

The Influence of Quality of Care on Fertility Outcomes in Kenya

The purpose of this study is to examine how the quality of care provided at family planning service delivery points (SDPs) interacts with individual characteristics to explain the odds of a woman ever using contraceptives in Kenya in 1993 and 1998. The present study provides new findings by investigating individual-level fertility outcomes in one country, Kenya, utilizing multi-level models applied to a unique data set integrating community-level development and family planning service quality of care indicators with nationally representative Demographic and Health Survey data from 1993 and 1998 and clinic-level data from 1989 and 1999 to test both direct and interactive effects of quality of care on changing fertility behaviors and outcomes.

There has been much work evaluating the expected relationship between increased contraceptive use and improved quality of care (Potter, 1971; Phillips et al. 1982; Lapham and Mauldin, 1984; Lapham and Mauldin, 1985; Simmons, Koblinsky and Phillips, 1986; Phillips et al., 1988; Jain, 1989; Pariani, Heer and Van Arsdol, 1991; Cotton et al., 1992; Mensch, Arends-Kuenning and Jain, 1996; Steele, Curtis and Choe, 1999; Koenig, Hossain and Whittaker, 1997; Magnani et al., 1999; Blanc, Curtis and Croft, 2002; RamaRao et al. 2003). There have also been studies, both theoretical and empirical, on other aspects of quality of care and their relationship to fertility and health outcomes (Zeighami et al., 1976; Repetto, 1977; Sung, 1977; Bailey and Keller, 1982; Pebley and Brackett, 1982; Soni, 1983; Simmons et al., 1988; Jain, Bruce and Mensch, 1992; Mensch et al., 1994; Askew, Mensch and Adewuyi, 1994; Bessinger and Bertrand, 2001). The level of interest in how quality of care impacts fertility outcomes is not surprising given the amount of international aid flowing into family planning programs throughout the developing world during this time. In fact, Jain (1989) states when the international family planning movement began to make its way into developing countries, the “importance of quality of services was recognized explicitly” (1) and quality was defined as the program’s ability to meet an individual’s needs. Unfortunately, over time “meeting demographic objectives became the overriding concern” of many family planning programs and many forgot “the underlying principle of meeting individual needs” (Jain, 1989: 1).

Many family planning programs were established and received funding to meet the goal of reducing fertility and stabilizing population growth; meeting those goals became the primary concern of many of the programs. During the 1980s and 1990s the international family planning movement reestablished a commitment to meeting fertility individual needs and desires. However, this increased interest initially focused on “program

performance and the ethics of family planning service provision” (Bruce, 1990: 61) and often overlooked quality of care. Bruce (1990) states much of this neglect arose out of confusion surrounding the meaning of quality of care.

Bruce (1990) states there have been very few systematic studies defining quality of care and without a coherent framework it is difficult to discuss quality of care in a consistent manner. However, the author states there are six “salient elements of family planning programs that together constitute quality” (Bruce, 1990: 63) and they are: choice of methods; information given to clients; technical competence; interpersonal relations; mechanisms to encourage continuity; and an appropriate constellation of services. Information regarding the *appropriate constellation of services* will not be discussed in this paper because it will not be tested in this current study, owing to a lack of available indicators in the Kenyan data.

Choice of Methods

Bruce (1990) considers a choice of methods “a central principle of family planning programs” (65). A program does not have to provide every contraceptive method at all service delivery points to provide adequate choice. However, there should be an “effort on a geographic basis” to provide prospective users “reasonable if not utterly equal access to a variety of methods” (Bruce, 1990: 65). Choice is an important element of quality for several reasons. First, an individual’s needs and desires change throughout their reproductive life and the best contraceptive method to meet those needs and desires may change as well. Second, there are side effects, contraindications and/or risks associated with certain contraceptive methods for individual women. Thus, method choice is important so women have the ability to switch methods because of adverse side effects or contraindications. The ability to switch is essential to a client’s satisfaction and their “ability to practice contraception over a long term” (Bruce, 1990: 65). Third, Bruce (1990) also believes method choice is important for philosophical reasons, reaffirming the desire to serve an individual’s need for “effective contraception, not the promotion of a given method” (66). Fourth, method choice is important for practical reasons, allowing providers to provide alternative technologies to clients. Ultimately, choice is “not feasible without an adequately developed delivery system” (Bruce, 1990: 66).

Bruce (1990) describes the impact method choice has on improving the effectiveness of family planning programs. Several early studies (Potter, 1971; Freedman and Berelson, 1976; Mauldin, 1978; Pebley and Brackett,

1982; Lapham and Mauldin, 1985) found a consistent positive relationship between method choice and contraceptive prevalence rates. More recently, Jain (1989) found evidence of a relationship between increasing method choice and the adaptation and continuation of contraceptive use. Based on all the available information, Bruce (1990) concludes “choice is not only the first, but the fundamental element of providing quality in services” to clients. A range of “competently provided” methods will help “attract more acceptors and provide for the switching among methods that is the foundation of satisfied and sustained use” (68).

Information Given to Clients

Bruce (1990) identifies three aspects to information giving involved in defining quality. The first aspect involves information given to clients regarding method choice. Clients must understand there are a variety of methods available and the differences of the methods. The second aspect involves giving information regarding how to use the method effectively and the potential physical changes the method may cause. If individuals do not obtain and understand usable information on the correct use of self-employed methods they will not be as effectively utilized by clients and if they do not understand the potential side effects of clinical methods they are more likely to discontinue use. The third aspect of information giving relates to what was previously discussed as ‘screening’ in the family planning literature. Screening referred to obtaining the individual’s health information and matching them to an appropriate method. Bruce (1990) states screening is an element of quality because “it seeks to exclude women or men from the pool of acceptors who might experience dangerous health conditions as a result of specific contraceptive choices” (69). Bruce (1990) states a lack of accurate information given about the chosen contraceptive method is a “reason for discontinuing method use, and belief in rumors may be a deterrent to use altogether” (71).

Technical Competence

Technical competence is the most difficult element of quality for clients to evaluate; providers are usually evaluated based on the time they spend with clients and their attitude toward the clients (Sung, 1977). Although technical competence is not often reported, it is often part of a program’s “wider pattern” of performance (Bruce, 1990: 71). Bruce (1990) states evidence of poor technical competence and its consequences was the most difficult

to find in the literature reviewed. There was some indirect evidence of insufficient training of providers negatively impacting programs and the use of particular methods. Bruce (1990) found providers “uncertain of their skills are sometimes reluctant to use them or, worse, apply them badly” and such “performance generates negative rumors about programs and methods” (72).

Interpersonal Relations

Interpersonal relations is a distinct element of quality of care, separate from the information given to the client. It is defined as the interaction between the client and the provider, separate from the accuracy of the information given by the provider. Interpersonal relations can effect a client’s “confidence in their choice and ability, satisfaction with services and the probability of a return visit” (Bruce, 1990: 74). Ideally, a client will perceive their interaction as a two-way exchange with the provider as “positive and productive” (Bruce, 1990: 74). Bruce (1990) discusses studies which found the level of comfort women experience impacts a woman’s feelings about and acceptance of contraceptive services (Mernissi, 1975; Repetto, 1977).

Continuity and Follow-up

Early family planning programs were clinic based and provided little, if any, follow-up if a client did not return. Unfortunately, many women are still served in clinic based settings with little follow-up in many countries. Bruce (1990) believes the strongest argument for including continuity and follow-up as an element of quality is the “consequences to individual and national efforts of the failure to do so” (78). Many programs are designed to recruit new users, not necessarily maintain their use once recruited. Bruce (1990) states in areas where contraceptive use is widespread and accepted this recruitment without maintenance structure is not too serious a problem. However, in areas where contraceptive use is “still an innovative behavior, the neglect of the pool of users has very serious consequences for overall program performance” (Bruce, 1990: 78). Jain’s research (1989) found programs had better results when “they concentrate on a small number of annual acceptors” and concentrate on providing quality care to improve their satisfaction and continuation” (6). Bruce (1990) found “lapsed” users discuss “poor initial contact, ignorance of side effects and the possibility of switching methods, and inadequate follow-up as primary reasons” for discontinuing use of a method (Bruce, 1990: 78). Bruce (1990) found little evidence in these studies

that discontinuation within 12 months of beginning contraceptive use was “traceable to changes in clients’ intentions” (Bruce, 1990: 78).

There has been research assessing various components of quality of care since Bruce (1990) outlined the basic framework (Askew, Mensch and Adewuyi, 1994; Bessinger and Bertrand, 2001; Blanc, Curtis and Croft, 2002; Cotton et al., 1992; Koenig, Hossain and Whittaker, 1997; Magnani et al., 1999; Mensch et al., 1994; Pariani, Heer and Van Ardsol, 1991; RamaRao et al., 2003; Steele, Curtis and Choe, 1999). However, very little of it has examined the impact of several components together with individual measures. Women experience all the components of quality of care to some degree when they visit a service delivery point and they bring their individual characteristics to the experience as well. This study will examine five components of quality of care together to determine the significance of the components when considered with individual characteristics. The data available in Kenya provides a unique opportunity to more accurately assess what a woman experiences when she visits a provider. Cross-level interactions will be tested once significant main effects have been determined.

Hypothesis for Study:

Based on the available information, residing in a district with a higher degree of quality care at service delivery points will have a positive effect on an individual woman’s choice to ever use modern contraceptives.

The Role of Population Policy on Quality of Care and Contraceptive Use

Policies or programs attempting to influence demographic outcomes are often overlooked in the assessment of quality of care. Tsui (2001) defines a population program as “the enactment of nationally defined policies or organized strategies to affect demographic trends and patterns” (187) and most have focused on modifying fertility levels in some way. However, as Jain (1989) and Bruce (1990) state quality of care can often be impacted by the demographic goals of a country’s population policy. A country’s population policy goals can impact the resources available to a family planning program, impacting the quality of care received at service delivery points. Government programs facilitating access to modern contraceptives can be important because according to Watkins (1987) the “legitimacy or encouragement offered by agents of these institutions clearly can affect the social climate within which individual contraceptive decisions are made” (658). More recently, Tsui (2001) states many

governments have been expanding their contraceptive delivery services. The author continues to point out there have been “sustained” fertility declines “accompanied by sustained rises in contraceptive practice using modern methods” (185). These trends have reinforced the value and continued expansion of these services in many countries (Tsui, 2001: 185).

Kenya has had a population policy since 1967, although there is ample evidence that the strength of the “programme effort” was not great enough to impact fertility rates until the mid 1980s, shortly before the beginning of the time this study examines (Ajayi and Kekovole, 1999; Chimbwete, Watkins and Zulu, 2005; Robinson, 1992; Watkins, 1987, 1990, 2000; Watkins and Hodgson 1999; Weinreb, 2001).

The *National Development Plan For the Period 1989 to 1993* stated Kenya had an “undesirably high growth rate” but also stated “direct population control measures such as contraception” “oversimplify the problem” (Republic of Kenya, a: paragraph 9.39). The government believed such measures to be unsuccessful in the past because they tended to “gloss over crucial economic, social and cultural considerations” and failed to “connect the well-being and quality of life of the people to population control mechanisms” (Republic of Kenya, a: paragraph 9.39), indicating a lingering resistance to actions that could be perceived to be population control. The *National Development Plan For the Period 1989 to 1993* discusses the implementation of a family planning program as part of larger national development goals, while still considering the importance of culture and the individual in Kenya, indicating an important change in Kenya’s policy. The *National Development Plan For the Period 1994 to 1996* stated the major goal of Kenya’s population policy was to “control population growth and distribution” and to “reduce the imbalance between population size and the resources available to the country” (Republic of Kenya, b: paragraph 10.35). The *National Development Plan For the Period 1997 to 2001* considered rapid population growth the “bane of economic development” (Republic of Kenya, c: paragraph 6.1.1). The government was concerned about a high dependency ratio and all the education and health care a youthful population requires (Republic of Kenya, c: paragraph 6.1.1).

Data and Methods

Utilizing four datasets—the 1993 and 1998 Kenya Demographic and Health Surveys (KDHS) and the 1989 Kenya Situation Analysis Study (KSAS) and the 1999 Kenya Service Provision Assessment Survey (KSPA)—the relationship between the quality of care at family planning service delivery points (SDPs) and individual

characteristics affect a woman's contraceptive use will be examined in Kenya. The KDHS, the KSAS and the KSPA contain information on relevant factors related to these issues. The specific variables utilized in this study will be defined following a description of the data and methods.

This current study is designed to consider the relationships between an individual woman's fertility outcomes and her individual characteristics within the context of her district of residence in Kenya. Research suggests there are significant regional differences in contraceptive prevalence in Kenya.¹ This research led to the decision to utilize hierarchical linear models to analyze the data in this study. There are 17 districts in Kenya in which approximately 94 per cent of the population lives. The four datasets utilized in this study have data in all 17 of these districts. Individual women and SDPs were matched by district for sorting in the hierarchical linear models. Women living in the same district of Kenya are believed to be more similar than other women randomly sampled in the population in terms of their environment, background and experiences because they have the same choices of family planning service delivery providers in their district. Preliminary analysis indicated individual observations were not fully independent.

Hierarchical Linear Models: Bernoulli Sampling Model and Cross Level-Interactions

Hierarchical linear models can examine the joint effect of a variable at the lower level in conjunction with a variable at the higher level. However, the variable measuring whether or not a woman has ever used modern contraceptives has a binary outcome (0 = never used a modern contraceptive; 1 = ever used a modern contraceptive) and thus linearity and normality cannot be assumed to be true for the model. An individual woman has either ever used a modern contraceptive at some point in her life or she has not. A binary outcome constrains the predicted outcome and therefore a logit transformation must be used to satisfy the constraint in the model. Additionally, since the outcome can only have one of two values, the random effect can only have one of two values and cannot be

¹ In the 1993 KDHS contraceptive use varied greatly by province. "Women in Central Province have the highest prevalence rates (56 percent) compared to Coast Province with the lowest (20 percent)" (National Council for Population and Development (NCPD), Central Bureau of Statistics (CBS) (Office of the Vice President and Ministry of Planning and National Development [Kenya], and Macro International (MI), 1994: xx). The 1998 KDHS found little evidence of change in the prevalence rate. "More than half of currently married women in Central Province (61 percent) and Nairobi Province (56 percent) are currently using a method, compared with 28 percent in Nyanza and 22 percent in Coast Province" (National Council for Population and Development (NCPD), Central Bureau of Statistics (CBS) (Office of the Vice President and Ministry of Planning and National Development [Kenya], and Macro International (MI), 1999: xviii).

normally distributed. In order to correct for these violations in the data, a Bernoulli sampling model and a log link function can be utilized.

Let Y_{ij} = whether or not woman i in district j has ever used modern contraceptives at the time of the interview or “trial”

and m_{ij} = 1993 or 1998 and may be considered the “trial”

and $Y_{ij}|\phi_{ij} \sim B(m_{ij}, \phi_{ij})$, which expresses Y_{ij} has a binomial distribution with m_{ij} trials and probability of success per trial is ϕ_{ij} (Raudenbush and Bryk, 2002: 294).

The new transformed expected value and variance for level-1 can be written as:

$$E(Y_{ij}|\phi_{ij}) = m_{ij}\phi_{ij}, \quad \text{Var}(Y_{ij}|\phi_{ij}) = m_{ij}\phi_{ij}(1 - \phi_{ij}).$$

According to Raudenbush and Bryk (2002) the most common and convenient logit link is:

$$\eta_{ij} = \log(\phi_{ij} / 1 - \phi_{ij}).$$

η_{ij} is the log odds of success. If the probability of success, ϕ_{ij} , is .5 the odds of success $(\phi_{ij} / 1 - \phi_{ij}) = .5 / .5 = 1.0$ and the log-odds or “logit” is $\log(1) = 0$. When the probability of success is less than .5, the odds are less than 1.0 and the logit is negative. When the probability is greater than .5, the odds are greater than 1.0 and the logit is positive. This transformation allows η_{ij} to take on any real value while ϕ_{ij} is constrained to be in the interval (0, 1). The predicted log-odds can be converted to odds by taking the $\exp(\eta_{ij})$. The predicted log-odds can also be converted to a predicted probability through the following:

$$\phi_{ij} = 1 / 1 + \exp\{-\eta_{ij}\} \text{ producing a value for } \phi_{ij} \text{ between zero and one.}$$

A cross-level interaction estimates the effect of each variable in the interaction when the other variable is controlled.

Contextual Quality of Care Variables Defined

It is based upon Bruce’s (1990) definitions and assumptions that this study structured its analysis of quality of care in Kenya. There was information for the first five components in both the 1989 KSAS and the 1999 KSPA.

Choice of Oral Contraceptives Available

The first variable constructed from the clinic-level measures the choice of oral contraceptives available. Only the availability of oral contraceptives at SDPs was examined because preliminary analysis indicated a high correlation between the number of oral contraceptives available and the availability of other methods. Thus, the variety in the choice of oral contraceptives at a service delivery point is believed to be a good indicator of the overall availability of contraceptive methods. Additionally, contraceptive technology has changed between the two time points and a comparison of available methods other than oral contraceptives would not be as consistent as comparing available oral contraceptives. Each district will have a method choice score calculated from inventory items regarding available oral contraceptive methods at the SDP. The 1989 scores range from 0.094 in South Nyanza to 0.625 in Nairobi; the 1999 scores range from 0.441 in Mombasa to 1.000 in Muranga and Uasin Gishu.

Information Provided to the Client

The next variable constructed at the clinic-level measures the information given to the client during their visit to the SDP. This variable measures the topics the provider and client discussed, whether or not family planning posters were in the clinic and whether or not informational brochures were available to the clients. The 1989 KSAS includes 16 items on these issues and the 1999 KSPA includes 20 items on the issues. The difference in the number of items is a result of the way information regarding oral contraceptives was measured in the data as well as the inclusion of newer contraceptive methods such as Norplant. In 1989, the KSAS only has a variable that measures whether or not oral contraceptives were discussed, while the 1999 KSPA measures whether or not the oral contraceptives were discussed by composition type or in general, resulting in three variables relating to oral contraceptives being included in the score. The 1989 scores range from 0.094 in Nandi to 0.594 in Nakuru; the 1999 scores range from 0.065 in Siaya to 0.800 in South Nyanza.

Provider's Technical Competence

The technical competence score measures the technical competence of the provider in the exam and provision of service to the client. In 1989, the KSAS only measured whether or not a pelvic exam was performed,

whether medical and gynecological histories were taken as well as whether the weight and blood pressure of the woman were measured. In 1999, whether or not a pelvic exam was performed is included as one variable but whether or not a medical and reproductive health histories were taken were combined into one variable instead of the two variables that were created in the 1989 data. In 1999, the KSPA went into much more detail in the observation of technical competence items, resulting in 48 items but the score will only be calculated from six items that are comparable to the five 1989 items. The scores in 1989 range from 0.000 in Kericho to 1.000 in Kisii and Mombasa; the 1999 scores range from 0.150 in Siaya to 0.667 in Bungoma.

Provider's Interpersonal Skills

The interpersonal relations score measures the interpersonal relations skills of the provider while interacting with the client at the SDP. The 1989 score will be calculated using nine items and the 1999 score will be calculated using ten items. The main difference in the calculation of scores is how the variables measuring family planning goals are measured. In 1989, the KSAS measures whether or not the provider inquired about family planning goals while in 1999 the KSPA had two variables measuring whether or not the provider asked if and when the client wanted more children. The 1989 scores range from 0.139 in Nandi to 1.000 in Nakuru; the 1999 scores range from 0.229 in Siaya to 0.857 in Kericho.

Provider's Continuity Mechanisms

The continuity variable measures whether or not measures were taken to ensure the continuity of service for the client. There are items on how the record system is utilized to maintain client records as well as how it helps maintain a continuous supply of methods for the clients. There are also items with regard to whether or not the client was told when and where to return for a follow up visit. The 1989 and 1999 scores will be calculated using six similar items. The difference in the scores The 1989 scores range from 0.214 in Kisii to 1.000 in Kericho; the 1999 scores range from 0.379 in Mombasa to 1.000 in South Nyanza.

Individual Characteristics of Kenyan Women

Age at First Birth, Age at First Marriage, Years Married and Current Marital Status

Age at first birth, age at first marriage, years married and current marital status are important controls for a woman's risk of pregnancy and thus would be expected to impact her odds of ever using modern contraceptives. It is expected the older a woman is when she marries or has her first birth, she may be less interested in having children, which could potentially increase her odds of ever using modern contraceptives. The longer a woman has been married, the longer she has been exposed to the risk of pregnancy and thus, may be more likely to ever use modern contraceptives. A woman's current marital status is expected to have a positive impact on a woman's exposure to the risk of pregnancy and thus increase her odds of ever using modern contraceptives, resulting in never married women having the lowest odds of ever using modern contraceptives. The original current marital status variable had three categories: Never Married, Currently Married and Formerly Married. This variable was recoded such that Never Married became the reference category that Currently Married and Formerly Married were compared to in analysis.

Favored Ethnic Group

The Kalenjin, Kikuyu and Luo are believed to be the favored ethnic groups in the country (Weinreb, 2001; Watkins, 2000). The original variable had eleven ethnic categories in 1993 and twelve ethnic categories in 1998. The variable was coded such that being a member of a favored ethnic group (Kalenjin, Kikuyu or Luo) was coded to equal one (1) and all other categories equaled zero (0). In 1993, the favored ethnic group made up 0.409836 per cent of the sample in Kisii and 98.91 per cent of the sample in Nyeri; in 1998, the favored ethnic group made up 0.3636 per cent of the sample in Kisii and 97.69 per cent of the sample in Nyeri.

Ever Moved

This study examines the effect of contextual influences on an individual woman's fertility outcomes, thus, it is necessary to account for any difference in exposure to quality of care a woman may experience through migration over her life. The original variable measured how long a woman had lived in her current location. This

variable was recoded such that 0 = never moved (always lived in her current location in the original coding) and 1 = ever moved (all other responses indicating a move at some time in a woman's life). In 1993, 1,906 women had ever moved during their lives, representing 31.20 per cent of the women in the survey. In 1998, 3,263 women had ever moved during their lives, representing 54.12 percent of the women in the survey. Upon examining the original variable to see if there was a noticeable difference in the number of women who had moved in the five years preceding each survey, a noticeable increase was found. In 1993, 671 women (11.01 per cent of all respondents) had moved in the five years preceding the survey; in 1998, 1,445 women (24.02 per cent of all respondents) had moved in the five years preceding the survey. This increase in migration five years in between the two surveys explains much of the significant difference in the percentage of women migrating in Kenya in the two surveys.

Ever Discuss Family Planning with Partner (Status of the Woman in the Household)

The type of information collected in the KDHS makes it difficult to obtain unique variables measuring the status of a woman in the household. There is information on whether a woman works, whether she earns cash for her work, the highest level of education she has completed but these variables are already utilized in the study to assess their impact individually, so they cannot go into a composite score to reflect her overall status. It was decided to utilize whether a woman ever discussed family planning with her partner to measure her status in the household. Several studies have shown spousal communication to be a key factor in contraceptive use (Ezeh, 1993; Gage, 1995; Doodoo, 1998). Based on this information, whether a woman ever discussed family planning with her partner was recoded such that 0 = no (never discussed family planning with her partner) and 1 = yes (ever discussed family planning with her partner). In 1993, 2,269 women ever discussed family planning with their partner, representing 37.14 per cent of the sample. In 1998, 2,638 women ever discussed family planning with their partner, representing 43.76 per cent of the sample.

Occupational Category

Women working in a modern sector job have been found to be more likely to use modern contraceptives in previous research (*International Family Planning Perspectives*, 1986; Gage, 1995; Mburugu and Zulu, 1998). The original variable included nine categories and they were collapsed into the following categories: Not Working;

Works in Agriculture; Works in Household and Domestic Services and Unskilled Manual Labor; Works in Sales; and Works in Professional, Technical and Managerial, Clerical and Skilled Labor. These categories were chosen based on the amount of training or education that would be required for the type work and Not Working was the reference category throughout the study.

Educational Level Attained

Previous research has found better educated women in Kenya are more likely to use modern contraceptives (Njogu, 1991; Mburugu and Zulu, 1998). The original variable was coded to measure the level of education a woman had completed at the time of the survey. There were four categories in this variable: No Education, Completed Primary School, Completed Secondary School and Completed Beyond Secondary School. This variable was recoded such that No Education became the reference category that Completed Primary School, Completed Secondary School and Completed Beyond Secondary School were compared to in analysis.

Results

The hypothesis on how quality of care at family planning service delivery points and individual characteristics are related to the odds of a woman ever using modern contraceptives are examined in Tables 1 and 2. In general, the quality of care at service delivery points improved throughout Kenya between 1989/1993 and 1998/1999. The only exception was the provider's technical competence, which worsened between the two time points. In most cases, the variance in the quality of care a woman received at a service delivery point was reduced between 1989/1993 and 1998/1999. In addition to the improvement in quality, there was a substantial increase in the number of service delivery points throughout Kenya, as the government and people grew more accepting of family planning. However, despite this improvement none of the quality of care indicators had a consistent significant effect on the odds of a woman ever using modern contraceptives between the two time points. Thus, although women in Kenya are getting better care, in general, and they have more choices about where they receive care, the effect of quality of care did not have the expected significant positive effects in 1998/1999.

Individual Characteristics

All the individual variables related to working in the modern sector (working in an unskilled or skilled profession and working in sales) and the status of a woman in the household have a very significant positive effect on the odds of a woman ever using modern contraceptives in both time points. Working in agriculture has a non-significant positive effect on the odds of a woman ever using modern contraceptives in 1989/1993 and a significant positive effect in 1998/1999 but is not considered modern sector employment. Ever discussing family planning with a partner has the expected very significant positive effect on the odds a woman ever using modern contraceptives. All three individual level education variables have a very significant positive effect on the odds of a woman ever using modern contraceptives in both time points. Being a member of a favored ethnic group has a non-significant inverse effect on the odds of a woman ever using modern contraceptives in both time points.

Control Variables

The age at which a woman has a first birth has the expected significant inverse effect on the odds of a woman ever using modern contraceptives in 1989/1993 and 1998/1999. However, the age at which a woman first marries has a significant positive effect on the odds of a woman ever using modern contraceptives in both time points. The number of years a woman is married has the expected very significant positive effect on the odds of a woman ever using modern contraceptives, owing to the increased exposure to the risk of pregnancy while married. Being currently or formerly married also has the expected very significant positive effect on the odds of a woman ever using modern contraceptives in both time points because currently or formerly married women are or have been exposed to the risk of pregnancy while married. Only women exposed to the risk of pregnancy would be expected to have ever used modern contraceptive methods. Whether a woman has ever moved during her life has a slightly significant effect on the odds of a woman ever using modern contraceptives in 1989/1993 and a non-significant positive effect in 1998/1999, indicating migration affected the odds of a woman ever using modern contraceptives when fewer women ever moved in Kenya. As more women began to move in Kenya and quality of care began to consistently improve in most cases throughout Kenya, the effect of migration became non-significant, indicating migration is not a significant factor influencing the odds of a woman ever using modern contraceptives when considering quality of care factors and individual characteristics.

Cross-Level Interactions: Female Educational Attainment and the Choice of Oral Contraceptives in a District

Since none of the quality of care indicators were significant in 1998/1999 and only the choice of oral contraceptives had a significant effect on the odds of a woman ever using modern contraceptives in 1989/1993, it was decided to run cross-level interactions with the choice of oral contraceptives in a district and the individual female educational attainment variables. A woman's education is predicted to affect the quality of care she receives at a service delivery point, as measured by the choice of oral contraceptives in a district, because it is predicted better educated women will understand the information presented to them and their choices better than less educated women. Thus, it is expected the interactions would have a positive effect on the odds of a woman ever using modern contraceptives as the choice of oral contraceptives at service delivery points increase in a district. The choice of contraceptives available in most districts has greatly improved between the two time points, thus, providing educated women more options with which to exercise their desire to control their fertility with modern contraceptives.

Table 2 examines the cross-level interaction of an individual woman completing primary school and the choice of oral contraceptives at service delivery points in the district in which she resides in 1989/1993 and 1998/1999. The interaction has an overall positive and significant effect on the odds of a woman ever using modern contraceptives in both time points and the combined effect is more significant in 1998/1999 than in 1989/1993. A woman completing primary school has a very significant effect in both time points. The positive effect of the choice of oral contraceptives in a district has a slightly significant positive effect in 1989/1993 and a very significant positive effect in 1998/1999. The effects and significance of the other variables in the model changed very little in either time point when the interaction was included.

The results of the educational cross-level interactions provide some interesting insight into how quality of care and a woman's education affects her decision to ever use modern contraceptives. An increasing number of women are attaining higher levels of education throughout Kenya but they are not evenly distributed throughout Kenya at the higher levels of education. As stated earlier, there are only 17 districts in Kenya with data available for this hierarchical study. In some districts there are very few or no women who have completed secondary school or beyond secondary school. For this reason, only the results for the cross-level interaction of completing primary school, which has a better distribution of women throughout the districts in Kenya, and the choice of modern

contraceptives will be discussed in this study². This interaction produces the predicted significant positive effect on the odds of a woman ever using modern contraceptives. This result could be an indication that quality of care will affect a woman's decision to ever use modern contraceptives when she has some education with which to better understand her choices. However, it is important to note the main effect of oral contraceptive choice is only significant in 1989/1993, indicating the importance of the characteristics a woman possesses when she goes to a service delivery point above and beyond the quality of care she receives there. This could be considered an indication that a woman has to possess a certain amount of knowledge when she goes for care in order to be able to take full advantage of increased choices available to her. This is a somewhat troubling and problematic conclusion regarding the quality of care in Kenya. Although more women are receiving more education, there are still a significant number of women who do not have any education and, based on these results, will not be able to fully avail themselves of their increasing options.

Conclusions

Family Planning Policy Implications

The measures of quality of care at service delivery points have almost no significant main effects on the odds a woman will ever use modern contraceptives. The cross-level interactions of the choice of oral contraceptives at service delivery points in a district and a woman's educational attainment illustrates the importance of individual characteristics on a woman's decision to ever use modern contraceptives. These results suggest quality of care is only providing an effect on a woman's fertility outcomes if she already possesses certain characteristics. If a woman goes to a service provider with a certain amount of knowledge, as indicated by completing primary school, then the cross-level interaction with the choice of oral contraceptives available at service providers in a district has a significant positive effect on her decision to ever use modern contraceptives. Considering it is likely most women going to service delivery providers are expecting to receive some information or care unavailable to them elsewhere, these results pose a unique problem for policy-makers and service providers. Not all women know what they want, need or is healthy for them when they go to a service provider and at this time a woman who has not completed primary school, and thus may not possess enough understanding of the information provided to her at a service

² The results for the other two cross-level interactions are available upon request.

provider to ask necessary questions to help her decide whether or not to use modern contraceptives, will potentially not receive the same level of care at a service provider and this needs to be addressed in future policies.

The results of this study provide useful insight into how contextual factors and individual characteristics influence a woman's fertility outcomes in Kenya. Studies similar to this current study could be used to help other countries improve the service delivery at family planning service providers. There may be different contextual and/or individual factors impacting the provision of quality care in other countries and studies structured in a similar manner may help identify areas which can help improve care at service providers. This current study illustrates the importance of a woman's educational background when she receives care at a family planning provider. It also highlights the importance of a woman's status in the household positively impacting her odds of ever using modern contraceptives. In order to better serve women in family planning clinics, it is necessary to better understand the complex contextual and individual dynamics underway in a country. It is doubtful that a policy focusing exclusively on family planning service provision or female education and empowerment to the exclusion of the other would be as successful as one that recognizes the importance of understanding the impact female education and status have in providing quality care at family planning service providers. Service providers may need to develop new interpersonal communication skills to effectively obtain and communicate relevant information based on a woman's level of education or status in her household. Until all women are educated and have the ability to discuss their family planning desires openly with their partners the burden falls to service providers to find ways to provide the same level of care to all women regardless of the characteristics they bring with them to the service provider.

Table 1: Ever Use of Modern Contraceptives Among Kenyan Women, Accounting for Quality of Care, 1989/1993 and 1998/1999

Variable	1989/1993		1998/1999	
	DF	Coefficient (Standard Error)	DF	Coefficient (Standard Error)
Level-2: Contextual I				
Intercept, γ_{00}	11	-0.871*** (0.114)	11	-0.577** (0.153)
Oral Contraceptive Choice, γ_{01}	11	2.989* (1.156)	11	1.384 (1.174)
Information Provided to the Client, γ_{02}	11	-1.890 (1.7582)	11	0.589 (1.357)
Provider's Technical Competence, γ_{03}	11	1.114 [†] (0.543)	11	-2.022 (2.072)
Provider's Interpersonal Skills, γ_{04}	11	-0.387 (1.021)	11	-0.374 (0.963)
Provider's Continuity Mechanisms, γ_{05}	11	0.154 (0.739)	11	1.144 (2.119)
Level-1: Individual				
Age at First Birth, β_1	6088	-0.043** (0.013)	6008	-0.041** (0.014)
Age at First Marriage, β_2	6088	0.043*** (0.013)	6008	0.041** (0.013)
Years Married, β_3	6088	0.039*** (0.005)	6008	0.029*** (0.004)
Favored Ethnic Group (1 = Yes; 0 = No), β_4	6088	-0.043 (0.071)	6008	-0.045 (0.104)
Ever Moved (1 = Yes; 0 = No), β_5	6088	0.159* (0.071)	6008	0.025 (0.068)
Ever Discuss Family Planning with Partner (1 = Yes; 0 = No) β_6	6088	0.793*** (0.078)	6008	1.238*** (0.083)
Work in Agriculture (Not Working), β_7	6088	0.127 (0.084)	6008	0.223** (0.080)
Work in an Unskilled Profession (Not Working), β_8	6088	0.542*** (0.156)	6008	0.462** (0.147)
Work in Sales (Not Working), β_9	6088	0.588*** (0.089)	6008	0.661*** (0.095)
Work in a Skilled Profession (Not Working), β_{10}	6088	0.726*** (0.123)	6008	0.668*** (0.127)
Currently Married (Never Married), β_{11}	6088	0.928*** (0.117)	6008	0.842*** (0.122)
Formerly Married (Never Married), β_{12}	6088	1.288*** (0.138)	6008	1.606*** (0.141)
Complete Primary School (No Education), β_{13}	6088	0.641*** (0.094)	6008	0.639*** (0.101)
Complete Secondary School (No Education), β_{14}	6088	1.377*** (0.118)	6008	1.193*** (0.121)
Complete Beyond Secondary School (No Education), β_{15}	6088	1.825*** (0.454)	6008	1.292*** (0.264)

$p \leq .001 = ***$; $p \leq .01 = **$; $p \leq .05 = *$; $p \leq .09 = \dagger$

Table 2: Ever Use of Modern Contraceptives Among Kenyan Women, Accounting for Quality of Care with a Cross-Level Interaction of Complete Primary School and Oral Contraceptive Choice, 1989/1993 and 1998/1999

Variable	1989/1993		1998/1999	
	DF	Coefficient (Standard Error)	DF	Coefficient (Standard Error)
Level-2: Contextual				
Intercept, γ_{00}	11	-0.869*** (0.114)	11	-0.574** (0.152)
Oral Contraceptive Choice, γ_{01}	11	2.993* (1.155)	11	1.319 (1.162)
Information Provided to the Client, γ_{02}	11	-1.918 (1.582)	11	0.596 (1.344)
Provider's Technical Competence, γ_{03}	11	1.124 [†] (0.543)	11	-2.000 (2.051)
Provider's Interpersonal Skills, γ_{04}	11	-0.377 (1.020)	11	-0.371 (0.953)
Provider's Continuity Mechanisms, γ_{05}	11	0.146 (0.739)	11	1.113 (2.097)
Level-1: Individual				
Age at First Birth, β_1	6087	-0.042** (0.013)	6007	-0.042** (0.014)
Age at First Marriage, β_2	6087	0.043** (0.013)	6007	0.041** (0.013)
Years Married, β_3	6087	0.039*** (0.005)	6007	0.029*** (0.004)
Favored Ethnic Group (1 = Yes; 0 = No), β_4	6087	-0.041 (0.106)	6007	-0.044 (0.104)
Ever Moved (1 = Yes; 0 = No), β_5	6087	0.160* (0.071)	6007	0.017 (0.068)
Ever Discuss Family Planning with Partner (1 = Yes; 0 = No) β_6	6087	0.791*** (0.078)	6007	1.238*** (0.083)
Work in Agriculture (Not Working), β_7	6087	0.128 (0.084)	6007	0.225** (0.080)
Work in an Unskilled Profession (Not Working), β_8	6087	0.534*** (0.156)	6007	0.461** (0.147)
Work in Sales (Not Working), β_9	6087	0.594*** (0.089)	6007	0.669*** (0.095)
Work in a Skilled Profession (Not Working), β_{10}	6087	0.725*** (0.124)	6007	0.669*** (0.127)
Currently Married (Never Married), β_{11}	6087	0.926*** (0.117)	6007	0.842*** (0.123)
Formerly Married (Never Married), β_{12}	6087	1.285*** (0.138)	6007	1.618*** (0.141)
Complete Primary School (No Education), β_{13}	6087	0.647*** (0.094)	6007	0.637*** (0.101)
Oral Contraceptive Choice		1.076* (0.556)		1.315** (0.437)
Complete Secondary School (No Education), β_{14}	6087	1.398*** (0.118)	6007	1.177*** (0.121)
Complete Beyond Secondary School (No Education), β_{15}	6087	1.885*** (0.455)	6007	1.285*** (0.264)

$p \leq .001 = ***$; $p \leq .01 = **$; $p \leq .05 = *$; $p \leq .09 = \dagger$

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