Trends and Determinants of Contraceptive Method Choice in Kenya

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This study uses data from the 1989, 1993, and 1998 Kenya Demographic and Health Surveys to examine trends and determinants of contraceptive method choice in Kenya. The analysis, based on two-level multinomial regression models, shows that, over time, the use of modern contraceptive methods, especially long-term methods, is higher in urban than in rural areas, whereas the pattern is reversed for traditional methods. Use of barrier methods among unmarried women is steadily rising, but the levels remain disappointingly low, particularly in view of the HIV/AIDS epidemic in Kenya. One striking result from this analysis is the dramatic rise in the use of injectables. Of particular program relevance is the notably higher levels of use of injectables among rural women, women whose partners disapprove of family planning, uneducated women, and those less frequently exposed to family planning media messages, compared with their counterparts who have better access to services and greater exposure to family planning information. (STUDIES IN FAMILY PLANNING 2003; 34[3]: 149–159)

Substantial evidence is found in existing literature that broadening the choice of contraceptive methods increases overall contraceptive prevalence (Freedman and Berelson 1976; Phillips et al. 1988; Jain 1989). The provision of a wide range of contraceptive methods increases the opportunity for individual couples to obtain a method that suits their needs. A recent study of contraceptive method choice in developing countries confirmed that prevalence is highest in countries where access to a wide range of methods is uniformly high (Ross et al. 2002).

Contraceptive choice is also a central element of quality of care in the provision of family planning services and an important dimension of women's reproductive rights (Bruce 1990; Díaz et al. 1999). To increase prevalence of use, family planning programs should offer a variety of safe, effective, acceptable, and affordable contraceptive methods to help women prevent unwanted pregnancies and sexually transmitted diseases (STDs) and to help them achieve their childbearing goals. Method mix is a key determinant of the fertility impact of contraceptive practice; the use of more effective methods, even by a smaller proportion of eligible couples, can produce a greater decline in fertility than can the use of less effective methods by a larger proportion of couples (Shah 1991). Therefore, a proper understanding of factors associated with contraceptive method choice is not only important for improvements in quality of care and program planning and management (for example, logistics, training needs, financial planning) but also for enabling a country to realize the desired impact of its family planning policies and programs concerning unwanted fertility.

Studies of contraceptive method choice in countries of sub-Saharan Africa are few, probably because of the generally low contraceptive prevalence in the region. In Kenya, modern methods of contraception have been available since 1957 through the facilities of the Ministry of Health (MOH) and the private sector, including nongovernmental organizations (NGOs). In 1967, Kenya was the first country in sub-Saharan Africa to adopt a national population policy. The current Kenyan national family planning strategy goal is to "[m]ake available quality and sustainable family planning services to all who need them, in order to reduce the unmet needs for

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family planning" (MOH 1996:25). The combined program efforts of public and private agencies facilitated the country's transformation from having the highest fertility level in the world in the late 1970s to one that has experienced since then one of the most dramatic fertility declines in human history. Contraceptive use among married women increased from 17 percent in 1984 to 39 percent in 1998, making Kenya's contraceptive prevalence rate one of the highest in sub-Saharan Africa. The main methods currently available include the pill, injectables, the intrauterine device (IUD), hormonal implants, barrier methods (mainly male condoms), sterilization, and natural family planning.

Given this background of rapidly growing family planning practice, issues of contraceptive-use dynamics are becoming increasingly important in Kenya. A growing need exists for an examination of the implications of method-choice patterns for the fertility impact of contraceptive practice and for the sustainability of the Kenyan family planning program. Analysis of the trends in the characteristics of users of specific methods can provide insights about Kenya's future contraceptive needs (see Johnson and Macke 1996). Such information will help the family planning program operate optimally by enabling it to procure and distribute adequate quantities of desired and appropriate methods to meet increasing demand.

The aims of this study are to examine the trends and determinants of contraceptive method choice in Kenya; to identify the sociodemographic and community factors influencing method choice; and to establish whether the patterns of choice suggest that the types of methods chosen are suitable for users' reproductive needs.

Data and Methods

The analysis presented here is based on the three sets of data collected in 1989, 1993, and 1998 for the Kenya Demographic and Health Survey (KDHS). A total of 22,571 women aged 15–49 were interviewed for the three surveys. Information obtained from responses to the questionnaire provides data on the socioeconomic, cultural, and demographic characteristics of users of a variety of contraceptive methods. Moreover, the KDHS data provide information for constructing contextual community factors (for example, the proportion of women reached by information campaigns through mass media such as radio) that are also included in the analysis. Background characteristics were selected for inclusion in the analysis based on their significance in previous studies of contraceptive behavior or on their hypothesized association with contraceptive choice. They can be grouped broadly into contextual factors (survey year, region, and area of residence); demographic factors (age, number of living children, marital status, and planning status of the most recent pregnancy); socioeconomic factors (religion and education); and knowledge and attitudinal factors (ideal family size, partner's attitude toward family planning, knowledge of the ovulatory cycle, and community exposure to family planning messages on the radio).

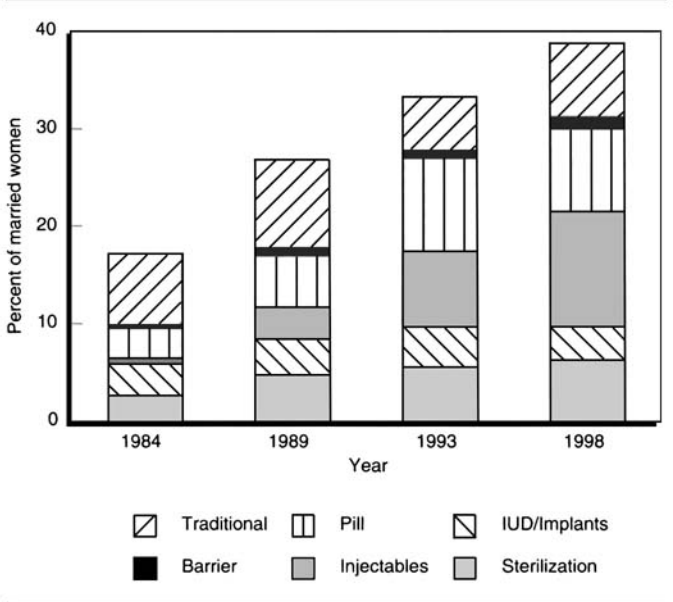
The prevalence of specific contraceptive methods is determined by two related processes: the decision to practice contraception and the choice of method. Therefore, these processes are modeled here in two stages. In the first stage, we examine trends and determinants of the decision to practice contraception. This analysis is based on data from all ever sexually active women of reproductive age. In the second stage, we examine trends and determinants of the choice of methods among women who are using a contraceptive. Two analyses of method choice are carried out. In the first analysis, we focus on the choice between general classes of methods. The response variable, method type, is classified into four categories: short-term modern,[1] long-term modern,[2] permanent, and traditional. The second analysis focuses on the choice between specific modern methods, and the response variable is classified into five distinct categories: the pill, injectables, IUD/implants,[3] sterilization, and barrier methods (mainly male condoms). The three KDHS data sets are merged, and interactions of specific factors with year are included to test whether the determinants of method choice are significantly different across survey years.

Contraceptive use and method choice among women in the same community are likely to be correlated as a result of unobserved factors such as the availability of specific methods at existing facilities or the community's perceptions of specific methods. Therefore, we use multilevel logistic and multinomial models for the multivariate analyses. These two-level models take into account effects at the individual level and at the unobserved community level. Details of the multilevel multinomial model used can be found in Magadi et al. (2001). A convenient way to present the effects of the predictor variables on an outcome based on multinomial models is in the form of estimated probabilities (Retherford and Choe 1993). These probabilities are calculated for each covariate while the remaining covariates and the community-level random effects are held at their mean values. They represent the estimated probability of choosing a particular method when other factors are held constant. For comparability, we also present predicted probabilities for the logistic model of contraceptive use.

Results

Figure 1 shows overall trends in contraceptive use by method among currently married women in Kenya from 1984 to 1998. Overall, contraceptive use among married women increased from 17 percent in 1984 to 39 percent in 1998. The proportion of married women choosing sterilization more than doubled between 1984 and 1998, but the rate of increase slowed down in the 1990s compared with the 1980s. The use of long-term methods (the IUD and implants) rose steadily until 1993, but declined thereafter. The same pattern is shown for pill use, which increased sharply from 3 percent in 1984 to almost 10 percent in 1993, but had dropped slightly by 1998. Injectables have shown the most dramatic and consistent increase over the years, from less than 1 percent in 1984 to 12 percent in 1998. The use of barrier methods generally increased over the years, but the levels are still relatively low, with about 1 percent of married women reporting use of these methods in 1998. The trend in the use of traditional methods has been inconsistent, reaching its highest level of 9 percent in 1989, then decreasing to 6 percent in 1993, and increasing to nearly 8 percent in 1998. These method-specific trends show that the method mix in Kenya shifted from one in which almost half of all women practicing contraception were using traditional methods and in which modern-method use was fairly evenly divided among sterilization, the pill, and the IUD, to one in which hormonal methods, particularly injectables, dominate.

Figure 1 Trends in contraceptive method choice (current use) among married women aged 15–49, by survey year, according to method, Kenya, 1984–98



Factors Associated with Current Contraceptive Use and Nonuse

To better understand the context of method choice, we start by examining factors associated with overall contraceptive use and nonuse. The results in Table 1 confirm the increasing trend in contraceptive use in Kenya, net of key socioeconomic and demographic factors. The determinants of contraceptive use are largely as expected. No statistical significance is found for the interaction between area of residence and survey year, so the trends are the same in urban and rural areas. Central province is associated with the highest probability of contraceptive use, followed by Eastern and Nairobi, while Western and Nyanza provinces are associated with the lowest probability of contraceptive use. Increasing age and parity are both associated with increasing contraceptive use. In particular, parity has a strong association with contraceptive use; women with at least five living children are 6.5 times more likely than those with no living children to use contraceptives. Those who are unmarried or whose partners do not approve of family planning are less likely to use contraceptives than are married women and those whose partners approve of family planning.

As expected, women who have attained higher levels of education are more likely than others to practice contraception. Women who desire larger families are less likely to use contraceptives. Interestingly, women who recently experienced an unplanned birth are less likely than those who did not to be currently using a family planning method, implying that not enough is being done to prevent repeated unplanned births. Exposure to family planning information is associated with increased contraceptive practice. In addition to these factors, certain unobserved community factors have a significant effect on contraceptive use. Intracommunity correlations suggest that 5 percent of the total unexplained variations in contraceptive use is attributable to unobserved community factors. These variations may reflect service availability and accessibility within specific communities.

Determinants of Method Choice

The parameter estimates from the multivariate model of the determinants of contraceptive method type are presented in Appendix Table A1, and the corresponding predicted probabilities are given in Table 2. Overall, couples in Kenya are more likely to use short-term modern contraceptive methods than either long-term or traditional methods. This finding is consistent across almost all subgroups of women. The determinants of method choice are fairly constant over time; only urban–rural differ-

Table 1 Parameter estimates, odds ratios, and predicted probabilities for use and nonuse of contraceptives, by selected variables, Kenya, 1989–98

Variable	Estimate (standard error)	Odds ratio	Predicted probabilities
Constant	−2.30 (0.158)	—	0.25
Year of survey			
1989 (r)	0.00	1.00	0.19
1993	0.49 (0.062)*	1.63	0.28
1998	0.60 (0.062)*	1.83	0.30
Residence			
Urban (r)	0.00	1.00	0.32
Rural	−0.40 (0.068)*	0.67	0.24
Region			
Nairobi	−0.48 (0.114)*	0.62	0.28
Central (r)	0.00	1.00	0.39
Coast	−0.84 (0.090)*	0.43	0.21
Eastern	−0.22 (0.075)*	0.80	0.33
Nyanza	−1.03 (0.078)*	0.36	0.18
Rift Valley	−0.69 (0.072)*	0.50	0.24
Western	−1.04 (0.096)*	0.35	0.18
Age group			
15–24 (r)	0.00	1.00	0.22
25–34	0.29 (0.056)*	1.33	0.27
35+	0.28 (0.074)*	1.33	0.27
Marital status			
Never married	−0.22 (0.061)*	0.80	0.23
Currently married/ cohabiting (r)	0.00	1.00	0.27
Formerly married	−0.73 (0.064)*	0.48	0.15
Partner's attitude toward family planning			
Approves (r)	0.00	1.00	0.31
Disapproves	−1.07 (0.062)*	0.34	0.13
Unsure/missing	−0.77 (0.058)*	0.46	0.17
Number of living children			
0 (r)	0.00	1.00	0.09
1–2	0.91 (0.074)*	2.48	0.20
3–4	1.46 (0.095)*	4.30	0.30
5+	1.87 (0.106)*	6.51	0.40
Educational level			
None (r)	0.00	1.00	0.15
Primary incomplete	0.44 (0.059)*	1.55	0.22
Primary complete	0.74 (0.062)*	2.10	0.28
Secondary+	1.22 (0.066)*	3.38	0.38
Ideal family size			
<3 (r)	0.00	1.00	0.31
4	−0.26 (0.044)*	0.77	0.25
5+	−0.56 (0.057)*	0.57	0.20
Nonnumeric	−0.81 (0.123)*	0.44	0.16
Had recent unplanned birth			
No (r)	0.00	1.00	0.26
Yes	−0.18 (0.040)*	0.83	0.23
Proportion in community who heard about family planning on radio[a]	0.86 (0.123)*	2.35	
0			0.18
1			0.33
Community effect (standard deviation)	0.43 (0.029)*	—	—

* Significant at $p<0.05$. (r) = Reference category. — = Not applicable.
[a] Predicted probability when the proportion in the community who heard about family planning on the radio is zero and 1.

ences in method choice vary significantly by year, as illustrated in Figure 2. The probability of using modern contraceptive methods, especially long-term methods, is consistently higher in urban than in rural areas, whereas the probability of using traditional methods is higher in rural than in urban areas. In 1989, rural women were more likely to use traditional methods than modern methods, but this pattern was reversed in the 1990s, when overall, use of short-term modern methods was greater compared with use of the other methods. This pattern reflects a shift from traditional to short-term modern methods among rural users between 1989 and 1993 but relatively little change in the probability of choosing different types of methods since then. The probability that women will choose long-term methods has steadily declined over the years in both rural and urban areas, net of other factors.

As Table 2 shows, marked regional differentials appear in patterns of method choice. Women in Central Province are the most likely to use long-term methods, whereas those in Coast Province are the most likely to use short-term methods. The highest probability of use of permanent methods is in Nyanza, whereas Eastern Province shows the highest probability of use of traditional methods. The high probability of using permanent methods in Nyanza Province may be associated with a voluntary surgical contraception program in the province's Kisii district.

As expected, the probability of use of short-term methods declines steadily with age, whereas the probabilities of use of long-term and permanent methods increase with age. Single and younger women tend to be more likely to use traditional methods than their older and married counterparts. The highest probability of use of traditional methods is associated, however, with women who have no living children.

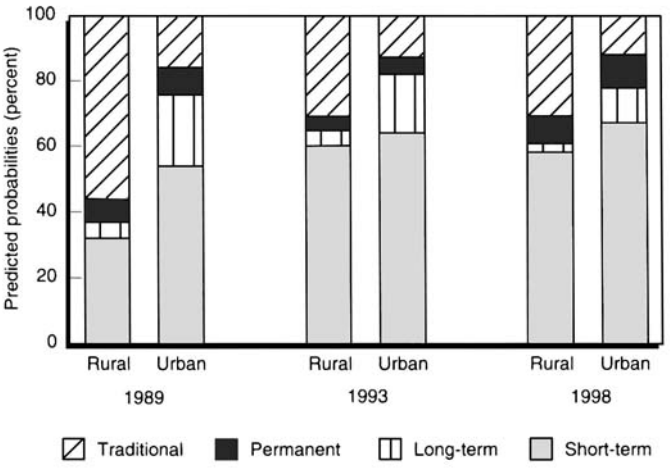
Despite the open opposition of the Catholic Church to the use of modern contraceptive methods, little variation is found in the probability of choosing between modern and traditional methods by religious affiliation. The variation in choice of different types of methods by educational attainment also seems minimal, although more highly educated women (those who attended secondary school or higher) are the most likely to use long-term methods, whereas those with no formal education are the most likely to use traditional methods. Partner's approval of family planning is important in method choice. Women whose partners disapprove of family planning are highly likely to use traditional methods of family planning, suggesting that in this group of women, the disapproval is directed toward modern contraceptive methods. As Table 1 shows, however, many women whose partners disapprove of family planning remain nonusers.

Table 2 Predicted probabilities that women will choose short-term modern, long-term modern, permanent, or traditional contraceptive methods, by selected variables, Kenya, 1989–98

Variable	Type of method			
	Short-term (modern)[a]	Long-term (modern)[b]	Permanent (modern)[c]	Traditional[d]
Residence/year of survey				
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				
Never married	0.59	0.06	0.06	0.29
Currently married/ cohabiting	0.65	0.10	0.06	0.19
Formerly married	0.64	0.07	0.11	0.17
Number 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
Educational 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 toward family planning				
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				
<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
Nonnumeric	0.68	0.09	0.03	0.20
Had recent unplanned birth				
No	0.62	0.10	0.07	0.21
Yes	0.68	0.07	0.06	0.19
Has accurate knowledge of ovulatory cycle				
No	0.64	0.09	0.07	0.20
Yes	0.62	0.11	0.08	0.19
Proportion in community who heard about family planning 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

[a] Includes injectables, the pill, and barrier methods. [b] Includes implants and the IUD. [c] Includes tubal ligation and vasectomy. [d] Includes periodic abstinence and withdrawal.

Figure 2 Urban–rural differentials in method choice, by survey year, Kenya, 1989–98



Although some statistically significant effects are found, method choice shows little substantive variation by ideal family size, recent experience of an unplanned birth, or exposure to mass media messages. A community's exposure to family planning media messages on the radio is generally associated with a higher probability of use of long-term and permanent methods, and a lower probability of use of short-term methods.

A significant community effect is seen in the multilevel model, suggesting that unobservable community factors influence the choice of different types of contraceptive methods, especially the choice between traditional versus short-term modern methods. The intracommunity 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 a high degree of homogeneity in the use of traditional methods within communities but do not shed light on the whether the factors behind that homogeneity are cultural or service related.

Determinants of Choice of Specific Modern Methods

The parameter estimates for the models of choice of specific modern methods are presented in Appendix Table A2 and the corresponding predicted probabilities in Table 3. The predicted probability of using injectables increased considerably from 0.2 in 1989 to 0.5 in 1998, whereas the probability of using the IUD or implants, and to some extent the pill, declined over this period. This finding suggests that Kenyan women who previously would have used other reversible modern contraceptive methods are now choosing injectables. The use

Table 3 Predicted probabilities for women's choice of specific modern contraceptive methods, by selected variables, Kenya, 1989–98

Variable	Method				
	Pill	Injectables	IUD/ implant	Female sterilization	Barrier
Year of survey					
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					
Never married	0.34	0.41	0.10	0.10	0.05
Currently married/ cohabiting	0.37	0.33	0.15	0.09	0.05
Formerly married	0.30	0.36	0.10	0.18	0.06
Number of 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
Educational 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 toward family planning					
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					
<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
Nonnumeric	0.45	0.34	0.12	0.04	0.05
Had 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
Proportion in community who heard about family planning 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

of injectables is associated with rural residence, whereas the use of the IUD and implants is associated with urban residence. Nairobi and Eastern provinces have the highest probability of pill use; use of injectables is highest in Rift Valley and Nyanza provinces.

The probability of using the pill tends to decline with age, as does that of using injectables, to a lesser extent. The probability of pill use is highest among women with one to two living children and lowest among women with five or more living children, but the probability of injectable use increases consistently with the number of living children. Overall, barrier methods are used predominantly by women who have not begun childbearing.

Educational attainment and partner's disapproval influence modern-method choice. Use of injectables declines with increasing educational attainment, whereas use of barrier methods tends to increase with education. Women whose partners disapprove of contraception are more likely to use injectables and less likely to use barrier methods, compared with those whose partners approve of family planning. This finding is not surprising: Condom use, after all, requires a partner's cooperation, whereas injectables may be used without a partner's knowledge. Community exposure to family planning media messages also has a significant effect on the choice of specific modern methods; greater exposure to family planning messages is associated with increased use of the pill, the IUD and implants, and sterilization, but with reduced use of injectables.

In addition to the factors mentioned above, the choice of injectables versus the pill varies significantly across communities (see Appendix Table A2). The intracommunity correlations suggest that 12 percent of the total variation in injectable versus pill choice is attributable to unobserved community factors (not shown). Such factors may include the availability of specific services within the communities, or communities' perceptions of specific contraceptive methods.

Contraceptive Method Mix and Reproductive Needs

Family planning clients have different needs: Young women may want to delay childbearing, couples may want to space births, and others may want to stop childbearing. An important question addressed here is whether the contraceptive method choices of users are consistent with their reproductive needs. The analysis draws on previous studies of appropriate contraceptive method mix (Choe and Bulatao 1992; Galway and Stover 1994; WHO 1999) to assess whether different groups of Kenyan women are using methods most likely to suit them. Table 4 shows trends in method mix by type of user.

Over the years, married limiters have constituted more than half of all contraceptive method users in Kenya, whereas unmarried women have constituted more

Table 4 Percentage distribution of methods, by survey year, according to type of user, Kenya, 1989–98

Year/type of user	Users	Percent using method						(N)
		Pill	Injectables	Barrier	IUD/implant	Female 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 <35	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 <35	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 <35	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)

than 20 percent of users. The most popular method among older limiters (aged 35 and older) is sterilization, accounting for about one-third of overall contraceptive use among this group of women. By contrast, the pill and, more recently, injectables, are the most popular methods among limiters younger than 35. In general, married spacers tend to favor the pill (constituting at least one-third of contraceptive use among this subgroup over time). This group also favored the use of traditional methods in the earlier (1989) period, and to some extent, preferred the use of injectables during the latter (1998) period. Traditional methods are the most popular choice among unmarried women, although their use declined from 43 percent in 1989 to 28 percent in 1998. While use of traditional methods among unmarried women has been declining, the use of injectables increased dramatically, so that by 1998, unmarried women were just as likely to use injectables as traditional methods. Use of barrier methods and, for the most part, of long-term methods (the IUD and implants), has remained low among all types of users. Although an appreciable proportion of younger married limiters (21 percent) were using IUDs or implants in 1989, this proportion dropped significantly to 6 percent by 1998. The use of barrier methods is rapidly gaining popularity among unmarried women, although the level in 1998 was still relatively low at about 11 percent.

The consistently increasing trend in the use of injectables, accompanied by a declining trend in the use of the IUD and implants among young married limiters, suggests an apparent shift from the IUD and implants to injectables among women in this group. This finding implies possible underuse of long-term methods. On the other hand, the apparent general shift by all types of users from traditional methods to injectables during the 1989–93 period is a positive change toward greater use of more effective contraceptive methods.

Discussion

A clear finding that has emerged from this analysis of method choice in Kenya is the dramatic rise in the use of injectables. The results suggest that women who previously would have chosen other reversible contraceptive methods (including the pill, the IUD and implants, and traditional methods) are shifting to injectable contraceptives. During the period from 1989 to 1993, the increase in injectable use was primarily at the expense of traditional method use, particularly in rural areas. More recently, the increased use of injectables has occurred primarily at the expense of pill use and long-term modern-method use. The popularity of this type of method shows no signs of declining. In separate analyses, injectable contraceptives were observed to be the most commonly cited preferred method among current nonusers who said they intended to use a method in the future. This type of method also has the lowest discontinuation rate during the first 12 months of use (22 percent), compared with discontinuation rates of 33–62 percent observed for the other methods (NCPD et al. 1999; Magadi

et al. 2001). Kenya's rate of discontinuation for injectables is low by international standards, suggesting general satisfaction with the method.

What are the program implications of this trend? Of possible concern is the apparent shift from the IUD and implants to injectables among limiters (especially younger ones) for whom long-term methods might be a suitable option. Typically, discontinuation and failure rates for injectables are higher than those occurring with IUDs and implants (Blanc et al. 2002), resulting in higher levels of unwanted fertility. In Kenya, however, discontinuation and failure rates for injectables appear to be as low as those for IUDs and implants, so the shift to injectables will probably not have a great impact in terms of unwanted fertility. Higher educational attainment and exposure to family planning messages through the mass media are both associated with reduced use of injectables, which suggests that use of this method may not always be well informed. Moreover, the increased use of injectables in rural areas in contrast with the IUD and implants suggests that service availability may be a factor in method choice. According to the 1999 Kenya Service Provision Assessment (KSPA) survey, the proportion of facilities offering the IUD varied from about one-third of facilities in Coast and Nyanza provinces (where IUD/implant use is lowest) to almost 80 percent of facilities in Nairobi (MOH et al. 2000).

From the perspective of service delivery, the rising popularity of injectables underscores the need for safe injection practices in the context of Kenya's high HIV prevalence and the recent debate on the transmission of HIV/AIDS in Africa (Brewer et al. 2003; WHO 2003). Although research findings conflict on the question of whether hormonal contraceptives facilitate transmission of HIV, clearly they do not protect users against HIV or other STIs, so that women who are at high risk of acquiring STIs should also use a condom during sex. Moreover, costing of programs, logistics, and staff training all must take into account the rising popularity of injectables over alternative methods.

Many positive aspects may be seen in the shift to injectables, however. The greater use of this type of method (as opposed to barrier methods) among women whose partners disapprove of family planning suggests that this is a viable option for family planning where spousal support is lacking. However, programs should encourage a partner's support (for example, through male-involvement initiatives) to ensure that individuals have the opportunity to make informed choices among the methods available. As noted above, a positive aspect of the apparent shift from traditional methods to injectables is that it suggests an increasing use of more effective contraceptive methods.

A critical question is whether method choice is predominantly supply driven or demand driven: Are women using the particular contraceptive methods that they prefer to use because the providers recommend them or because they are available at local facilities? The KSPA survey data suggest that method choice in Kenya is probably primarily demand driven. Although the health workers interviewed in the KSPA survey were often observed to promote or emphasize a particular method during consultations with clients, 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 they were asked, and most of them (88 percent) received their preferred method. The injectable is the most commonly preferred method (its popularity is increasing), followed by the pill, the popularity of which is declining. Choice is, to some extent, also influenced by supply, however; more than 85 percent of the 341 facilities surveyed provided injections, condoms, and oral contraceptives, whereas about half of the facilities provided the IUD. Natural family planning was taught at about 40 percent of the facilities, and only about 10 percent or fewer of the facilities provided implants, female sterilization, or vasectomy (MOH 2000).

The analysis of trends in method mix suggests a steady increase in the use of barrier methods among unmarried women, an increase that could be attributed to the growing use of condoms for the prevention of sexually transmitted diseases, including HIV/AIDS. A separate analysis of the 1998 KDHS data shows significantly higher condom use at last sex among adolescents and unmarried women, compared with older and married women (Waithaka and Bessinger 2001). The multivariate analysis presented here suggests, however, that having no living child, rather than marital status or age, is the main factor in the use of barrier methods. Clearly, age, marital status, and number of living children are closely related. The multivariate analysis enables us to examine independent effects of these variables. The strong effect of number of living children compared with age and marital status could indicate the use of condoms among those most at risk of acquiring HIV/AIDS; unmarried adolescents without children are perhaps those least likely to be in a stable relationship and more likely than unmarried adolescents with children to use condoms. In other words, marital status per se is not what drives condom use; condom use is driven by a combination of circumstances best captured by the number of living children.

Overall, the patterns of contraceptive method mix by type of user observed in this study suggest that to a large extent, most contraceptive users in Kenya are using methods that are suitable for their reproductive

needs. This situation is reflected in the predominant use of sterilization among older limiters, and the use of the pill and injectables among spacers and younger limiters, respectively. Oral and injectable contraceptives are generally recommended for spacers because of their high level of effectiveness and high level of user control over continuity. The relatively low use of barrier methods and the use (albeit at low levels) of the IUD and implants among unmarried women are of potential concern.[4] Sexual activity among the unmarried may be sporadic and involve multiple sexual partners with unknown medical histories. For this group, nonclinical supply methods, such as condoms, which are simple to use and provide protection against sexually transmitted diseases, are recommended (Choe and Bulatao 1992). The IUD and implants are generally considered less suitable for these women because the user lacks control over their use. Moreover, the IUD usually is not recommended for women who have multiple sexual partners because of their increased risk of pelvic inflammatory disease, which is associated with an increased risk of STIs (Kost et al. 1991; WHO 2000). As noted above, trends are going in a positive direction, however, in that use of barrier methods among unmarried women is increasing and use of the IUD and implants is declining.

The patterns and trends in contraceptive method choice observed here have implications for the impact of contraceptive use on fertility in Kenya. Magadi et al. (2001) found that in 1989, the reported contraceptive prevalence in Kenya was considerably higher than the level that would be expected to yield the observed fertility rate. By 1998, however, the discrepancy between the observed and expected fertility rates was minimal, given the level of contraceptive use. A plausible explanation for this finding is the relatively greater use of less effective traditional methods and the subsequent shift to more effective modern methods between 1989 and 1993. Those areas that demonstrated the largest discrepancy between the observed and expected fertility rates in 1989 were the areas in which traditional method use was highest (that is, rural areas and the Rift Valley and Eastern provinces). Thus, the general trend in Kenya toward use of more effective methods is likely to help reduce unwanted fertility.

Kenya has seen a dramatic increase in contraceptive use during the last two decades, and with that success has come new challenges. Understanding what motivates women's choices of contraceptive methods is an important step in ensuring that the family planning program meets the goals of providing women with a range of methods and information with which they can make informed choices, and of developing service-delivery mechanisms to implement their choices.

Appendix

Table A1 Parameter estimates for women's choice of long-term modern or traditional contraceptive methods relative to short-term modern methods, by selected variables, Kenya, 1989–98

Variable	Parameter estimates (standard errors)		
	Long-term (modern)	Permanent	Traditional
Constant	–2.28 (0.527)	–6.66 (1.255)	0.05 (0.435)
Year of survey			
1989 (r)	0.00	0.00	0.00
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 (r)	0.00	0.00	0.00
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 (r)	0.00	0.00	0.00
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)
Rift 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 (r)	0.00	0.00	0.00
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/ cohabiting (r)	0.00	0.00	0.00
Formerly married	–0.33 (0.192)	0.60 (0.166)*	–0.10 (0.183)
Living children			
0 (r)	0.00	0.00	0.00
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 (r)	0.00	0.00	0.00
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)
Educational level			
None (r)	0.00	0.00	0.00
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 (0.158)	–0.14 (0.155)
Partner's attitude toward family planning			
Approves (r)	0.00	0.00	0.00
Disapproves	–0.09 (0.230)	–0.24 (0.220)	1.15 (0.145)*
Unsure/missing	–0.49 (0.367)	3.35 (0.170)*	1.78 (0.190)*
Ideal family size			
<3 (r)	0.00	0.00	0.00
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)*
Nonnumeric	–0.16 (0.386)	–0.82 (0.307)*	0.22 (0.325)
Had recent unplanned birth			
No (r)	0.00	0.00	0.00
Yes	–0.42 (0.117)*	–0.26 (0.128)*	–0.17 (0.097)
Has accurate knowledge of ovulatory cycle			
No (r)	0.00	0.00	0.00
Yes	0.17 (0.107)	0.22 (0.117)	0.30 (0.096)*
Proportion in community who heard about family planning on radio	0.54 (0.300)	0.87 (0.279)*	0.06 (0.281)
Interactions with year			
Rural (1993)	–0.27 (0.238)	–0.54 (0.389)	–0.75 (0.347)*
Rural (1998)	–0.31 (0.237)	–0.50 (0.302)	–0.62 (0.347)
Community effect (standard deviation)	0.10 (0.094)	0.38 (0.098)*	0.87 (0.079)*

*Significant at $p<0.05$. (r) = Reference category.

Table A2 Parameter estimates for women's choice of specific modern methods relative to the pill, by selected variables, according to method, Kenya, 1989–98

Variable	Parameter estimates (standard errors)			
	Injectables	IUD/implants	Female sterilization	Barrier
Constant	−2.16 (0.485)	−1.76 (0.579)	−6.29 (1.161)	−1.20 (0.713)
Year of survey				
1989 (r)	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 (r)	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 (r)	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)
Rift 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 (r)	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/cohabiting (r)	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)
Number of living children				
0 (r)	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)*
Educational level				
None (r)	0.00	0.00	0.00	0.00
Primary incomplete	−0.19 (0.173)	0.46 (0.247)	−0.10 (0.183)	0.67 (0.421)
Primary complete	−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 toward family planning				
Approves (r)	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/missing	0.03 (0.298)	−0.50 (0.406)	3.63 (0.245)*	−0.57 (0.542)
Ideal family size				
<3 (r)	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)
Nonnumeric	−0.20 (0.327)	−0.36 (0.436)	−1.09 (0.360)*	−0.23 (0.764)
Had recent unplanned birth				
No (r)	0.00	0.00	0.00	0.00
Yes	0.10 (0.104)	−0.39 (0.126)*	−0.14 (0.146)	0.35 (0.188)
Proportion in community who heard about family planning on radio	−0.56 (0.285)*	0.33 (0.338)	0.56 (0.323)	−0.26 (0.441)
Community effect (standard deviation)	0.65 (0.093)*	0.14 (0.120)	0.12 (0.133)	0.15 (0.167)

* Significant at $p<0.05$. (r) = Reference category.

Notes

1 Short-term modern methods comprise injectables, oral contraceptives, and barrier methods (including male and female condoms, foam, and jelly, but primarily male condoms).

2 Long-term modern methods include the IUD and hormonal implants.

3 The IUD and implants are combined in one category because the proportion of women using these long-term clinical methods, especially implants, is too low to permit meaningful analysis of each method. These methods share a number of characteristics, most notably that they both require a health-care provider to insert and remove them, and both are designed to be used for three to five years.

4 Reporting of condom use is sensitive to the way survey questions are asked. In this study, condom use is determined from questions on use for contraceptive purposes. Questions on use for STD prevention or specifically on condom use at last sex typically yield higher levels of use than do questions on condom use for contraception. For example, Waithaka and Bessinger (2001) found that about 15 percent of never-married, sexually active women used a condom during last sex.

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Acknowledgments

This study is based on secondary analysis of contraceptive-use dynamics in Kenya carried out by the African Population and Health Research Center, Nairobi, Kenya and the MEASURE Evaluation project. The study was supported by the United States Agency for International Development.