Contraceptive Use among Women of Reproductive Age in Kenya's City Slums

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Abstract

The Kenya government in collaboration with other stakeholders involved in the provision of family planning services have put in place various strategies and policies to increase uptake of family planning services. These are aimed at increasing contraceptive prevalence rate (CPR), reduction in both total fertility rate (TFR) and unmet need for family planning services. Despite the various strategies and policies, total fertility rate still remains high at 4.6 percent, while CPR and unmet need for family planning are estimated at 46 percent and 24 percent, respectively. The purpose of the study was to examine the utilization level of family planning services and to analyze the determinants of demand for family planning services among women in City slums in Kenya. To realize this objective, a survey design was adopted. The target population constituted women in city slums in Kenya, who were identified through multistage random sampling. Primary data was collected from the women using a structured interview schedule. A fact sheet was used to summarize the data collected before it was cleaned, coded and edited for completeness and accuracy. The study revealed low usage of contraceptives compared to the national level. Use of the services varied in terms of demographic and socioeconomic factors of the woman and also the woman's perception in terms of the facility/provider factors such quality, friendliness of staff and promotion. Various factors accounted for the low use of family planning services. These included partner's approval, quality of the services, friendliness of the staff administering the services and the woman's knowledge about family planning services. Other factors included the woman's income level, proximity to the provider and the religious background of the woman. To increase the use of family planning services among women in slums, activities of community based distributors should be revived and enhanced, promotion of family planning education and activities at the household level should be accorded priority. Formation of lobby groups to enhance cultural change, awareness creation and counselling and integrating family planning services with HIV/AIDS are recommended.

Keywords: Family planning, women, reproductive age, Kenya

Introduction

Many developing economies are characterized by rapid population growth that is partly attributed to high fertility rate, high birth rates accompanied by steady declines in death rates, low contraceptive prevalence rate and high but declining mortality rate (Oyedokun, 2007). In Sub-Saharan Africa (SSA), the rate of population growth is one of the highest in the world, (2.8 percent) compared to the rest of the world (USAID/HPI, 2007). Equally, the number of people in need of health and education, among other public goods is large and increasing which in turn requires large amounts of resources, personnel and infrastructure. This is likely to be an impediment towards the realization of the reduction of child mortality, improvement of maternal health, achievement of universal primary education, environmental sustainability and combating HIV/AIDS, malaria and other diseases as part of the Millennium Development Goals (MDGs) (Health Policy Initiative, 2007). To address this, many countries in the Sub Saharan Africa (SSA) including Kenya focused their attention on birth control measures, especially the use of family planning services.In Kenya, family planning services have been in use since 1957 when the Family Planning Association of Kenya (FPAK) started operating family planning clinics within Ministry of Health facilities.

The government recognized the importance of family planning soon after independence, and formally accepted population planning and family planning as part of the National Planning Strategies (Republic of Kenya, 1965). To enhance its commitment, the Government of Kenya established the National Council for Population and Development (NCPD) in 1982. The mandate of the institution was to formulate population policies and strategies aimed at reducing Kenya's population growth rate. In the Kenya Health Policy Framework (KHPF) of 1994, the Government identified population development as a priority strategy for achieving balanced socio economic development. In the report, reproductive health components were identified as one of key strategies. Specifically, the Government prioritised reduction in fertility rate as well as increase in the proportion of health facilities providing integrated reproductive health services including family planning (FP) services as key priority in population development. To reinforce its commitment further, the government launched Sessional Paper No. 1 of 1996 on National Population Policy for Sustainable Development, in which it recognized population challenges as unmet need for family planning and high level of adolescent fertility. As a result, the government reiterated its commitment to increasing availability, acceptability and affordability of quality family planning services.

To ensure quality provision of these services, the government, through the Ministry of Health (MOH), developed guidelines and standards for family planning service providers in 1991. The guidelines were not only developed to assist family planning providers in educating clients, but also to determine and provide the best method for clients' needs and to instruct the clients in the use of method and follow-up (Republic of Kenya, 1991). The guidelines were however reviewed in 1997 and consequently incorporated in the Reproductive Health/Family Planning Policy Guidelines and Standards for Service Providers (Republic of Kenya, 2007). In the policy document, provision of quality and sustainable family planning services was identified as the main goal that would help to reduce the unmet needs for family planning. As part of its commitment in addressing population growth, the Government in the National Health Sector Strategic Plan II (NHSSP-II) of 2005-2010 specified the Kenya Essential Health Package (KEPH). In the package, a wide range of population growth issues was addressed. These range from maternal health infections, nutritional deficiencies, family planning and child spacing. The Government further reiterated its commitment in containing population growth in the Vision 2030 and National Population Census report of 2010 through various interventions including provision of family planning services (Republic of Kenya, 2007b; Republic of Kenya, 2010).

Trends in Fertility Rate and Contraceptive use in Kenya

The policy developed by the Government since 1968 remained dormant until the findings from the World Fertility Survey (WFS) in 1977 showed that Kenya had one of the highest fertility rates in the world of 8 children per woman (WFS, 1977). This statistic served to focus both policy and public attention on fertility issues and to reinvigorate the population policy, with the result that substantial national and international support was dedicated to developing and strengthening a vigorous national family planning programme. The impact of this was remarkable, as the fertility rate declined from 8.1 children per woman in 1977 to 6.7, 4.7 and 4.6 in 1989, 1998 and 2008 respectively, (Republic of Kenya, 2009). Indeed, the decline in fertility between 1977 and 1998, from 8.1 to 4.7 births per woman was one of the most rapid declines ever documented in the world. This consistent decline in fertility led to projections that total fertility rate (TFR) would decline gradually to about 3.5 by 2008. This decline was attributed to increased contraceptive use among women aged between 15 and 49 years (Republic of Kenya, 2003). On the other hand, the contraceptive prevalence rate increased rapidly from 9.7 percent in 1984 to 39 percent in 2003. The sustained increase in the use of family planning services was a major factor in fertility transition, providing women and couples with the means to help them plan pregnancies (Backer, 2003; USAID/HPI, 2007; Republic of Kenya, 2007b).

As one of the first countries in Africa to develop a Population Policy and establish a Family Planning Programme as the main policy lever to reduce the population growth rate, Kenya has been well placed to initiate a fertility transition through government-led actions (Koome *et al.*, 2005; Ian *et al.,* 2009). In the 1980s and 1990s, Kenya achieved a rapid fertility decline, because of the official commitment of the government, substantial funding and technical support from a range of bilateral and multilateral development partners.

Indeed, when the results of the 1993 Demographic Health Survey (DHS) were released, Kenya's success in achieving a phenomenal decline in fertility was lauded globally, and many national and international observers felt that social norms in favour of small families and increased use of contraception were now well established and irreversible (Ian *et al.,* 2009).Over the decade starting from the mid-1990s, the national family planning programme was substantially reduced following the withdrawal of funding from donors, and a reduction of government funding. As a result, the large-scale community-based distribution (CBD) programmes that allowed low-cost contraceptive information and services to reach rural and peri-urban communities declined drastically. At the same time, the nationwide information education and communication (IEC) campaigns advocating for small families and the use of contraception collapsed. Both of these components had been introduced as demand creation strategies for family planning services. The drastic reduction in investment in these strategies at this time reflected the false perception that the demand for family planning was sufficiently well established in the general population, and that the programme's focus should consequently have shifted to addressing the resulting unmet need (Crinchton, 2008).

Several other factors also influenced funding of the family planning programmes. Some of these relate to policy and programmatic decisions concerning the family planning effort in the 1990s. The International Conference on Population and Development (ICPD) in 1994 affirmed the importance of providing family planning within a rights-based framework and as part of a comprehensive set of services to meet individual reproductive health needs that would also address broader development concerns (Westoff and Cross, 2006). While this undoubtedly broadened the range and quality of reproductive health services provided in Kenya, the energies and resources expended on re-aligning policies, programmes and services almost certainly diluted the attention being paid to basic family planning services.Long-standing donor investment in family planning in Kenya had been seen to produce a major fertility decline, and many donors either re-directed their investments into a broader range of maternal child health (MCH) related services. Others included emerging priorities such as HIV/AIDS, or in basket funding to the government to support a range of social investments (Ian *et al.,* 2009). According to Crinchton (2008), in the 1990s, the Kenyan economy was also characterized by declining growth in the Gross Domestic Product (GDP) and increases in the population living below the poverty line. At the same time, political tensions increased significantly following the introduction of a multiparty political system in the 1992 elections. Further, the donor community reduced funding for Kenya's programmes including family planning services, due to Kenya's poor macroeconomic policies. These factors attracted the attention of politicians as well as other influential leaders and indeed the general population. In the end, the family planning "success story" soon became yesterday's news, and attention to population issues in general and fertility decline in particular gradually waned.

The political turbulence of the 1990s also facilitated a rise in public advocacy against family planning from conservative religious leaders and "pro-life" groups. As a result, many politicians became more cautious in making any public statements about reproductive health generally and family planning in particular. There was evidence of a decline in international and national support for the family planning programme since the mid to the late 1990s, which mirrors the decrease in overall official assistance to Kenya. This was estimated to have dropped from a high of above $1billion in the late 1980s to under $400 million by 2000 (Crinchton, 2008). The timing of this decrease also parallels the stall in fertility decline, although the magnitude of the effect of this decrease in development assistance is yet to be fully evaluated.

An increase followed by a decrease in institutional commitment to family planning programmes appears also to have affected the stall, with the timing of these changes in commitment and corresponding programmes effort. This closely mirrored the decline and then stagnation in the fertility rate (Ian *et al.,* 2009). On the realization that HIV and AIDS were reaching pandemic proportions, the government of Kenya diverted national and international attention and resources into fighting the epidemic. Not only did this reduce the funding allocated for family planning services, but it also reduced the levels of national and international technical expertise available, and importantly, took well-trained health personnel and support systems away from reproductive health to work in the newly created HIV/AIDS programmes. The 1998 DHS showed a four-percentage point increase in contraceptive prevalence from 26 percent to 39 percent between 1993 to 2003, while total fertility declined substantially over the same period from 5.4 to 4.7 (Republic of Kenya, 2003).

These findings reinforced the impression that the fertility transition in Kenya was well and truly established, and that the strategies that were being implemented and levels of funding available for both creating and supplying demand were appropriate for the country at this stage of fertility transition.

Consequently, the results of the 2003 DHS came as a shock to national and international observers and a flurry of activities ensued to try to "reposition" both family planning and population as key issues worthy of attention and investment. The government, for example replaced the NCPD with a National Coordinating Agency for Population and Development (NCAPD), and the Millennium Development Goals provided a platform for the role of population growth in sustainable development to be revisited and addressed. Many development partners have sought ways to increase their investments in support of family planning services, but their gradual disengagement over the previous decade has meant that it has been difficult to make convincing arguments to increase allocations for family planning in the face of other development challenges such as transportation, infrastructure, HIV/AIDS and education. Notwithstanding this, studies by Sharma *et al*. (2005a) and Sharma *et al*. (2005b) have however shown that, paradoxically, it is the wealthier groups who benefit from government healthcare spending, not the poor. Moreover, the poor may not be aware of policies designed to help increase access to reproductive healthcare services in general and family planning services in particular, such as user fee exemption schemes for the poor, or they may be subject to informal fees charged by providers.

Importance of Family Planning

An analysis of the contribution of family planning to the MDGs by Moreland and Talbird (2006) showed that satisfying unmet family planning needs in Kenya could avert 14,040 maternal deaths and 434,306 child deaths by the MDG target date of 2015 (Republic of Kenya, 2007b). In USAID/HPI (2007), it was noted that the cost savings in providing services to meet MDGs outweigh the additional costs of family planning by a factor of almost 4 to 1. Specifically, the social sector cost savings and family planning costs in Kenya for 2005-2015 are estimated at $271 millions, with maternal health taking $75 million, while water and sanitation, immunization and education each taking $36 million, $37 million and $115 million, respectively. This compares with the total cost of family planning estimated at $71million, which implies that total savings will be $200 million (Moreland and Talbird, 2006; USAID/HPI, 2007).

Promotion of family planning in countries with high birth rates has the potential of reducing poverty and hunger, while at the same time averting 32 percent of all maternal deaths and nearly 10 percent of child mortality. This would contribute substantially to women's empowerment, achievement of universal primary schooling and long-term environmental sustainability (Cleland *et al.,* 2006). If access to family planning services was increased, the unmet need for family planning could be met, thereby slowing population growth rate and reducing the costs of meeting MDGs in terms of universal primary education, which is influenced by the number of children in need of education (Moreland and Talbird, 2006). Hawkins *et al.* (1995) observed that family planning services offer various economic benefits to the household, country and the world at large. First, family planning permits individuals to influence the timing and the number of births, which is likely to save lives of children. Secondly, by reducing unwanted pregnancies, family planning service can reduce injury, illness and death associated with child birth, abortions and sexually transmitted infections (STIs) including HIV/AIDS. Further, family planning contributes to reduction in population growth, poverty reduction and preservation of the environment as well as demand for public goods and services (Shane, 1997; Cincotta and Engelman, 1997).

Other substantial economic benefits could include demographic *bonus* or dividends. Demographic *bonus* exists when there is a shrinking share of the population consisting of dependent children at the same time as a greater share consisting of working-age adults. According to David *et al.* (2002), when this occurs, it boosts productivity and allows added savings or investment. David *et al.* (2002) observed that family planning helps to reduce the number of high-risk pregnancies that result in high levels of maternal and child illness and death. Wawire (2006) noted that high population growth is associated with high illiteracy rates and low education level that make it difficult to implement government programmes, given their budgetary implications. According to World Bank (2003), the use of family planning services is an important issue for a developing country like Kenya.

The World Bank (2003) noted that this was due to the benefits gained in terms of development through reductions in fertility levels. Furthermore, the uptake of family planning widened choices available to people, particularly women, by allowing individuals and society more opportunities for social and economic development. Singh *et al.* (2004) revealed that a high fertility rate (which in many cases is attributed to low contraceptive prevalence rate) impedes economic growth.

Singh *et al*. (2004) observed that countries with high "population pressure" or with rapidly growing populations may not be able to meet the large education, labour, health, and infrastructure-related demands of the population. Leisinger *et al*. (2002) noted that population growth affects the environment and raises concerns about food security, safe drinking water and availability of arable land. Eastwood and Lipton (2001) observed that reducing fertility can help alleviate poverty and stimulate economic growth. They noted that reducing the birth rate by 5 births per 1,000 during the 1980s would have reduced the average national incidence of poverty from 18.9 percent in the mid-1980s to 12.6 percent in the mid-1990s. Merrick (2002) forecasted that declining birth rates can result in an improved dependency ratio, with an increasing number of productive adults relative to the number of young and elderly dependents. This, Merrick (2002) contended, would be realized only if countries responded with appropriate family planning policies and the resources that would have been required to meet the needs of a larger number of dependents. According to USAID/HPI (2007), family planning can slow population growth and reduce demographic pressure, which can in turn help countries to lift themselves out of poverty. Reduced population sizes mean a decreased burden on national expenditures for education, health and other social services, as well as less strain on the environment and natural resources. This further contributes directly to reduced infant and maternal mortality and morbidity.

The Profile of Study Area

The study was conducted in the city slums of Nairobi, Kisumu and Mombasa. These slums are characterized by high poverty levels, low levels of education, large household sizes that affect access to basic health services including family planning services. According to USAID/HPI (2007), women from the lowest socio-economic status (SES) groups, including slums, are the least likely to use modern contraceptive methods. In 2003, for instance, only 12 percent of women from the very low SES groups used modern family planning methods, while 45 percent of women from the high SES groups did the same (Republic of Kenya, 2003). USAID/HPI (2007) noted that SES affects the access to and use of family planning services. In terms of unmet need for family planning services, women in slums have the highest levels of unmet need for family planning, estimated at 33 percent compared to only 17 percent in high SES groups. It is estimated that half of the 2.2 million Kenyans living with HIV live in slums (USAID/HPI, 2007). Similarly, young girls are also married off by their parents/guardians at a tender age in order to secure a perceived financial support. By the time they reach 40 years of age a majority of them will have given birth to more than six children. Additionally, access to health services in slums is another issue of concern given the poverty levels. Thus, the ability to access family planning services is equally affected, leading to incidences of high child mortality, poor maternal health, non sustainability of the environment and inability to combat HIV/AIDS, malaria and other diseases. In the final analysis, the ability to achieve universal primary education as envisaged in vision 2030 is affected. In the process, this contributes towards high levels of school dropouts, high unemployment levels as well as prostitution.

Given the low levels of education among women in slums together with high levels of school dropout rates and insufficient knowledge of family planning services, the utilization of family planning is expected to be low compared to the national level estimated at 46 percent (Republic of Kenya, 2008). Households in slums earn their livelihoods through different forms of economic activities, which include employment as waiters, bar men, bar maids, drivers, watchmen, shop assistants, casual labourers (in factories and construction sites), artisans, small business owners, and other income generating activities such as herbalists, entertainers, carriers of goods and any other assignment with money attached (Karirah-Gitau,1999). This, according to Karirah-Gitau, impacts heavily on their ability to access basic needs including education and health (which includes family planning services). Mitullah (1997) reported that most residents in slums had primary education level (61 percent) and secondary level education (32 percent) with about 7 percent having no formal education. Mitullah further revealed that these households earn, on average, very low incomes ranging between Ksh. 1,000 and 28,000 with a majority earning between Ksh. 5,000 and 7,500 (Mitullah, 1997). Such low incomes have an impact on access to basic needs.

In terms of ailments, APHRC (2001) noted that in the slums, the incidence of malaria, waterborne diseases such as typhoid and cholera is high. These have in the process contributed to high rates of child mortality and poor maternal health. Other common ailments according to APHRC (2001) include measles, flu, STIs including (HIV/AIDS), and TB. APHRC (2001) contended that poor environmental conditions including crowding, lack of access to family planning services as well as lack of clean water had accounted for the ailments.
Given all these characteristics, there is likelihood that contraceptive prevalence rate and unmet needs in the slums are lower than the national rates estimated at 46 percent and 24 percent, respectively. Similarly, fertility rates are expected to be higher than the national rate of 4.6 percent. For these reasons, the study was perceived necessary in these areas to inform the policy process on the way forward.

Statement of the Problem

As indicated in the foregoing discussion, the Kenyan government has put in place various strategies and policies to facilitate the use of family planning services as a step towards reducing the fertility rates, increasing contraceptive prevalence rate (CPR) and reducing the unmet family planning needs (Republic of Kenya, 2003b; Republic of Kenya, 2007b; Ian *et al.*, 2009; and Republic of Kenya, 2008). Despite these policy measures, total fertility rate still remains high at 4.6 percent, while CPR for all methods is at 46 percent. On the other hand, the unmet needs for family planning services average at 24 percent (Republic of Kenya, 2007a; Republic of Kenya, 2009; Ian *et al.*, 2009). The high TFR together with low CPR, unmet needs for family planning services, low death rate (estimated at 14.02 deaths per 1,000 women), high birth rate (estimated at 39.73 births per 1,000 population) and low infant mortality (estimated at 59.26 per 1000 live births) (Republic of Kenya, 2009) could be contributing towards high population growth. Standards of living tend to worsen when the rate of population growth exceeds the rate of economic growth (Feyisetan and Bamiwuye, 1998). At the household level, the high fertility rate may be contributing towards depletion of productive resources in the society, rising cost of living, ill health, poor nutrition and limited educational opportunities, ultimately trapping women in a poverty cycle. In the case of slums where poverty levels are high, the situation is likely to be worse. Although 2008 KDHS demonstrated that education, marital status, woman's income, and other demographic and socio-economic factors affect utilization of family planning services, the significance of these factors and provider factors have not been determined for the urban poor women living in the slums. The purpose of the study was to analyse the level use of contraceptives amongst women of reproductive age within the city slums in Kenya while at the same time examine the factors that was contribute towards the utilization of the contraceptives amongst these women.

Overview of Past Studies

Various studies have been conducted with regard to the demand for health services in general and contraceptives in particular. In general, there are some aspects of the existing literature that deserve scrutiny. Most of these studies have used econometric tools that are inadequate in accounting for the complexity of relationships between family planning services due to the insufficiency of economic theory in the determination of the right specification. For instance, majority of the variables did not have a direct theoretical relationship, hence estimation could not have been plausible as it was done in the studies. Specifically, other than studies by Mwabu (1984), Mwabu *et al.* (2003), David *et al.* (2002), Odwee *et al.* (2006) and Ajakaiye and Mwabu (2007), none of the other studies developed a theoretical model that provided the solid ground for adopting models that were estimated. Even though these studies developed a theoretical model, all of them were concerned with the demand for health care and not family planning services. Similarly, none of the studies targeted respondents directly in the slums. This compares to the current study where respondents from the slums were targeted. As revealed in the literature review, most of the studies on family planning services such as the Lewis *et al.* (1986), Mohamad *et al.* (1988), Abdullah (1997), Mahidul *et al.* (1998) and Kamal (1994) were not only done outside Africa but also relied on secondary data from demographic health surveys.

At country level, although there exists a few studies (Njogu, 1991; Kyalo, 1996; and Aquanda, 2005) regarding contraceptive use, most of them relied on secondary data from the demographic health surveys. On the other hand, other country based studies such as Korir and Mwabu (2004), Obonyo and Muga (2005), Korir *et al.* (2004) considered policy issues, especially user fees. The current study, however, went beyond by incorporating policy as well as demographic and socio-economic variable studies in order to examine how these variables influence the demand for family planning services in city slums.

In terms of variables considered, many of the studies were limited and relied heavily on descriptive statistics in the analysis. For instance, although the study by Clements and Nyovani (2004) considered a wide variety of variables such as education level of both the woman and her partner, religion, the partner's approval, marital status and age, no econometric model nor tests were incorporated. This makes the study inadequate especially in the world of academic rigour. Like the case of Clements and Nyovani (2004), Betrand *et al.* (2005) considered many factors, some of which were incorporated in the current study. However, the study captured both the supply side as well as the demand side to evaluate family planning services. The current study, however, only considered the demand side variables to avoid the economic problem of double causality. On the basis of the literature reviewed, various variables were found to affect demand for family planning services. This study considered some of these variables on a restrictive basis to examine how they affect demand for the services amongst the urban poor in the city slums. It is worth noting that none of the studies reviewed targeted respondents in the city slums.

Data and Methods

The study adopted a survey design in order to obtain the necessary data. The selection of the design was due to twofold reasons. First, it facilitated the collection of original data necessary to realize the research objectives. Secondly, it was also appropriate in collecting useful data that could be quantified and reported as a representation of the real situation or characteristic in the study population. The target population was women in slums in the three cities of Nairobi, Mombasa and Kisumu who were identified through multistage sampling. The study objective was achieved using both quantitative and qualitative data. The study relied on primary data collected using a structured interview schedule that contained both open ended and closed ended questions.

Before collecting the necessary data, the research instrument was pilot tested with a small representative sample. The pre-test of the instrument was necessary to find out if the tool could collect the necessary data. This was because at a glance, it was not only possible to foresee all the potential misunderstandings or biasing effects of the questions but also to facilitate perfection of concept and wording. A code book was prepared for the various responses obtained. Thereafter, the data was cleaned to ensure completeness of the information before it was converted into the mode that could pick the necessary information based on the research problem. The data collected was analyzed first in terms of descriptive statistics to examine the utilization level based on the woman demographic and socioeconomic factors as well as facility/provider factors. Secondly a binomial logistic model was estimated using a two step regression in terms of probability and finally marginal effects. Various diagnostic tests including normality test, model specification, multicolinearity and heteroskedasticity were undertaken on the specified model.

Theoretical Framework and Model

In the derivation of the model, an attempt was made to provide a theoretical explanation for certain empirical observations about a woman in her behaviour to seek family planning services. It was assumed that a woman faced information asymmetry and a variety of family planning services. In the study, the utility of a representative consumer who in this case was a woman was expressed as a function of observable attributes of family provider/facility, characteristics of the woman who intend to consume family planning services, and a random error. In the study, the amount of family planning services consumed is an argument of a consumer's utility function. To avoid problems of measuring the amount of family planning services consumed, an indirect utility function of the following form was used.

$$V_{ij} = V(P_{ij}, Y_i, S_i, F_{ij}, P_o) \qquad \ldots\ldots 1$$

where V_{ij} was indirect utility that consumer i derived from consuming family planning services j, where j = 1, 2,…,m; **P** was a vector of prices that consumer *i* faced for the family planning services *j,* Y_i was income of the consumer i; $\mathbf{S_{ij}}$ was **p**ersonal characteristics of consumer *i* like age, education, religion, and marital status, among others for family planning services *j*; $\mathbf{F_{ij}}$ was facility/provider characteristics such as friendliness of staff at facility, perceived quality of the services and accessibility of the facility, among others that provide family planning services *j, and* P_o was Government policies relating to family planning services such as promotion of family planning, among others.

Given the choice model, it was necessary to invoke Roy's identity as implied in Varian (2002) in order to obtain the amount of family planning services implied by the maximization of the indirect utility in equation.

$$In\{P/1-P\} = \boldsymbol{X_{ij}\beta} \;\ldots\ldots\ldots\ldots\ldots\ldots\ldots 2$$

where *P* was the probability of using any method of contraception. In this case, a consumer might be using or not using contraceptives; *In* is the natural logarithmic function, $\boldsymbol{\beta}$ is a vector of regression coefficients to be estimated; while X_{ij} is a vector of explanatory variables that affect utilization of family planning services *j* by household *i*. Based on the theoretical framework a functional equation was developed with dependent variable being use of family planning services (USfp) as the proxy for demand. The explanatory variables were characteristics of the woman (HHcrt); characteristics of the family planning services' provider (Pfpcrt); and government policies (Govp). These variables were chosen to reflect the factors that might be associated with family planning use in Kenya's city slums. The characteristics of the family planning services' providers and government policies were selected as indirect explanatory variables. The individual consumer characteristics included age (ag), number of living children (nlc), level of education (led), desire for children (dmc), marital status (mrts), partner's education (pted), approval by partner (pap), religious background of the woman (rlg) and average income of the woman (avinc). The characteristics of the family planning services' provider included quality of family planning services (qfps), proximity of the family facility (pxif) and friendly staff at facility (fsp). Government policies were restricted to promotion of family planning services (prfs) and user fees/price (pri). The restriction was necessary in order to limit the analysis on the knowledge of the woman regarding family planning services. Thus equation considered was:

USfp=f(ag, nlc, pted, mrts, led, dmc, pap, rlg, avinc, qfps, pxif, fsp, prfs, …...................8

Empirical Results

a) Descriptive Statistics

In terms of descriptive statistics, overall utilization level is provided followed by reasons for use and the commonly used methods. Thereafter, utilization of family planning services in terms of demographic, socioeconomic and facility factors are provided in that order.

i) Utilization

While 51 percent of the respondents were currently using family planning services, the remaining 49 percent were not. Those using the contraceptives cited various reasons ranging from managing the family to preventing sexually transmitted diseases. Whereas 20 percent of the respondents were using family planning to manage the family, 30 percent were using family planning for purposes of preventing pregnancy. This result points out that the major reasons why women in slums use contraceptives to prevent pregnancy and contraction of STIs. On the other hand, non-use of contraceptives was attributed infrequent sex, not married, desire for children, cultural norms, pregnant, religion and lack of support from the partner. In terms of methods, the study reveals that the most commonly used contraceptives were condoms (35%), pills (33%), injection (19%), and IUD (4%)

ii) Demographic and Socio Economic Factors

The first objective of the study was to examine demographic and socio-economic factors that affect the use of family planning services by women in city slums. Various demographic and socio-economic factors considered include age of the woman, religion of the woman, level of education of the woman and partner, marital status, number of living children, desire for more children, partner's approval, employment status and average level of income. Information obtained was analysed as summarized in table 1.

Use of family planning was found to be highest among women aged between 20 – 39 years compared to those below 20 years and above 39 years. Whereas 49 percent of the women that were using contraceptives were aged 20- 29 years, 41 percent were aged between 30 - 39 years, while no woman aged 50 years and above was found to be using any form of family planning services. On the other hand, 4 percent and 6 percent of the women who were using family planning services were less than 20 years and between 40 – 49 years of age, respectively.

As shown in the table, majority of those using contraceptives had post primary education, while the least users of family planning had no formal education. In percentage terms, whereas 49 percent of the users of family planning services had secondary education, 28 percent had university education while only 15 percent had primary education with 6 percent reporting no formal education. In terms of religious background of the woman, out of the 51 percent that were using contraceptives, 52 percent were Protestants, 35 percent Muslims while only 13 percent were Catholics. This is an indication that use of contraceptives vary across religion with Catholics using the least.

Table 1: Demographic and Socio Economic Factors

Demographic and Socio Economic Factors		**No. of Respondents**	**Percentage (%)**
1. Woman's Age Group	a. Above 50 Years	0	0
	b. Less than 20 Years	20	4
	c. 20 – 29 Years	245	49
	d. 30 – 39 Years	205	41
	a. 40 – 49 Years	30	6
2. Woman's Level of Education	a. None	30	6
	b. Primary	75	15
	c. Secondary	245	49
	d. Post Secondary	140	28
3. Partners Level of Education	a. None	20	4
	b. Primary	95	19
	c. Secondary	235	47
	d. Post Secondary	150	30
4. Religion	a. Catholics	65	13
	b. Protestants	260	52
	c. Muslim and Others	175	35
5. Marital Status	a. Married	315	63
	b. Single	185	37
6. Partners Approval	a. Yes	280	56
	b. No	115	23
	c. None	105	21
7. Partners Level of Education	a. None	20	4
	b. Primary	95	19
	c. Secondary	235	47
	d. Post Secondary	150	30
8. Number of Living Children	a. None	10	2
	b. Between 1-3	75	15
	c. Between 4 – 6	150	30
	d. Between 7 – 9	180	36
	e. Above 9	85	17
9. Desire to have Children	a. Using FP	55	11
	b. Not Using FP	445	89
10. Employment Status	a. Casuals	115	23
	b. Employed	240	48
	c. Others	145	29
11. Woman's Level of Income	a. None	15	3
	b. Less than 5,000	35	7
	c. Between 5001 – 10,000	60	12
	d. Between 10,001 – 15,000	95	19
	e. Between 15,001 – 20,000	140	28
	f. Above 20,000	155	31
12. Knowledge by Respondents	Using FP	140	28
	Not using FP	360	72

Source: Survey Data, 2010

Use of contraceptives was found to vary across marital status with married women using the services most compared to single women. In the study, married women were found to be using contraceptives the most due to high incidences of sexual activities compared to single women. In this case, it was revealed that use of contraceptives was aimed at helping to space children and prevent unwanted pregnancy. Regarding partner's approval, 56 percent of the women sought approval before using contraceptives, while 23 percent did not bother. The remaining 21 percent of the respondents were however uncertain an indication that they were either not having a regular sexual partner whom they could seek approval from, or that they were not sexually active. The high percentage of those who sought approval from a partner clearly indicates the importance of a partner's consent in making a final decision on use of family planning services.Women with more living children were using family planning services more compared to those with fewer children. Out of the women that were using family planning services, 36 percent had 4 – 6 children, followed by those with between 1-3 living children at 30 percent.

On the other hand, 17 percent of those respondents using family planning services had between 7 – 9 living children, while 15 percent had no living child. This reveals that the higher the number of living children, the more the desire to use family planning services. This is because with more children might not be having desire for children as the desire has already been satisfied. The desire for more children was attributed to many factors, including a cultural perception that more children signified a source of wealth. For instance, those who had girls only needed boys to satisfy their parent in-laws, who preferred boys. On the other hand, those who reported no desire for children cited having enough children, not being married and economic factors, especially lack of necessary resources to take care of the children, to have contributed to lack of desire for additional children. Out of those with a desire to have more children, only 11 percent were using family planning services, while 89 percent were not. In terms income, out of the total number using contraceptives, 31 percent had an average monthly income of Ksh 20,000 and above while 28 percent had an average monthly income of between Ksh. 15,000 to 20,000. On the other hand, 7 percent of users had an average monthly income of less than 5,000. Those with no income were, however, the least users of family planning services. The results thus reveal that in the absence of an income source, usage of family planning would decline. Among respondents who had knowledge about family planning services, 72 percent were using family planning services, while the remaining 28 percent were not using the services.

iii) Facility Factors determining the use Family Planning Services

The second objective of the study was to examine facility factors that affect the use of family planning services by the respondents in city slums. Various facility factors were identified and considered in the study. These included family planning provider, quality of family planning services, availability of family planning services, user fees charged for family planning services, and proximity of the family planning facility.

Out of the 51 percent that were using contraceptives, 49 percent obtained the services from health facilities, 15 percent obtained from pharmacies, while a paltry 6 percent obtained from both workplace and mobile health facility. On the other hand, 30 percent could not specify the source of the services. These results clearly point out that government and other stakeholder's sponsored large scale provision of family planning services might not be working effectively, especially in the slums. Regarding quality of the contraceptives, whereas 40 percent of the respondents were uncertain about the quality of family planning services provided, 41 percent agreed that quality was good, while 19 percent were of the opinion that quality was not good. There is a possibility that women who were uncertain about the quality could be among those who were either unaware of the availability family planning services or not using the services, and therefore had no way of gauging the quality of family planning services. Given the multiple sources of family planning services in slums, quality of the services was bound to be compromised, especially in slums where monitoring by health officials was likely to be limited if at all it existed. Out of the 41 percent that agreed that quality of the services was good, 86 percent were using the services, while the remaining 14 percent were not using the services. The results reveals that although quality is an important consideration in making a decision regarding family planning services, other factors could also account for the use of the services among these respondents. In terms of availability, about 60 percent of the respondents were in agreement that family planning services were available, while the remaining 40 percent were uncertain or disagreed altogether.

Whereas availability of family planning services could be attributed to the fact that there are multiple sources of family planning services (including shops, health facilities and workplaces), uncertainty about the services could have been attributed to lack of awareness and use by the respondents. This percentage is worrying and therefore may need to be addressed by the stakeholders involved in family planning programmes, especially in slums.

With regard to use of family planning services in relation to distance, 41 percent of the users of contraceptives lived within a distance of less than one kilometre, 27 percent lived between 1 and 5 kilometres while 8 percent lived beyond a distance of 10 kilometres. This clearly points out that distance account partly for the use of contraceptives amongst women in the slums. Regarding perception on the friendliness of staff, 68 percent of the respondents who were using contraceptives perceived the staff to be friendly while 19 percent perceived the staff to be unfriendly. The remaining 13 percent were uncertain about their perception regarding the staff. In terms of cost, out of the total number of using contraceptives, 45 percent of the respondents indicated that the cost of the services was free, 32 percent found the services affordable, while 6 percent found the service expensive. The remaining 17 percent had no idea whether cost of the services was expensive or not. This finding reveals that the cost of family planning service is an important determinant of the use of family planning services.

Table 2: Facility Factors and use of Contraceptives

Facility Factors and use of Contraceptives		**Number of respondents**	**Percentage (%)**
Family Planning Service Provider	Health facility	245	49
	Mobile Health Workers	15	3
	Pharmacy	75	15
	Workplace	15	3
	Others	150	30
Quality of family planning services	Use of family planning services	430	86
	Not using	70	14
Availability of Family Planning Services	Disagreed	65	13
	Uncertain	140	28
	Agreed	295	59
Proximity of the Family Planning provider and proximity to the provider	Less than 1	220	44
	1-5	135	27
	5-10	105	21
	Beyond 10	40	8
Use of Family Planning Services and Friendliness of Staff	Unfriendly Staff	95	19
	Friendly	340	68
	Uncertain	65	13
Use of Family Planning Services and Cost	Affordable	160	32
	Expensive	85	17
	Free	225	45
	No Idea	30	6
	Strongly Agreed	80	16
Availability of FP Workers	None Available	65	13
	Uncertain	140	28
	Available	295	59

Although 50 percent of the respondents agreed that there was promotion of family planning services in the slums, the remaining 50 percent were either uncertain or disagreed. The high percentage of respondents who were uncertain or in disagreement could explain why majority of them obtained the family planning services from either shops or pharmacies.Further, lack of awareness could be attributed to lack of access to information regarding the services. The inability to access such important information is bound the affect the woman's ability to make an informed decision on uptake of family planning services. Lastly, whereas 59 percent of the respondents were in agreement that family planning workers were available, 28 percent of the respondents were uncertain about the availability of the workers. On the other hand, 13 percent of the respondents were of the opinion that family planning workers were not available. This finding supports the previous findings where 38 percent of the respondents were uncertain about the promotion of family planning services by family planning workers

Regression Results

Use of family planning services was the dependent variable and was used as a proxy for demand for contraceptives. This took the value of one (1) if contraceptives were used and zero (0) if otherwise. The explanatory variables considered were age of the woman, marital status, number of living children, average monthly income, educational level of the woman and partner, partners approval, proximity of family planning provider, price of family planning services, knowledge of contraceptives, friendliness of the staff, availability of contraceptives, quality of contraceptives and religious background of the woman. In order to determine the explanatory variables to use, correlation analysis was undertaken to establish the degree of correlation between the explanatory variables to avoid the problem of multicolinearity. However, explanatory variables are rarely uncorrelated with each other and so multicolinearity is a matter of degree. The degree of correlation between the explanatory variable is presented in the appendices. All the variables with a correlation of 0.50 and above were identified and only one of the variables was selected for use in the regression. For instance, the degree of correlation between age of woman (age) and number of living children (nlc) was 0.64. Number of living children was picked and age of woman dropped from the regression. The correlation between proximity to the family planning facility and price of family planning services was -0.50. Given that government health facility offers the services free of charge, proximity was considered an ideal proxy for price of the contraceptives. The further away from the facility a respondent is the higher would be transport cost or transaction cost of accessing the facility.

The partner's approval was preferred over availability of contraceptives. The choice of the variable was also influenced by the fact that marital status and partner's education had a correlation of 0.50. Since partners approval is already included, it was ideal to include marital status. The explanatory variables that were included in the regression were income, proximity, marital status, female education, knowledge of the contraceptives, partner's approval, number of living children, religion, friendliness of staff and quality of contraceptives. The results of the binomial logistic regression are presented in table 3.

Table 3: Results of Logistic Regression Analysis

Dependent Variable	**Use of Family Planning Services**				
No. of Observations	**500**				
Explanatory Variable	Coefficient	Z	P>|z	[95 percent Conf. Interval]	
Marital Status	0.107	0.29	0.775	-0.628	0.843
Religion	-1.955*	-5.24	0.000	-2.685	-1.224
Partners Approval	7.362*	6.61	0.000	5.177	9.545
No. of living children	0.119	0.97	0.332	-0.122	0.361
Quality	1.023*	2.58	0.010	0.245	1.801
Proximity	-0.221*	-2.73	0.006	-0.380	-0.062
Friendly	1.125*	2.56	0.010	0.264	1.985
Income	0.011**	2.01	0.045	0.000	0.023
Women Education	-0.003	-0.05	0.958	-0.130	0.125
Knowledge of FP	1.369**	2.22	0.026	0.162	2.575
C	-2.945	-2.83	0.005	-4.984	-0.906 -2.945
Pseudo R^2	0.6843				
LR $chi^2(10)$	468.56				

Source: Derived from Data Analysis

** Imply significance at 1 percent level while ** imply significance at 5 percent level of significance*

From the table, all the coefficients of the explanatory variables had the expected sign except women education. Similarly, seven explanatory variables had coefficient that were statistically significant while the remaining three had coefficients that were statistically insignificant. The interpretation of the coefficient values is complicated by the fact that estimated coefficients from the model cannot be interpreted as the marginal effect on the dependent variable as a result, there was need to estimate the marginal effects as shown in table 4.

Table 4: Results of Logistic Regression Analysis for Marginal Effects

Dependent Variable	**Use of Family Planning Services**						
No. of Observations	**500**						
Explanatory Variable	dy/dx	Std. error	Z	P>|z|	[95percent Conf. Interval]		X
Marital Status	0.016	0.057	0.28	0.776	-0.095	0.128	0.640
Religion	-0.278*	0.086	-3.25	0.001	-0.446	-0.110	0.556
Partners Approval	0.829*	0.028	29.04	0.000	0.773	0.885	0.420
No of living children	0.018	0.019	0.95	0.343	-0.019	0.054	2.364
Quality	0.166**	0.079	2.08	0.037	0.009	0.322	0.622
Proximity	-0.033**	0.016	-2.14	0.033	-0.063	-0.003	3.158
Friendly	0.193**	0.093	2.09	0.037	0.012	0.373	0.701
Income	0.002***	0.001	1.74	0.081	-0.001	0.004	24.824
Woman Education	-0.001	0.009	-0.05	0.958	-0.019	0.019	10.123
Knowledge of FP	0.257***	0.139	1.85	0.064	-0.015	0.529	0.806

Source: Derived from Data Analysis

** Imply significance at 1 percent level while ** and *** imply significance at 5 and 10 percent level of significance, respectively*

Discussion and Conclusion

As presented in table 2, all the explanatory variables had coefficients with expected signs except woman education, which was shown to negatively influence the use of family planning. The coefficient of woman education was, however, not statistically significant at 1 percent as well as 5 percent and 10 percent level of significance. Seven variables, namely marital status of the woman, partner's approval, number of living children, quality of family planning services, friendliness of family planning services providers, proximity to the provider, income of the woman and knowledge of woman on family planning services had coefficients with positive signs. This implies that they increase the likelihood of the respondent using family planning services. On the other hand, religious background of the woman, proximity to the provider and education level of the woman had negative coefficients. This implies that they reduce the likelihood of respondents using family planning services.

The coefficients of religion and partner's approval were statistically significant at 1 percent whereas the coefficients of quality of family planning services, proximity to the provider and friendly staff at facility were statistically significant at 5 percent. On the other hand, the coefficients of income and knowledge of family planning were statistically significant at 10 percent level. Marital status and number of living children had coefficients that were not statistically significant. The most important determinant of the likelihood of respondents in the slums using family planning services was partner's approval, whose marginal effect was 0.83. This means that the probability of a respondent using family planning services was 83 percent where consent from partner was granted compared to where no consent was granted. The significance of this could be attributed to the fact that for a woman to use family planning services, partner's approval was critical. Otherwise if found using without the consent of partner it could be misinterpreted, thereby causing misunderstanding in a marriage.

The second most important determinant was religion, which took the value of one if Catholic and zero, otherwise. The marginal effect was negative 0.28, implying that the probability of a woman using family planning services if she is a Catholic was 28 percent lower compared to others with different religious background such as Protestant and Muslims. This is because catholic faith discourages its faithfuls from using contraceptives as birth control measures. Faithfuls are instead encouraged to rely more on observation of menstruation cycles and natural safe days of a woman. This finding clearly indicates a significance difference in the use of family planning services between Catholics and other religions.Knowledge of family planning services was found to be the third most important determinant of likelihood to use of family planning services with a marginal effect of 0.26. The likelihood of using family planning services would be 26 percent higher for woman with knowledge of family planning services than those without.

This clearly suggests that for increased uptake of family planning services, promotion that facilitates awareness about the available family planning services and their possible side effects and benefits is paramount. Friendliness of family planning staff had a marginal effect of 0.19, implying that the likelihood of respondents using family planning services was 19 percent higher if family planning staff was friendly than when they were not. The significance of this determinant could be explained by the fact that provision of certain types of family planning services requires performance of some procedures by the person administering the services, for example injectables, hormone releasing implants and use of IUD. With regard to quality of family planning services, the marginal effect was 0.17. This implies that the probability of a woman using family planning services was 17 percent higher for respondents who perceived the services to be of high quality than for those who perceived otherwise. The positive impact of quality could be attributed to the fact that in the process of making a decision on using family planning services, perceived quality of the service is given a high consideration as supported by theory whereby taste and preference is an important factor in making demand decision. Proximity to family planning services provider had a marginal effect of negative 0.03, implying that the further away from the family planning services provider, the lower the likelihood of seeking the services by 3.3 percent.

The negative impact of distance from the service provider could be attributed to the fact that when the provider is far away from the woman, there is bound to be some imbedded costs in terms of transport and transaction costs as well as waiting and travelling time, which may discourage a person from seeking the services. The last statistically significant variable was income, which had a marginal effect of 0.002, implying that an increase in average income of a woman by Kshs. 1,000 increased the likelihood of using family planning services by 2 percent. Marital status and number of living children had each a marginal effect of about 0.02, although they were not statistically significant at either 1 percent, 5 percent and 10 percent. The positive influence of marital status on the likelihood of using family planning services could be attributed to the fact that couples might decide to postpone raising children by resorting to use of family planning services. The value of the marginal effect simply means that a married woman is 2 percent more likely to use family planning services than a single woman. Finally, the positive influence of the number of living children on the likelihood of using family planning services could be attributed to the woman's desire for children having been satisfied. Mahidu *et al.* (1998) for instance found that once the teenage women and newlyweds had a child, contraceptive use prevalence rose to a level comparable to that of women in their twenties.

Conclusion

Various facility factors were considered, among them quality of family planning services, availability of family planning services, proximity of the family planning facility and friendliness of staff. Notable views provided were uncertainty by respondents about the availability of the family planning services as well as the availability of family planning health workers. This not only points out the inadequacy of family planning services but also the family planning workers in the slums. Among the statistically significant determinants of likelihood of usage of family planning services by order of their marginal effect were the partner's approval, religion, knowledge of family planning services, friendliness of family planning staff, quality of family planning services, proximity to the family planning facility and income. All explanatory variables positively influenced the usage of family planning services except religion and proximity to the family planning facility. The study revealed that the farther away the women were from the family planning facilities, the lower the likelihood of using their services.

In terms of the explanatory power of the model, 68 percent of the variation of the likelihood of the usage of family planning services was captured by the explanatory variables included in the model. Utilization of family planning services has been the concern of not only the government but also other stakeholders including researchers. In this study, it has been established that only a few couples in the city slums use family planning services. It has further been established that various demographic, socio-economic and provider factors affect use of family planning services amongst women in slums. These include by order of their marginal effects partner's approval, religion, knowledge of family planning services, friendliness of family planning staff, quality of family planning services, proximity to family planning facility and income.

Recommendations

In light of the research findings, demand for family planning services in Kenya in general and among women in Kenya's city slums in particular is affected by various factors. In order to enhance the uptake of family planning services as a bold step towards meeting the challenges envisaged in the Kenya's Vision 2030 and the realization of the MDGs, the following are recommended. The government through the Ministry of Health to revive and support family planning education at both household and community level that targets the woman and her partner. This could be undertaken through print and mass media, chiefs' *barazas,* market places as well as newsletters and posters. Additionally, the Ministry of Health should encourage the uptake of contraceptives at household level by enhancing continuous promotion of family planning services and provision of free condoms. This could be realised by supporting family planning outreach activities by the health workers. This is expected to contribute positively towards enhancing awareness of family planning services and the benefits and side effects. Enhancing standards and regulation to ensure that contraceptives provided are of good quality. In addition, public health facilities may need to use revenue generated through facility improvement funds (FIF) to improve the quality of FP services, including infrastructure, to encourage utilization of the services at facility level by the providers.

Revamping and supporting Community Based Distribution of Family Planning services by the government, NGOs, and the CBOs is inevitable. The NGOs and CBOs need to revamp and support the services of community based distributors so that contraceptives could reach the underserved who are the majority in slums. Lastly, the Ministry of Health in collaboration development partners involved in the provision of family planning services need to enhance large scale training of service providers in quality care, client follow up, communication skills, counselling, referral and feedback and provision of a wide choice of methods. With good customer care, clients who seek contraceptives will have confidence in the staff which in the process will attract more users while at the same time encouraging further usage on those currently using them. However, for this programme to be effective, donor support is critical.

Creation of advocacy groups at community level is highly recommended. This will not only articulate the rights of the clients, in this case the woman who seek contraceptives, but will lead to cultural and attitude change towards the services thereby encouraging their uptake. In the end, this is expected to contribute positively towards a reduction in the total fertility rate as well as decline in population growth rate. NGOs, CBOs, and other institutions involved in family planning need to initiate and promote targeting programmes for the uptake of the services in the slums.

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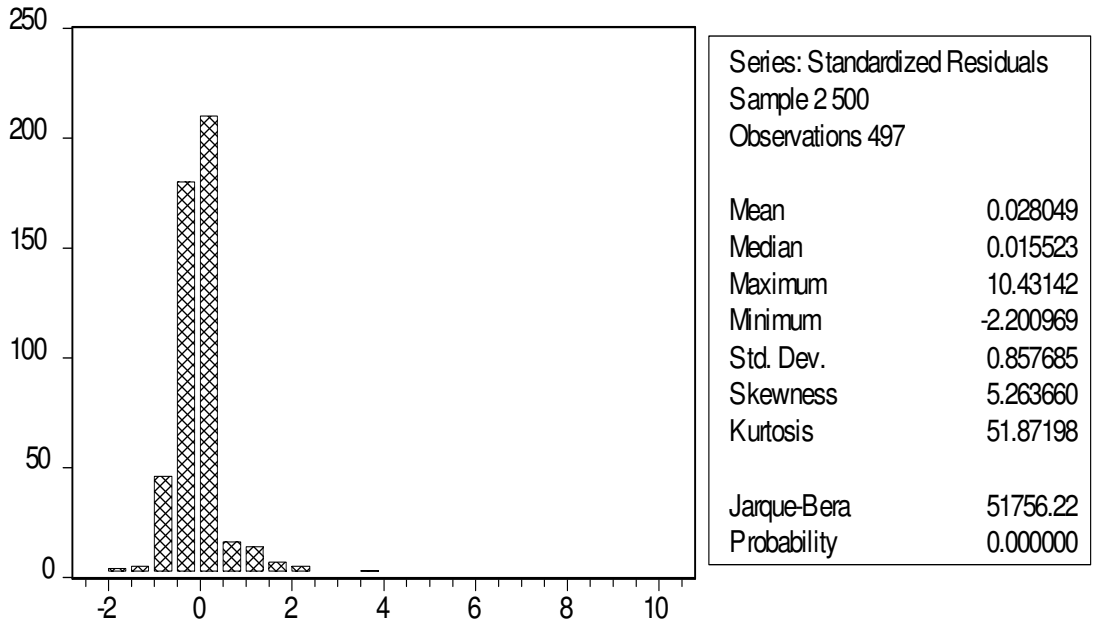
Appendix 1

Table A3: Pairwise Correlation Matrix for Explanatory Variables

	Mstat	Price	Pappr	Age	Lchild	Quality	know	Proxity	DChild	Peduc	Relign	Wedu	Friend	Incm
MStat	1													
Price	0.058	1.000												
Pappr	0.248	0.482	1.000											
Age	0.354	0.077	0.060	1.000										
LChild	0.449	0.045	0.120	0.639	1.000									
Quality	-0.044	0.102	0.153	-0.050	-0.073	1.000								
know	-0.057	-0.051	0.599	-0.060	-0.114	0.186	1.000							
Proxity	-0.041	-0.601	-0.205	-0.102	0.139	-0.052	-0.091	1.000						
DChild	0.045	0.060	-0.130	0.162	-0.109	-0.021	0.038	-0.050	1.000					
Peduc	0.498	0.079	0.231	-0.178	0.301	-0.036	-0.012	-0.025	-0.095	1.000				
Relign	0.019	-0.063	0.057	0.034	-0.043	-0.015	0.001	-0.137	0.028	0.071	1.000			
Weduc	0.005	0.002	0.059	-0.034	-0.037	0.015	-0.008	0.063	-0.041	0.198	-0.013	1.000		
Frind	0.041	0.220	0.248	0.021	-0.040	0.200	0.223	-0.241	0.066	0.027	0.074	0.044	1.000	
Incm	0.231	0.780	0.117	0.247	0.215	-0.007	-0.054	-0.002	0.610	0.613	-0.052	0.097	-0.051	1.000

Appendix 2

Normality Test Results



Appendix 3

Test for Heteroskedasticity using Residual Graph