SIXTH AFRICAN POPULATION CONFERENCE

5th – 9th December 2011, Ouagadougou, Burkina Faso

Correlates of Contraceptive use among Ghanaian women of Reproductive Age (15-49 Years)

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Abstract

The Government of Ghana has since 1969 initiated a National Population Policy aimed at managing the country's population in a manner consistent with its developmental objectives. Though fertility in Ghana has declined from an average of 8 children per woman over the past three decades to 4 per woman in recent times, the current rate of population growth is still unmatched by economic growth. Evidence from the 2008 GDHS, suggests that the use of contraceptives have increased marginally despite the considerable decline in fertility rate. Ghana's contraceptive prevalence rate is at par with WHO regional average of 24% but below the rate in other sub-Saharan countries. The objective of this paper is to revisit the determinants of contraceptive use among Ghanaian women, aged 15-49 using the 2008 GDHS. Empirically, the logistic and multinomial logistic regression models are used. Our results indicate that wealth status, level of education, ownership of health insurance, number of surviving children, marital status, location and geographical area of residence are significant correlates of contraceptive use among women in their reproductive age. Other variables that proved significant include religion and the degree of women autonomy. The finding reveals that, women who take health decisions alone or together with their partners are more likely to use modern and any contraceptives. The policy implications of the results are discussed.

Keywords: contraceptives, modern, traditional, reproductive age, women, discrete choice, Ghana

1.0 Introduction

One of the features of developing and impoverished countries is high population growth, of which Ghana is no exception. The upsurge in population growth, coupled with the modest decline in death rates could potentially threaten the health related MDGs especially those on maternal and child health (MDGs 4 and 5) with long run repercussion on poverty reduction (Feyisetan and Bamiwuye 1998). The United Nations estimated that two-thirds of the decline in total fertility rate in the developing world over the periods 1960-65 and 1980-85 are attributable to the use of family planning methods (Cohen et al. 1994; Freedman and Blanc, 1992).

The Government of Ghana has since 1969 initiated a National Population Policy aimed at managing the country's population in a manner consistent with the government's ultimate goal of achieving accelerated economic growth and development. The policy which has been revised since 1994 specifically aimed at reducing the total fertility rate to three by 2020, partly through increasing the contraceptive prevalence rate to 50%, reducing the population growth rate from about 3 percent per annum to 1.5 percent by the year 2020; and increasing life expectancy from the current level of 58 years, to 65 years by 2010, and to 70 years by 2020 (Clements and Madise, 2004; Ghana Statistical Service, 1999; NPC, 1994**)**. The revision also took into consideration emerging issues such as HIV/AIDS, population and the environment, concerns about the elderly and children. The National Population Council and its Secretariat were established in 1992 as the highest statutory body to advise the government on population related issues as well as to facilitate, monitor, coordinate, and evaluate the implementation of population programmes and has since collaborated with the United Nations Population Fund (UNFPA), the United States Agency for International Development (USAID), the World Bank, and other development partners, in promoting reproductive health programmes (GSS, 2008).

However, after almost four decades of population management, population growth still remains unreasonably high and thus accelerated use of family planning methods are considered crucial in curbing the high population growth. Though fertility in Ghana has declined from an average of about 8 children per woman over the past three decades to 4 per woman in more recent times, the current rate of population growth is not matched by increased productivity. Evidence from DHS 2008, the most recent demographic and health survey in Ghana, suggests that the use of contraceptives have increased marginally despite the considerable decline in fertility rate. The contraceptive prevalence rate increased from 22% among currently married women in 1998 to 25% in 2003 and has since declined by 1% percentage point in the past five years to 24% in 2008. More specifically, the use of modern method[i] of contraceptives among married women had generally increased over the years with a slight decline from 19 to 17 per cent and the proportion who used any method of contraceptives almost doubled from 13 to 24 per cent over the past two decades. Those who used modern methods increased from 5% in 1998 to 17% in 2008, a 12 percentage points increase over a period of 10 years (Ghana Statistical Service, 2008). Ghana's contraceptive prevalence rate of 24% is at par with the WHO regional average of 24%, it is however, no match for the rate in other sub-Saharan countries such as Mauritius (76%) and South Africa (60%). What is interesting is that countries such as Kenya (40%) among others have higher prevalence rate and yet records higher fertilities relative to Ghana. With a significant decline in fertility from 6.4 births per woman in 1999 to 4.0 births in 2008 (Ghana Statistical Service, 2008), Ghana has achieved a feat of having the lowest fertility in sub-Saharan Africa. Nevertheless, the total fertility rate of 4.9 children per woman among rural women far outweighs that of urban women which stands at 3.1 children per woman. Generally, the empirical literature

attest to the importance of age, education, religion and income *inter alia* as the significant predictors of contraceptive usage (see Biney 2011, Okech et al. 2011, Okezie; Addai, 1999; Tawiah, 1997).

Although the government is committed to improving access and equity to essential health care services via the introduction of interventions such as the Community-based Health Planning and Services (CHPS) and the introduction of the National Health Insurance Scheme (NHIS) and the free maternal care programme (United Nations, 2008), access still remains a problem. For instance, the unmet need for family planning of 34 % among married women (WHO, 2010) is quite alarming and could thwart an otherwise sound population policy.

In the wake of the declining contraceptive use (family planning) in Ghana within the past decade, as revealed by the 2008 GDHS and other studies, no further empirical study so far has been undertaken to analyze the socio-economic correlates of contraceptive use in order to provide further insight into the significant predictors of contraceptive use in Ghana. Understanding the factors that influence contraceptive use is crucial to the government and other stakeholders in finding the right-mix of policies to increase prevalence and STI prevention services in Ghana. This is rightly so since the high level of contraceptive knowledge is not matched by the use of modern contraceptives coupled with the high level of unmet need for family planning services. The purpose of this study therefore, is to subject findings of the GDHS 2008 to more rigorous econometric analysis to determine which socio-economic factors emerge as significant predictors of contraceptive use. The studies' outcome is important in informing policy makers and other stakeholders in the quest to increase family planning and STI prevention services in Ghana, with the ultimate aim of curbing excessive population growth through fertility declines, prevention of STI/HIV infection and improvement of maternal health through reduction of maternal deaths, thereby accelerating access to the attainment of MDG 5.

2.0 Literature Review

Rationale for and trends in contraceptive use

The subject of contraception readily brings to mind population growth and family planning. Rapid population growth and over population have become issues of great concern to both national governments and the international community (Lucas, 1992; Oliver, 1995; Feyisetan and Ainsworth, 1994; Cohen, 2000, cited by Okezie, et al, 2010). In order to forestall the dangers inherent in high population growth rates, countries such as Korea, Brazil, Columbia, China, India, Bangladesh and Malawi have used family planning successfully (Okezie, et al, 2010). However, the picture is different in most Sub-Saharan African countries. For example, Nigeria also adopted family planning as a strategy to curb the high rate of population growth that it is presently experiencing. However, the acceptance rate of this strategy or practice is still low (Okezie, et al, 2010).

Ghana introduced a revised population policy in 1994 to curb the unacceptably high population growth. This was done by a systematic integration of population in development planning with renewed emphasis on fertility reduction through family planning, in order to accelerate economic modernization, sustainable development, and poverty eradication (NPC, 1994). Even though there has been a minimal decline in fertility rate from 4.4 in 2003 to 4.0 in 2008, recent evidence

indicates that the trend is not likely to improve if steps are not taken to reverse the declining trend of contraceptive use in Ghana. Trends in contraceptive use among currently married women based on the results from Demographic and Health Surveys (DHS) surveys indicate that there was a large increase in contraceptive use in Ghana in the late 1980s and 1990s, from 13 to 22 percent among married women. However, over the previous ten years (1998 to 2008), increases had been small. The contraceptive prevalence rate increased from 22 percent among currently married women in 1998 to 25 percent in 2003, and has declined to 24 percent between 2003 to 2008-a reversal in the trend. Similarly, use of modern methods nearly doubled over the past 15 years from 10 percent in 1993 to 19 percent in 2003, before declining slightly to 17 percent in 2008. Over the past 20 years, there has been a slight decrease in the use of traditional methods. While initially there was a small increase in the use of traditional methods from 8 to 10 percent between 1988 and 1993, use of these methods decreased to 9 percent in 1998 and to 7 percent in 2003 and 2008 (GDHS 2009). A recent holistic assessment of the Ghana Ministry of Health by an independent health sector review team also found a continuous decline in family planning uptake from 33.8% in 2008 to 3.1% in 2010, proving further evidence of the declining trend of family planning in Ghana (Ministry of Health, 2011).

Promoting family planning through contraceptive use is also a strategy to improve reproductive health of women, especially those in Africa. It is reported that in Africa, one in 26 women of reproductive age dies from a maternal cause, as opposed to one in 9400 in Europe (Ahmed et al. 2010). It has been reported that the risk of maternal death increases proportionately with the number of pregnancies (Verea et al. 2002;Hoj et al. 2002; Testa et al. 2002). Contraceptive use would therefore reduce the risk of pregnancy and/or birth spacing which could positively impact maternal mortality. Maternal mortality is Ghana's heartbeat to the attainment of the Millennium Development Goal (MDG) 5. The 2008 Ghana Millennium Goals Report (NDPC 2010) indicates that Ghana is unlikely to meet her MDG target of 185 per 100,000 by 2015, given the trend of institutional maternal mortality ratio which reduced from 224/100,000 in 2007 to 201/100,000 in 2008, after an increase from 187/100,000 in 2005 to 197/100,000 in 2006. One important step that could improve progress towards the attainment of MDG 5 therefore, is to promote contraceptive use.

Another justification for contraceptive use is prevention of sexually transmitted infections (STI), including HIV infection. Various studies have established the potential of sexual and reproductive health services (SRH) to contribute to the fight against HIV/AIDS (Pachauri 1994, Mayhew 1996, Askew and Maggwa 2002, Dehne and Snow Lush et al. 1999, Haberland et al. 2002). Some of the justifications provided for integration of SRH with HIV/AIDS services include the following: Women and men seeking other sexual and reproductive health services may be receptive to information and services concerning HIV when they understand the importance of preventing and managing HIV infection through the use of family planning. Also, antenatal care, child health care and family planning are now relatively accessible to the majority of the world's population through clinical, outreach and community-based programmes, and are being utilised by an increasing proportion of women of reproductive age (Askew 2003). In Ghana, SRH services include antenatal, perinatal, postnatal and child welfare services, as well as the provision of various contraceptive services.

2.1 Determinants of contraceptive use

Many studies have identified age, residential area, length of marriage, level of education, number of living or deceased children, gender of living children, prior discussion of family planning, husband's approval, socioeconomic status, and religion as key factors affecting the use of modern contraceptive methods in Asia and some parts of Africa. However, in Africa, socioeconomic status, husband's approval, being the head of the household, the number of living children, level of education, work status, prior discussions of family planning and urbanization emerge as determinants of modern contraceptive use (Kayembe, 2006; Chaudhury 1984, Oneheba-Sakyi 1990 and 1992, Mahgoub 1994, Lasee and Becker 1997, Tawiah , 1997; Ekani-Bessala et al. 1998) . Generally, there is a positive relationship between improvement in these factors and contraceptive use. For example, the higher the socio-economic status, or the higher the level of education, the more likely women are able and willing to use contraceptives.

Findings from the 2008 Ghana Demographic and Health Survey (GDHS) also support most of these studies. According to the report current contraceptive use varied with number of living children, urban-rural residence, region, education, and wealth. The proportion currently using contraception generally increased with increasing number of children. Seventeen (17) percent of women without children used contraceptive methods, compared with 26 percent of women with five or more children, while women who had three or four children were 27 percent. Women in urban areas were more likely to use contraceptive methods (27 percent) than their rural counterparts (21 percent). The Greater Accra region, where Ghana's capital city is located, had the highest contraceptive prevalence rate (33 percent), followed by the Brong Ahafo and Volta regions (29 percent each). The Northern region, which is largely rural and a relatively poor region, reported the lowest current level of contraceptive use (6 percent). Women with at least some secondary education were more than twice as likely to use contraception as women with no education (30 and 14) percent, respectively). Use of any method and use of any modern method increased with level of education. Use of contraception was also positively related to wealth status, increasing from 14 percent among currently married women in the lowest wealth quintile to 31 percent in the highest wealth quintile.

The pattern of current use of modern and traditional methods of contraception was similar across subgroups. Use of both modern and traditional methods was more common in urban areas than rural areas, and increased with level of education and wealth quintile. Clements and Madise (2004) using a DHS-based logistic regression examined the various socio-demographic groups and modern contraceptive use among women in three sub-Saharan countries-Ghana, Tanzania and Zimbabwe. The results show that though some groups or characteristics are country-specific, there were some similarities and consistencies in the factors influencing modern contraceptive usage such as education, age, wealth status and the number of living children. In others studies including Oyedokun (2007), there was no empirical support for income, number of existing children and employment as significant correlates of contraceptive usage among a sample of women in the reproductive age in Osun State, Nigeria. In a more recent qualitative study, Biney (2011) concluded that women seeking induced abortion tended not to have knowledge of contraceptive methods prior to the abortion, while others were informed but failed to use contraceptives for a variety of reasons including rumours of side effects to personal negative experiences with modern contraceptive methods. A few women also stated contraceptive failure

as a reason for their unintended pregnancies that were later aborted. Thus women who are armed with knowledge on family planning methods could potentially prevent unwanted pregnancies.

In Kenya, Okech et al. (2011) using a multivariate logistic model found that among women in the reproductive age in Kenya, income level, proximity to the provider, religious affiliation of the woman, partner's approval are some of the key factors driving contraceptive usage in Kenya. The literature also suggests that many developing countries have substantial geographic variations in contraceptive use (Stephenson et. al. 2007; Clements and Madise, 2004) partly due to the unequal access to health services across regions and different geographical area.

While most of the studies in Ghana and elsewhere have adequately addressed contraceptive use from different perspectives, investigating the phenomenon from the viewpoint of choosing traditional, modern or no contraceptive method in the context of a developing country has not been adequately explored. In addition, a variable such as ownership of health insurance which is missing in previous DHS is included in the model to ascertain whether it plays any crucial role in the choice of contraceptive methods. It is against this backdrop that this paper fills this gap and contributes to the empirical knowledge on family planning methods.

2.2 A model of Contraceptive Demand

Following Grossman (1972, 1979), the demand for health is modeled as an investment framework, where health is the outcome of a productive process and choices are made to maximize utility. The demand for contraceptive is a derived demand in that it is not demanded for its own sake but to promote a healthy outcome. This is done via birth spacing, the prevention of sexually transmitted diseases as in the case of condom and the prevention of an unwanted pregnancy, all with the view to promoting good health. Thus the demand for contraceptives can be derived from a model incorporating utility-maximizing behavior and the production of an adult woman's health, treating contraceptives as input in the production process. To begin with, assume that the *ith* woman in reproductive age has a utility function (*U*) defined over her own health (*H*) and a vector of all other goods (Z_i):

$$Utility_i = U[H_{i,} Z_i; X_i] \quad (1)$$

With $\frac{\delta U}{\delta H_i} \geq 0$ and $\frac{\delta U}{\delta Z_i} \geq 0$. While X_i is a vector of characteristics of the *ith* woman that influence preferences for contraceptives relative to all other goods. The health of the *ith* woman is produced via a health production technology (*T*) using contraceptives or family planning methods (C_i) and a vector of other complementary health inputs (M_i):

$$H_i = T(C_i, M_i; Y_i) \quad (2)$$

With $\frac{\delta T}{\delta C_i} \geq 0$ and $\frac{\delta T}{\delta M_i} \geq 0$. Y_i is a vector of characteristics of the *ith* woman that determine the efficiency of her own health production.

Equations 1 and 2 imply a composite utility function (U^i)

$$Utility_i = U[T(C_{i,} M_i; Y_i), Z_i; X_i] \quad (3)$$

$$Utility_i = U'[C_i, M_i, Z_i; X_i, Y_i]$$

Now, regarding the choice of contraceptives, define Z_i' to be a vector consisting of the components of Z_i and M_i . Hence, the composite utility function in Equation 3 is reduced to:

$$Utility_i = U'[C_i, Z_i'; X_i, Y_i] \quad (4)$$

Assume that each woman in the specified age category faces the following budget constraint.

$$I_i = P_c C_i + P_{z'} Z_i' \quad (5)$$

Where I_i is the total income for the *ith* woman, P_c is price of contraceptives, $P_{z'}$ is a vector of the prices of all other goods. We also assume that prices and incomes are exogenous. P_c, which is the full price of family planning services or cost of contraceptives include transportation and opportunity costs. Maximizing Equation 4 subject to Equation 5 generates a set of first-order conditions that describe the optimal consumption bundles of C_i and Z_i'. Now, solving for the first order conditions derives the general equation for contraceptive demand for the *ith* woman:

$$C_i = D_C[P_c, P_Z', I_i, X_i, Y_i] \quad (6)$$

The reduced form expression for contraceptive demand in Equation 6 is a derived demand since contraceptives are not consumed for their own sake but rather their usefulness in promoting good health, and thus the utility is only indirectly impacted by contraceptive. Given the normal assumptions regarding derived demand, contraceptive demand is decreasing in (P_c). The effect of changes in income on contraceptive usage can be positive or negative depending on each woman's preferences for quantity vs. quality health outcome. The *ith* woman can choose to use or invest in more contraceptives of low quality with a higher probability of contraceptive failure or fewer and quality contraceptive options with high health status. In our study, we assume that modern contraceptives are more potent or superior to traditional methods of contraceptives.

3.0 Empirical Estimation

3.1 Logistic Regression

Maternal characteristics can influence contraceptive usage through taste for own health (X_i) and through the efficiency of own health production (the vector Y_i). In this paper, the maternal characteristics included are: level of education, marital status, wealth index, health insurances status, area of residence, age, decision on own health, number of surviving children, religion, employment status and region of residence. It is worth noting that some characteristics of the mother will affect both taste and productive efficiency. Consider for instance, the effect of increasing age on demand for contraceptives. Older women may have greater knowledge of the value of contraceptives in producing good health than younger women, resulting in a greater taste for contraceptive usage. Alternatively, greater knowledge also implies that older women may be more efficient in improving own health. Additionally, the rate at which the body can absorb health inputs; productive efficiency like contraceptives to improve own health outcome may be negatively impacted by increases in age due to the general decline in health stock.

Assuming that the production technology and taste remains same in a cross-sectional survey which spans a period of three months as in the case of the GDHS, the utilization of contraceptives can be modeled as a discrete event; a person either uses or does not.

In our study, we considered the usage of any method of contraceptive (both traditional and modern methods) against non-usage and the choice of modern over tradition methods. Therefore, there is a dichotomy of 'use' versus 'non-use'. Given this type of dependent variable, some type of logit or probit function may be the most appropriate technique of analysis. Because of the variety and number of predictors, logistic regression is used to generate the coefficients[ii]. The logistic regression model estimates a model of the form:

$$logit(p_i) = ln\left(\frac{p_i}{1-p_i}\right) = \alpha_0 + \alpha_1 x_{1,i} + \cdots + \alpha_k x_{k,i}$$

where 'p' represents the probability of presence of characteristics of interest (i.e using any method of contraceptives (coded 1) or none (coded 0) and using modern contraceptives (coded 1) and 0 if using traditional methods. The regression coefficients are estimates by maximum likelihood. The study focuses on contraceptive use by women currently married and sexually active unmarried women aged 15-49. The variables of particular interest include age, residence, region, education, wealth quintile, marriage, employment status, decision-making units and religion. The choice of the independent variables was informed by the theoretical and empirical literature (Bour, 2004, Addai , 2000, De Allegri 2011, etc).

3.2 Multinomial Logistic regression

Following McFadden (1981), it is assumed that a decision maker faces multiple choices and that there is an associated random utility function for each choice. In this case, the choice of a particular contraceptive method yields different satisfaction levels. The Multinomial logistic regression can be represented as follows;

$$\Pr(y=1) = \frac{e^{X\beta^{(1)}}}{e^{X\beta^{(1)}} + e^{X\beta^{(2)}} + e^{X\beta^{(3)}}}$$

$$\Pr(y=2) = \frac{e^{X\beta^{(2)}}}{e^{X\beta^{(1)}} + e^{X\beta^{(2)}} + e^{X\beta^{(3)}}}$$

$$\Pr(y=3) = \frac{1}{e^{X\beta^{(1)}} + e^{X\beta^{(2)}} + e^{X\beta^{(3)}}}$$

Where y is the outcome category- choice of contraceptive methods. y = 1 implies the choice of traditional methods of contraceptives; y=2 denotes the choice of modern methods while y = 3 represents no method of contraceptives (the base outcome). The multinomial logit has properties similar to that of the binomial logit model except that in the case of the binomial, one probability is estimated for each individual whereas in the multinomial model, *m-1* probabilities are estimated for each individual, where *m* is the total number of choices. The model also assumes that all the alternatives are dissimilar or, equivalently the random components of the utility function are independent (often referred to as independence from irrelevant alternatives (*IIA*)

assumption)). When the IIA property holds, the odds-ratio of any two alternatives is independent of any other alternatives in the choice set (Greene 2003).

3.3 Data

The 2008 Ghana Demographic and Health Survey (GDHS), a household-based survey is employed for this study. The 2008 GDHS is the fifth in a series of national-level population and health surveys conducted in Ghana as part of the global Demographic and Health Surveys (DHS) programme. It was the fifth of its kind to be conducted in the country. Previous GDHS had been conducted in 1988, 1993, and 1998 and 2003. The GDHS is a nationally representative, stratified; self-weighting probability sample of women aged 15-49. The GDHS is primarily conducted by the Ghana Statistical Service and the Noguchi Memorial Institute for Medical Research with technical assistance from ORC Macro, USA. Financial support for the survey was provided by the U.S. Agency for International Development (USAID), the Government of Ghana, UNICEF, UNFPA and Danish International Development Agency (DANIDA).The survey used a two-stage sample based on the 2000 Population and Housing Census to produce separate estimates for key indicators for each of the ten regions in Ghana.

The GDHS 2008 sampled more than 12,000 while a total of 11,778 households were interviewed. In half of the households selected for the survey, all eligible women age 15- 49 and all eligible men age 15-59 were interviewed with the Women's and Men's Questionnaires, respectively. A total of 4,916 women age 15-49 and 4,568 men age 15-59 from 6,141 households were interviewed. Data collection took place over a three-month period, from early September to late November 2008. The survey obtained detailed information on fertility, marriage, sexual activity, fertility preferences, awareness and use of family planning methods, childhood mortality, maternal and child health, awareness and behaviour regarding HIV/AIDS, and other sexually transmitted infections (STIs) among others. Notably, data were not collected in one of the selected clusters due to security reasons, resulting in a final sample of 12,323 selected households. Weights were calculated taking into consideration cluster, household, and individual non-responses, so the representations were not distorted. This paper is based on the women questionnaire. Further details of the data and content of the questionnaire can be found in the GDHS 2008 Report (Ghana Statistical Service, 2009).

4.0 Results and Discussion

The results of the baseline characteristics and the chi-square test reported in Tables 1 and 2 show significant variations in the associated socio-economic and demographic characteristics. With the exception of marital status, the chi-sure test shows robust significant association between the selected variables and the use of contraceptives. Of the women sampled for the analysis, about 67% live in the rural areas while 33% reside in urban areas. Approximately 43% of the women had no education at all while a little fewer than 2% had higher education. With regard to marital status, 86% were currently married while the remaining 16% were unmarried. The rest of the discussion focuses on the multivariate regression.

Table 1: Descriptive Statistics by Choice of Contraceptives

Variable	No Method (%)	Traditional (%)	Modern (%)	Chi square(X^2)
Wealth Index				
Poorest	84.17	2.4	13.43	291.38***
Poorer	79.96	5.74	14.3	
Middle	78.17	4.61	17.21	
Richer	72.66	8.7	18.65	
Richest	65.75	9.77	24.47	
Educational Level				
No education	85.31	1.76	12.93	357.52***
Primary	74.25	7.44	18.31	
Secondary	71.41	8.79	19.8	
Residence				
Urban	75.01	6.85	18.13	35.68***
Rural	79.48	4.79	15.73	
Health Insurance				
Not Insured	79.31	5.77	14.93	33.04***
Insured	76.07	5.05	18.88	
Age				
15 - 19 years	88	1.6	10.4	17.94***
20 - 35 years	76.47	5.85	17.68	
36 - 49 years	78.94	5.27	15.79	
Marital Status				
Not married	76.67	4.29	19.05	1.43
Married	76.64	5.93	17.43	
Decision on own health				
Respondent alone	78.69	6.42	14.89	46.41***
Wife and Partner	75.2	4.89	19.91	
Husband alone	77.05	6.99	15.96	
Religion				
Catholic	76.83	4.79	18.37	185.59***
Anglican/Methodist/Presbyterian	73.44	5.52	21.03	
Pentecostal/charismatic	74.75	7.79	17.46	
Moslem	85.4	2.36	12.24	
Traditional/Spiritual	83.09	3.35	13.56	
Employment status				
Not working	83.82	5.04	11.13	23.10***
Working	77.48	5.52	17	
Region				
Western region	81.2	7.04	11.76	622.26***
Central region	74.07	5.3	20.63	

Greater Accra	66.99	10.26	22.75	
Volta region	71.53	5.6	22.88	
Eastern region	73.48	8.68	17.83	
Ashanti region	74.66	9.97	15.38	
Brong Ahafo	77.02	6.59	16.38	
Northern	94.24	0.26	5.5	
Upper East	84.65	0.51	14.83	
Upper West	76.36	0.71	22.93	
Number of Children				
Between 1 and 5 children	76.91	6.11	16.98	17.76***
More than 5 children	79.65	4.52	15.83	

Table 2: Logistic Regression Results (Any Contraceptive method)

	Coefficient	Marginal Effects
Wealth (ref: Richest)		
Poorest	-0.737***	-0.113
Poorer	-0.777***	-0.113
Middle	-0.634***	-0.092
Richer	-0.194**	-0.031
Education (ref: No education)		
Primary	0.427***	0.075
Secondary	0.379***	0.065
Health Insurance	-0.09	-0.015
Residence(ref: urban)	-0.225***	-0.036
Age (ref: 15-19 years)		
20 - 35 years	0.441	0.074
36 - 49 years	0.34	0.056
Marital status	0.028	0.005
Decision on own health (ref: wife alone)		
Wife and Partner	0.232***	0.039
Partner alone	0.161**	0.027
Number of Children	0.045***	0.007
Religion (ref: Catholic)		
Anglican/Methodist/Presbyterian	0.057	0.01
Pentecostal/Charismatic	0	0
Moslem	-0.274***	-0.043
Traditional	-0.061	-0.01
Employment (ref: not working)	0.596***	0.084
Region (ref: Greater Accra)		
Western	-0.735***	-0.101
Central	-0.316***	-0.048
Volta	-0.165	-0.026

Eastern	-0.352***	-0.053
Ashanti	-0.374***	-0.057
Brong Ahafo	-0.206*	-0.032
Northern	-1.626***	-0.189
Upper East	-0.678***	-0.094
Upper West	-0.023	-0.004
Constant	-1.655***	
Wald chi2(28) =659.04 Prob>chi(2) =0.000 Log pseudolikelihood = -5116.8534 Pseudo R2 = 0.0658		

***:Significant at 1%, **: Significant at 5%, *: Significant at 10%.*

Table 3: Multinomial Logistic Regression on the Choice of Contraceptives

	Traditional methods		Modern methods	
Variable	**Coefficient**	**Marginal Effects**	**Coefficient**	**Marginal Effects**
Wealth (ref: Richest)				
Poorest	-0.812***	-0.018	-0.710***	-0.085
Poorer	-0.823***	-0.017	-0.782***	-0.089
Middle	-0.96***	-0.019	-0.536***	-0.061
Richer	-0.123	-0.002	-0.238**	-0.03
Education (ref: No education)				
Primary	0.907***	0.031	0.297***	0.036
Secondary	0.9***	0.028	0.239***	0.028
Health Insurance	-0.412***	-0.01	-0.166***	-0.02
Residence(ref: urban)	0.272***	0.008	-0.206*	-0.029
Age (ref: 15-19 years)				
20 - 35 years	0.828	0.023	0.295	0.036
36 - 49 years	0.942	0.025	0.133	0.014
Marital status	-0.106	-0.004	0.107	0.015
Decision on own health (ref: wife alone)				
Wife and Partner	-0.192*	-0.007	0.357***	0.05
Partner alone	0.268**	0.007	0.119	0.015
Number of Children	-0.003	0	0.060***	0.008
Religion (ref: Catholic)				
Anglican/Methodist/Presbyterian	-0.181	-0.005	0.141	0.021
Pentecostal/Charismatic	0.126	0.004	-0.055	-0.008
Moslem	-0.178	-0.004	-0.304***	-0.038
Traditional	0.28	0.009	-0.154	-0.021
Employment (ref: not working)	0.431**	0.008	0.669***	0.073
Region (ref: Greater Accra)				
Western	-0.308***	-0.005	-0.935***	-0.096

Central	-0.744***	-0.015	-0.173	-0.02
Volta	-0.368**	-0.009	-0.084	-0.01
Eastern	0.074	0.004	-0.533***	-0.062
Ashanti	0.027	0.003	-0.540***	-0.064
Brong Ahafo	-0.123	-0.002	-0.22	-0.027
Northern	-3.144***	-0.041	-1.438***	-0.134
Upper East	-2.462***	-0.032	-0.472***	-0.051
Upper West	-2.158***	-0.033	0.225	0.038
Constant	-3.409***		-1.902***	

******:Significant at 1%, **: Significant at 5%, *: Significant at 10%.***

Prob>Chi^2=0.0000, Log pseudolikelihood = -6247.8949, Pesdo R^2=0.09, Wald Chi^2(56)= 1006.23

The major determinants of contraceptive use vary across countries, regions and cultures. As is the case with any nonlinear estimation, the coefficients in Tables 3 and 4 cannot be interpreted as marginal effects, and thus cannot be used to evaluate the predicted magnitudes of the impact of a change in an independent variable on the use of contraceptives. Hence, the marginal effects are computed to throw more light on the magnitudes of the associative effects.

In our study, wealth index is used as a proxy for income due to the lack of information on incomes in the GDHS. This is in line with other studies using demographic and health surveys. Wealth status is categorized into five quintiles ranging from poorest to richest. The wealth quintiles were created from household socio-economic indicators such as source of drinking water, ownership of television, bicycle, car and sanitation facilities *inter alia*. The results show that women in the poorest to richer wealth brackets are less likely to use contraceptives relative to their counterparts in the richest bracket, the reference category. This result is inconsistent with Okezie et al. (2010) who found an inverse relationship between income and contraceptive usage, albeit insignificant. The results is however consistent with Clements and Masiye (2004) to the effect that women in the highest amenities score, an indicator for income are more likely to sue modern contraceptives relative to those in the lowest bracket.

Our results give credence to the rural urban differential in the utilization of contraceptives. The study shows that rural dwellers are approximately 4 percentage points less likely to use any contraceptive method while in the case of choice of contraceptives; rural dwellers are 29 percentage points less likely to use modern methods as compared in comparison with urban women. Regarding, the choice of traditional methods, rural women are 8 percentage points less likely to use traditional methods relative to their urban counterparts. The results reveal that rural women have a higher propensity to use traditional methods relative to modern methods. This result is confirmed by Bour (2004) who studied the factors that influence the utilization of health services by women in the rural and urban areas in Ghana and found that rural women are less likely to utilize maternal health services including family planning methods. The low level of utilization of family planning methods or contraceptives by rural dwellers is further corroborated by other studies on Ghana and elsewhere (see Clements and Madise, 2004; Parr, 2003; Amin et al. 2002; Tuoane, 2003; Stephenson et al. 2007).

Maternal education was found to be a significant predictor of the use of contraceptives. The results indicate that women with primary education or better are more likely to use any and

modern methods of contraceptives relative to their non-educated counterparts. For instance, women with secondary education are 7 percentage points and 3 percentages points more likely to use any and modern contraceptive methods respectively. The importance of female education in the utilization of any and modern contraceptive methods might be attributable to the fact that more educated women are more likely to appreciate the advantages of having fewer children and its potential positive impact on their own economic productivity. This finding has strong support in the empirical literature (Okezie et al. 2011; Stephenson, 2007; Koc, 2000; Clements and Madise 2004, Addai, 1999).

Although insurance ownership does not guarantee free access to contraceptives, it provides some insight into the health seeking behavior of women in the reproductive age. Women with health insurance are generally thought to be cautious with their health. We found that women without health insurance are 1 and 2 percentage points less likely to use traditional and modern contraceptives respectively. In the case of using any method tall, uninsured women are approximately 9 percentage points less likely to adopt family planning methods. Thus the current campaign on health insurance participation, the free maternal health policy notwithstanding must be intensified to ensure a higher modern contraceptive prevalence. In a related study, Jewell (2009) found that women with health insurance have a higher propensity to intensify the utilization of antenatal care services.

Regarding decision making on contraceptive use, two important proxies were introduced to capture the nature of the decision making. In both cases, the variables namely where the decision is made by both partners and where it is made by the woman alone, the variables were statistically significant and more robust in the use of any contraceptive methods as against the choice between traditional and modern methods. In particularly, the propensity to use any method of contraceptive increases by 4 and 3 percentage points when the decision on the woman's own health is made by both partners and partner alone respectively. In the case of choice of methods, women who make decision on health with partners are 5 percentage points more likely to use modern methods, while same women are a percentage point less likely to use traditional methods. This result is corroborated by studies elsewhere in the literature including Okech et al. (2011) who in a more recent study among women in the reproductive ages in Kenya found that, income level, proximity to the provider, religious affiliation of the woman, partner's approval are some of the key factors driving contraceptive use in Kenya. Others studies elsewhere, using proxies for husband's approval or woman's autonomy have shown a strong effect on use of contraceptives among women (Stephenson, 2007; Narzary, 2001; Shrestha, 2000; Haile and Enqueselassie, 2006).

While most studies (Clements and Madise, 2004; Chacko, 2001) have found a strong association between religion and contraceptive use, few studies did not detect such strong correlations (Kayembe et al. 2006). Our finding corroborates that of Stephenson et al. (2007) who reported a very strong inverse association between Moslem women and modern contraceptive use in Malawi. In particular, Muslim women were approximately 4 percentage points less likely to use either any contraceptive method or modern contraceptive method. While the age of the woman especially those above 36 years has the correct positive signage, it was insignificant in either the use of any or modern contraceptives or the choice of contraceptives. This result is in sharp contrast with Clements and Madise (2004), Stephenson (2007). One would have argued that with the depreciation of one's health stock with age in accordance with the Grossman's model

(Grossman), older women would have a higher probability of using contraceptives. It is also probable, that educated women start child bearing late in life and thus would still be procreating in their 30s till their early 40s.

Number of surviving children has a positive and significant relationship with modern and any contraceptive methods.. For instance, if the number of surviving children were to increase by one, the propensity to use any and moderns will increase by 7 and 8 percentage points respectively. Unsurprisingly, the number of surviving children and the choice of traditional contraceptive methods showed a weak association. The lack of strong association might be due to the fact that traditional methods are not as efficacious as modern contraceptive methods. Our finding is consistent with Madise and Clement (2004) and Varea *et al*. (1996) who found that the utilization of modern contraceptives intensifies with the number of surviving children. In Morocco, This results stems from the fact that women tend to use more contraceptives when they attain their ideal family size, barring other circumstances. With the ever increasing medical knowledge and more assurance of surviving offspring, there is the tendency for partners to reduce the number pregnancies to achieve the desired number of surviving children. This may also reduce the pressure on women to start childbearing at an early age, which will give them the opportunity for increased educational attainment and higher future family income. In a related study, Akarro (2009), did not find any strong support for contraceptive usage and the number of children. More specifically, there was no significant statistical association between condom use and the number of surviving children among Bar Maids in Tanzania.

Our empirical results also show compelling evidence that employment status is positively associated with contraceptive usage. Women who are engaged in employment of some sort were consistently associated with a higher probability of contraceptive usage. Particularly, women who are employed are approximately 8 percentage points more likely to use any contraceptive method. Regarding the choice of contraceptives, women who are employed are 8 and 7 percentage points more likely to choose traditional and modern contraceptive methods respectively. Our finding on marital status is however at variance with Clements and Madise (2004) who reported a significant association between women in both monogamous and polygamous unions and modern contraceptive use in Ghana. Okech et al. (2011) also reported an insignificant association between martial status and use of family planning methods. Though the non-robustness of the marital status variable in our study was unexpected, it is probable that in a bivariate analysis, marriage proves important in explaining contraceptive use but in a multivariate analysis, the robustness is attenuated by covariates such as educational attainment.

As regards regional disparities in the usage of contraceptives, most of the regions showed an inverse and significant association. In the case of the choice of modern contraceptives, the Upper West Region showed a positive association, albeit insignificant. Although, this region is one of the poorest in Ghana, the activities of health related NGOs and public subsidization and in some cases free distribution of contraceptives, might explain the positive association. Amin et al. (2002) found significant spatial variation in contraceptive use among ever-married women in Bangladeshi and India. In Ghana, other studies have document substantially regional variation in the use of maternal health services (Abor et al. 2011; Appiah-Kubi, 2004; Addai, 1999 and 2000).

4.1 Conclusions and Recommendations

Access to modern contraceptives constituents the most important intervention to population management. This paper examined the correlates of using any contraceptive method and the choice of traditional and modern contraceptive methods among sexually active females in the reproductive bracket (15-49 years) using the most recent GDHS. The empirical findings from the multivariate logistic and multinomial logistic regression conform to the general empirical literature. The study found that primary education or better significantly influences the utilization of any and modern contraceptives, and same explains the choice of contraceptive as per the multinomial logistic regression. While women with secondary education are approximately 7 percentage points more likely to use any contraceptive, same women are only 3 percentage points more likely to choose modern over traditional methods of contraceptives. The employment status of the woman was also found to be consistently correlated with contraceptive usage in all the estimations. However, we did not find support for any age category as a distinct predictor of contraceptive use. While age was significant at the bivariate level (chi-square test), its robustness was attenuated by the inclusion of other controls. Our results lend support to the government policy of intensifying and complementing the Free Compulsory Universal Basic Education (FCUBE) as in the case of the school feeding programme to act as additional bait to the FCUBE. Family level policies that encourage both spouses to make joint health decisions are important in promoting the use of modern contraceptives. Women with health insurance are generally thought to be health conscious and seek family planning services to enhance welfare. We found that women without health insurance are less likely to use modern contraceptives. Thus the current campaign on the need to enroll on the NHIS, the free maternal health policy notwithstanding must be intensified to ensure a higher modern contraceptive prevalence.

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[i] The GDHS identified 12 modern methods-female and male sterilization, the pill, the IUD, injectables, implants, male and female condoms, diaphragm, foam tablets and jelly, lactational amenorrhea method (LAM), and emergency contraception. The traditional methods are identified as rhythm or periodic abstinence and withdrawal. In this paper, the terms "family planning methods" and "contraceptives" are used interchangeably.