion of users of barrier methods living in urban areas steadily increased to almost 40 percent in 1998. While the proportion of users of barrier methods from Nairobi and Eastern provinces steadily increased during the 1989-98 period, there was a sharp decline in the proportion of users of barrier methods from Central Province over the same period. Adolescents comprise a considerable and increasing proportion of users of barrier methods (30-45%). Consistent with this pattern is the considerable increase in the proportion of users of barrier methods who are single or have no living children. The observed pattern of use of barrier methods by demographic characteristics most likely reflects an increase in condom use by young unmarried women over the recent years, mainly for protection against sexually transmitted

infections. About half of users of barrier methods have at least secondary level education, but there is no indication that the users are becoming more educated over time.

Table 5.1b presents the profile of users of permanent and long-term methods. The data show that about three-quarters of women who had a tubal ligation in 1998 and more than 80

Table 5.1a: Trends in Socio-demographic profile of users of short-term modern methods (injectable, pill, barrier methods)

What is the profile of users of short-term modern methods, according to socio-demographic factors, and has this changed over time?

Socio-demographic Characteristic	Percent of users using								
	Injectable			Pill			Barrier methods		
	1989	1993	1998	1989	1993	1998	1989	1993	1998
Residence									
Urban	16.1	15.8	26.2	32.3	29.0	33.7	24.1	32.4	38.0
Rural	83.9	84.2	73.8	67.7	71.0	66.3	75.9	67.6	62.0
Region									
Nairobi	5.2	5.5	9.1	16.5	14.4	18.4	13.2	15.1	23.0
Central	18.8	16.3	19.1	23.2	29.4	20.0	20.8	21.9	9.0
Coast	9.4	6.0	6.3	8.8	7.5	4.7	3.8	9.6	4.1
Eastern	16.1	14.9	16.7	19.8	23.0	24.5	15.1	17.8	23.8
Nyanza	12.0	16.1	18.4	7.6	7.0	10.2	7.5	6.8	11.5
Rift Valley	31.3	22.3	23.1	14.0	9.8	15.1	28.3	15.1	21.3
Western	7.3	18.9	7.3	10.1	8.9	7.2	11.3	13.7	7.4
Age group									
15-24	10.4	15.3	22.3	32.3	32.7	30.2	29.6	41.9	44.6
25-34	52.6	54.4	47.2	50.0	53.0	49.8	37.0	37.8	33.9
35 +	37.0	30.2	30.5	17.7	14.2	22.0	33.3	20.3	22.3
Marital Status									
Never married	10.4	10.3	8.6	16.2	13.5	14.9	13.0	33.8	33.9
Currently married	82.8	79.7	82.3	75.5	77.9	80.8	81.5	56.8	55.4
Previously married	6.8	10.0	9.1	8.3	8.5	4.3	5.6	9.5	10.7
No. of living children									
0	1.0	1.2	1.4	2.7	4.1	8.0	3.7	32.9	35.5
1-2	15.6	20.4	36.1	36.0	46.1	50.2	31.5	30.1	37.2
3-4	32.3	33.3	34.1	35.7	29.9	27.5	18.5	19.2	13.2
5 +	51.0	45.1	28.3	25.6	19.9	14.3	46.3	17.8	14.0
Education level									
None	18.8	16.2	7.9	13.1	7.5	4.1	9.4	5.5	3.3
Primary incomplete	38.2	30.1	19.7	24.1	19.6	16.3	17.0	16.4	17.4
Primary complete	28.3	27.9	36.4	29.6	32.1	37.3	20.8	26.0	33.9
Secondary +	14.7	25.8	36.0	33.2	40.8	42.4	52.8	52.1	45.5
Ideal family size									
3 or less	21.4	48.7	44.5	36.8	63.2	61.9	35.2	62.2	59.5
4	41.1	35.6	37.3	39.5	26.9	26.5	42.6	24.3	25.6
5 +	29.7	15.3	16.4	21.9	8.2	9.0	22.2	10.8	14.0
Non-numeric	7.8	0.5	1.9	1.8	1.8	2.6	0.0	2.7	0.8
Total percent	100	100	100	100	100	100	100	100	100
No. of cases	192	417	695	328	562	510	54	74	121

Base population: Current users of short-term modern contraceptive method in 1989, 1993 and 1998.

percent in 1989 and 1993 were living in rural areas. The Rift Valley and Central provinces had the highest number of women sterilized in 1989, each making up more than 20 percent of women sterilized. However, these proportions steadily declined over the years. In 1998, Nyanza had the highest number of sterilized women (constituting 28% of all women sterilized). At least 70 percent of women sterilized are 35 and above, at least two-thirds have more than 4 living children, and more than 85 percent are currently married. Consistent with the overall increasing educational attainment in the country, the proportion of sterilized women who are more educated is increasing with time. Nevertheless, those with no education still comprise a considerable proportion (17%) of sterilized women, especially given that only 8 percent of users of all methods in 1998 had no education.

Although the majority of IUD and implant users are rural residents, the proportion of urban residents among the users is considerable, at 36-45 percent (note that urban residents comprise 20-30% of all users of all methods). Central Province has the highest proportion of IUD and implant users, constituting 26-41 percent of all users of these methods, but the proportions have been declining over time. The vast majority of users of IUD and implants (82-91%) are currently married. In general, users of IUD and implants are becoming older with time, but having fewer living children. The more educated women (at least complete primary education) comprise the vast majority of IUD or implants users (69-84%), and the proportion is steadily rising. About 44 percent of IUD and implant users had at least secondary level education in 1989, and this proportion steadily increased to 62 percent in 1998.

Finally, Table 5.1c gives the profile of users of traditional methods of family planning. The proportion of users of traditional methods who live in the rural areas declined from 88 percent in 1989 to 74 percent in 1998. Eastern Province constituted the largest proportion of users of traditional methods in 1989 (37%). This reduced to just over 20 percent in 1998, when Rift Valley constituted the highest proportion (29%). Traditional methods seem to be particularly unpopular in Coast Province, which constitutes no more than 5 percent of users of the method across the years. The use of traditional methods by demographic characteristics does not show a clear trend. However, it is clear that traditional methods are relatively popular among younger women. While less than a quarter of users of all methods across years are adolescents aged 15-24, this group constitutes 34-43 percent of users of traditional methods. Consistent with the general profile of family planning users in Kenya, a typical user of traditional methods of family planning (based on modal category) has shifted from women with 5 or more living children in 1989 to those with 1 to 2 children in 1998. Similarly, users of traditional methods are becoming more educated, in line with the general increase in educational attainment in the country.

Table 5.1b: Trends in Socio-demographic profile of users of long-term modern and permanent methods (sterilization, IUD/implants)

What is the profile of users of long-term modern and permanent methods, according to socio-demographic factors, and has this changed over time?

Socio-demographic Characteristic
Residence
Urban
Rural
Region
Nairobi
Central
Coast
Eastern
Nyanza
Rift Valley
Western
Age group
15-24
25-34
35 +
Marital Status
Never married
Currently married
Previously married
No. of living children
0
1-2
3-4
5 +
Education level
None
Primary incomplete
Primary complete
Secondary +
Ideal family size
3 or less
4
5 +
Non-numeric
Total percent
Number of cases

Base population: Curr
1989, 1993 and 1998.

Table 5.1c Trends in Socio-demographic profile of users of traditional methods

What is the profile of users of traditional methods, according to socio-demographic factors, and has this changed over time?

Socio-demographic Characteristic	Percent of users using traditional methods		
	1989	1993	1998
Residence			
Urban	12.2	18.4	26.1
Rural	87.8	81.6	73.9
Region			
Nairobi	5.6	10.2	11.5
Central	15.2	16.8	10.5
Coast	2.8	5.1	2.2
Eastern	36.6	27.2	23.4
Nyanza	7.7	9.7	11.5
Rift Valley	25.5	22.4	28.7
Western	6.6	8.7	12.1
Age group			
15-24	33.9	43.1	34.6
25-34	36.8	35.7	38.7
35 +	29.3	21.2	26.7
Marital Status			
Never married	24.0	30.2	22.9
Currently married	70.9	64.5	73.5
Previously married	5.1	5.4	3.6
No. of living children			
0	17.1	23.8	20.0
1-2	24.2	28.9	34.3
3-4	22.0	20.5	24.1
5 +	36.7	26.9	24.2
Education level			
None	24.1	12.5	10.7
Primary incomplete	26.7	24.7	19.0
Primary complete	24.7	26.3	31.2
Secondary +	24.5	36.5	39.1
Ideal family size			
3 or less	25.5	46.2	38.8
4	41.8	34.7	38.2
5 +	31.6	18.4	20.0
Non-numeric	1.2	0.8	3.0
Correctly knows ovulatory cycle?			
No	69.0	66.3	67.0
Yes	31.0	33.7	33.0
Total percent	100.0	100.0	100.0
Number of cases	607	392	495

Base population: Current users of traditional contraceptive method in 1989, 1993 and 1998.

An interesting observation on users of traditional methods[11] is that the majority do not have correct knowledge of a woman's ovulatory cycle, with only about one-third being able to

[11] Traditional methods comprise mainly periodic abstinence, which constituted about 85 percent of users of traditional methods in 1998.

correctly state the period when a woman is likely to conceive. This suggests that many women using periodic abstinence may be using the method incorrectly, greatly lowering the contraceptive effectiveness of the method.

5.4 Correlates of Method Choice

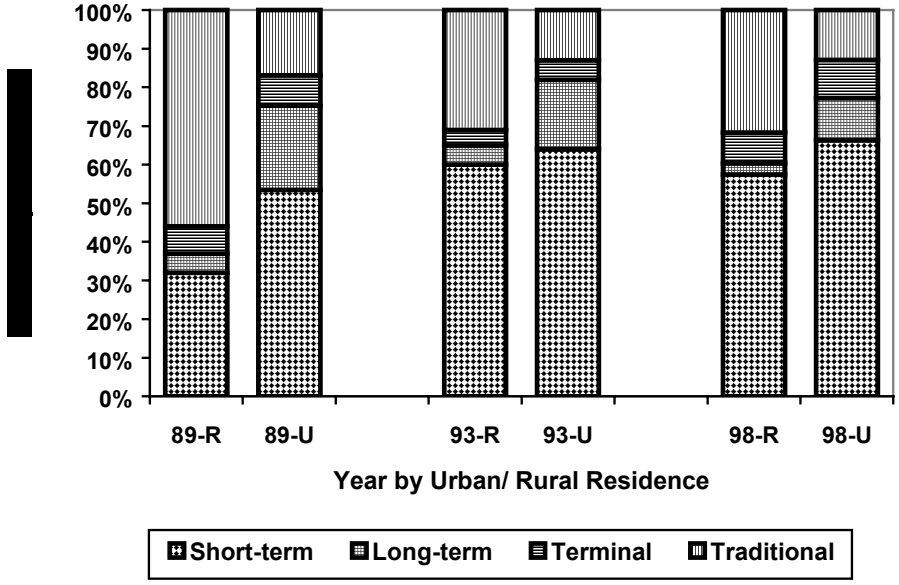
The analysis of correlates of method choice aims at answering such questions as, why has the adoption of specific methods (especially long-term methods and/or sterilization) slowed down recently? Are women who previously would have chosen these methods now opting for other methods? The analysis includes variables available in the three KDHS data sets. The three data sets are merged in the multivariate analysis, and interactions of specific factors with year included to test whether the determinants are significantly different across years. Particular focus is placed on the variables that are more program relevant while controlling for other factors as necessary. The analysis is carried out in two stages: the first on determinants of broad method types, comprising long-term modern, short-term modern and traditional methods; the second on determinants of specific modern methods, with particular focus on the choice of specific short-term modern methods.

5.4.1 Factors associated with the choice of different types of methods

The descriptive bivariate tables for current use of specific contraceptive methods in 1989, 1993 and 1998 are presented in Appendices VIII, VIIX and X, respectively, while parameter estimates for the final multivariate models on contraceptive method type are presented in Appendix XI and the corresponding predicted probabilities in Table 5.2. Overall, couples in Kenya are more likely to use short-term modern contraceptive methods than either the long-term or traditional methods, and this is consistent across almost all subgroups of women. The urban/rural differences in method choice vary significantly by year as illustrated in Figure 5.2.

Across years, use of modern contraceptive methods, especially the long-term methods, is higher in the urban than rural areas, while use of traditional methods is higher in rural than urban areas. In 1989, rural women were more likely to use traditional methods than modern methods, but this pattern was reversed in the 1990's, when there was overall greater use of short-term modern methods compared to the other methods. The pattern reflects a shift from traditional to short-term modern methods among rural users between 1989 and 1993. It is important to note that the use of long-term methods has steadily declined over the years in both rural and urban areas.

Figure 5.2
Urban/ Rural Differentials in Method Choice by Year.



There are marked regional differentials in method choice. Women in Central Province are the most likely to use long-term methods, while those in Coast are the most likely to use short-term methods. Nyanza is associated with the highest use of terminal methods, while Eastern has the highest use of traditional methods. The high usage of terminal methods in Nyanza Province may be attributed to a VSC program in Kisii district within the province.

As would be expected, the use of short-term methods steadily declines with age while use of long-term and terminal methods increase with age. Single and younger women tend to use traditional methods more than their older and married counterparts. However, the greatest use of traditional methods is associated with women who have no living children.

It is interesting to note that, despite the Catholic Church's open opposition to the use of modern contraceptive methods, there is little variation in the choice between modern and traditional methods by religious affiliation. The variation in choice of different types of methods by educational attainment also seems minimal, though the highly educated (secondary or higher) are the most likely to use long-term methods, while those with no formal education are the most likely to use traditional methods. Partner's approval of family planning is quite important in method choice. Women whose partners disapprove of family planning are highly likely to use traditional methods of family planning, suggesting that the disapproval is mainly for modern contraceptive methods, rather than the idea of family planning. It is also important to note that this analysis only focuses on users, and many women whose partners disapprove of family planning will remain nonusers.

Table 5.2 Predicted probabilities for choice of short-term modern, long-term modern, terminal and traditional contraceptive methods in Kenya : 1989-98.

Variable	Type of Method			
	Short-term (modern)[1]	Long term (modern)[2]	Terminal (modern)[3]	Traditional[4]
Year*residence interaction				
Urban 1989	0.54	0.22	0.08	0.17
Rural 1989	0.32	0.05	0.07	0.56
Urban 1993	0.64	0.18	0.05	0.13
Rural 1993	0.60	0.05	0.04	0.31
Urban 1998	0.67	0.11	0.10	0.13
Rural 1998	0.58	0.03	0.08	0.32
Region				
Nairobi	0.67	0.08	0.06	0.19
Central	0.63	0.18	0.06	0.14
Coast	0.74	0.06	0.06	0.13
Eastern	0.57	0.10	0.05	0.28
Nyanza	0.65	0.06	0.11	0.18
Rift Valley	0.61	0.08	0.06	0.25
Western	0.63	0.08	0.07	0.22
Age group				
15-24	0.72	0.05	0.01	0.21
25-34	0.67	0.08	0.06	0.18
35+	0.49	0.13	0.18	0.19
Marital status				
Single	0.59	0.06	0.06	0.29
Currently married	0.65	0.10	0.06	0.19
Previously married	0.64	0.07	0.11	0.17
No. of Living children				
0	0.32	0.02	0.00	0.65
1-2	0.65	0.09	0.03	0.23
3-4	0.66	0.11	0.08	0.16
5+	0.60	0.10	0.15	0.15
Religion				
Catholic	0.64	0.09	0.05	0.22
Protestant	0.65	0.09	0.07	0.19
Muslim/ other	0.59	0.12	0.06	0.22
Education level				
None	0.64	0.04	0.07	0.24
Primary incomplete	0.66	0.08	0.06	0.19
Primary complete	0.66	0.08	0.07	0.19
Secondary +	0.60	0.14	0.06	0.20
Partner's attitude on FP				
Approves	0.68	0.10	0.05	0.17
Disapproves	0.50	0.07	0.03	0.39
Unsure/ missing	0.21	0.02	0.47	0.30
Ideal family size				
Less than 3	0.67	0.10	0.07	0.16
4	0.62	0.09	0.07	0.23
5 +	0.60	0.08	0.06	0.27
Non-numeric	0.68	0.09	0.03	0.20
Recent unplanned birth?				
No	0.62	0.10	0.07	0.21
Yes	0.68	0.07	0.06	0.19
Correctly knows ovulatory cycle				
No	0.64	0.09	0.07	0.20
Yes	0.62	0.11	0.08	0.19
Prop. heard FP on radio				
0	0.68	0.07	0.04	0.21
1	0.61	0.11	0.09	0.19
Overall mean	**0.64**	**0.09**	**0.07**	**0.20**

1 – includes injetables, pill and barrier methods, 2– includes norplant and IUD, 3- includes TL and vasectomy, 4- – includes periodic abstinence and withdrawal

Method choice shows little variation by ideal family size or recent experience of an unplanned birth, but exposure to mass media messages appears important. A community's exposure to family planning media messages on the radio is generally associated with an increase in the use of long-term and terminal methods, and a decline in the use of short-term methods.

The choice between long-term or traditional methods, versus short-term methods varies significantly between communities, suggesting that there are unobservable community factors that do influence choice of different types of contraceptive methods, especially the choice between traditional versus short-term modern methods. The intra-community correlations suggest that 19 percent of the total unexplained variation in the choice of traditional versus short-term modern methods is attributable to community factors, not included in the model. The results imply high homogeneity in the use of traditional methods within communities.

5.4.2 The determinants of choice of specific modern methods

The parameter estimates for the final models on choice of specific modern methods are presented in Appendix XII and the corresponding predicted probabilities in Table 5.3. The interactions between year and various factors were not significant, suggesting that there were no systematic shifts in the choice of specific modern methods among sub-groups over time.

The probability of using injectables increased considerably from 0.2 in 1989 to 0.5 in 1998, while the probability of using IUD/Implants, and to some extent the pill, declined over this period. This suggests that Kenyan women who would have previously used the other reversible modern contraceptive methods are now choosing the injectable. The use of injectables is associated with rural residence, while the use of IUD/Implants is associated with urban residence. Nairobi and Eastern provinces have the highest probability of pill use, while use of injectables is highest in Rift Valley and Nyanza.

Use of the pill, and to some extent the injectables, tends to decline with age. More or less similar patterns are observed for pill use by number of living children, but injectables use increases with number of living children. Overall, barrier methods are predominantly used by women who have not begun childbearing.

Educational attainment and partner's disapproval do influence method choice. Use of injectables declines with increasing educational attainment, while use of barrier methods tends to increase with education. However, women whose partners disapprove of contraceptives are more likely to use injectables, but less likely to use barrier methods, compared to those whose partners approve of family planning. This is not surprising since condom use requires partner's co-operation, while injectables may be used without the partner's knowledge. Community exposure to family planning media messages also has a significant effect on the choice of specific modern methods, with greater exposure to family planning messages being associated with increased use of pills, IUD/Implants and sterilization, but reduced use of injectables.

Table 5.3 Predicted probabilities for choice of specific modern contraceptive methods 1989-98.
What factors are associated with the choice of specific modern methods, and has method choice changed significantly across years?

	Type of Method				
Variable	Pill	Injectables	IUD/Implants	Sterilization	Barrier
Year					
1989	0.39	0.19	0.21	0.15	0.05
1993	0.41	0.33	0.15	0.05	0.06
1998	0.28	0.45	0.08	0.14	0.05
Residence					
Urban	0.34	0.29	0.22	0.11	0.04
Rural	0.37	0.36	0.11	0.10	0.06
Region					
Nairobi	0.47	0.25	0.11	0.09	0.07
Central	0.36	0.29	0.24	0.08	0.04
Coast	0.39	0.37	0.09	0.09	0.07
Eastern	0.45	0.23	0.16	0.09	0.06
Nyanza	0.28	0.44	0.09	0.16	0.04
Rift Valley	0.26	0.47	0.11	0.10	0.05
Western	0.35	0.37	0.11	0.11	0.06
Age group					
15-24	0.48	0.37	0.08	0.02	0.06
25-34	0.39	0.36	0.12	0.09	0.04
35 +	0.24	0.27	0.18	0.25	0.06
Marital Status					
Single	0.34	0.41	0.10	0.10	0.05
Currently married	0.37	0.33	0.15	0.09	0.05
Formerly married	0.30	0.36	0.10	0.18	0.06
Living children					
0	0.36	0.08	0.05	0.01	0.50
1-2	0.48	0.27	0.13	0.05	0.08
3-4	0.36	0.36	0.14	0.10	0.04
5 +	0.26	0.39	0.13	0.19	0.04
Education level					
None	0.35	0.44	0.07	0.11	0.03
Primary incomplete	0.36	0.37	0.12	0.10	0.05
Primary complete	0.37	0.36	0.12	0.10	0.06
Secondary +	0.35	0.28	0.21	0.09	0.07
Partner's attitude on FP					
Approves	0.37	0.35	0.15	0.08	0.06
Disapproves	0.37	0.40	0.14	0.06	0.03
Unsure/ missing	0.10	0.09	0.02	0.78	0.01
Ideal family size					
Less than 3	0.37	0.34	0.14	0.10	0.05
4	0.34	0.36	0.14	0.10	0.06
5 +	0.37	0.33	0.12	0.10	0.08
Non-numeric	0.45	0.34	0.12	0.04	0.05
Recent unplanned birth?					
No	0.36	0.33	0.15	0.11	0.05
Yes	0.36	0.37	0.11	0.09	0.07
Prop. heard FP on radio					
0	0.33	0.44	0.10	0.07	0.06
1	0.37	0.28	0.16	0.13	0.05
Overall mean	**0.36**	**0.34**	**0.14**	**0.10**	**0.05**

In addition to the above factors, the choice of injectables or sterilization versus choice of the pill varies significantly across communities. Twelve percent of the variation in injectable versus pill choice is attributable to unobserved community factors. Such factors may include the availability of specific services within the communities, or communities' perceptions on specific contraceptive methods.

One critical program question in the analysis of the determinants of contraceptive method choice is whether method choice is predominantly provider driven or client driven. Are women using contraceptive methods that they prefer to use, or are the methods used based on what the providers recommend or what is available at the facilities? Understanding whether method choice is supply driven or demand driven is important in helping family planning programs identify where to target their efforts. The 1999 KSPA survey data suggest that method choice in Kenya is mainly demand driven, but to some extent also influenced by the supply. More than 85 percent of the 341 facilities surveyed provided injections, condoms and the pills, while about half of the facilities provided IUD. Natural family planning was provided by about 40 percent of the facilities, and only about 10 percent or less provided Norplant, female sterilization or vasectomy (NCPD, MOH and ORC Macro 2000). Although the health workers were observed to promote or emphasize a particular method in a number of consultations, the distribution of new family planning clients by whether or not they received their preferred method shows that all women expressed a method preference either spontaneously or when asked, and most of them (88%) received the preferred method. Table 5.4 shows that the injectable is by far the most popular method among new clients, followed by the pill.

Table 5.4 Percent distribution of new family planning clients who received their preferred method, by method received.

Type of method	Percent	Cases (weighted)
Injectable	65.0	62.2
Pill	27.9	26.7
Other short-term	4.4	4.2
IUD	1.6	1.6
Other long term	0.5	0.5
Condom	0.4	0.4
Total	100.0	95.6

Source: KSPA –New FP client exit interviews

Although the KSPA data are limited due to small numbers, an examination of preferred future method among nonusers who intend to practice family planning based on the KDHS data (see Chapter 3) also suggests that the preferred method mix among non-users conforms with the method mix for current users. The injectable is the most preferred method (and the popularity is increasing), followed by the pill, whose popularity is declining.

5.5 Contraceptive Method Mix in Kenya

An important program question that this section seeks to address is whether contraceptive method mix by type of user suggest that family planning users are choosing the types of methods that would be most suitable for them. Family planning clients have different needs: young women who want to delay childbearing; couples who want to space births; and those who want to stop childbearing. The analysis draws on previous studies on appropriate contraceptive method mix (Choe and Bulatao 1992; Galway and Stover 1994; WHO 1999) to assess if different groups of women are using methods most suitable for them. Table 5.5 shows trends in method mix by type of user.

Table 5.5 Percent distribution of method mix according to type of user, by year of survey.

Year	Type of user	% of users	Percent using method						No.of Cases
			Pill	Injectable	Barrier	IUD/ Implants	Sterilization	Traditional	
1989	Unmarried	25.3	25.3	8.2	2.7	12.2	8.7	42.9	368
	Married spacer	18.1	35.2	8.0	4.9	15.2	0.0	36.7	264
	Married limiter U35	26.3	25.3	15.4	2.1	20.9	15.7	20.6	383
	Married limiter 35+	30.3	10.9	12.5	3.6	16.6	32.2	24.3	441
	Total	100.0	22.7	11.3	3.2	16.3	16.1	30.3	1,456
1993	Unmarried	24.5	27.8	19.5	7.6	4.6	8.0	32.4	435
	Married spacer	17.0	42.2	19.9	5.0	11.0	0.0	21.9	301
	Married limiter U35	30.3	31.4	31.0	2.6	10.4	14.1	10.4	538
	Married limiter 35+	28.1	11.0	22.2	3.0	14.2	37.1	12.4	499
	Total	100.0	26.6	23.9	4.3	10.2	16.7	18.3	1,773
1998	Unmarried	21.2	20.3	27.7	10.9	5.3	8.1	27.7	433
	Married spacer	20.8	33.6	31.9	5.5	6.9	0.0	22.1	420
	Married limiter U35	25.0	24.8	41.8	3.2	6.1	10.5	13.7	505
	Married limiter 35+	32.8	12.2	25.9	2.6	10.7	35.3	13.3	663
	Total	100.0	21.5	31.5	5.1	7.6	15.9	18.3	2,021

Over the years, married limiters have constituted more than half of all family planning users in Kenya, while unmarried women constitute more than 20 percent of users. The most popular method among the older limiters (aged 35+) is sterilization, accounting for about one-third of overall contraceptive use among this group of women. On the other hand, the pill and, more recently, the injectable, are the most popular methods among the younger limiters aged below 35 years. In general, the married spacers tend to favor mainly the pill (constituting at least one-third of contraceptive use among this subgroup across the years). However, this group also equally favored the use of traditional methods in the earlier period, and to some extent, use of injectables, during the latter period. Traditional methods are the most popular among unmarried women, although the use has declined from 43 percent in 1989 to 28 percent in 1998. Use of barrier methods, and to some extent long-term methods (IUD/ Implants), has remained low among all types of users. Although an appreciable proportion of younger married limiters (21%)

were using IUDs or Implants in 1989, this proportion has dropped significantly to 6 percent by 1998. The use of barrier methods is rapidly gaining popularity among the unmarried women, though the level is still relatively low at about 10 percent.

The consistent increasing trend in injectables use, accompanied with a declining trend in the use of IUD/Implants among the young married limiters suggests an apparent shift from IUD/Implants to injectables among young limiters. This implies possible underutilization of long-term methods. On the other hand, the apparent general shift by all user types from traditional methods to the injectables during the 1989-93 period is a positive change towards greater use of more effective contraceptive methods.

The patterns of contraceptive method mix by type of user observed above suggests that to a large extent, most family planning users in Kenya are using methods that are suitable for their family planning needs. This is reflected in the predominant use of sterilization by older limiters, and use of pills and injectables by spacers and younger limiters, respectively. Pills and injectables are preferred for spacers given their high level of effectiveness and high level of user control over continuity.

However, the relatively low use of barrier methods among unmarried women and the use of IUD/Implants by this group of women (albeit low levels) are of concern. Sexually activity among the unmarried may be sporadic and have high possibility of multiple sexual partners with unknown medical history. For this group, non-clinical supply methods which are simple to use and provide protection against sexually transmitted diseases, such as condoms, are preferred (Choe and Bulatao 1992). On the other hand, IUD and implants are less suitable because of their long-acting characteristics and provider involvement. In addition, IUD is inappropriate for women who have multiple sexual partners because of the increased risk of pelvic inflammatory disease (Kost et al. 1991). Nevertheless, the trend of increasing use of barrier methods and reduction in the use of IUD/Implants by unmarried users is encouraging. Also of concern is the significant proportion of limiters, especially older limiters who are using injectables and pills. These methods are generally considered less appropriate for an extended period of use because of their medical effects and the inconvenience of user dependency (Choe and Bulatao 1992).

5.6 Conclusions and policy/program implications

A clear picture that has emerged from the analysis of method choice is the dramatic rise in the use of injectables. The results suggest that women who would have previously chosen the other reversible contraceptive methods (including the pill, IUD/Implants and traditional methods) are shifting to the injectable. This trend is likely to continue in the future since the analysis of preferred future methods (see Chapter 3) also revealed that the injectable is the most preferred future method for nonusers who intend to practice family planning. An important question is, what are the program implications of this trend? Of possible concern to programs is the apparent shift from IUD/Implants to injectables among the limiters (especially younger ones) for whom the long-term methods would be more suitable. Furthermore, the fact that higher educational attainment and exposure to family planning messages through the mass media are both associated with reduced use of injectables suggests that the usage may not always be well

informed. Also, the increased usage of injectables in the rural areas, as opposed to IUD/Implants, suggest that service availability is probably a factor.

There are, however, some positive aspects in the shift to injectables. The higher use of injectables (as opposed to barrier methods) by women whose partners disapprove of family planning suggests that this is a viable option for family planning where spousal support is lacking. While injectables may provide an option for family planning for women with non-supportive partners, programs should aim at encouraging partner support (e.g. through male involvement projects) to ensure that individuals are in a position to make informed choices between the various methods available. Another positive aspect is the apparent shift from traditional methods to injectables, which suggests increasing use of more effective contraceptive methods. The fact that the majority of users of traditional methods may be using the method incorrectly, greatly lowering its effectiveness, implies the need to either encourage shifts to the more effective methods, or impart correct knowledge to the users.

The analysis of trends in profile of users and trends in method mix suggest a steady increase in the use of barrier methods among young unmarried women. This could be attributed to increasing use of condoms for the prevention of sexually transmitted diseases, including HIV/AIDS. However, from a program perspective it is disappointing that the multivariate analysis, controlling for year and other important factors, shows no evidence of increased use of barrier methods among adolescents or the unmarried women. In fact, having no living child is the main driving factor for use of barrier methods, the same factor that primarily determines use of traditional methods.

Regional patterns in profile of users of specific methods may partly explain some of the results in the data quality section, with respect to the CPR/TFR discrepancy. For instance, the fact the Rift Valley and Eastern provinces are associated with greater use of traditional methods may partly explain the observed CPR that was higher than expected in these regions. With greater use of less effective contraceptive methods (e.g. traditional methods), the impact of contraceptive use on fertility would be lower than expected.

CHAPTER 6

CONTRACEPTIVE FAILURE, SWITCHING AND DISCONTINUATION

6.1 Rationale

Analysis of dynamics surrounding change in use status among contraceptive users is important for understanding how well family planning programs address contraceptive users' expectations, needs and concerns (Kost 1993; Ali and Cleland 1995; Datey et al. 1995; Petta et al. 1994). It has been demonstrated that as the level of current use of contraception increases, continuity of contraceptive use becomes an important measure of overall program effectiveness in meeting the needs of contraceptive users (Jain 1989; Bertrand, Magnani and Knowles 1994). The gap between the percentage of women in the childbearing age group who have ever used and those currently using contraception is a crude measure of extent of discontinuation in a given population (Curtis and Nietzel 1996). As contraceptive prevalence rate (CPR) increases, current and potential users of family planning are increasingly drawn from women with past contraceptive use, implying that further increases in the CPR is more dependent on promotion of continuation rates and re-adoption of contraception among past users than it will be on promotion of new acceptance rates because unwanted and mistimed pregnancies would increasingly result from discontinuation of methods rather than failure to use contraception at all (Jain 1989). It has also been demonstrated that the importance of contraceptive effectiveness in determining fertility levels increases when desired family size is low (Bongaarts and Rodriguez 1991; Wang and Diamond 1995) because unintended births resulting from contraceptive failure are bound to constitute a sizable proportion of fertility. As the focus of family planning providers shifts from recruiting new users to satisfying current users and encouraging re-adoption among those who discontinued use, issues related to quality of family planning services become an increasingly influential part of service provision (Bruce 1990; Jain 1989).

Levels and trends in contraceptive use in Kenya underscore the need to examine the dynamics of contraceptive use in the country. In 1977/78, when the CPR was about 7 percent, about 32 percent of married women had ever used family planning. By 1998, when the CPR was 39 percent, about 61 percent of married women had ever used a method of family planning. Thus, the Kenyan family planning program is increasingly dealing with a population that has had some experience with contraception. The need to ensure that women who are using family planning are adequately protected from having unwanted births is even more critical in the Kenyan context where induced abortion is illegal and desired family size has declined substantially from 6.3 in 1984 to 4.1 in 1998. The proportion of women who would like to stop childbearing altogether has increased from 13 percent to 52 percent over the same period.

The overall objective of this analysis is to examine the experiences and behavior of women who have used contraception in order to understand the overall effectiveness of the family planning program in enabling clients to fulfill their reproductive goals. The chapter is divided into four parts. The first part describes the data and methods of analysis used. The second part examines

the overall and method-specific rates of contraceptive discontinuation and failure, and the extent of unwanted fertility resulting from contraceptive discontinuation. The third part looks at reasons for contraceptive discontinuation, and the fourth part looks at the determinants of contraceptive discontinuation.

6.2 Data and Analysis

6.2.1 Data

The analysis in this chapter mostly utilizes contraceptive use calendar data collected in the 1998 KDHS, which was the first attempt to collect such data at a national level in Kenya. The calendar contains monthly contraceptive histories for the previous five years for all women who had ever used contraception. For each month, respondents were required to indicate their maternity status (whether they were pregnant or gave birth or terminated a pregnancy) or the type of contraceptive used. If the respondent stopped using a method in that month, she was asked to give a reason for discontinuation. In each month, the respondent also indicated whether she was in a marital union (married or living together) or not, and whether she had changed place of residence (city, town, country-side). These data allow us to examine various rates of contraceptive discontinuation, switching, and the reasons why those who discontinue use of specific methods do so. A copy of the contraceptive calendar form is attached in Appendix XIII. Data from women's individual questionnaire are also used to provide background variables for the analysis of determinants of contraceptive discontinuation, switching, and failure.

6.2.2 Analysis

Two forms of analysis are carried out in this chapter. First, descriptive tables are used to examine rates of contraceptive discontinuation and reasons for discontinuation. The second form of analysis examines determinants of contraceptive discontinuation, using discrete-time competing-risks multi-level event history models. The unit of analysis in the descriptive analysis is an episode of contraceptive use, which is defined as a period of continuous use of a specific method, as recorded during the interview. Women who did not use contraception during the period covered by the calendar are not included in the analysis. Additionally, women who were sterilized before the period covered by the calendar are excluded from the analysis because use status does not change after sterilization. For the same reasoning, episodes of sterilization that began during the calendar are excluded from the analysis, although episodes contributed by the same woman before the sterilization are included. The analysis is restricted to the 3-63 month period prior to the survey. Episodes that began more than 63 months before the survey are excluded. The three months prior to the survey are omitted to avoid potential bias due to underreporting of first trimester pregnancies, which can result in underestimates of contraceptive failure rates (Curtis 1997). After these data checks, we end up with the sample characteristics presented in Table 6.1 where, at the national level, there are 3181 episodes of use, contributed by 1997 women, giving an average of 1.6 episodes per woman.

Table 6.1 Sample characteristics

Province	No. of clusters	No. of women	No. of episodes of use	No. of episodes per cluster	No. of women per cluster	No. of episodes per woman
National	446	1997	3181	7.13	4.48	1.59
Nairobi	28	150	379	13.54	5.36	2.53
Central	69	238	381	5.52	3.44	1.60
Coast	53	217	158	2.98	4.09	1.37
Eastern	61	371	670	10.98	5.80	1.81
Nyanza	58	286	498	8.59	4.93	1.74
Rift valley	123	467	677	5.50	3.80	1.44
Western	54	268	417	7.72	4.96	1.56

Where rates of contraceptive discontinuation are computed, life table analysis is used to take account of right censoring of episodes of use that were still in progress at the time of the survey. The hierarchical structure of the calendar data (episode level, individual women's level, and community level) necessitates use of multi-level modeling in the analysis of determinants of contraceptive discontinuation to take account of variation at the different levels (Steel, Diamond, and Wang 1996). Since individual women contributed an average of 1.6 episodes during the five-year period covered by the calendar, episodes contributed by the same women are likely to be correlated since they are affected by the same individual characteristics of the women. The contraceptive behavior of women who live in the same community or cluster is also likely to be affected by the same community and program factors (Curtis and Blanc 1997). Thus, we have three levels of data where the episode of use constitutes the first level that is nested within individual women (level 2), who are in turn nested within clusters (level 3). The analysis of the determinants of contraceptive discontinuation is based on discrete-time competing-risks multi-level event history models. These models analyze simultaneously the probability of falling into each of the following broad categories of contraceptive discontinuation at a given duration of use:

a. Contraceptive failure (those who got pregnant while using the method)
b. Switching (those who switch to another method in the month immediately following discontinuation)
c. Abandoning use with no further need of contraception (those who discontinue because they want to get pregnant or their exposure to the risk of pregnancy is reduced)
d. Abandoning use while still in need of contraception (as a result of various problems such as side effects, health concerns, access/availability, including cost, and spousal disapproval).

Each of these categories has important ramifications for understanding how well contraceptive users are satisfied with various methods they are using. Of particular concern are discontinuations while the woman is still in need of contraception and due to contraceptive failure because these discontinuations would increase the risk of having unplanned and unwanted

fertility. For switching, transitions from effective (modern) methods to less effective ones may also increase the likelihood of contraceptive failure for fecund and sexually active women who are seeking to stop childbearing or postpone the next birth. The main reason for discontinuing a method is valuable not only in understanding why certain women and methods of contraception are more prone to contraceptive discontinuation than others, but also in defining whether women are in need or not. Essentially, we assume that a woman is still in need unless they cite one of the reduced need reasons as their main reason for discontinuation. However, the interpretation of these results should be qualified by the fact that reproductive decisions, including decisions about contraceptive discontinuation, are part of complex social system where decisions are usually made after considering multiple factors and issues.

Multivariate analysis

The multi-level models are fitted in MlwiN software (Goldstein 1995, Rasbash and Woodhouse 1995). The multivariate analysis examines the influence of cluster, woman-level, and episode-level factors on contraceptive discontinuation as summarized in Table 6.2. The individual characteristics are divided into two broad categories: demographic/method-related and socioeconomic factors. Since contraceptive use varies by age of the mother and number of surviving children, these two demographic factors have been included in the analysis. Three measures of marital status (status at the beginning of the interval, change in marital status in the previous interval, and change in the current interval) are used to control for the effect of changes in exposure to sex on contraceptive discontinuation. Change in marital status in the immediately preceding interval is used to take account of the possibility that the effect of marital change on contraceptive discontinuation may not be immediate. For instance, injectables and Norplant may not be discontinued immediately even when exposure to sex is reduced. Since the type of method used may affect continuity of use, the method used in each episode is also used as a covariate in the analysis. We also examine the effect of the woman's previous experience with contraception through an indicator of use status in the month prior to the start of the episode of use (whether the woman was using a method, not using, or was pregnant or gave birth).

Finally, we examine the influence of the user's intention for using contraception, based on the woman's report about the wantedness of the next birth after the episode of use. Women who said the birth was wanted then or later are considered to be using for spacing purposes, while those who said the birth was not wanted at all are considered to be using for limiting purposes. If there is no birth following the episode of use, the variable is based on the woman's fertility preferences at the time of the survey, whereby sterilized women are taken as limiters and those who were not sure about their fertility preference or timing of the next birth are taken as spacers. In the descriptive analysis we also examine differentials in discontinuation across various sub-groups of the Kenyan population, defined by place of residence (rural versus urban), province of residence and religion. These variables reflected the status at the time of the survey.

Four cluster-level variables, which have proved to have a significant impact on contraceptive discontinuation in other settings, were also included in the analysis to measure the effect of contraceptive environment on discontinuation. These variables were computed from the 1998 KDHS data at the cluster level, and they represent the proportion of women in a given cluster who have the given characteristic. The first measures the impact of contact with a CBD

on contraceptive discontinuation. The second examines the effect of contraceptive experience in the cluster on contraceptive discontinuation, with the expectation that women in communities that have more women who have used contraception are likely to exhibit lower discontinuation rates. We also examine the influence of the extent of spousal communication in a community (which is taken as a measure of acceptance of family planning as a couple issue) on contraceptive discontinuation. Finally, we examine the influence of acquisition of family planning IEC from clinics on contraceptive use discontinuation. Women who come from communities where clinics are more active in promoting family planning are likely to exhibit lower levels of contraceptive discontinuation.

The final model fitted is a two-level model with individual women at Level 2 and the episode of use at Level 1 (see Appendix XIV). The model does not include the four cluster-level variables included in this study because none of them has a significant effect on contraceptive discontinuation. Analyses of similar data from a number of countries have shown that service environment and community's contraceptive experience, measured by the proportion of ever married women who have ever used contraception, significantly affects the risk of abandoning use while in need (Steele et al. 1999; Curtis and Blanc 1997). It is not evident whether the result in this data is a reflection of data problems with the cluster-level data or the fact that these measures of the contraceptive environment are not important in Kenya. The analysis could have also been more program-relevant if it had included various measures of family planning service environment, which have proved to have a significant impact on contraceptive continuation in countries like Morocco (Steele et al. 1999). The 1998 KDHS did not have a service availability module, and attempts to merge the KSPA findings with the KDHS data were futile.

Although the contraceptive use calendar data provide valuable insights into contraceptive use dynamics, they have some limitations, which should be taken into account when interpreting the results. The analysis of patterns and determinants of contraceptive discontinuation rests on the reliability of information on durations of contraceptive use as well as reasons for discontinuation. The calendar section of the KDHS asked to reconstruct their contraceptive use histories over a five-year period. As demonstrated in Chapter 2, the reporting of episodes of contraceptive use does not appear to suffer from serious memory lapse effects, as there is remarkably close consistency between contraceptive use rates based on the calendar data and current data for the same period. Additionally, the durations of use data do not seem to suffer from serious heaping in the reporting of durations of use. However, detailed evaluation of the quality of Morocco's longitudinal calendar data demonstrated that while gross reporting of contraceptive use may be fairly reliable, there is considerable unreliability in individual-level

Table 6.2 Independent Variables

VARIABLE	DESCRIPTION/CATEGORIES
Duration	Each episode of use for an individual woman is divided into three-month intervals from 0-36 months, which are modeled using a quadratic term
INDIVIDUAL LEVEL VARIABLES	
DEMOGRAPHIC AND METHOD FACTORS	
Woman's Age	Woman's age at the start of the episode of use Under 25 (Reference Category) 25-34 35-49
Number of Living Children	Number of living children at the beginning of the episode of use 0 1-2 3-4 5+ (Reference Category)
Marital Status	Marital status at the start of the three-month interval within the episode of use Married Not Married (Reference Category)
Recent Change in Marital Status	Time dependent variable indicating whether there was a change in marital status during the previous three-month interval preceding? the episode No Change (Reference Category)
Change in Marital Status	Time dependent variable indicating whether marital status changed during the three-month interval within the episode No Change (Reference Category)
Method	Pill IUD Other Modern Traditional (periodic abstinence and withdrawal) Injectables (Reference Category)
Previous Status	Status in month immediately prior to start of episode using a method birth or termination not using a method (Reference Category),
Contraceptive Intention	Whether the episode of use was for spacing or limiting purposes – based on ideal versus actual family size Spacing (Reference Category)
SOCIOECONOMIC FACTORS	
Education	Highest level of education attended No Education Primary Secondary and above (Reference Category)
Area of Residence	Place where the respondent was resident during the beginning of the episode of use City Town Countryside (Reference Category)
Socioeconomic Status	Index of socioeconomic status based on the number (0-5) of the following possessions/amenities owned by the household: drinking water piped into the household; flush toilet; bicycle, radio, cement floor material, and motorcycle/car coded as follows: Low (0-1) – Reference Category Medium (2-3) High (4-5)
COMMUNITY/CLUSTER VARIABLES	
Contact with community based distributors (CBDs)	Proportion of women in a cluster who have been in contact with a CBD
Contraceptive experience.	Proportion of women in cluster who have ever used any method of contraception
Spousal discussion of family planning	Proportion of women in cluster who have ever discussed family planning
Family planning IEC through clinics	Proportion of women in cluster who have ever heard a message about contraception at the clinic

responses relating to duration of contraceptive use (such as those on contraceptive failure, switching and discontinuation) and reasons for discontinuation (Stickler et al. 1997). Although Stickler et al. (1997) went on to recommend that this type of analysis should not rely on reason for discontinuation, we argue that, in the absence of any detailed current or prospective data on contraceptive use dynamics, insights from the calendar data can demonstrate critical areas of concern to programs.

6.3 Results

6.3.1 Contraceptive Discontinuation Rates

Table 6.3 shows the cumulative method-specific and overall discontinuation rates after 12, 24, and 36 months of contraceptive use and median durations of use. The method-specific data reveal substantial differences in the extent of contraceptive discontinuation over the three duration intervals. Overall, condom users exhibit the shortest durations of continuous use of contraception (10 months), followed by traditional method users (19 months) and pill users (20 months). With median durations of use between 35 and 36 months, Norplant, injectable and IUD users exhibit the longest durations of continuous use. With the exception of Norplant, which has no discontinuation in the first year of use, injectables have the lowest rate of discontinuation (18%), while condoms have the highest rate (62%). Of the three major modern methods used in Kenya (pills, injectables, and IUD), pills have a substantally higher level of discontinuation (34%) than the other two (less than 20%). Another notable category with a relatively high twelve-month discontinuation rate is traditional methods (35%). The patterns of discontinuation after 24 and 36 months of use is consistent with the 12-month pattern in that condom users exhibit the highest discontinuation rates, followed by traditional methods users, and pill users. Norplant users exhibit the lowest discontinuation rates, followed by injectable and IUD users.

For all methods combined, the data show that 30, 51, and 65 percent of all women discontinue contraceptive use within the first 12, 24 and 36 months of use, respectively. After initiating use, women continue using the same method for a median duration of about two years. The overall discontinuation rates in Kenya compare closely to the rates derived from Zimbabwe, which is the only other Sub-Sahara African country with similar national-level contraceptive use calendar data. The data show that Zimbabwe's relatively long duration of continuous use (25 months) is mostly a result of its lower gross discontinuation rate during the first twelve months of use (20% compared to Kenya's 30%). Zimbabwe's low discontinuation rate during the first 12 months of contraceptive use stands out even when compared with non-African countries (Curtis and Blanc 1997). After 24 and 36 months of use, however, the difference in discontinuation rates between Zimbabwe and Kenya is very small. The median durations of continuous use for pills and condoms are much higher in Zimbabwe than in Kenya

Table 6.3 Life Table Cumulative Discontinuation Rates at 12 months, 24 months and 36 months duration of use and median duration of use by method, Kenya 1998 and Zimbabwe, 1994

Method	12 Month	24 Month	36 Month	Median Duration	No. of segments	Zimbabwe (Median Duration)
Pills	34.5	57.9	74.7	19.9	934	27.6
Injectables	17.5	35.3	50.6	35.5	832	-
IUD	19.0	37.6	51.5	34.7	118	-
Condom	60.6	77.2	83.8	9.9	292	16.3
Norplant	0.0	16.7	29.5	36.0	44	
Traditional Methods	35.4	59.4	75.3	19.27	773	18.8
All Methods	30.4	50.5	64.7	23.71	2993	25.2
Zimbabwe, 1994	20.1	47.8	66.9	25.2	3381	

NOTE:
About 123 cases of female sterilization that were initiated within the period covered by the calendar have been omitted because the method cannot be discontinued. There was also one case of vaginal methods, which has been dropped from the analysis.
The discontinuation rates for Zimbabwe are derived from Curtis and Blanc (1997) - Table 4.1, and the median duration of use from Sambisa (1996) – Table 3.
Traditional methods include withdrawal, periodic abstinence, and other non-specified methods

Table 6.4a shows the all-method cumulative percentage of users who discontinue use within 12 and 24 months after initiating use, and the median duration of use by women's background characteristics. When examining contraceptive discontinuation rates for all methods combined, a distinction is made between the all-method discontinuation rate (where switches are not treated as discontinuations) and the first discontinuation rate (where switches are treated as discontinuation). Both rates have important ramifications on program effectiveness. By giving the overall duration of continuous contraceptive use, the all-method rate is valuable in understanding the extent to which women are fully protected from unintended pregnancies. The first method discontinuation rate, on the other hand, is very useful for understanding the extent of clients' satisfaction with, and adherence to specific methods of contraception. The first-method rate for all methods has a potential problem in that the method-mix of the episodes of use could influence differentials in discontinuation rates, since different subgroups will have different method mixes of episodes and discontinuation rates vary greatly by method.

The results show that age is negatively associated with contraceptive discontinuation, and consequently, that contraceptive use segments for older women are considerably longer than those for younger women (10 months for women aged 15-24 and 22 months for those aged 35-49 years). Surprisingly, socioeconomic status is also negatively associated with continuity in

Table 6.4a Life table all method discontinuation rates and median duration of use by background characteristics

Characteristic	12 month discontinuation rate (percent)	24 month discontinuation rate (percent)	Median Duration of use (months)
All women	30.4	50.5	23.71
Age group			
Under 25 years	61.1	84.8	9.81
25 – 34 years	41.4	68.9	15.72
35 + years	31.2	53.8	21.97
Socio-economic status			
Low	44.9	71.9	14.23
Medium	44.8	71.3	14.34
High	50.8	73.0	11.80
Intention of use			
Spacer	51.8	77.9	11.57
Limiter	37.4	61.5	18.24
Surviving children			
0	59.5	82.2	10.07
1-2	50.7	76.9	11.83
3-4	41.9	42.5	15.90
5+	37.6	62.7	17.90
Residence			
Urban	49.2	71.9	12.38
Rural	45.7	72.1	13.86
Province			
Nairobi	47.9	68.6	13.17
Central	36.3	62.3	18.31
Coast	49.7	74.0	12.12
Eastern	43.2	70.0	15.02
Nyanza	44.8	69.11	14.55
Rift Valley	47.7	77.51	12.92
Western	61.1	81.2	9.81
Education			
None	44.1	67.4	15.00
Primary incomplete	45.7	73.6	13.84
Primary complete	46.7	72.5	13.52
Secondary+	48.5	71.6	12.75
Religion			
Catholic	43.1	71.9	13.73
Protestant	46.7	72.3	13.51
Muslim	54.4	71.1	11.01
Other/no religion	33.8	64.0	18.41
Marital status			
Married	29.0	60.8	19.90
Not married	31.7	59.7	19.81

contraceptive use. As one would expect, women whose contraceptive intent is to limit their fertility experience longer durations of contraceptive use than those who are using contraception for child spacing purposes. As with age, the number of surviving children that a woman has is negatively associated with contraceptive discontinuation. There are small differences in the extent of contraceptive discontinuation between rural and urban residents, with rural women continuing use for slightly longer duration than their urban counterparts (the

Table 6: 4b: Twelve-month first method discontinuation rates for all reversible methods and median duration of use by different background characteristics.

Background Characteristic	Discontinuation rate	Median Survival Time	# of Episodes
All Women	50.3	11.65	872
Age Group			
< 25 years	56.4	9.6	458
25-34 years	42.1	15.1	334
35 years	48.4	12.1	80
Socio Economic Status			
Low	50.4	12.2	231
Medium	51.0	11.6	306
High	49.6	11.5	335
Use Intention			
Intent (Spacer)	54.1	10.7	614
Intent (Limit)	36.2	16.7	234
Living Children			
0	55.6	6.9	61
1-2	53.9	9.9	390
3-4	45.3	13.7	223
5+	46.3	14.0	198
Region			
Nairobi	38.1	16.7	37
Central	38.0	15.5	74
Coast	58.5	9.7	104
Eastern	47.9	12.6	180
Nyanza	54.4	11.4	120
Rift valley	51.9	11.3	201
Western	56.1	8.5	156
Place of Residence			
Urban	51.0	11.4	173
Rural	50.1	11.8	699
Education Level			
None	51.5	11.4	56
Primary Education	51.1	11.8	527
Secondary+	51.4	9.3	19
Religion			
Catholic	51.4	11.4	227
Protestant	48.6	12.2	582
Muslim	60.8	9.2	51
Other Religion	76.1	6.9	10
Marital Status			
Married	46.9	12.8	610
Not Married	47.9	13.3	73

difference mostly generated from differences during the first 12 months of use). Women who

live in Central Province exhibit the longest durations of contraceptive use (18.3 months), while those in Western have the shortest (9.8 months). Although the percentage of women without education who use contraception is generally considerably lower than those with primary and secondary education, non-educated women who initiate contraceptive use tend to use for longer durations than their more educated counterparts. There is not much difference in the extent of contraceptive discontinuation between Catholics and Protestants, but Muslims have considerably higher levels of discontinuation during the first 12 months of use, and people with other or no religion exhibits the lowest levels of discontinuation. There is also no difference in contraceptive continuation/discontinuation between married and single users. Table 6.4b shows the all method discontinuation rates for the same background characteristics. The results are generally similar to those for first-method discontinuation rates, except that the relationship between age and contraceptive discontinuation is curve-linear rather than linear in the former case.

6.3.2 Reasons for discontinuation

Understanding reasons that respondents give for discontinuing use of specific contraceptive methods is vital for improving the quality of services provided to clients. Women who discontinued a method were asked reasons for discontinuation. Table 6.5 shows the percentage of users of specific methods who discontinued use within 12 months of initiation. For all methods combined, the data show that about a third (33%) of all users discontinue a method within 12 months of use. Concern about side effects is the single most important reason for discontinuing use for all methods combined (8.5%), followed by method failure (5%) and desire to become pregnant (4.6%). Contraceptive failure, desire to become pregnant (and infrequent sex), and health concerns (and other method-related reasons) account

Table 6.5 Twelve Months Contraceptive Discontinuation Rates by reason for discontinuation according to method

Contraceptive Method	Method Failure	To Become Pregnant	Side effects, Health Concerns	Husband Disapproves	Inconvenience/ Cost	More effective Method	Infrequent Sex	Other/ Missing	All Reasons
Pill	2.3	4.6	17.3	1.3	3.5	1.7	1.4	2.2	34.3
Injectables	0.9	3.4	9.5	0.8	1.2	0.1	0.6	1.0	17.5
IUD	5.7	7.1	2.8	2.2	0.0	2.5	0.0	0.0	20.4
Condom	3.6	7.8	0.4	10.1	9.3	7.7	15.4	6.6	60.7
Traditional Methods	13.9	6.0	0.0	0.7	1.1	3.3	4.2	6.1	35.3
All Methods	5.0	4.6	8.5	1.6	2.7	2.4	3.2	2.1	30.1

NOTE: Norplant is not included because out of the 44 cases of Norplant episodes of use, only 1 episode was discontinued because of a woman wanting to get pregnant and 2 for side effects and health concerns the other 41 episodes of Norplant use were not discontinued.

for 17, 26, and 50 percent of all discontinuations within 12 months of initiating use. Concern about side effects is also the most commonly cited reason for discontinuation of the two most

commonly used methods of contraception in Kenya (pills and injectables), while method-failure is the leading cause for discontinuing traditional methods. For IUDs, desire to become pregnant is the leading reason cited for discontinuation (7.1%) followed by method failure (5.7%). Lack of exposure to sex, spousal disapproval, inconvenience, and need for a more effective method are the leading unintentional reasons for condom discontinuation.

The importance of each reason of discontinuation can be further examined by comparing the percentage distribution of all discontinuations by reason for discontinuation for all durations of use (Table 6.6). For all methods, more than a quarter (27%) of all discontinuations are due to side effects or health concerns, another quarter (24%) due to desire to become pregnant, and 18 percent due to contraceptive failure. It is evident that health concerns and side effects are, by far, the most commonly mentioned reasons (42% to 52%) for discontinuing the three most popular methods in the country (pills, injectables and IUDs). Contraceptive failure is the leading reason for discontinuation of traditional methods, while infrequent sex is the key reason for discontinuing the coital-dependent condom. Voluntary discontinuations (desire to become pregnant and reduced exposure to sex or the risk of conception) account for about a third (33.4%) of all discontinuations, while the other two-thirds are due to method-related reasons. These rates are similar to the rates in Zimbabwe where method-related reasons account for about 62% of all discontinuations (Sambisa 1996).

Table 6.6 Reasons for Discontinuation

Main reason for discontinuation	Pill	IUD	Injectables	Condom	Periodic Abstinence	Norplant	All Methods
Became pregnant	8.5	8.3	5.0	7.1	43.1	0.0	17.7
To become pregnant	24.7	37.5	24.1	14.6	25.4	33.3	24.0
Husband disapproved	3.2	0.0	3.1	14.6	1.1	0.0	4.0
Side effects/Health concern	42.1	45.8	51.7	0.5	1.1	66.7	26.9
Access/ Availability/ Cost	3.5	0.0	2.5	3.5	0.0	0.0	2.2
More effective method	4.1	4.2	1.5	12.6	9.4	0.0	6.1
Inconvenient to use	4.6	2.1	1.9	11.1	4.5	0.0	4.9
Infrequent sex/Menopause	4.1	0.0	4.3	29.8	11.9	0.0	9.4
Other/Don't know	5.2	2.1	5.9	6.1	3.4	0.0	4.9
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Number of cases	539	48	323	198	444	3	1577

Further analysis of reasons for contraceptive discontinuation in this study is based on the four broad avenues of contraceptive discontinuation (failure, switching, abandonment while in need, and abandonment when there is no need for contraception), which are defined in Section 6.2.2. Table 6.7 shows cumulative rates of contraceptive failure, switching, and abandonment after 12, 24, and 36 months of use. These data show that abandonment of contraceptive use while still in need of contraception is the most commonly occurring type of discontinuation during each of the three duration segments. A significant proportion of contraceptive users (8% at the end of 12 months of use, and 15.8% at the end of 36 months of use) end up with unplanned pregnancies due to contraceptive failure. If discontinuation while still in need is combined with discontinuation due to contraceptive failure (two areas where programs can make a difference by improving the quality of services and method mix), between 20 and 40 percent (after 12 and 36

months of use, respectively) of all contraceptive users become unsatisfied program clients. Expressed as a proportion of all discontinuations, the data show that close to 60 percent of all contraceptive discontinuations during the first 36 months of use are a result of these two extremely undesirable reasons. This pool of unsatisfied program clients represents the potential impact that family planning programs could have on contraceptive prevalence rates by ensuring that women attain their reproductive goals, and that a sizable proportion of those who would like to stop childbearing or delay the next birth would continue using contraception.

Table 6.7 Method Specific Cumulative Rates of Contraceptive Failure, Switching and Abandonment, Kenya 1998.

Duration	Failure	Switching	Abandon No need	Abandon In need	% Discontinuing	% Continuing	Episodes
All methods							
12 months	8.3	4.8	9.3	11.2	33.6	66.4	2993
24 months	13.0	6.4	16.9	16.4	52.7	47.3	
36 months	15.8	7.7	19.6	23.3	66.4	33.6	
Pill							
12 months	3.7	2.9	10.3	40.8	57.7	42.3	934
24 months	6.1	3.8	20.6	51.6	82.1	17.9	
36 months	8.6	4.1	28.8	58.5	99.1	0.9	
Injectables							
12 months	2.3	0.3	10.6	35.7	48.9	51.5	832
24 months	3.9	0.3	18.7	51.3	74.2	25.8	
36 months	4.9	1.7	28.5	64.9	100.0	0.0	
IUD							
12 months	4.7	3.7	6.9	30.2	45.5	54.5	118
24 months	7.8	4.7	16.0	47.8	76.3	23.7	
36 months	7.8	4.7	37.3	50.2	100.0	0.0	
Condom							
12 months	5.3	11.1	37.0	31.4	84.8	15.2	292
24 months	6.7	12.6	42.9	35.4	97.6	2.4	
36 months	7.2	12.6	44.4	35.8	100.0	0.0	
Norplant							
12 months	0.0	0.0	0.0	0.0	0.0	100.0	44
24 months	0.0	0.0	27.6	0.0	27.6	72.4	
36 months	0.0	0.0	46.4	53.6	100.0	0.0	
Traditional							
12 months	25.1	6.8	19.2	8.5	59.6	40.4	773
24 months	37.4	8.3	30.1	11.0	86.8	13.2	
36 months	43.0	9.1	37.0	11.0	100.0	0.0	

Between 5 and 8 percent of all women (constituting 16% and 9% of all discontinuations at 12 and 36 months, respectively) switched contraceptive methods. Condom users exhibit the highest rates of contraceptive switching throughout the first 36 months of contraceptive use, followed by users of traditional methods, IUDs and pills. Injectable users exhibit the lowest switching rates, and none of the 44 women who had adopted Norplant had switched to another method by the time of the survey. It is worth noting that the switching rates for Kenya are slightly lower than those for Zimbabwe (7.2%, 7.3%, and 10.9% for 12, 24, and 36 months respectively), but much lower than those for other developing countries outside Africa where switching is generally the most commonly occurring form of discontinuation of all the four outcomes (Curtis and Blanc 1997). The relatively low rates of switching in Kenya and Zimbabwe may be indicative of limited contraceptive choice (method mix) for women.

6.3.3 Patterns of Contraceptive Switching

When users of family planning switch from one method to another, the primary concerns for programs are whether the user switches to the new method immediately or not (i.e. there is no risk of getting mistimed or unwanted conceptions between termination of the old method and adoption of the new method), and also whether the new method is equally, more, or less effective than the discontinued method. Switching to less effective methods exposes women to a greater risk of unwanted pregnancies. Understanding reasons for discontinuing the previous method may also be critical in assessing the potential for the user to be satisfied with the new method.

The analysis presented in Table 6.8a examines the switching patterns for episodes that ended in a switch by the new method adopted. The results show that pill users constitute the largest proportion of contraceptive switchers (43%), and also that the majority of the pill users (60%) who switch methods switch to injectables. Although the number of cases in the other specific methods is rather small to make any substantive comments on the patterns, the data suggest that a sizable proportion of women switch from traditional to modern methods, but also from modern (particularly condom and pill users) to the less effective traditional methods. The patterns of switching show that women generally switch to methods that serve similar broad contraceptive goals. For instance, users of short-term methods tend to switch to other short-term methods (60% of pill users switch to injectables, while 61% of injectable users switch to pills). Similarly, users of coital-dependent methods tend to switch to other coital dependent methods. Over a third of women who were using condoms switched to the coital dependent traditional methods (withdrawal or periodic abstinence), and over half of traditional users switch to condoms (26%) or another coital-dependent traditional method (28%). Injectables appear to operate as a transitional stage to sterilization, as users of injectables exhibit the highest likelihood of switching to sterilization. The switch from pills to injectables represents the transformation of the method mix/preference in Kenya whereby pills have been replaced by injectables as the most popular contraceptives in the country. However, the comparably high proportion of switches from injectables to pills suggests that the two methods will continue to be the dominant methods of choice for Kenyan women. For all methods, injectables are the most preferred method for switchers, followed by pills and traditional methods.

Table 6.8a Percentage of Segments of Switching from a Specific Method to a Different Method in the last 5-year period prior to the survey

	New method							
Old method	Sterilization	Pill	Injectables	IUD	Condom	Other modern	Traditional	Number of cases
Pill	0.8	0.0	59.7	7.6	12.6	2.5	16.8	119
Injectables	7.1	60.7	0	1.8	17.9	1.8	10.7	56
IUD	0.0	54.5	36.4	0	0.0	0.0	9.1	11
Condom	0.0	26.3	28.9	7.9	0.0	0.0	36.8	38
Other Modern	0.0	100.0	0.0	0.0	0.0	0.0	0.0	2
Traditional	0.0	29.4	17.6	0.0	25.5	0.3	27.5	51
All Methods	1.8	24.1	34.2	4.7	13.7	1.1	18.0	277
Cases	5	67	95	13	38	4	55	

Examination of reasons for method switching is consistent with the general pattern of reasons for contraceptive discontinuation. Table 6.8b shows the proportion of women giving specific reasons for switching specific methods distributed by the new method adopted. The majority of women switching from pills and injectables do so because of health effects, while those switching from traditional methods do so in search of more effective methods. However, what is interesting is that, while 56 percent of users who abandon pills for health concerns and side effects end up adopting injectables, about 62 percent of injectable users who switch for the same reasons end up adopting pills. It is also interesting that about 62% of the women who discontinued pills because they needed a more effective method ended up opting for injectables, which may be a reflection of the relatively long-term and high user-effectiveness rates associated with injectables. Users who abandon traditional methods in search of more effective methods are more likely to adopt pills (29%) than the other methods. A substantial proportion of users who abandon traditional methods for this reason (47%) adopt another coital dependent traditional method or condoms (23.5% each).

Table 6.8b: Percentage distribution of reasons given for discontinuing specific method by new method adopted

OLD METHOD	NEW METHOD							Number
	Sterilization	Pill	Injectables	IUD	Condom	Other modern	Traditional	
Pill								
Side Effects/ Health Concerns	0.0	0.0	56.1	8.5	17.1	0.0	18.3	82
More effective Method	6.3	0.0	62.5	12.5	6.3	12.5	0.0	16
Other reasons	0.0	0.0	73.7	0.0	0.0	0.0	23.3	19
Injections								
Side Effects /Health Concerns	4.4	62.2	0.0	2.2	15.6	0.0	13.3	45
Other Reasons	14.3	50.0	0.0	0.0	28.6	0.0	7.1	14
Traditional								
More effective Method	0.0	29.4	23.5	0.0	23.5	0.0	23.5	34
Other reasons	0.0	31,2	6.3	0.0	31.2	0.0	31.2	16
All Methods								
Side Effects/ Health Concerns	1.4	24.6	34.8	5.8	15.9	0.7	16.6	138
More effective Method	4.1	20.3	40.5	5.4	12.2	2.7	14.9	74
Inconvenient to use	0.0	32.1	35.7	0.0	10.7	0.0	21.4	28
Partner disapprove/ other	0.0	24.3	5.4	18.9	10.8	0.0	40.5	37

6.3.4: Determinants of Contraceptive Failure, Switching and Discontinuation

As noted in the data section, the multivariate analysis on contraceptive discontinuation uses the discrete-time competing-risks multilevel modeling to examine the effects of various demographic, method-related, socioeconomic, and cluster level variables on the simultaneous risk of falling into any of the following four discontinuation categories: failure, switching to another method, abandoning use while not in need of family planning, and abandoning use while still in need of contraception. Table 6.9 presents the parameter estimates for this analysis. The coefficients compare the net likelihood that a given episode of use would end up in each of the four discontinuation avenues, as opposed to continuing use (the omitted category). The coefficient for the random effect depicts whether variation at the second level of the multilevel analysis (woman level) significantly affects the outcome being considered.

6.3.4.1 Contraceptive Failure

All contraceptive methods (with the exception of sterilization) are associated with varying levels of failure that may result from defectiveness of the method itself or user error or carelessness (Bongaarts and Potter 1983). Identification of factors that increase the risk of contraceptive failure beyond the standard method-failure rates could assist programs to reduce user-enhanced contraceptive failures. The multivariate results show that woman-level variation does not have a significant effect on the likelihood of experiencing contraceptive failure (the coefficient for random effect is not significant). Exposure to sex (marriage) and type of method used are the only two factors that have a significant net effect on the likelihood of contraceptive failure.

Women who were not married at the beginning of the interval are less likely to experience contraceptive failure than women who were married, probably because single women are more likely to be careful about not getting unwanted and mistimed pregnancies than married ones. The relatively low level of exposure to sex associated with not being married is also a likely explanation for this pattern.

Women who recently changed marital status (either became single or married) during the preceding three-month interval are more likely to experience contraceptive failure than those whose status did not change. Change in marital status may involve various disruptions in the woman's life, which may affect adherence to contraceptive use. For those starting a new marital partnership, issues like uncertainties about the new spouse's support of contraceptive use and perceptions about his reproductive goals (if the woman thinks he wants to have a child with her immediately) may increase chances of contraceptive failure.

Users of pills and traditional methods are significantly more likely to experience contraceptive failure than users of injectables. While traditional methods have relatively low efficacy rates, the significantly high likelihood of failure may also be enhanced by the fact that, in Kenya, most users of withdrawal and periodic abstinence (64%) are incapable of correctly identifying the middle of the menstrual cycle as the period when a woman's chances of conception is highest (NCPD, CBS and MI 1999). For pills, the high likelihood of failure may be a consequence of failure by the users to follow instructions for using the product, such as failure to take the pills every day. The importance of the type of method on contraceptive failure demonstrates the potential for programs to reduce failure by ensuring expanded method choice, that various users use appropriate methods (in terms of health effects), and ensuring that users of methods that are characterized by relatively low use-effectiveness rates are shifted to more effective methods or trained to use the methods effectively. Women with primary education are marginally significantly more likely to experience contraceptive failure (at 10% level of significance) than women with secondary education.

Table 6.9 Parameter estimates (with standard errors) from the discrete-time competing risks model on Contraceptive discontinuation

Characteristics	Failure		Switching		Abandon No Need		Abandon still in need	
Constant	0.03442	(0.00547)***	0.12460	(0.00957)***	0.06626	(0.00569)***	0.12210	(0.00553)***
Duration	-0.00236	(0.00027)***	-0.00406	(0.00028)***	-0.00370	(0.00027)***	-0.00718	(0.00027)***
Duration Squared	0.00003	(4.76E-06)***	0.00006	(4.95E-06)***	0.00005	(4.80E-06)***	0.00009	(4.77E-06)***
Individual characteristics								
Age								
15-24 (Reference)	0.00000	-	0.00000	-	0.00000	-	0.00000	-
25-34	0.00559	(0.00462)	-0.00163	(0.00477)	0.00020	(0.00467)	0.01259	(0.00463)***
35-49	0.00463	(0.00382)	-0.00390	(0.0039)	-0.00174	(0.00385)	0.00524	(0.00383)
Number of surviving children								
No children	-0.00148	(0.00624)	-0.01177	(0.00669)*	0.04243	(0.00633)***	-0.01940	(0.00626)***
1-2 children	-0.00234	(0.00406)	-0.00006	(0.00422)	0.01385	(0.0041)***	-0.01338	(0.00407)***
3-4 children	0.00070	(0.00338)	-0.00090	(0.00348)	0.00472	(0.00341)	-0.00613	(0.00339)
5+ children (Reference)	0.00000	-	0.00000	-	0.00000	-	0.00000	-
Marital status								
Married (Reference)	0.00000	-	0.00000	-	0.00000	-	0.00000	-
Not married	-0.01111	(0.00312)***	0.00466	(0.00348)	-0.01349	(0.00322)***	0.01030	(0.00314)***
Recent change in Marital Status								
No change (Reference)	0.00000	-	0.00000	-	0.00000	-	0.00000	-
Change	0.04393	(0.01154)***	-0.01571	(0.0118)	0.04778	(0.01156)***	-0.01569	(0.01154)
Marital status change								
No change (Reference)	0.00000	-	0.00000	-	0.00000	-	0.00000	-
Change	-0.00135	(0.01249)	-0.00507	(0.01269)	0.04368	(0.01251)***	0.03072	(0.01249)**
Contraceptive intention								
Limiting (Reference)	0.00000	-	0.00000	-	0.00000	-	0.00000	-
Spacing	0.00155	(0.00263)	-0.00788	(0.00277)***	0.01331	(0.00267)***	0.00877	(0.00264)***

Table 6.9 (continued): Parameter estimates (with standard errors) from the discrete-time competing risks model on Contraceptive discontinuation

Characteristics	Failure		Switching		Abandon No Need		Abandon still in need	
Contraceptive Method used								
Injectables (Reference)	0.00000	-	0.00000	-	0.00000	-	0.00000	-
PILL	0.00610	(0.00273)**	0.00699	(0.00286)**	0.00043	(0.00276)	0.01041	(0.00273)***
IUD	0.00363	(0.00533)	0.00087	(0.00551)	0.00817	(0.00538)	0.00033	(0.00535)
Condom	0.00587	(0.005)	0.01264	(0.00526)**	0.02730	(0.00505)**	0.00422	(0.00501)
Norplant	0.00418	(0.00808)	0.00125	(0.008526)	-0.00305	(0.00822)	-0.00877	(0.00811)
Traditional	0.03674	(0.00305)***	-0.00856	(0.00322)***	0.00809	(0.00310)***	-0.02460	(0.00306)***
Use status (Previous interval)								
Not using	0.00000	-	0.00000	-	0.00000	-	0.00000	-
Using Method	0.00142	(0.00335)	0.00892	(0.00351)***	-0.00325	(0.00339)	-0.00631	(0.00336)
Birth/Pregnant	0.00046	(0.00263)	-0.00046	(0.00274)	-0.00108	(0.00265)	-0.01159	(0.00264)***
Level of education	0.00000	-	0.00000	-	0.00000	-	0.00000	-
No education	0.00238	(0.00466)	-0.00284	(0.00483)	0.00298	(0.00470)	0.01783	(0.00467)***
Primary	0.00449	(0.00242)	-0.00304	(0.00257)	-0.00133	(0.00246)	0.00684	(0.00243)***
Secondary plus	0.00000	-	0.00000	-	0.00000	-	0.00000	-
Place of residence								
Country	0.00000	-	0.00000	-	0.00000	-	0.00000	-
City	-0.00354	(0.00364)	-0.00014	(0.00388)	-0.00807	(0.00369)**	-0.00159	(0.00365)
Town	-0.00170	(0.00358)	-0.00042	(0.00386)	-0.01009	(0.00365)***	0.00430	(0.00360)
Socio-economic Status								
Low (0-1 amenities)	0.00000	-	0.00000	-	0.00000	-	0.00000	-
Medium (2-3 amenities)	0.00136	(0.00235)	0.00097	(0.00246)	-0.00543	(0.00238)**	0.00396	(0.00236)*
High (4-5 amenities)	0.00025	(0.00398)	0.00119	(0.00423)	-0.00167	(0.00403)	0.00464	(0.00340)
Random effect variances	0.00002	(1.78E-05)***	0.01646	(0.00151)***	0.00019	(4.81E-05)***	0.00005	(2.41E-05)**

NOTE: **=Significant at p <=0.10, **= Significant at p <=0.05, ***= Significant at p <=0.01

6.3.4.2 Method Switching

Method switching should generally be seen as a positive form of contraceptive discontinuation by programs, so long as the switch is to an equally or more effective method, and as long as the user does not get exposed to the risk of mistimed or unwanted conceptions between the time the old method is discontinued and when the new one is adopted. Examination of patterns of method switching may also help to identify methods that users are not satisfied with, as well as the basis of the dissatisfaction. While a high level of method switching could be a concern from the perspective of the discontinued methods, it may also be a positive marker for the program's capacity to provide alternative methods to users. Unlike the contraceptive-failure case, the results show that woman-level heterogeneity has a strong and significant impact on the likelihood of contraceptive switching. This implies that efforts to change switching rates (reduce or increase, depending on why the switching is taking place) should also focus on identifying women who are more likely to switch methods than others.

Method-characteristics, contraceptive intentions and experience affect the likelihood of contraceptive switching. Women who are using contraception for birth spacing are significantly less likely to switch to another method than women whose intention is to limit their fertility. One of the key reasons why switching increases with parity is that women who are using contraception for spacing purposes tend to switch from short-term to mid-term methods, such as injections, before shifting to long-term or terminal methods such as norplant, IUD or sterilization (Ferguson 1992). In the early stages of the family planning program in Kenya, injectables were seen (by both service providers and clients) as methods most suited for women at high parities, many of whom were inclined to limit fertility rather than space births (Ndhlovu 1998). The importance of having an expanded method choice for women is demonstrated by the significance of type of method on the likelihood of switching. Pill users exhibit significantly higher levels of switching than users of injectables. As noted in the descriptive section, most switchers from the pill tend to go for injectables, a transformation that is seeing injectables replace pills as the most widely used contraceptive methods in Kenya. Condom use, which is mostly disrupted because of low effectiveness and inconvenience, is also more likely to end in a switch to another method than injectable use. Users of traditional methods are less likely to switch to other methods than users of injectables, indicating that apart from women who discontinue traditional methods due to failure, a substantial proportion of the traditional users would rather stick to the methods, despite their relatively low use-effectiveness rates. Women who were using another method of contraception in the month immediately prior to the start of the episode of use (previous switchers) are more likely to switch to another method than those who were not using a method. This suggests that switching from one method to another increases the likelihood that the user will make another switch in the future.

6.3.4.3 Discontinuation With No Need for Contraception

Since the role and objective for programs should be to assist couples attain their reproductive goals and needs, those who discontinue contraceptive use in order to have another child, or because they have reduced exposure to the risk of conception, should not be worrisome to programs. Determinants of contraceptive abandonment when not in need are more indicative of fertility intentions than contraceptive problems. It is not surprising, therefore, that the

likelihood of falling into this category of discontinuation is significantly influenced by a wide range of factors, including woman-level variables. Women who have one or two children or none at all are more likely to discontinue contraception when there is no need compared to those with more children. All the three measures of exposure to sex have a significant impact on the likelihood of falling into this category. Women who were not married at the beginning of the interval are less likely to fall in this category of discontinuation than women who were married, while those who had a change in marital status in the current interval, as well as in the previous, are more likely to abandon use probably because they do not need contraception. However, those who got married may abandon use because they want to have a child with their new spouse, while those who became single may abandon use because of reduced (or non-existent) exposure to sex. Women who are using contraception for spacing (as opposed to limiting) children are more likely to abandon use because they still desire to have more children. Users of the two coital-dependent methods (condoms and traditional methods) have a higher risk of falling in this category than those using injections, which may be a reflection of temporary reduction in exposure to sex or frustrations with inconveniences associated with these methods. Abandonment of use when there is no need is the only type of discontinuation that is significantly affected by place of residence and socioeconomic status. Women who were living in cities and towns at the beginning of the episode of use are less likely to fall in this category than residents of the countryside (rural areas), while women in the medium socioeconomic range are less likely to abandon use than their poorer counterparts.

6.3.4.4 Discontinuation while Still in Need of Contraception

Abandonment of contraceptive use while the woman is still in need of contraception should be as worrying as discontinuation due to method failure because the user is likely to have an unwanted or mistimed pregnancy if a new method is not adopted quickly. The multivariate results identify groups of women (differentiated by demographic, method and social characteristics) who have an increased risk of falling into this category of discontinuation. The results show that older women and women at higher parities are more likely than younger and lower parity women to discontinue use while still in need.

Women who were not married at the beginning of the interval, and those who experienced a change in marital status during the interval are more likely to abandon contraceptive use while still in need than those who were married and those who remained in the same marital status by the end of the interval. As noted in section 6.2.3, the categorization of women into those who abandoned use while in need and those who did so without need is based on the main reason for discontinuation given by the respondent. It is possible that some of the women who abandoned use did so at the time when they had temporal reduction in the need for contraception, but they gave another reason as the main reason for discontinuation.

Women who were using contraception for spacing purposes are more likely to abandon use while in need than those who seek to limit their fertility, probably because limiters are generally likely to be more protective about having unwanted fertility than spacers, who may end up having mistimed fertility. Pill users are also more likely to discontinue use while in need, while traditional users are less likely to do so compared to injectable users. Again, this appears to define a group of users who would rather stick to the less effective traditional methods than

abandon it. Women who gave birth in the month immediately prior to initiation of the episode of use are less likely to discontinue while still in need, most probably because the presence of the young child would increase the stakes of having a mistimed or unwanted conception.

It should be noted that while education is a powerful covariate for many reproductive outcomes, including adoption of contraception, it does not have a significant impact on the likelihood of experiencing contraceptive failure, switching, and abandonment when not in need of contraception. The level of education only has a significant impact on the likelihood of abandoning use while still in need where, as expected, non-educated and less educated women are more likely to fall in this category of discontinuation than their more educated counterparts. This shows that once a woman adopts contraception, what happens thereafter (in terms of level of protection and satisfaction) is not as dependent on socioeconomic factors as the decision to adopt contraception is.

6.4 Conclusions and Discussion

As a result of the phenomenal increase in the proportion of women using contraception in Kenya over the last two decades, the Kenyan family planning program is increasingly dealing with a population that has had some experience with contraception. In 1977/78, when about 7 percent of married women were using contraception; about 32 percent of married women had ever used family planning. By 1998, when close to 40 percent of all women were using contraception, about 61 percent of all married women had ever used a method of family planning. As noted by Jain (1989), further increases in the contraceptive prevalence rate at such a high level of contraceptive use is bound to be more dependent on promotion of continuation rates and re-adoption of contraception among past users than on promotion of new acceptance rates because unwanted and mistimed pregnancies would increasingly result from discontinuation of methods rather than failure to use contraception at all. The need to ensure that women who are using family planning are adequately protected from having unwanted births is even more critical for family planning programs since desired family size has declined substantially from 6.3 in 1984 to 4.1 in 1998. The analyses presented in this paper provide useful insights in understanding various dynamics of contraceptive use. The study examined overall and method-specific rates of contraceptive discontinuation, reasons for discontinuation and factors associated with various forms of discontinuation.

The data show that about 33 percent of all users discontinue a method after 12 months of use. Concern about side effects is the single most important reason for discontinuing use for all methods combined (8.5%), followed by method failure (5%) and desire to become pregnant (4.6%). For the specific methods, condom users have the highest rate of discontinuation during the first twelve months of use (62%), followed by pill users (36%), while injectable users exhibit the lowest rate of discontinuation (22%). Concerns about side effects is the most important reason for discontinuation of the two most commonly used methods of contraception in Kenya, pills and injectables; while method-failure is the leading cause for discontinuing traditional methods. Lack of exposure to sex, spousal disapproval, inconvenience, and need for a more effective method are the leading reasons for condom discontinuation. Since side effects and health concerns include real as well as imagined side effects of contraceptives, these results

demonstrate potential to enhance continuity of contraceptive use by intensifying IEC campaigns (to minimize concerns originating from negative rumors about family planning and imagined effects) and choice expansion (to provide alternative methods to women who are not suited for given methods). Given the finding that fear of health concerns and side effects and lack of information are the most easily surmounted obstacles to contraceptive use (Westoff and Bankole 1998; Omondi-Odhiambo 1999), the Kenyan family planning program in Kenya has substantial potential to improve its effectiveness if these issues are addressed to promote continuity of contraceptive use among current users with these concerns, and re-adoption among past users who discontinued use for these reasons. Additionally, the results point to the need to place more emphasis in shifting users of less efficient methods (particularly traditional ones) to more efficient methods, or to empower users of traditional methods to use these methods effectively, given that many users of periodic abstinence, for instance, do not have correct knowledge of ovulatory cycle (NCPD, CBS, and MI 1999).

As shown in Chapter 5, the rapid increase in contraceptive use in Kenya has been accompanied by a substantial transformation of the method mix, whereby injectables are the most preferred method by new clients as well as non-users who have expressed desire to use contraception in future. Based on the trends established over the past five to ten years, injectables are becoming the most commonly preferred method of contraception in Kenya. The analysis of discontinuation presented in this chapter has confirmed what other localized studies have shown that many pill users are switching to injectables primarily because of side effects and health concerns, although it is also interesting to note that most of the women who switch from injectables to pills do so for the same reasons. This pattern underscores the pivotal role played by these two methods in fulfilling women's reproductive goals in Kenya, and also on the need to ensure that service delivery points provide women with a choice between these two, and other methods. It is also worth noting that the overall switching rates for Kenya are slightly lower than those for Zimbabwe and other developing countries outside Africa where switching is generally the most commonly occurring form of discontinuation outcome. The relatively low rates of switching in Kenya may be indicative of limited contraceptive choice (method mix) for women.

The major weakness of the multivariate analysis of contraceptive discontinuation is that we did not have access to appropriate service information at the cluster level to incorporate the role of the service environment on contraceptive discontinuation. The results basically confirm the patterns in the descriptive analysis and other most expected findings relating to the impact of the demographic and socioeconomic characteristics of the women on contraceptive use and discontinuation. It is interesting to note, however, that while education is negatively associated with discontinuation that results in unmet need for family planning, it does not significantly affect the other forms of discontinuation, such as failure. This shows that once contraception is adopted, subsequent behavior is less dependent on socioeconomic factors than pre-adoption behavior. Other factors that significantly affect abandonment of contraception while still in need are age (younger women less likely to discontinue), number of children (women with smaller families less likely to discontinue, contraceptive intention (spacers more likely to discontinue than limiters), and method used (pills an more likely but traditional methods less likely than injectables). Actually, type of method used is the only variable to consistently affect the two critical forms of discontinuation (failure and abandonment while still in need), further signifying

the need to expand method choice and ensure that users adopt most appropriate methods for their needs.

NOTES

1 The model is of the following form:

$$\log\left(\frac{h_{rtijk}}{h_{5tijk}}\right) = \alpha_{rt} + x_{rtijk}\,\beta_r + u_{rjk} + v_{rk} + w_{r,} \quad r = 1,\ldots,4,$$

Where h_{rtjjk} is the hazard that an event (discontinuation) of type *r* occurs at duration *t* for episode *i*, woman *j*, located in cluster *k*. The hazard of continuing use (which is taken as a reference) is h_{5ijkl}. Thus, the model yields, over time, a series of contrasts comparing the hazard of discontinuation with the hazard of continuing use. The individual and community level random effects associated with the type of discontinuation r are u_{rij} and v_{rk}, which are assumed to be normally distributed with zero means and variance σ^2_{ru} and σ^2_{rv} respectively (Steele et al. 1999).

The model is fit in MlWin using the multinomial logistic model, which gives the same likelihood function as the competing risks discrete time hazards model (Yang et al. 1999, Goldstein 1995; Steele et al. 1996). The second order penalized quasi-likelihood approximation (PQL) estimation (Rasbash 1996) has been used (see Curtis and Blank 1997; Steele et al. 1999; Steele and Diamond 1999 for discussion of model fitting on contraceptive discontinuation in MLn). Each episode of contraceptive use is divided into three-month intervals to reduce the size of the analysis data file and speed up model fitting.

CHAPTER 7

CONCLUSIONS

This report has taken a comprehensive look at contraceptive use in Kenya based primarily on data from the 1989, 1993, and 1998 Kenya DHS surveys. There are several general themes and conclusions that emerge from this analysis.

7.1 Implications of urbanization

Contraceptive use remains higher in urban areas than in rural areas. Indeed, there is evidence that, net of other factors, urban-rural differentials in contraceptive use have widened during the 1990s due to a slower decline in nonuse associated with unmet need for contraception in rural areas than in urban areas, particularly in the period 1989-93. Rapid urbanization combined with higher levels of contraceptive use in urban areas should lead to overall increases in contraceptive use.

Despite higher levels of contraceptive use in urban areas, rapid urbanization means that non-users of contraception are becoming increasingly urban. The main reasons for non-use of contraception in both urban and rural areas are low pregnancy risk and health concerns, but health concerns are more frequently cited in urban than rural areas. The results of this study also suggest that urban non-users are becoming increasingly less likely to intend to use contraception in the future, while intention to use among rural residents has remained fairly constant or has even increased slightly, net of other factors. Although overall discontinuation rates are similar between urban and rural areas, urban residents are significantly less likely to discontinue use due to reduced need for family planning than rural residents.

Urban contraceptive users are more likely to choose long-term modern methods and less likely to choose traditional methods than their rural counterparts. Therefore, urbanization should result in a shift in the method mix towards modern methods. However, the differential between urban and rural use of traditional methods has decreased significantly, particularly between 1989 and 1993, due to reduced use of traditional methods in rural areas. In addition, use of long-term modern methods has declined in both urban and rural areas. Therefore, the effects of urbanization on method mix are subtle, perhaps resulting in less decline in the use of long-term modern methods than would have been seen otherwise.

7.2 Young unmarried adults

The analysis of non-users revealed that the proportion of ever-sexually active non-users who are aged 15-24 is increasing, as is the proportion who are unmarried. The reproductive health needs of these groups are different from those of older married women who have been the traditional focus of family planning activities in Kenya, and the analysis in this report presents a mixed picture of how well these needs are being met. Not surprisingly, the main reason for non-

use reported by young and unmarried women is low pregnancy risk, reflecting sporadic sexual activity in these groups. The 1998 KDHS shows that, whereas 44 and 54 percent of adolescent boys and girls aged 15-19 have ever had sex, only 19 and 25 percent respectively had sex in the four week period preceding the survey. The percentage of ever-sexually active young women and unmarried women who have ever used contraception is increasing, but even in 1998 half of young and unmarried women who had ever had sex had never used contraception. Lack of knowledge of family planning methods and sources is a more significant barrier to use for younger women than for older women; non-users aged 15-24 are significantly more likely than older non-users to report these reasons for non-use. Discontinuation rates are much higher among younger women than among older women. Net of other factors, younger women are significantly more likely than older women to discontinue use while they still need contraception, as are unmarried women.

Young and unmarried women who use contraception are most likely to choose short-term modern methods, particularly pills and injectables. Condom use among both young women and unmarried women is rising, but remains low. Neither age nor marital status has much effect on the probability of choosing a barrier method (mainly condoms) over other modern methods after controlling for other factors, although having no living children significantly increases condom use. An important finding is the relatively high level of current use of traditional methods among young women and particularly among unmarried women. Traditional methods are also more likely to be chosen as a first method among unmarried women and among women with no living children. This finding has important implications because the analysis presented here found high levels of pregnancy and low rates of current use of modern methods among women who first used a traditional method, and significantly higher failure rates among traditional method users in general.

Low rates of contraceptive initiation, high discontinuation rates, and relatively high levels of use of traditional methods among young, unmarried sexually active women combine to provide high potential for unintended pregnancy. The 1998 KDHS data show that about one in five women age 15-19 were either pregnant or already had a child at the time of the survey, and there has been little change in this figure between 1993 and 1998 (NCPD, CBS, and MI 1994; NCPD, CBS, and MI 1999). A wider range of DHS data from Sub-Saharan Africa show that about half of the births among women under 18 occur before marriage (Mahy and Gupta, in press). Thus, our findings lend further support for the inclusion of adolescent reproductive health in the most recent population policy.

7.3 Earlier initiation of contraceptive use

Another important trend identified by this report is that of earlier initiation of contraceptive use. Between 1993 and 1998, the mean number of living children at first use declined by half a child. The analysis shows that this decline is primarily driven by increased initiation of contraception for limiting at lower parities, although there has also been some increase in use for spacing, and spacing remains the main reason for initiating use at low parities.

7.4 The importance of sustaining use

While it is still true that the majority of non-users have never used contraception, the proportion of non-users who have previous contraceptive experience has increased substantially during the 1990s, reflecting higher levels of contraceptive use in general. In many ways, this is a positive trend in that the analysis here shows that women who have used contraception in the past are more likely than other women to intend to use in the future. Indeed, data from Morocco have shown that past use and intention to use in the future are strong predictors of subsequent contraceptive use (Curtis and Westoff 1997).

Not surprisingly, past users of contraception are less likely to cite disapproval of family planning as their reason for not currently using a contraceptive method, and are more likely to cite low pregnancy risk. Among all discontinuations in the five-year period prior to the 1998 KDHS, the most common reason given was to get pregnant. These discontinuations are mostly contributed by women who adopted use for spacing purposes and are likely to continue using after the birth of their child. Overall, 21 percent of users discontinue their method within two years due to reduced need for contraception. Therefore, many past users of contraception are not current users because of a reduced need for contraception. However, many users discontinue contraceptive use for other reasons that leave them exposed to the risk of unwanted pregnancy; overall 23 percent of women abandon use while in need within 3 years of initiating use and an additional 16 percent experience a contraceptive failure.

As contraceptive use continues to rise in Kenya the proportion of all non-users who are past users of contraception will also continue to rise. Hence, maintaining use among users and providing the appropriate services for past users who want to reinitiate use after a period of reduced need for family planning will become increasingly important. Addressing the needs and concerns of these women will require some different strategies from the strategies required to attract new users to family planning. The analyses in this report show that health concerns are the second most important reason for not currently using a method and for not intending to use a method. Past users of contraceptives, particularly modern methods, are more likely than never users to cite health concerns as their reason for not currently using a method. In addition, discontinuation of modern methods for side effects and health concerns is high, being the most commonly cited reason for pills, IUD and injectable discontinuations. Rutenberg and Watkins (1997) found in Nyanza Province, Kenya that the most common family planning topic women discussed in their social interactions outside the formal family planning sector was the side effects of modern contraceptives, especially oral contraceptives. They concluded that addressing concerns about side effects was essential to improving quality of care.

Method switching is often an appropriate response to side effects and other problems with methods; yet method switching rates appear to be low in Kenya. The reasons for the low switching rates require further exploration, although lack of availability of a range of methods does not seem to be a major factor since the majority of facilities have at least three methods available, and just over half have five or more methods available (MOH, NCPD, and ORC Macro 2000). Addressing concerns about and appropriately managing side effects, as well as supporting method switching, will play an important role in maintaining use among women who use contraception, attracting past users back to contraception, and attracting new users.

7.5 Changing method mix – the rise of injectables

A very striking feature of contraceptive trends in Kenya during the 1990s is the rise in the use of injectables. During the period 1989-1993 the increase in injectable use was primarily at the expense of traditional methods, particularly in rural areas. More recently, the increased use of injectables has been primarily at the expense of the pill and long-term modern methods. A brief examination of the KSPA data shows that the rise in injectable use is primarily driven by client demand, although there is some evidence that some health workers promote injectables over other methods. There is no sign of the popularity of this method declining; the injectable is most commonly cited as the preferred method among current non-users who intend to use contraception in the future and its popularity has increased over time. Pills remain more popular than injectables as a first method, particularly among recent initiators, but many women who started with the pill had switched to injectables by the time of the survey. Injectables are growing in popularity with all types of users, but are particularly popular among married spacers and young married limiters. Injectables also have the lowest discontinuation rate during the first 12 months of use with only 22 percent discontinuing compared to discontinuation rates of 33-62 percent observed for the other methods. This rate of discontinuation for injectables in Kenya is low by international standards, probably suggesting general satisfaction with the method.

Concurrent with the rise in injectables has been a decline in traditional methods, although this decline has been slowing since 1993. This is an important trend because traditional methods have high failure rates, in part due to the high proportion of traditional method users who do not have correct knowledge of the ovulatory cycle. Yet, traditional methods remain a relatively popular first method, particularly among young, low parity women. Relatively few women whose first method was a traditional method had switched to a modern method by the time of the survey, although many of them were pregnant, probably in part due to the significantly higher failure rate of these methods.

In conclusion, the majority of non-users of contraception in Kenya are still married women, live in rural areas and have never used contraception before. However, there are some important new trends emerging that deserve attention. As the population of Kenya becomes more urban and more educated, non-users of contraception also are becoming more urban and more educated. Such trends should ultimately lead to sustained increases in contraceptive use. The reproductive health needs of young, unmarried women are also becoming increasingly important. While there is some evidence of modest progress in meeting the needs of these women, there is still a lot to do. More and more women have experimented with contraception so sustaining the use of contraception among these women should be a growing priority. Finally, injectables have proved a very popular method in Kenya and their use looks set to continue to rise. The 2000 Sessional Paper No. 1 incorporates many of these areas; urban-rural disparities, adolescent reproductive health, and the quality of family planning services. The challenge now is to turn these policies into improvements in the reproductive health of Kenyan couples.

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APPENDIX I

Model specifications

The general form for the two-level multilevel multinomial model may be expressed as:

$$\log\left(\frac{\pi_{(s)ij}}{\pi_{(1)ij}}\right) = X'_{(s)ij}\beta_{(s)} + u_{(s)j}, \quad s = 2,3,...,k \quad [1]$$

Where:

- π_{ij} is the probability of an individual woman i in community j having a specific contraceptive status: user, non-user without unmet need, or non-user with unmet need (or the probability of woman i in community j reporting a particular reason for non-use);
- $X\mathbf{N}_{ij}$ is a vector of observed (fixed) covariates which may be defined at woman level or community level;
- β is associated vector of fixed parameter estimates;
- $u_{(s)j}$ is a vector of community level random effects, $u_{(s)j} \sim N(0, \sigma^2_{(s)u})$.

There are k response categories and one of the categories (e.g. the first category) is taken as the reference category. The subscript (s) represents the other categories of contraceptive status (or reasons for non-use).

The interpretation of the parameter estimates in a multinomial logit model is not straightforward, since the effect of the predictor variables on $\log(\pi_{(s)}/\pi_1)$ depends on the values of π_1. A convenient way to present the effects of the predictor variables on the outcome based on multinomial models is in the form of estimated probabilities (see Retherford and Choe, 1993).

The multilevel logistic model that is used in the analysis of future contraceptive intentions is of the form:

$$Logit\ \pi_{ij} = X\mathbf{N}_{ij}\ \beta + u_j \quad [2]$$

Where: π_{ij} is the probability of an individual non-user i in community j reporting no intention to use family planning in future; and the other parameters are as defined in [1] above.

APPENDIX II

Trends in socio-demographic profile of all sexually active women of reproductive age (1989-98)

Socio-demographic Characteristic	Percent of women (weighted) 1989	1993	1998
Residence			
Urban	17.5	17.5	23.6
Rural	82.5	82.5	76.4
Region			
Nairobi	7.8	6.9	9.8
Central	15.1	14.4	10.8
Coast	7.0	9.1	7.6
Eastern	17.5	19.0	17.1
Nyanza	17.8	16.2	21.4
Rift Valley	21.4	20.2	22.1
Western	13.4	14.1	11.2
Age group			
15-24	30.8	35.6	32.9
25-34	37.0	35.8	35.0
35+	32.2	28.7	32.0
Marital Status			
Never married	15.3	17.9	17.0
Currently married	76.3	72.3	72.8
Previously married	8.4	9.9	10.2
Number of living children			
0	12.5	16.4	15.6
1-2	26.9	29.7	34.0
3-4	23.6	23.1	24.3
5 +	37.0	30.8	26.1
Education level			
None	28.4	20.6	13.4
Primary incomplete	28.7	28.6	25.8
Primary complete	23.7	27.2	32.4
Secondary +	19.2	23.6	28.5
Past contraceptive behaviour			
Never used any	55.8	46.6	39.1
Used only traditional	16.7	13.5	10.8
Ever used any modern	27.5	39.9	50.1
Ideal family size			
3 or less	21.7	41.6	38.6
4	40.4	34.4	34.0
5+	33.9	18.3	22.4
Non-numeric	4.1	5.7	5.0
Future fertility desire			
Want later	20.1	18.8	25.1
Want no more	37.7	33.4	44.7
Other (want soon, undecided, infecund, etc)	42.3	47.7	30.3
Recent experience of an unplanned birth			
No	64.5	65.9	77.3
Yes	35.1	34.1	22.7
Total cases	6247	6402	6639

Base population: women who have ever had sex.

APPENDIX III

Socio-demographic characteristics of currently married sample by contraceptive/ unmet need status, 1989, 1993 and 1998 KDHS.

Socio-demographic Characteristic	Percent of women (weighted)			
	Current users	Non-users with no unmet need	Non-users with an unmet need	No. of cases
Year				
1989	25.5	29.3	45.2	4,771
1993	32.3	35.3	32.4	4,572
1998	37.0	37.9	25.1	4,847
Residence				
Urban	38.0	32.9	29.1	2,599
Rural	30.2	34.5	35.3	11,591
Region				
Nairobi	41.4	29.0	29.6	934
Central	51.8	20.3	27.9	1,865
Coast	23.1	46.4	30.5	1,932
Eastern	42.0	25.9	32.1	1,910
Nyanza	20.9	42.6	36.5	2,570
Rift Valley	30.3	33.5	36.2	3,045
Western	21.9	35.8	42.2	1,934
Age group				
15-24	21.0	41.6	37.4	3,595
25-34	35.2	30.9	33.9	5,740
35+	35.2	32.5	32.3	4,855
Number of living children				
0	6.0	78.7	15.3	1,018
1-2	28.6	38.7	32.7	3,986
3-4	35.7	30.8	33.5	3,908
5 +	35.8	24.7	39.5	5,278
Education level				
None	17.9	42.6	39.5	3,226
Primary incomplete	26.3	35.1	38.6	4,058
Primary complete	34.0	32.5	33.5	3,822
Secondary +	50.1	26.2	39.5	3,084
Ideal family size				
3 or less	43.7	28.2	28.1	3,946
4	32.3	31.7	36.0	5,391
5+	21.9	40.4	37.7	4,258
Non-numeric	15.3	51.4	33.3	595
Recent experience of an unplanned birth				
No	31.6	41.8	26.6	9,634
Yes	31.7	18.0	50.3	4,556
Partner's attitude on FP				
Approves	41.6	27.6	30.8	8,628
Disapproves	15.8	39.3	44.9	2,721
Unsure/don't know	16.5	49.3	34.2	2,841
Total	31.6	34.2	34.2	14,190

Base population: Currently married women.

APPENDIX IV

Parameter estimates for contraceptive non-use (versus. current use) by unmet need status

Parameter	Non-users with no unmet need	Non-users with an unmet need
Constant	2.65	1.88
Year (1989)[1]		
1993	-0.18	-1.12*
1998	-0.24	-1.29*
Residence (Urban)[1]		
Rural	0.31*	0.13
Region (Central) [1]		
Nairobi	0.57*	0.50*
Coast	1.04*	0.82*
Eastern	0.38*	0.32*
Nyanza	1.26*	1.05*
Rift Valley	0.78*	0.78*
Western	1.31*	1.24*
Age (15-24s) [1]		
25-34	-0.03	-0.49*
35+	-0.01	-0.65*
Number of living children (0)[1]		
1-2	-2.14*	-0.87*
3-4	-2.91*	-1.17*
5 +	-3.66*	-1.34*
Education level (None)[1]		
Primary incomplete	-0.47*	-0.37*
Primary complete	-0.84*	-0.65*
Secondary +	-1.38*	-1.24*
Ideal family size (3 or less)[1]		
4	0.38*	0.28*
5+	0.83*	0.45*
Non-numeric	1.24*	0.65*
Wanted status of last birth (Wanted)[1]		
Unplanned	-0.56*	0.59*
Partner's attitude on FP (Approves[1])		
Disapproves	0.99*	1.12*
Unsure /missing	0.86*	0.62*
Proportion in community heard FP message on radio	-0.99*	-0.97*
Year *residence interaction		
Rural 1993	0.06	0.36*
Rural 1998	0.05	0.24
Community random Effect (standard deviation)	0.46*	0.48*

1 - Reference category , * - p<0.05.

Base population: Currently married women (1989, 1993 and 1998)

APPENDIX V

Parameter estimates for specific reasons for non-use versus want children

Variable	Low/no pregnancy risk	Disapproval of FP	Health concerns	Other reasons
Constant	-0.57	-1.67	-1.61	-0.61
Residence				
Urban[1]	0.00	0.00	0.00	0.00
Rural	-0.51*	-0.76*	-0.87*	-0.47
Province				
Nairobi	-0.08	-0.09	-0.38	-0.42
Central[1]	0.00	0.00	0.00	0.00
Coast	-0.76*	-0.18	-0.64*	-0.98*
Eastern	0.47	0.07	0.26	-0.26
Nyanza	-0.20	-0.35	-0.23	-0.34
Rift Valley	-0.13	-0.13	-0.22	-0.02
Western	0.22	-0.09	-0.02	-0.18
Age group				
15-24[1]	0.00	0.00	0.00	0.00
25-34	-0.18	-0.06	-0.10	-0.78*
35 +	1.00*	0.65*	0.76*	-0.13
Marital Status				
Never married	3.38*	2.58*	2.82*	2.77*
Currently married[1]	0.00	0.00	0.00	0.00
Previously married	1.82*	0.99*	1.05*	1.28*
Number of living children				
0[1]	0.00	0.00	0.00	0.00
1-2	0.47*	1.60*	1.44*	0.90*
3-4	1.10*	2.49*	2.26*	1.93*
5 +	1.83*	3.40*	3.38*	2.44*
Education level				
None[1]	0.00	0.00	0.00	0.00
Primary incomplete	0.30	0.29	0.29	-0.18
Primary complete	0.51*	0.55*	0.57*	-0.20
Secondary +	0.29	0.02	0.39	-0.48
Past contraceptive behaviour				
Never used any[1]	0.00	0.00	0.00	0.00
Used only traditional	1.63*	-0.10	0.45	0.70*
Ever used modern	1.05*	-0.62*	0.86*	-0.05
Ideal family size				
3 or less[1]	0.00	0.00	0.00	0.00
4	-0.29	-0.08	-0.08	-0.27
5 +	-0.46*	-0.52*	-0.47*	-0.18
Non-numeric	0.02	0.33	-0.01	0.05
Recent unplanned birth				
No[1]	0.00	0.00	0.00	0.00
Yes	0.65*	1.01*	0.90*	1.02*
Community effect (s.d)	0.36*	0.44*	0.28*	0.02

[1] - Reference category, * - $p<0.05$.

Base population: non-users who have ever had sex (1998 KDHS)

APPENDIX VI

Parameter estimates for determinants of first contraceptive choice, KDHS, 1998.

	Model 1			Model 2		
	Sterilization/ Long-term	Traditional Methods	Short-term method	Sterilization/ Long-term	Traditional Methods	Short-term method
Parity at Initialization						
0	0.02**	0.56***	0.42	0.004**	0.598***	0.398
1(ref)	0.08	0.20	0.71	0.042	0.207	0.751
2	.055*	0.18***	0.77	0.032	0.148*	0.820
3-4	0.11	0.11***	0.78	0.077***	0.097***	0.826
5+	.0.18***	0.08***	0.74	0.186***	0.056***	0.759
Current age						
< 25 yrs(ref)	0.03	0.25	0.72	0.011	0.212	0.777
25 – 34 yrs	0.07***	0.21	0.72	0.048***	0.186	0.766
35+ yrs	0.15***	0.18	0.67	0.104***	0.160	0.736
Marital status						
Never married	0.07	0.16***	0.77	0.050	0.137**	0.813
Married(ref)	0.08	0.23	0.70	0.042	0.205	0.833
Formerly married	0.06	0.16**	0.78	0.038	0.129**	0.753
Desire for children						
Parity > ifs	0.06	0.29***	0.65	0.032*	0.249*	0.718
Parity = ifs	0.09	0.15**	0.77	0.042	0.120***	0.839
Parity < ifs(ref)	0.08	0.20	0.72	0.052	0.181	0.766
Education level						
No education				0.032	0.270*	0.698
Prim. incomplete(ref)				0.038	0.198	0.764
Prim. Complete				0.039**	0.177	0.785
Secondary+				0.071	0.145*	0.785
Place of Residence						
Urban				0.057	0.112***	0.831
Rural(ref)				0.039	0.213	0.748
Religion						
Catholic				0.036	0.217**	0.746
Protestant(ref)				0.047	0.168	0.785
Muslim/other				0.034	0.248*	0.718
Ethnicity						
Nairobi				0.055	0.172	0.772
Central				0.077*	0.108***	0.814
Coast				0.043	0.042***	0.915
Eastern				0.039	0.290	0.672
Nyanza				0.036	0.141***	0.823
Rift Valley				0.031	0.265	0.704
Western				0.038	0.234	0.728

* Significant at p<0.05 ** Significant at p<0.01 *** Significant at p<0.001

APPENDIX VII

Trends in Socio-demographic profile of users of contraceptives in Kenya (all methods)

Socio-demographic Characteristic	Weighted percent of all FP users		
	1989	1993	1998
Residence			
Urban	20.4	23.0	29.5
Rural	79.6	77.0	70.5
Region			
Nairobi	9.5	10.0	13.6
Central	20.8	22.6	16.4
Coast	5.3	6.3	4.6
Eastern	25.2	21.4	20.4
Nyanza	8.9	11.1	15.4
Rift Valley	22.6	17.2	20.8
Western	7.7	11.3	8.7
Age group			
15-24	23.3	24.4	23.7
25-34	40.9	44.8	40.9
35 +	35.8	30.8	35.4
Marital Status			
Never married	15.3	14.1	13.0
Currently married	77.5	77.7	80.0
Previously married	7.3	8.2	7.0
Number of living children			
0	7.2	7.5	8.4
1-2	23.2	28.4	34.6
3-4	26.9	27.3	28.0
5 +	42.7	36.8	29.0
Education level			
None	19.6	12.5	8.2
Primary incomplete	27.9	24.2	18.8
Primary complete	25.3	28.2	33.4
Secondary +	27.2	35.0	39.6
Ideal family size			
3 or less	28.7	52.8	46.9
4	41.4	32.5	34.2
5 +	27.8	13.5	16.5
Non-numeric	2.2	1.2	2.4
Correctly knows ovulatory cycle?			
No	70.7	71.4	68.9
Yes	29.3	28.6	31.1
Total percent	100.0	100.0	100.0
No. of cases	1656	1951	2355

Base population: Current users of all contraceptive method in 1989, 1993 and 1998.

APPENDIX VIII

Weighted percent distribution of users of specific contraceptive methods by background characteristics, 1989.

What factors are associated with the choice of specific contraceptive methods

	Type of Method						
Variable	Pill	Injectables	IUD/ Implants	Sterilization	Barrier	Traditional	No. of Cases
Residence							
Urban	31.5	9.2	22.8	10.7	3.9	22.0	337
Rural	16.8	12.2	10.5	16.9	3.1	40.4	1318
Region							
Nairobi	34.6	6.4	21.8	10.9	4.5	21.8	156
Central	22.0	10.4	21.4	16.2	3.2	26.7	345
Coast	33.3	20.7	6.9	17.2	2.3	19.5	87
Eastern	15.6	7.4	9.8	12.0	1.9	53.2	417
Nyanza	17.0	15.6	7.5	25.2	2.7	32.0	147
Rift Valley	12.3	16.0	9.1	17.1	4.0	41.4	374
Western	25.6	10.9	11.6	16.3	4.7	31.0	129
Age group							
15-24	27.5	5.2	8.1	1.6	4.2	53.5	385
25-34	24.2	14.9	14.2	10.8	2.9	33.0	678
35 +	9.8	12.0	14.8	30.5	3.0	30.0	594
Marital Status							
Single	20.9	7.9	9.9	0.8	2.8	57.7	253
Currently married	19.3	12.4	13.8	17.5	3.4	33.6	1282
Formerly married	22.5	10.8	10.8	27.5	2.5	25.8	120
Living children							
0	7.5	1.7	1.7	0.8	1.7	86.7	120
1-2	30.6	7.8	13.8	5.2	4.4	38.2	385
3-4	26.3	13.9	17.3	10.1	2.2	30.1	445
5 +	11.9	13.8	11.9	27.4	3.5	31.5	708
Education level							
None	13.3	11.1	6.5	22.3	1.5	45.2	323
Primary incomplete	17.1	15.8	9.8	20.2	2.0	35.1	461
Primary complete	23.2	12.9	12.9	12.6	2.6	35.8	419
Secondary +	24.2	6.2	21.1	9.1	6.2	33.1	450
Partner's attitude on FP							
Approves	20.8	12.2	15.5	19.9	3.8	27.8	1062
Disapproves	16.0	15.3	8.4	6.9	2.3	51.1	131
Unsure/ missing	5.6	11.1	1.1	4.4	1.1	76.7	90
No partner	21.6	8.8	10.1	9.6	2.7	47.2	375
Ideal family size							
Less than 3	25.4	8.6	16.8	12.6	4.0	32.6	476
4	19.0	11.5	14.2	14.9	3.4	37.1	685
5 +	15.7	12.4	8.0	19.6	2.6	41.7	460
Non-numeric	16.2	40.5	5.4	18.9	-	18.9	37
Recent unplanned birth?							
No	16.9	10.8	13.5	15.9	2.6	40.4	1040
Yes	24.6	13.0	12.2	15.4	4.4	30.5	617
Total	**19.8**	**11.6**	**13.0**	**15.6**	**3.3**	**36.7**	**1655**[1]

Base population: Current users of all contraceptive method in 1989, 1993 and 1998.

APPENDIX IX

Weighted percent distribution of users of specific contraceptive methods by background characteristics, 1993

What factors are associated with the choice of specific contraceptive methods

	Type of Method						
Variable	Pill	Injectables	IUD/ Implants	Sterilization	Barrier	Traditional	No. of Cases
Residence							
Urban	36.4	14.7	16.5	10.9	5.4	16.1	448
Rural	26.5	23.4	9.3	16.2	3.3	21.3	1503
Region							
Nairobi	41.5	11.8	14.9	5.6	5.6	20.5	195
Central	37.3	15.4	16.3	12.4	3.6	14.9	442
Coast	34.1	20.3	9.8	13.8	5.7	16.3	123
Eastern	30.8	14.8	11.9	13.8	3.1	25.5	419
Nyanza	18.0	30.9	5.1	26.3	2.3	17.5	217
Rift Valley	16.4	27.7	7.4	19.0	3.3	26.2	336
Western	22.7	35.9	7.3	14.1	4.5	15.5	220
Age group							
15-24	38.5	13.4	5.2	1.0	6.5	35.4	478
25-34	34.1	26.0	11.6	9.0	3.2	16.0	873
35 +	13.3	21.0	14.8	34.6	2.5	13.8	601
Marital Status							
Single	27.5	15.6	3.3	1.8	9.1	42.8	276
Currently married	28.9	22.0	12.8	17.0	2.8	16.6	1516
Formerly married	30.2	26.4	6.9	18.9	4.4	13.2	159
Living children							
0	15.8	3.4	0.7	-	16.4	63.7	146
1-2	46.8	15.4	11.0	2.4	4.0	20.4	553
3-4	31.6	26.1	13.5	11.1	2.6	15.0	532
5 +	15.6	26.2	11.3	30.5	1.8	14.6	718
Education level							
None	17.3	28.0	4.5	28.4	1.6	20.2	243
Primary incomplete	23.3	26.6	8.2	18.8	2.5	20.5	473
Primary complete	32.7	21.2	10.3	13.6	3.4	18.7	551
Secondary +	33.5	15.8	15.6	8.6	5.6	20.9	684
Partner's attitude on FP							
Approves	36.9	26.3	16.5	-	3.7	16.7	1074
Disapproves	22.4	33.6	9.5	-	-	34.5	116
Unsure/ missing	4.9	3.4	1.8	78.8	0.6	10.4	326
No partner	28.5	19.5	4.6	8.0	7.4	32.0	435
Ideal family size							
Less than 3	34.5	19.8	12.4	11.3	4.5	17.6	1030
4	23.8	23.5	10.3	18.1	2.8	21.5	634
5 +	17.3	24.1	7.1	21.4	3.0	27.1	266
Non-numeric	43.5	8.7	8.7	17.4	8.7	13.0	23
Recent unplanned birth?							
No	26.6	18.0	13.1	16.1	4.3	21.9	1219
Yes	32.5	27.0	7.4	13.1	3.0	16.9	732
Total	**28.8**	**21.4**	**11.0**	**15.0**	**3.8**	**20.1**	**1951**[1]

Base population: Current users of all contraceptive method in 1993

APPENDIX X

Weighted percent distribution of users of specific contraceptive methods by background characteristics, 1998.

What factors are associated with the choice of specific contraceptive methods

	Type of Method						
Variable	Pill	Injectables	IUD/ Implants	Sterilization	Barrier	Traditional	# of Cases
Residence							
Urban	24.7	26.2	12.8	11.1	6.6	18.6	695
Rural	20.3	30.9	6.7	15.5	4.5	22.0	1661
Region							
Nairobi	29.3	19.6	13.7	10.9	8.7	17.8	321
Central	26.3	34.3	13.4	9.8	2.8	13.4	388
Coast	22.0	40.4	7.3	15.6	4.6	10.1	109
Eastern	26.0	24.2	7.3	12.3	6.0	24.2	480
Nyanza	14.3	35.2	5.2	25.8	3.8	15.7	364
Rift Valley	15.7	32.8	6.5	10.8	5.3	28.9	491
Western	18.0	24.9	4.4	19.0	4.4	29.3	205
Age group							
15-24	27.6	27.8	4.1	-	9.7	30.7	557
25-34	26.4	34.1	8.5	7.0	4.2	19.9	962
35 +	12.2	25.4	11.3	32.0	3.2	15.8	834
Marital Status							
Single	24.8	19.6	3.6	1.6	13.4	36.9	306
Currently married	21.9	30.3	9.1	15.9	3.6	19.3	1885
Formerly married	13.5	38.7	9.8	19.0	8.0	11.0	163
Living children							
0	20.7	5.1	2.5	-	21.7	50.0	198
1-2	31.3	30.7	9.2	2.4	5.5	20.8	817
3-4	21.2	36.0	10.3	14.0	2.4	16.1	659
5 +	10.7	28.8	7.6	32.8	2.5	17.6	683
Education level							
None	10.8	8.4	2.1	29.4	2.1	27.3	194
Primary incomplete	18.7	30.9	6.3	18.1	4.7	21.2	443
Primary complete	24.2	32.2	5.6	13.1	5.2	19.6	785
Secondary +	23.2	26.8	13.2	10.2	5.9	20.7	932
Partner's attitude on FP							
Approves	23.1	32.1	10.3	16.3	3.9	14.3	1589
Disapproves	15.6	21.3	2.4	12.3	2.4	46.0	211
Unsure/ missing	13.3	20.5	4.8	16.9	-	44.6	83
No partner	20.9	26.2	5.7	7.7	11.5	28.1	470
Ideal family size							
Less than 3	28.5	28.0	9.5	10.1	6.5	17.4	1105
4	16.8	32.2	7.8	15.9	3.9	23.5	805
5 +	11.9	29.4	6.7	22.2	4.4	25.5	388
Non-numeric	23.2	23.2	8.9	16.1	1.8	26.8	56
Recent unplanned birth?							
No	21.5	28.0	9.4	16.3	5.0	19.7	1889
Yes	22.1	35.6	4.7	5.8	5.6	26.2	466
Overall	**21.6**	**29.5**	**8.5**	**14.2**	**5.1**	**22.0**	**2356**

Base population: Current users of all contraceptive method in 1998

APPENDIX XI

Parameter estimates for choice of long-term modern or traditional contraceptive methods, versus short-term modern methods (Standard errors given in brackets)

	Estimates (standard errors)		
Parameter	Long-term (modern)	Permanent	Traditional
Constant	-2.28 (0.527)	-6.66 (1.255)	0.05 (0.435)
Year of survey			
1989[1]	-	-	-
1993	-0.38 (0.215)	-0.64 (0.366)	-0.46 (0.330)
1998	-0.92 (0.195)*	0.05 (0.278)	-0.52 (0.322)
Residence			
Urban[1]	-	-	-
Rural	-0.50 (0.182)*	0.21 (0.278)	0.96 (0.282)*
Region			
Nairobi	-0.92 (0.192)*	-0.01 (0.287)	0.24 (0.300)
Central[1]	-	-	-
Coast	-1.25 (0.193)*	-0.07 (0.209)	-0.23 (0.245)
Eastern	-0.49 (0.155)*	0.05 (0.175)	0.80 (0.165)*
Nyanza	-1.05 (0.181)*	0.58 (0.174)*	0.21 (0.192)
R. Valley	-0.83 (0.157)*	0.15 (0.156)	0.60 (0.166)*
Western	-0.86 (0.193)*	0.14 (0.193)	0.45 (0.195)*
Age Group			
15-24[1]	-	-	-
25-34	0.52 (0.166)*	1.62 (0.425)*	-0.06 (0.127)
35 +	1.28 (0.213)*	2.99 (0.432)*	0.28 (0.172)
Marital status			
Never married	-0.37 (0.226)	0.07 (0.337)	0.52 (0.153)*
Currently married[1]	-	-	-
Formerly married	-0.33 (0.192)	0.60 (0.166)*	-0.10 (0.183)
Living children			
0[1]	-	-	-
1-2	0.77 (0.398)	1.27 (1.249)	-1.74 (0.181)*
3-4	1.02 (0.421)*	2.15 (1.259)	-2.14 (0.225)*
5 +	1.01 (0.447)*	2.87 (1.270)*	-2.13 (0.251)*
Religion			
Catholic[1]	-	-	-
Protestant	0.04 (0.111	0.25 (0.120)*	-0.17 (0.092)
Muslim /other	0.44 (0.203)*	0.25 (0.238)	0.19 (0.210)
Education level			
None[1]	-	-	-
Primary incomplete	0.56 (0.220)*	-0.24 (0.144)	-0.27 (0.150)
Primary Complete	0.57 (0.224)*	0.02 (0.154)	-0.29 (0.155)
Secondary +	1.24 (0.220)*	-0.03 90.158)	-0.14 (0.155)
Partner's attitude			
Approves[1]	-	-	-
Disapproves	-0.09 (0.230)	-0.24 (0.220)	1.15 (0.145)*
Unsure	-0.49 (0.367)	3.35 (0.170)*	1.78 (0.190)*
Ideal family size			
<3[1]	-	-	-
4	-0.01 (0.114)	0.03 (0.127)	0.46 (0.099)*
5+	-0.16 (0.165)	-0.06 (0.146)	0.67 (0.129)*
Non numeric	-0.16 (0.386)	-0.82 (0.307)*	0.22 (0.325)
Wanted status of last birth			
Wanted[1]	-	-	-
Unplanned	-0.42 (0.117)*	-0.26 (0.128)*	-0.17 (0.097)
Correct knowledge of ovulatory cycle			
No[1]	-	-	-
Yes	0.17 (0.107)	0.22 (0.117)	0.30 (0.096)*
Prop. heard FP on radio	0.54 (0.300)	0.87 (0.279)*	0.06 (0.281)
Interactions with year			
Rural_93	-0.27 (0.238)	-0.54 (0.389)	-0.75 (0.347)*
Rural_98	-0.31 (0.237)	-0.50 (0.302)	-0.62 (0.347)
Community effect (s.d)	0.10 (0.094)	0.38 (0.098)*	0.87 (0.079)*

1 – reference category, *p<0.05

APPENDIX XII

Parameter estimates for choice of specific modern methods versus injectable .

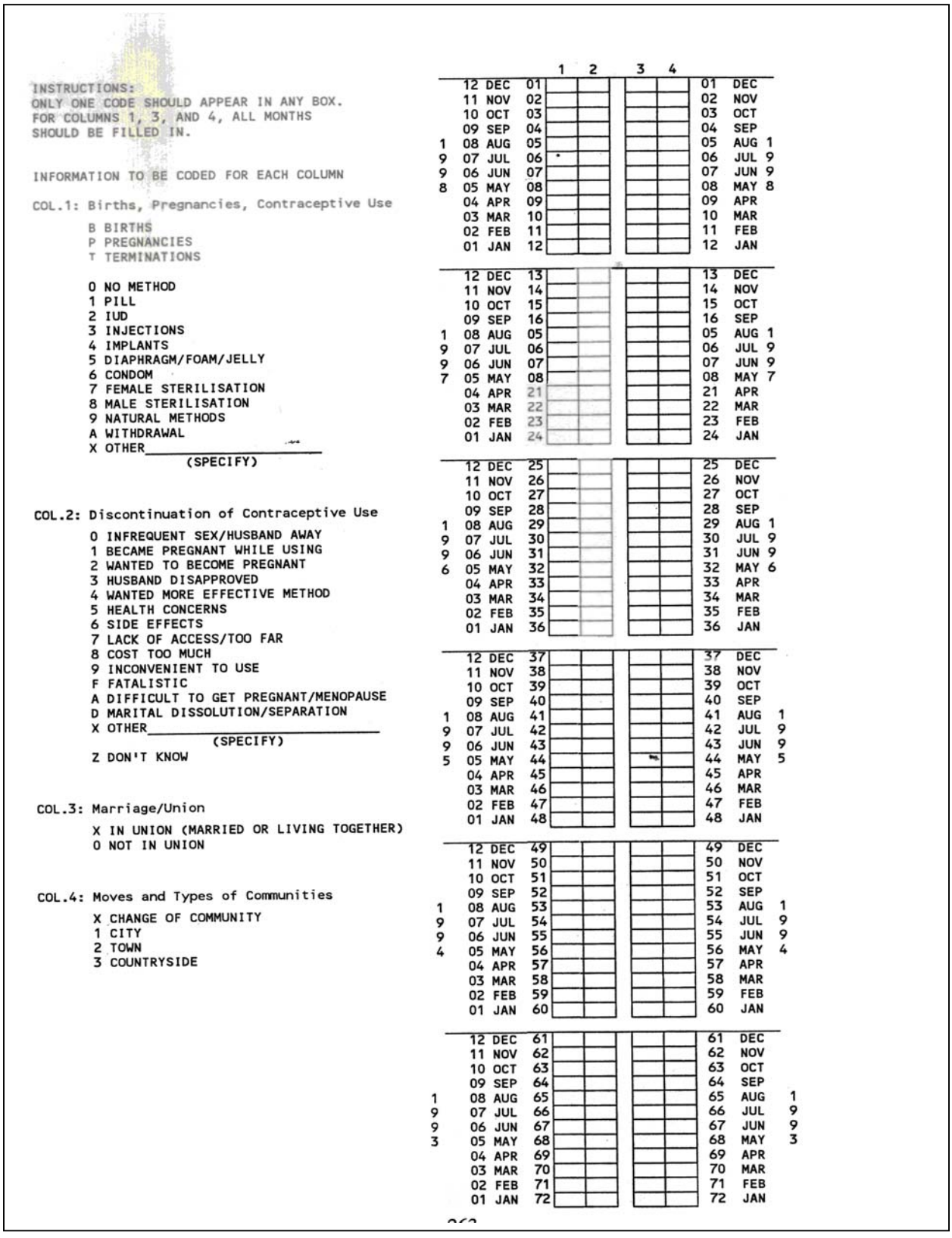
What factors are associated with the use of specific modern methods, and are these determinants significantly different across years?

	Estimates (standard errors)			
Parameter	Injectable	IUD/Implants	Sterilization	Barrier
Constant	-2.16 (0.485)	-1.76 (0.579)	-6.29 (1.161)	-1.20 (0.713)
Year of survey				
1989[1]	0.00	0.00	0.00	0.00
1993	0.51 (0.157)*	-0.38 (0.153)*	-1.27 (0.199)*	0.02 (0.236)
1998	1.22 (0.154)*	-0.59 (0.150)*	0.26 (0.147)	0.24 (0.230)
Residence				
Urban[1]	0.00	0.00	0.00	0.00
Rural	0.14 (0.172)	-0.75 (0.159)*	0.15 (0.191)	0.27 (0.255)
Region				
Nairobi	-0.40 (0.278)	-1.04 (0.226)*	-0.12 (0.288)	0.24 (0.346)
Central[1]	0.00	0.00	0.00	0.00
Coast	0.16 (0.206)	-1.11 (0.218)*	0.04 (0.218)	0.38 (0.326)
Eastern	-0.44 (0.189)*	-0.63 (0.169)*	-0.14 (0.190)	0.18 (0.262)
Nyanza	0.69 (0.196)*	-0.73 (0.207)*	0.95 (0.212*	0.16 (0.329)
R. Valley	0.82 (0.161)*	-0.43 (0.178)*	0.57 (0.173)*	0.60 (0.278)*
Western	0.26 (0.187)	-0.73 (0.204)*	0.28 (0.210)	0.34 (0.309)
Age Group				
15-24[1]	0.00	0.00	0.00	0.00
25-34	0.19 (0.144)	0.63 (0.174)*	1.79 (0.413)*	-0.14 (0.223)
35 +	0.36 (0.193)	1.51 (0.233)*	3.30 (0.421)*	0.77 (0.311)*
Marital status				
Never married	0.28 (0.170)	-0.27 (0.245)	0.15(0.345)	-0.09 (0.286)
Currently married[1]	0.00	0.00	0.00	0.00
Formerly married	0.28 (0.172)	-0.21 (0.215)	0.83 (0.193)*	0.30 (0.322)
Living children				
0[1]	0.00	0.00	0.00	0.00
1-2	0.91 (0.342)*	0.56 (0.424)	1.77 (1.153)	-2.16 (0.304)*
3-4	1.48 (0.365)*	0.94 (0.447)*	2.79 (1.144)*	-2.53 (0.402)*
5 +	1.89 (0.386)*	1.20 (0.480)*	3.78 (1.160)*	-2.30 (0.458)*
Education level				
None[1]	0.00	0.00	0.00	0.00
Incomplete primary	-0.19 (0.173)	0.46 (0.247)	-0.10 (0.183)	0.67 (0.421)
Complete primary	-0.28 (0.168)	0.41 (0.248)	-0.14 (0.186)	0.72 (0.415)
Secondary +	-0.46 (0.180)*	1.07 (0.247)*	-0.21 (0.200)	0.95 (0.423)*
Partner's attitude				
Approves[1]	0.00	0.00	0.00	0.00
Disapproves	0.15 (0.180)	-0.07 (0.254)	-0.35 (0.254)	-0.58 (0.449)
Unsure	0.03 (0.298)	-0.50 (0.406)	3.63 (0.245)*	-0.57 (0.542)
Ideal family size				
<3[1]	0.00	0.00	0.00	0.00
4	0.13 (0.110)	0.05 (0.124)	0.07 (0.143)	0.24 (0.195)
5+	0.03 (0.145)	-0.16 (0.182)	-0.09 (0.174)	0.48 (0.269)
Non numeric	-0.20 (0.327)	-0.36 (0.436)	-1.09 (0.360)*	-0.23 (0.764)
Recent unplanned birth:				
No[1]	0.00	0.00	0.00	0.00
Yes	0.10 (0.104)	-0.39 (126)*	-0.14 (0.146)	0.35 (0.188)
Prop heard FP on radio	-0.56 (0.285)*	0.33 (0.338)	0.56 (0.323)	-0.26 (0.441)
Community effect (s.d)	0.65 (0.093)*	0.14 (0.120)	0.12 (0.133)	0.15 (0.167)

$p<0.05$,

[1] - Reference categories.

APPENDIX XIII



INSTRUCTIONS:
ONLY ONE CODE SHOULD APPEAR IN ANY BOX.
FOR COLUMNS 1, 3, AND 4, ALL MONTHS
SHOULD BE FILLED IN.

INFORMATION TO BE CODED FOR EACH COLUMN

COL.1: Births, Pregnancies, Contraceptive Use

B BIRTHS
P PREGNANCIES
T TERMINATIONS

0 NO METHOD
1 PILL
2 IUD
3 INJECTIONS
4 IMPLANTS
5 DIAPHRAGM/FOAM/JELLY
6 CONDOM
7 FEMALE STERILISATION
8 MALE STERILISATION
9 NATURAL METHODS
A WITHDRAWAL
X OTHER_____
(SPECIFY)

COL.2: Discontinuation of Contraceptive Use

0 INFREQUENT SEX/HUSBAND AWAY
1 BECAME PREGNANT WHILE USING
2 WANTED TO BECOME PREGNANT
3 HUSBAND DISAPPROVED
4 WANTED MORE EFFECTIVE METHOD
5 HEALTH CONCERNS
6 SIDE EFFECTS
7 LACK OF ACCESS/TOO FAR
8 COST TOO MUCH
9 INCONVENIENT TO USE
F FATALISTIC
A DIFFICULT TO GET PREGNANT/MENOPAUSE
D MARITAL DISSOLUTION/SEPARATION
X OTHER_____
(SPECIFY)
Z DON'T KNOW

COL.3: Marriage/Union

X IN UNION (MARRIED OR LIVING TOGETHER)
0 NOT IN UNION

COL.4: Moves and Types of Communities

X CHANGE OF COMMUNITY
1 CITY
2 TOWN
3 COUNTRYSIDE

			1	2	3	4		
	12 DEC	01					01	DEC
	11 NOV	02					02	NOV
	10 OCT	03					03	OCT
	09 SEP	04					04	SEP
1	08 AUG	05					05	AUG 1
9	07 JUL	06					06	JUL 9
9	06 JUN	07					07	JUN 9
8	05 MAY	08					08	MAY 8
	04 APR	09					09	APR
	03 MAR	10					10	MAR
	02 FEB	11					11	FEB
	01 JAN	12					12	JAN
	12 DEC	13					13	DEC
	11 NOV	14					14	NOV
	10 OCT	15					15	OCT
	09 SEP	16					16	SEP
1	08 AUG	05					05	AUG 1
9	07 JUL	06					06	JUL 9
9	06 JUN	07					07	JUN 9
7	05 MAY	08					08	MAY 7
	04 APR	21					21	APR
	03 MAR	22					22	MAR
	02 FEB	23					23	FEB
	01 JAN	24					24	JAN
	12 DEC	25					25	DEC
	11 NOV	26					26	NOV
	10 OCT	27					27	OCT
	09 SEP	28					28	SEP
1	08 AUG	29					29	AUG 1
9	07 JUL	30					30	JUL 9
9	06 JUN	31					31	JUN 9
6	05 MAY	32					32	MAY 6
	04 APR	33					33	APR
	03 MAR	34					34	MAR
	02 FEB	35					35	FEB
	01 JAN	36					36	JAN
	12 DEC	37					37	DEC
	11 NOV	38					38	NOV
	10 OCT	39					39	OCT
	09 SEP	40					40	SEP
1	08 AUG	41					41	AUG 1
9	07 JUL	42					42	JUL 9
9	06 JUN	43					43	JUN 9
5	05 MAY	44					44	MAY 5
	04 APR	45					45	APR
	03 MAR	46					46	MAR
	02 FEB	47					47	FEB
	01 JAN	48					48	JAN
	12 DEC	49					49	DEC
	11 NOV	50					50	NOV
	10 OCT	51					51	OCT
	09 SEP	52					52	SEP
1	08 AUG	53					53	AUG 1
9	07 JUL	54					54	JUL 9
9	06 JUN	55					55	JUN 9
4	05 MAY	56					56	MAY 4
	04 APR	57					57	APR
	03 MAR	58					58	MAR
	02 FEB	59					59	FEB
	01 JAN	60					60	JAN
	12 DEC	61					61	DEC
	11 NOV	62					62	NOV
	10 OCT	63					63	OCT
	09 SEP	64					64	SEP
1	08 AUG	65					65	AUG 1
9	07 JUL	66					66	JUL 9
9	06 JUN	67					67	JUN 9
3	05 MAY	68					68	MAY 3
	04 APR	69					69	APR
	03 MAR	70					70	MAR
	02 FEB	71					71	FEB
	01 JAN	72					72	JAN

APPENDIX XIV

The model is of the following form:

$$\log\left(\frac{h_{rtijk}}{h_{5tijk}}\right) = \alpha_{rt} + x_{rtijk}\,\beta_r + u_{rjk} + v_{rk} + w_{r,} \quad r = 1,\ldots,4,$$

Where h_{rtjjk} is the hazard that an event (discontinuation) of type *r* occurs at duration *t* for episode *i*, woman *j*, located in cluster *k*. The hazard of continuing use (which is taken as a reference) is h_{5ijkl}. Thus, the model yields, over time, a series of contrasts comparing the hazard of discontinuation with the hazard of continuing use. The individual and and community level random effects associated with the type of discontinuation r are u_{rij} and v_{rk}, which are assumed to be normally distributed with zero means and variance σ^2_{ru} and σ^2_{rv} respectively (Steele et al. 1999).

The model is fit in MlWin using the multinomial logistic model, which gives the same likelihood function as the competing risks discrete time hazards model (Yang et al. 1999, Goldstein 1995; Steele et al. 1996). The second order penalized quasi-likelihood approximation (PQL) estimation (Rasbash 1996) has been used (see Curtis and Blank 1997; Steele et al. 1999; Steele and Diamond 1999 for discussion of model fitting on contraceptive discontinuation in MLn). Each episode of contraceptive use is divided into three-month intervals to reduce the size of the analysis data file and speed up model fitting.