"The Determinants of Fertility Change in Kenya: Impact of the Family Planning Program"
Extended Abstract Submitted to PAA 2008
by David Ojakaa[1]

I. Introduction

From the mid-970s to the late 1990s, the on-going fertility transition in Kenya was characterised by a sharp decline in the total fertility rate (TFR) and an increase in contraceptive prevalence. Thus, the TFR declined from 8.2 births per woman in 1977/78 to 4.7 in 1998, representing a reduction of 42.7%. Over the same period, contraceptive prevalence among women of reproductive age rose from 6.7% to 39.3% (NCPD 1999). In order to gain further insights into the dynamics of this fertility transition, this study proposes to examine the effects of the Kenyan family planning program on change in fertility using two datasets - the 1998 Kenya Demographic and Health Survey (KDHS) and the 1999 Kenya Service Provision Assessment (KSPA).

II. Evolution of the Kenyan Family Planning Program

A brief presentation of the milestones in Kenya's family planning program is useful in understanding the context and focus of this study. First, the family planning movement in Kenya began in the 1950s - during the pre-independence period - when a group of volunteers modestly inaugurated what was to become the Family Planning Association of Kenya (FPAK), now named Family Health Options Kenya (FHOK). Secondly, the provision of family planning services in health institutions operated by the Government commenced in 1967, when it was integrated into the maternal and child health (MCH) division of the Ministry of Health. Subsequent to this introduction into the public domain, a growing number of health facilities have provided family planning services in the country. Thirdly, in 1984, the Government ratified the population policy guidelines, following which a number of achievements were recorded. The population growth rate, total fertility rate, and ideal family size declined considerably. Knowledge and use of family planning methods also increased noticeably between 1984 and 1998. The District Population Program was implemented in "14 priority districts" in the country. The fourth major landmark in Kenya's family planning program was the passing by Parliament in 2000 of a revised population policy – the Sessional Paper on Population Policy for Sustainable Development. Reflecting the resolutions of the ICPD Cairo Conference of 1994, the new population policy places emphasis on reproductive health and gender equity (NCPD 2000).

The evolution of the program was such that by 1998, the contraceptive method mix comprised of injectables (used by 12% of married women of reproductive age), the oral pill (9%), female sterilization (6%), traditional methods (8%), IUDs (3%), condoms (1%), and implants (1%). Although use of modern methods was generally higher in urban areas compared to the rural, among the provinces, it was highest in Central Kenya. On the other hand, use of natural methods was higher in rural areas and lower in the urban (Magadi and Curtis 2003). The sources of family planning methods are also important and in 1998, Government health facilities were the most widely visited source, serving 58% of all contraceptive users. Private and Non-Governmental (NGO) health facilities served 33% of all family planning clients; other private sources such as shops served 5% of the clientele;

[1] Ph. D. Candidate, Université de Montréal, Canada. Correspondance:
Université de Montréal, 2350 Boulevard Édouard-Montpetit, 15243, Montréal Qc. H3T 1J4 Canada.
E-mail : david.ojakaa@umontreal.ca

Community Based Distributors (CBDs) were the source for 3% of contraceptive users. Relative to many other African countries, this level of prevalence and distribution is high.

III. Research Questions

Given these changes in fertility, the family planning program, and contraceptive use, two research questions form the focus of this study:
1. What was the impact of the family planning program before and after the introduction of the first population policy in 1984?
2. What is the link between the various service delivery outlets and the decline in fertility rates in the country?

Studies carried out at the community level or within the catchment of health facilities in the past indicated that access to family planning services is important in influencing contraceptive use and by implication, reduction in fertility. For example, using results of the 1988/89 KDHS that were linked to a community survey conducted soon thereafter, it was concluded that while at the beginning of the 1980s only 26% of the Kenyan rural population could reach a source of family planning services within three hours, this had increased to 87% by 1989 (Hammerslough 1992). Similarly, a study conducted in the catchment of the Chogoria Methodist Mission Hospital in the Mount Kenya region (Goldberg et al. 1989) showed that the family planning program operating in the area was possibly responsible for the fertility decline experienced in the region. Among the factors cited in support of the conclusion of positive program impact were, first, the setting up of many clinics providing health services including family planning in the catchment area, and secondly, the presence of health extension workers - Health Educators (HEs) and Community Health Workers (CHWs) - in the community.

In spite of the merits of these studies, the methods used are cross-sectional and as such are limited in addressing the problem of cause and effect (Bertrand et al. 1996; Wooldridge 2000). Thus, one interpretation of the observation of a positive relationship between the existence of a family planning facility and fertility outcome is that the facility caused the result; nevertheless the relationship could as equally be in the reverse direction. Family planning facilities may not have been randomly allocated in the various areas in the country, but instead placed in regions where preferences for family size are high or even in areas where the highest impact might be expected. For example, in implementing the population policy in the late 1980s, the National Coordinating Agency for Population and Development (NCAPD) targeted "14 priority districts" by setting up and staffing District Population Offices (DPOs). Fertility and infant mortality are high and contraceptive prevalence conversely low in some of these districts. Where these factors - related to reverse causality and endogenous placement – are unmeasured or omitted from analysis, estimates of the impact of the family planning program are most likely to be biased (Angeles et al. 1998 ; Angeles et al. 2005).

IV. Study Objectives

The general objective of this study is to assess the contribution of the family planning program on fertility, by controlling for the unobservable factors that jointly determine fertility and the service placement processes. Specifically, the study seeks to determine, first, the fertility impact of the passing of the 1984 population policy guidelines. Secondly, the study specifically compares the effects of the six health service delivery outlets (hospitals, health centers, dispensaries, maternity and or nursing homes, clinics, and community-based distributors) on fertility rates.

V. Justification and Policy Significance of the Study

This study is interesting for several reasons. First, it seeks to obtain more accurate estimates of the effect of the family planning program on fertility than some studies, which were limited to using only cross-sectional data, have attempted to do in the past. Secondly, the central question addressed in this study - the impact of programs - is a current and relevant population policy and program issue. For example, it could point out which combination of service delivery outlets would be more effective in reducing fertility. Effectiveness is also currently important for another reason – the justification of the family planning program in the face of competition from other health priorities (such as malaria or HIV/AIDS prevention and control) for limited resources. Finally, the reference year for the study, namely 1998, is significant because it represents the height of the fertility transition in Kenya before the stagnation, and so is a vantage point from which to look back.

VI. Pathways to Change in Fertility

The theoretical framework within which family planning programs create an impact is an important aspect underlying the evaluation issues presented above. In that regard, this study rests on the micro-economic theories of fertility - the supply and demand framework for changes in fertility in particular (Easterlin and Crimmins 1985). Most of the presentations on these models are static (Jensen 1985); yet what is required is a dynamic model of fertility that explains a couple's fertility progression over the reproductive life-cycle. Consequently, in this study, it is assumed that couples make fertility decisions over time in response to births and deaths of children (number of living children). The decision to use contraception is then made in order to maximize utility through time (Newman 1988; Guilkey and Jayne 1997).

In principle, the same factors that determine fertility demand and supply in the static model also apply to the dynamic perspective. In the static approach to the Easterlin supply and demand theory, fertility control (contraceptive use) takes place through variations in fertility prefernces, and in access to family planning services. Preferences are in turn determined by background socio-economic factors, a woman's fecundity, and the related aspects of the supply and demand for surviving children - in particular infant and child mortality. Once an individual, a couple, or community decide to control their fertility, whether they use a particular contraceptive method depends, among other things, on access, which comprises the economic, psychic, and social costs entailed in learning about and using specific methods of family planning. In this study however, it is those aspects of access associated with the physical location of health facilities offering family planning services that are taken into consideration.

Based on these pathways, the following hypotheses are tested in this study. First, we posit that due to possibly better access to services, residence in rural Central Kenya is associated with lower likelihoods of conception, and hence with lower fertility. Secondly, access to family planning facilities is associated with lower fertility; the relationship should be stronger with regard to access to dispensaries and community based distribution (CBD) of contraceptives, these two types of facilities being at the heart of rural communities where need is expected to be highest. Thirdly, programs implemented after the coming into force of the 1984 population policy guidelines made a bigger impact on fertility as compared to those implemented earlier.

VII. Data and Methods

Data for this study come from two surveys – the 1998 KDHS and 1999 KSPA. The first interviewed 7,881 women of reproductive age in 530 clusters on various issues including fertility, health, use of family planning services, and socio-economic factors. The second survey was conducted in 52% (275) of the clusters originally sampled in the 1998 KDHS, and

provides information on the availability of family planning services in the community. Family planning facilities covered in the KSPA survey include the district or higher-level hospital located within the catchment area of the community, the health centre, dispensary, maternity and or nursing home, private clinic, and the community-based distributor (CBD). To monitor the family-building process (timing and spacing of births), women who were at least 12 years old by 1967 - when integration and expansion of family planning services in public health facilities commenced – are followed up until 1998, the year of the survey. A similar follow-up is made with regard to health facilities; it is assumed that once opened, the facility remains accessible thererafter.

To prepare the two datasets for analysis, first, the 1998 KDHS was merged with the 1999 KSPA, and then reshaped into a panel of repeated observations (births) over time for each woman. Two equations are applied on this panel dataset – the first, a binary logit, models the effects of community and individual variables on fertility over time, and is the log odds of an annual conception that translates into a live birth. It is considered to be a function of a woman's time-varying personal characteristics (e.g. age), the presence of family planning services in the community, other observed time-varying community characteristics, unobserved individual characteristics (e.g. fecundity), as well as unobserved community factors (for example community fertility preferences). Three different binary logit regressions are run with the panel dataset. The first is a simple dichotomus logit regression that ignores the problem of cause and effect (reverse causality) between the presence of the family planning program and the outcome (births). In the second regression, a fixed effects estimator that removes the time-constant unobserved factors which might influence the outcome is applied. The third regression model - the random effects binary logit – controls for a different type of unobserved random factors (those thought to be uncorrelated with the explanatory variables). To determine the effect of the 1984 population policy on fertility, a year dummy variable that indicates the application of the population policy is introduced into the regressions (by interacting the presence of the family planning facility with the year the policy came into effect).

The second equation addresses the endogeneity between fertility and the placement of family planning services. It is expressed as a discrete-time hazard, and takes into account the time that a particular service delivery outlet began offering family planning services in the community. The dependent variable in the family planning placement equation is whether the family planning facility is located within five kilometres from the community. Six covariates determine this dependent variable: child mortality, gross domestic product for the province in which the community is located, Government expenditure on health for the province, the proportion of the national population living in the region, average educational levels for women in the community, and a dummy variable (before and after 1984) that indicates the introduction of the population policy. Parameters in the two equations are then estimated through the method of maximum likelihood.

VIII. Expected Results
Results and analysis of the study will be based on the following tabulations:
1. Descriptive statistics for variables at the individual and community levels;
2. Community and individual-level heterogeneity parameters;
3. Odds ratios for the effects of various factors on the fertility outcome (based on the simple logit, fixed effects, and random effects models);
4. Simulation of the effects of different types of on fertility reductions.

A number of conclusions and recommendations, which have a bearing on population policy and programs, follow from the analysis and interpretation in this evaluation-type study.

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