DETERMINANTS OF THE USE OF MODERN CONTRACEPTIVES IN BARINGO COUNTY

BY

RONO VICTOR KIMUTAI

SUPERVISOR: DR. RUIGU GEORGE

Research Paper submitted to the School of Economics, University of Nairobi, in Partial Fulfillment of the Requirements for the Award of the Degree of Master of Science in Health Economics and Policy, University of Nairobi.

2017

DECLARATION

This research paper is my original work and has not been presented for a degree award in any other university.

Signature…….Date……

RONO VICTOR KIMUTAI

This research paper has been submitted for examination with my approval as university supervisor

Signature……..Date……

DR. RUIGU GEORGE

DEDICATION

It is with my deepest gratitude that I dedicate this work to my parents who have been a constant source of knowledge and inspiration all my life.

ACKNOWLEDGEMENTS

The completion of this study would not have been possible without the expertise and guidance of Dr. George Ruigu throughout the research development and analysis.

ABSTRACT.

Birth control program is fundamental in the control of maternal and child mortality rates as a woman can then effectively space her births and avoid unwanted pregnancy. The major component of family planning is the use of contraceptives (especially modern) methods which form a critical pillar in maternal health provision and population control initiatives. The Kenyan government promotes the use of family planning by provision of these services through informed and voluntary choice at various health facilities across the country. The knowledge of family planning methods in Kenya is nearly universal and is a major requirement for the patient in making the decision to acquire the services. This has led to a substantial increase in the uptake of modern contraception over the years. Baringo County has 33.1 % prevalence rate of modern contraceptives use among women aged 15-49 while the national average is 53.2%. There are regional variations with urban-rural disparities regarding the use of modern contraceptives, and this means that there are very many women who are vulnerable to unplanned pregnancy and abortions that are largely unsafe. No previous study has been done to document the correlates of modern contraceptives in Baringo County hence the preparation of this paper.The study evaluated the determinants of the uptake of modern contraceptives in Baringo County in Kenya using the Kenya Demographic and Health Survey 2014 (KDHS, 2014). Probit model was used to achieve the study's objectives. The results showed that level of education- Secondary and higher education, Number of children, Visit to the health facility and was told about family planning, Married; Poorer; Middle, Richer, Richest and Protestant are all statistically significant in determining the uptake of modern contraception by women in the reproductive age in Baringo county. A woman who has secondary and higher levels of education, has children, in the age bracket of 20-34 years, classified as middle, richer, or richest, visits the health facility and told about Family Planning and is a protestant has a higher probability of up taking modern contraceptives for use. Poverty alleviation measures combined with increased access to formal education will go a long way in changing the attitudes of women in the reproductive ages to embrace more of the modern contraceptives.

ACRONYMS

TFR.....Total Fertility Rate

KDHS……Kenya Demographic and Health Survey

WHO……..World Health Organization

HIV……...Human Immunodeficiency Virus

IUD……....Inter Uterine Device

PRB……..….Population Reference Bureau

MOH…….Ministry of Health

KNBS……....Kenya National Bureau of Statistics

USAID……..United States Agency for International Development

LARCs……..Long Acting Reversible Contraceptives

CRR……..Centre for Reproductive Rights

TABLE OF CONTENT

TABLE OF FIGURES

CHAPTER ONE: INTRODUCTION

1.1. Background of the study

Contraceptive use is at the center of population control and has potential benefits both at the micro level-households and at the macro level. At the household level, couples are able to space their births, achieve desired fertility preference and protect themselves against myriad sexually transmitted diseases (STDs). On the other hand, benefits that accrue from the use of family planning at the macro level includes; controlled population growth rate and a reduction of the burden on the national budget (Nonvignon and Novignon, 2014). Also, it is documented that households with fewer number of births are able to offer their children good quality life necessities like health and education (Becker and Lewis, 1973).

A population growth rate that exceeds the rate of economic growth is not desirable. To initiate population decline, couples need to embrace and consume modern contraceptives while the relevant agencies like the government and the private sector work closely in ensuring that unmet needs for contraceptives is reduced (WHO, 2012).

1.2 Global State of Contraceptive Use

Table 1 shows use of the contraceptives globally for various regions of the world.

Table 1: Contraceptive use and Family Planning by World Regions

REGION	YEAR		Continental Average
	1970	2015	
Africa	8.2	33.4	33.4
Asia	28.4	67.8	67.8
Europe	64.2	69.2	69.2
Latin America & Caribbean	35.8	72.7	72.7
North America	64.5	74.8	74.9
Oceania	57.1	59.4	59.4

Source: The Guardian (London): 23rd August, 2016.

The Percentage of women using contraceptives is lowest in the Africa. This is again exacerbated by the very high numbers of unmet need of contraceptives in Africa. By world average of the use of contraceptives, other world regions are almost twice that of Africa North America is the one leading in terms of continental average of contraceptive use at 74.9% while Latin America & Caribbean are second.

A scrutiny of the use of contraceptives by type shows that a quick-fix and reversible contraceptive methods is widely used in Africa with the pill and the injectables being the most popular in the African continent. On the other hand, male condom use is lower in Africa. North America takes the lead in male sterilization globally while Latin America leads in the number of sterilised women in the world.

The rate of population growth is directly linked to contraceptive use. A report by United Nations in 2015 points to a higher population growth rate in the regions of the world where contraceptive use is low. Table 2 shows the rate of population change in percentage.

Table 2: World Average Annual Rate of Population Change (Percentages), 2015

Regions	Year	
	2005-2010	2010-2015
More Developed Regions	0.40	0.29
Less Developed Regions	1.40	1.36
Sub-Saharan Africa	2.73	2.71
Oceania	1.74	1.54
Northern America	0.93	0.78
Latin America and the Caribbean	1.24	1.12
Europe	0.17	0.08
Asia	1.11	1.04
Africa	2.53	2.55

Source: UN, 2015.

More developed regions have a lower average rate of population change when compared to less developed countries. Sub-Saharan Africa leads when it comes to population growth.

It is documented that over 50% of women of reproductive age in the African continent face unmet needs for contraceptives which can be broadly explained by factors ranging from gender based barriers to religious and cultural factors and unavailability of family planning services. East Africa in particular, experiences very high levels of unmet need for contraceptives which can largely be explained by socioeconomic variables and reproductive behaviours and the family planning environment (Shoran et al., 2009).

The population reference bureau in 2011 posited that nearly 55% of married women globally use modern family planning services while in Sub-Saharan Africa it stands at a paltry19%. In Sub-Saharan Africa, the number of women getting into their reproductive age has been on the rise which essentially means that there is a rise also in the numbers who needs contraceptives. Many Countries in the sub Saharan region are unable to provide adequate family planning methods to a woman who needs it leading to an ever widening gap of unmet need for contraceptives in this region (Sing and Darroch, 2012).

Moreover, Sub-Saharan Africa has the highest cases of new HIV infections, unintended pregnancies and the lowest possible level of contraceptive use (Hubacher, Mavranezouli and McGinn, 2008). To improve the use of family planning methods, there is need to avail contraceptives to widen the choice range of women in their reproductive intentions. Although short-acting means like the oral contraceptives (OCs), injectables and condoms features more in sub-Saharan Africa, long-acting reversible (LARC) and lasting methods are more successful as they do away with the need for adherence and have higher continuance rates. Countries in the Sub Saharan Africa thus stare at more cases of unintended pregnancy since the only available choice range of family planning methods are the short-acting which requires daily or quarterly use (Espey and Ogburn, 2011; McCoy, 2014).

The high cases of unintended pregnancies in Sub-Saharan Africa have largely been attributed to not using family planning methods, inconsistent use of contraceptives and contraceptive failures. This has far reaching consequences as it leads to high number of unplanned births, unsafe abortions and miscarriages which often leave the affected women with life threatening complications (Sing et al., 2012).

1.3 Contraceptives Use in Kenya

Contraceptives use has been on the rise in Kenya since the first fertility survey in 1977-78 when modern contraceptives use was 4.4% then to nearly 60% it is today. On the other hand, traditional contraceptives use has decreased over the years as shown in the Table 3.

Table 3: Contraceptive Prevalence by Method in Kenya, 2015

Year(s)	Age	Any method	Modern Methods							Traditional Methods			
			Any modern method	Sterilization F	M	Pill	Injectable	IUD	Male condom	Any traditional method	Rhythm	Withdrawal	Other traditional methods
1977-1978	15-50	**7.0**	**4.4**	1.0	0.0	2.0	0.6	0.7	0.1	**2.5**	1.1	0.2	1.2
1984	15-49	**17.0**	**9.7**	2.6	0.0	3.1	0.5	3.0	0.3	**7.3**	3.8	0.6	2.9
1988-1989	15-49	**26.9**	**17.9**	4.7	0.0	5.2	3.3	3.7	0.5	**9.0**	7.5	0.2	1.3
1993	15-49	**32.7**	**27.3**	5.5	0.0	9.5	7.2	4.2	0.8	**5.5**	4.2	0.4	0.8
1998	15-49	**39.0**	**31.5**	6.2	0.0	8.5	11.8	2.7	1.3	**7.5**	6.1	0.6	0.8
2003	15-49	**39.3**	**31.5**	4.3	0.0	7.5	14.3	2.4	1.2	**7.8**	6.3	0.6	0.8
2008-2009	15-49	**45.5**	**38.9**	4.8	0.0	7.2	21.6	1.6	1.8	**6.6**	4.7	0.7	1.2
2014	15-49	**55.7**	**55.4**	1.6	.	7.3	29.1	3.4	1.8	**0.2**	..	..	0.2

Source: UN, 2015.

Table3 indicates that the use of contraceptives has increased nearly 9 times from the 70's to the year 2015. It is also noted that sterilization is higher in females than in males. Among the modern contraceptives used in Kenya, Injectables are used more followed by the pill and then the IUD. Among the traditional methods, rhythm is more popular followed by withdrawal method. Despite the above documented gains, Kenya's fertility rate remains high at about 4 births per woman while the Kenya's rate of population growth rate is one of the highest in the world at about 2.6 per annum. The world total Fertility (TFR) is about 1.7 births per woman. To create a reduced population growth in Kenya, there is need to improve access and awareness of population growth in Kenya, there is need to improve access and awareness of family planning methods in Kenya (PRB, 2011). The 2014 KDHS reported that currently, 18% of the married women have unmet need for contraceptives, classified as 9% for spacing and 8% for birth limiting.

Baringo County has made great strides in as far as maternal health is concerned. Table 4 shows that contraceptive prevalence improved by 11.5% from 2012 to 2015. The national contraceptive prevalence on the other hand is much higher at 53.2%, which is more than 20% that of Baringo County. This is shown in the Table 4.

Table 4: Baringo County Health at a Glance

Indicator	2012	2015	Kenya
Population			
Total	609,910	649,065	45,108,414
Male	306,383	326,052	22,422,667
Female	303,527	323,013	22,685,747
1-5 years	98,805	105,149	6,936,931
< 1 years	20,737	20,068	1,425787
Maternal health			
Births Delivered at a health Facility (%)	**30.4**	**53.5**	**61.2**
Contraceptive Prevalence	**21.6**	**33.1**	**53.2**

Source: MOH, KDHS, 2014 and Kenya HIS, Division or Reproductive Health.

The population growth in Baringo has grown by a total of 39,155 people in the three year period between 2012 and 2015 while the contraceptive prevalence increased by 11.5% between the same period. However, contraceptive use and or prevalence is still very low and actually falls far below the national average of 53.2%. At such rate, there is a need to increase access and knowledge of modern contraceptives in this county.

1.4 Statement of the Problem

Kenya had a population growth rate of 2.6% in 2015 which weighs above the global average at 1.2% (UN, 2015). The current total population is further shown to be about 47 Million. A population growth rate that is above 2 births per woman has been shown to hamper economic growth and expose a country to myriad socio-economic challenges that can never be left to stabilize on their own. There is pressure on land, housing and social amenities especially in the urban places (Ajayi and Kovole, 1998).

Nearly 40% of all pregnancies in Kenya are unintended, that is mistimed or unwanted. These types of pregnancies are fueled largely by the widening gap of unmet need for contraceptives. Studies have documented that more than 25% of married women in Kenya have unmet needs for contraceptives while the national prevalence of modern contraception stands at nearly 55.9% (KNBS, 2010). Pregnancies that are not planned have serious negative maternal health outcomes affecting even the unborn child psychological development and can hinder their economic usefulness in future. Majority of such pregnancies ends in abortions that are largely unsafe leaving the affected women with life threatening complications of which some are permanent. Currently, Kenya loses nearly 2600 women and teenage girls due to abortions that are largely unsafe (CRR, 2010).

Even though the national figures indicate that the knowledge of contraceptives is above 95%, counties such Baringo are below this rate. This study seeks to unearth the determinants of contraceptive use in Baringo County.

1.5 Research Questions

i. What are the factors determining contraceptive use in Baringo County?
ii. What are the effects of costs of accessing on the use of contraceptives by women in Baringo County?

1.6 Objectives

The general objective of this study is to examine the determinants of contraceptives use in Baringo County.

The specific objectives are:

i. To evaluate the factors impacting on contraceptive use in Baringo County.
ii. To evaluate the effect of cost of accessing contraceptives among women in Baringo County.
iii. To draw key policy implications based on (i) and (ii) above.

1.7 Justification of the study

Proper identification of the correlates of contraceptive use will greatly benefit the county government of Baringo in planning populations. The County government of Baringo is set to benefit from this study since better maternal health initiatives in the County and also to have population growth that the county can be able to offer to the very much needed socio-economic infrastructure like health centers and schools. No such study has been undertaken in Baringo County to date.

Researchers and other agencies in the reproductive health care will also benefit from this study as the factors influencing contraceptives use in Baringo County will be clearly unearthed, thus enabling them to undertake informed programs to increase awareness, knowledge and effective use of the contraceptives in the County.

1.8 Scope of the study

The study will specifically focus on the County of Baringo in the Rift Valley region of Kenya. Data sets used will come from Kenya Demographic Health Survey (KDHS) 2014 report.

CHAPTER TWO: LITERATURE REVIEW

2.0 Introduction

This chapter reviews theoretical and empirical literature on studies that have been done on contraceptive use and the factors explaining its use. Theoretical literature is followed by empirical literature.

2.1 Theoretical Literature Review

The study reviews economic theories explaining contraception and its uses.

2.1.2. An Economic Framework for fertility

This model was developed by Easterline,(1975 and 1978). He argued that demand for children greatly explains birth behaviour while the use of contraceptive is determined by the number of children, the economic and psychological costs of family planning amongst other factors. In the model, the desire for children is synonymous with demand for goods and services and therefore factors such as income, parental costs and preferences that leads to welfare maximization on the part of the individuals also influences demand for children.

If individuals desire not to limit their number of births through family planning methods, there can be possibility of unwanted births. He moves further to clarify that contraceptive use remains a function of the desire to use contraceptives during fecundity, yet, desires no children, psychic costs of contraceptive use and market costs of contraceptive use (time, money to gain knowledge about and use contraceptives, health costs of contraceptives use, like the side effects). That there will be more use of family planning if the psychic and market costs are low. The psychic costs of use are explained by the shared endorsement of birth control methods and the specific techniques that are more susceptible to be correlated to educational, religious and cultural factors.

Market costs depend on the degree of access to fertility control as explained by the availability of information and the range of specific techniques and their prices. He concludes that for an individual to use contraceptives there is need to be aware of the availability and accessibility of the means of fertility regulation.

Beegle, K (1995), developed a model of household production where they argued that individuals in the households distribute their scarce resources to maximize their utility. They developed an economic model of contraceptive use where the desire for children is a function of the economic viability of the children to the family, children cost and the opportunities that can be lost. Therefore, the utilization of the contraceptives will be influenced by the costs in relation to the potential benefits of children as exhibited by the household's fertility level, educational pursuit by the individuals and the socioeconomic status of the household.

Becker, G.S (1965) in his model on the demand for children also opines that children demand is equal to durable goods. As such, as money income increases, households/ individuals focuses on the quality rather than the quantity of children. They therefore opt for birth control mechanisms that include the use of contraceptives of their choice.

2.2 Empirical literature

Gereltuya, et al (2007), in their study to examine the factors for the current use of contraception and family planning method choice in Mongolia used the 1998 Mongolian Demographic and Health Survey and the 2000 Population and Housing Census Survey. This gave rise to 7461 women in the reproductive age of 15-49 years.Analysis was done by fitting two logistic regression models, one analyzing the current use of contraception and the contraceptive method choice. A sample of 4500 married women who were not pregnant was used. Education level, fertility preference, age, and number of children were all found to influence contraception use and method choice in Mongolia. Those who said they had no intention of having more births, young in age (15-24, 25-34, and 35-44 years), and have more than four (4) births were more likely to use contraceptives. On the other hand, those who were older (45-49 years), and had fewer births, below four (4) births, showed lower probability of using contraceptives.

Douthwaite and Ward (2005), carried out an evaluation of the Lady Health Worker Programme in Pakistan to understand factors behind increased use of contraceptives by the rural Pakistani women enrolled in the programme. They did a random sampling of 4,277 women from the households served by the Lady Health Worker Programme. Analysis was done by fitting logit model to examine the effect of the programme on the use of modern reversible contraceptive

methods. The study concluded that women served by the programme-Lady Health Worker showed increased probability to use modern reversible contraceptives than those who were not covered by the programme. Education level, number of children, fertility preference, those who watched TV regularly, and place of residence were statistically significant in influencing the use of modern contraceptives. The odds ratio for women who were more educated (1.07), had more births (4 children and above) (2.59), those who desired no more births (1.79), and watched TV regularly (1.45) for the uptake of modern contraceptives were higher. Place of residence also played a key role in determining modern contraceptives uptake. Rural women who were in the programme were more likely to use modern contraceptives than their urban counterparts.

Clement and Madise (2004), did a study to examine why households who are considered poorest and most vulnerable in Ghana, Zimbabwe and Tanzania are the ones who have low usage of modern contraceptives. They used Demographic and Health Survey from the three countries (Ghana, Zimbabwe, and Tanzania) with specific focus on women in the reproductive age. The study realized that age, number of children, marital status, religion, and education level were significant in explaining the low usage of modern contraceptives by the poor and most vulnerable households of these three countries. Women who were aged 15-19, 20-29, 30-39 had higher odds ratio of use of modern contraceptives while those aged 39 years and above had lower odds ratio for the use of modern contraceptives indicating lower likelihood of use of contraceptives. By number of children, those who had 3 or more births had higher odds ratio of the use of modern contraceptives than those who had number of births that were below three children. While married women were more likely to use modern contraceptives, those who were single had higher ratio of the use of modern contraceptives than their married counterparts. Those who had traditional forms of religion had lower odds ratio of use of modern contraceptives than other categories of religions. Education level of a woman was also significant in influencing the usage of modern contraceptives. Those with higher education level had higher odds ratios of the use of modern contraceptives than those with secondary and primary levels of education.

Tobin- West et, al (2016), investigated the determinants of contraceptive uptake among women of reproductive age in semi urban people of Rivers State, Nigeria. They used cross sectional data of 772 women age between 15 -49 years. The analysis was done using logistic regression.The results indicated that age, marital status, and awareness about contraceptives were all statistically significant in explaining the use of modern contraceptives among women in the reproductive age in this region. Specifically, women who were young (15-34 years) and were single had higher odds ratio for contraceptive use than those who were older (35-44 years) and were married who had lower odds for the uptake of modern contraceptives.

Ochako et, al (2017), analyzed the determinants of modern contraceptive use among sexually active men in Kenya using the 2014 Kenya Demographic and Health Survey Data of 9514 sexually active men in the past one year. Analysis was done using bivariate and multinomial logistic regression. The study reported that the place of residence, wealth index, desire for more births, religion, interaction with a health service provider, number of sexual partners and the access to media were all significant factors influencing the use of modern contraceptives by sexually active men in Kenya. Logistic regression indicated that men who were classified as rich and or richer, had primary and above education, working, had frequent interaction with health workers, desired no more births and had more than one sexual partner were highly likely to use modern contraceptives. On the other hand, women who had no regular partners and were residing in the rural areas were less likely to use modern contraceptives.

Malalu et, al (2014), conducted a study to examine the determinants of modern contraceptives among women in the reproductive age in Baringo North District, Kenya. Their study involved collecting a random sample of 344 women respondents. Their analysis was done using logit model.Their results showed that marital status, sources of income, age, desire for more children, knowledge of the contraceptive methods and side effects, level of education, and method approval by self-partner were sufficiently significant in explaining the use and or uptake of modern contraceptives in Baringo North District. A woman's who is younger, knows any method, knows side effects of contraceptives, is educated and is married has more likelihood to use modern contraceptives than those who are older, knows no any contraceptive method, knows no side effects of contraceptives, has no education and is single.

Okech et, al (2011), made a study to examine the level of utilization of family planning services and the corresponding determinants of the demand for contraceptives among women of reproductive age living in the informal settlements in Nairobi. They used a sample of 500 women who were in the reproductive age. The analysis was done using logistic regression to determine factors explaining the demand for contraceptives. The factors that were statistically significant in influencing family planning services demand were: religion; proximity to service providers; partner's approval; quality of services offered; friendliness of the operators; income; marital status and the number of children. Religion and proximity to providers of family planning services were negatively influenced demand for family planning services by women in the reproductive age. On the other hand, partner's approval, quality of services, friendliness of the individuals offering the services, income and prior knowledge of family planning were positively correlated with the demand for family planning services.

2.3 Overview of literature review

The theory consumer behavior argues that individuals allocate their scarce resources among various goods and services with an aim of welfare maximization subject to some constraints. In analyzing contraceptive use in Baringo County. Households allocate their resources on various goods and services in an attempt to maximize their welfare subject to budget constraints, children, health production and time constraints and Becker (1956) who argued that use of contraception is affected by the expected benefits viz-a- viz costs.

From the models reviewed earlier, contraceptive use is not necessarily an individual decision but is influenced by various factors such as husband participation, level of education, the socioeconomic status, socio-cultural factors as well as the availability and accessibility of various methods, Oketch et al (2011),

Socio-cultural factors in which the desire for a boy child to carry the family name will determine the number of pregnancies a woman will have. There is still inadequate knowledge on contraception with perceived side effects being a hindrance to their use. Among African poor, the cost of obtaining contraception hinders use since one has to factor in the transport costs to

and from the hospital, loss of daily wages since one has taken time off work to go to the hospital and need for multiple follow ups at the hospital, Clement and Madise (2004),

The literature review shows that different factors affect contraceptive uptake in different regions. This study aims to replicate Gereltuya et, al (2007) study done in Mongolia.

CHAPTER THREE: METHODOLOGY

3.0. Introduction

This chapter brings out the method and approach used in the study to evaluate the factors accounting for modern contraceptive use in Baringo County. Specific areas addressed are; theoretical framework, econometric model (model specification), definition of variables, signs and their measurements, data source and estimation issues.

3.1. Theoretical Framework

Given a household's utility maximization function of the form:

$U=f(F_h, C)$…….1.

Where;

U=the household utility

F_h=Family Health

C=consumption of other market goods.

The household maximizes its utility subject to a budget constraint and a health production function. The budget constraint can be stated as follows:

$M=P_fF+ P_jJ+ P_cC$……...2.

Where;

M= the households' income

P_f= the costs of using a family planning method

P_j= the costs of other market inputs such as knowledge of contraceptives

P_c= the cost of other household consumption goods.

Further, the health production function can be given by:

$H= f(F_p, J_m, C_o)$ ……..….. 3.

Where, F_p= family planning methods

J_m= other markets inputs

C_o= other household consumption goods

Forming the Lagrange equation using 1 and 2, we have:

Ļ (F, C) = U (F_h, C) + K (M-P_fF- P_jJ- P_cC) ………………………...……………………..4.

Solving equation 4 above, we have the following reduced demand function for family planning use:

D= f (P_f, P_j, P_c, Y, V)…………………………………………………………….................5.

Where; V= other variables.

P_f, P_j, P_c and Y remain as defined above.

3.2. Econometric model

3.2.1. Probit Regression model

Binary probit model was used to predict contraceptive use. The predictions lie within an interval of (0, 1), where we assume that the probability of an individual using or not using contraceptives is either 1 or 0. We state binary outcome variable as follows:

Y_i= f (X_i)………………………………………………………………………………………6.

Where;

Y_i= 1 if the individual is using a contraceptive method, given that Y_i> 0.

Y_i = 0 if the individual is not using a contraceptive method, given that $Y_i \leq 0$.

X_i = a set of explanatory variables.

Following (Greene, 2002), we can define binary response model by transforming Xβ into a probability of the form:

$$\mathbf{prob}(\mathbf{y_i} = \mathbf{1}) = \mathbf{F}\ (\mathbf{X_i}\ \boldsymbol{\beta}) \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots .\ldots\ldots.\mathbf{6}.$$

Where β refers to the parameters to be maximized.

The maximum Likelihood method will be used to estimate the probability of contraceptive use.

3.3. Model Specification

$$\mathbf{MCU = \beta_0 + \beta_1 ED + \beta_2 SHD + \beta_3 NC + \beta_4 VHW + \beta_5 AG + \beta_6 ES + \beta_7\,MS + \beta_8\,WI + \beta_9\,HED + \beta_{10}\,RE + \beta_{11}\,DHF + \beta_{12} WTV + \beta_{13}\,LTR + \varepsilon \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots 7.}$$

Where;

MCU= Modern Contraceptive Use

ED= Education Level

SHD= Sex of the Household Head

NC=Number of Children living

VHWF= Visit to the Health Facility and discussed Family Planning with health care provider

AG=Age of respondent

ES=Employment Status

MS= Marital Status

WI=Wealth Index

HED= Husband Education Level

RE=Religion

DHF=Distance to Health Facility

WTV=Owns a TV

LTR=Owns a Radio

3.4 Data Source

The study used Kenya Demographic and Health Survey (KDHS) 2014 annual report, which is a nationally representative sample of 31,079 women in the age bracket of 15-49.This was the first KDHS that also included key select indicators' data for various counties.

The survey took place in 2014 from the month of May to October with the Kenya National Bureau of Statistics being the implementing agency while other partners included the Ministry of Health, the National AIDS Control Council (NACC), the National Council for Population and Development (NCPD), and the Kenya Medical Research Institute (KEMRI). Detailed information on fertility levels and trends, fertility preference, maternal and child mortality, marriage, sexual activity, contraceptive prevalence, breast feeding practices, child and maternal health and nutritional status of women were collected.

Table 5: Definition of Variables used in the Model

Variables	Definition
Dependent variable	
Current Contraceptive Method	Modern contraceptive use=1 and 0 if otherwise
Explanatory Variables	
Education Level	No education=0 Primary=1 Secondary=2 Higher=3
Sex of the household Head	1 if female, 0 otherwise
Number of children living	Number of children born (count)
Visit to health facility and told of family planning	1 if yes, 0 otherwise
Age	15-19= 0 20-34=1 35-49=2
Employment status	1 if employed, 0 otherwise
Marital status	1 if married, 0 otherwise
Wealth Index	Poorest=0 Poor=1 Middle=2 Richer=3 Richest=4
Husbands level of Education	Traditional=0 Primary=1 Secondary=2 Higher=3
Religion	Traditional=0 Roman Catholic=1 Protestant/Christian=2 Muslim=3
Access to health facility	Big problem=1(less than or equals to 3 km) Not a big problem =0(more than 3 km)
Owns a Radio	Yes=1 No=0
Owns a TV	Yes=1 No=0

Source: Author

CHAPTER FOUR: RESULTS ANALYSIS AND DISCUSSIONS

This chapter gives the regression results obtained by estimating probit model and the interpretation of the results. A probit model of the determinants of modern contraceptive use was estimated.

4.1 Descriptive Statistics

In this section, an in-depth description of the variables; their mean, standard deviation, minimum and maximum values of the 598 observations is presented.

Table 6: Descriptive Statistics: Modern and other Contraceptives use in Baringo County

Variable	Mean	Std. Dev.	Min	Max
Not using Contraceptives	0.6956522	0.4605159	0	1
Pill	0.0301003	0.1710065	0	1
Inter Uterine Device (IUD)	0.0217391	0.1459526	0	1
Injections	0.1187291	0.3237403	0	1
Condom	0.0284281	0.1663316	0	1
Female sterilization	0.0083612	0.0911328	0	1
Periodic abstinence	0.0451505	0.207808	0	1
Implants/Norplant	0.0351171	0.1842298	0	1
Lactational amenorrhea	0.0033445	0.057783	0	1
Female condom	0.0016722	0.040893	0	1
Other method	0.0016722	0.040893	0	1
Withdrawal	0.0100334	0.0997467	0	1

SOURCE: Computed from the 2014 KDHS Data: Baringo County

From Table 6, the descriptive statistics for modern contraceptive use shows that nearly 70% of the women in Baringo County were not using any contraceptive method. Modern contraceptive use were as follows: pills (3%), IUD (2%), Injections (12), Male Condoms (about 3%), Female sterilization (0.8%), Periodic abstinence (4.5%), Implants/Norplant (3.5%), Lactational amenorrhea (0.3%), Female condom (nearly 0.2%), Other methods (about 0.2%) and withdrawal (1%).

Table 7: Descriptive Statistics: Other Explanatory Variables

Variable	Mean	Std. Dev.	Min	Max
Women with no Education	0.1237458	0.329567	0	1
Secondary Education	0.2876254	0.4530345	0	1
Women with Primary Education	0.4899666	0.5003178	0	1
Women with Higher Education	0.0986622	0.2984576	0	1
Female head	0.416388	0.4933721	0	1
Number of children	2.51505	2.454738	0	12
Visit to Health Facility, told Family planning	0.2699115	0.444899	0	1
Fifteen to nineteen	0.2341137	0.4237981	0	1
Twenty to Thirty four	0.4983278	0.5004158	0	1
Thirty five to forty nine	0.2675585	0.4430567	0	1
Currently working	0.2876254	0.4530345	0	1
Married	0.5735786	0.4949706	0	1
Poorest	0.3428094	0.4750458	0	1
Poorer	0.1772575	0.3822062	0	1
Middle	0.1588629	0.3658542	0	1
Richer	0.2040134	0.4033162	0	1
Richest	0.1170569	0.3217572	0	1
Husband no education	0.0434783	0.3445886	0	1
Husband primary education	0.1170569	0.3217572	0	1
Husband secondary education	0.1070234	0.9477582	0	1
Husband higher education	0.1526316	1.081746	0	1
Muslim	0.0200669	0.1403465	0	1
Protestant	0.7842809	0.4116646	0	1
Roman catholic	0.1120401	0.3156799	0	1
Distance too long/a big problem	0.4202899	0.4945021	0	1
Owns a TV	0.1973244	0.3983124	0	1
Owns a Radio	0.3394649	0.4739241	0	1

SOURCE: Computed from the 2014 KDHS Data: Baringo County

From the sample (598), 12% of the women were illiterate, 49% had primary level of education, 29% had secondary level of education and a further 10% had higher education level.
Households that were headed by females stand at 42% while those with males as households head were 58%. It therefore means that majority of the households were headed by males.
The descriptive statistics have shown that the maximum number of children were 12. Those with none were the minimum.

From the descriptive statistics table, about 30% of the women had visited a health facility and had been informed on family planning matters.
By age, women in Baringo County who were in the ages of 15-19 years were 23%, those who were in the ages of 20-34 years were nearly 50%. Women who were in the ages of 35-49 years were about 27%.

By employment status, women who were currently employed were 29%.
The wealth index where households were categorized in terms of ownership of various assets have statistics showing that women who were classified as poorest were 34%, poorer at 18%, middle at 16%, richer at 20% and richest at 12%.

The descriptive statistics also shows that the level of education of the husband standing at 4.3% for those with no education. Husbands with primary level of education stood at 12%. Those with secondary education level were 11% while those with higher level of education were 15%.
By religion, 2% of the women sampled in Baringo County were Muslims, 78% were Protestants while Roman Catholics were 11%.

4.2. Econometric Results

4.2.1 Determinants of Modern Contraceptive use in Baringo County

Table 8 presents probit results for the determinants of modern contraceptives in Baringo County. The dependent variable is coded 1 if a woman used modern contraceptives and zero if otherwise. Stata software was used to analyse the data sets and the model fitted is Probit.

Table 8: Probit Regression Results of the determinants of Modern Contraceptives in Baringo County

Variables	Coefficients.	Robust Std. Err.	z	P>z	[95% Conf.	Interval]
Primary Education	0.3813714	0.295913	1.29	0.197	-0.1986074	0.9613501
Secondary Education	0.6908513	0.3227432	2.14	0.032	0.0582861	1.323416
Higher Education	1.112142	0.3719065	2.99	0.003	0.3832186	1.841065
Female head of household	-0.1563237	0.1328164	-1.18	0.239	-0.4166391	0.1039916
Number of children	0.0868272	0.0380188	2.28	0.022	0.0123116	0.1613428
Visit to health facility	0.4432176	0.2128444	2.08	0.037	0.0260502	0.8603849
Twenty to thirty four	0.863344	0.2153775	4.01	0.000	0.4412118	1.285476
Thirty five to forty nine	0.3238475	0.286772	1.13	0.259	-0.2382153	0.8859104
Currently working	-0.0219862	0.2132092	-0.10	0.918	-0.4398686	0.3958962
Married	0.3986321	0.1731434	2.30	0.021	0.0592773	0.7379869
Poorer	0.4690517	0.2089414	2.24	0.025	0.059534	0.8785693
Middle	0.4699384	0.2140872	2.20	0.028	0.0503352	0.8895416
Richer	0.7080939	0.2117741	3.34	0.001	0.2930243	1.123163
Richest	0.5400954	0.2603563	2.07	0.038	0.0298064	1.050384
Muslim	0.533055	0.6332471	0.84	0.400	-0.7080865	1.774196
Roman catholic	0.9290604	0.4684033	1.98	0.047	0.0110067	1.847114
Protestant	1.058462	0.4505881	2.35	0.019	0.1753253	1.941598
Husband primary education	-0.3664279	0.2796213	-1.31	0.190	-0.9144757	0.1816199
Husband secondary education	-0.2263179	0.2717823	-0.83	0.405	-0.7590015	0.3063656
Husband higher education	-0.1148259	0.342908	-0.33	0.738	-0.7869131	0.5572613
Owns TV	0.0053923	0.2091984	0.03	0.979	-0.404629	0.4154136
Owns a Radio	0.1686487	0.2256622	0.75	0.455	-0.273641	0.6109384
Access to health centre	0.1280201	0.1815583	0.71	0.481	-0.2278276	0.4838678
_cons	-3.502012	0.4918634	-7.12	0.000	-4.466047	-2.537978
Number of observations = 598						
Wald chi2(23) = 129.36						
Prob > chi2 = 0.0000						
Log pseudolikelihood = -284.11959						
Pseudo R2 = 0.2159						

Source: Derived from Data Analysis

The coefficients of probit model are normally interpreted in terms of a latent variable y^* that is unobserved and measured not in any kind of units. Inherently, the coefficients can only be interpreted by their signs and not the magnitudes. To interpret therefore the signs and the

magnitudes, that is quantitatively, we in this study will generate the marginal effects for continuous variables and the average effects for the dummy variables. The marginal effects are as shown in the Table 9 below:

Table 9: Probability of using Modern Contraceptive in Baringo County

Variable	Marginal Effects	Std. Err.	z	P>z	95% Confidence Interval	
Primary Education	0.1150208	0.08885	1.29	0.195	-0.059118	0.289159
Secondary Education	0.2271162	0.11226	2.02	0.043	0.007083	0.447149
Higher Education	0.4048734	0.13966	2.90	0.004	0.131148	0.678599
Female head of household	-0.0466572	0.03944	-1.18	0.237	-0.123965	0.030651
Number of children	0.026183	0.01145	2.29	0.022	0.003741	0.048625
Visit to health facility	0.1493309	0.07795	1.92	0.055	-0.003444	0.302105
Twenty to thirty four	0.2570432	0.06121	4.20	0.000	0.137069	0.377018
Thirty five to forty nine	0.1027765	0.09474	1.08	0.278	-0.08291	0.288463
Currently working	-0.0066067	0.0638	-0.10	0.918	-0.13166	0.118446
Married	0.1172407	0.04944	2.37	0.018	0.020336	0.214146
Poorer	0.1556809	0.07415	2.10	0.036	0.010346	0.301016
Middle	0.1567838	0.07675	2.04	0.041	0.006365	0.307202
Richer	0.24077	0.07701	3.13	0.002	0.089826	0.391714
Richest	0.1845122	0.09661	1.91	0.056	-0.004834	0.373859
Muslim	0.1867087	0.24384	0.77	0.444	-0.291215	0.664632
Roman catholic	0.3335749	0.17747	1.88	0.060	-0.014259	0.681409
Protestant	0.2443419	0.07067	3.46	0.001	0.105823	0.382861
Husband primary education	-0.0983935	0.06584	-1.49	0.135	-0.227435	0.030648
Husband secondary education	-0.0635608	0.07056	-0.90	0.368	-0.201848	0.074726
Husband higher education	-0.0332574	0.09514	-0.35	0.727	-0.219734	0.153219
Owns TV	0.001628	0.07045	0.03	0.979	-0.122319	0.125575
Owns a Radio	0.0518486	0.07045	0.74	0.462	-0.086227	0.189925
Access to health Centre	0.0397091	0.05798	0.68	0.493	-0.073931	0.153349

Source: Derived from Data Analysis. Note: dy/dx is for discrete change of dummy variable from 0 to 1.

The results in Table 9 show the probability of modern contraceptives use in Baringo County and its correlates. The study however focused on the analysis of the correlates whose coefficients are significant which are namely: Secondary education; Higher education; Number of children; Visit to the health facility and was told about family planning; Twenty to thirty four; Married; Poorer; Middle; Richer; Richest and Protestant.

Education is positively correlated with modern contraceptives use. More educated women are more likely to use modern contraceptives compared to illiterate women. The probability of a woman with primary level of education using modern contraceptives increases by nearly 23% compared to a woman who is illiterate. A woman with higher level of education has a higher chance of using modern contraceptives at 40% than a woman who is illiterate. The probabilities increase as the level of education increases for instance; the increase in probability by a woman with higher level of education is much greater than one with only secondary education level. The results are actually corroborated by the previous studies on contraceptives use nationally and regionally. We hypothesize that more educated women have shed traditional beliefs to make use of modern ways of controlling number of births for their own and their children's' health. They can also act independently to decide when and which of the contraceptives to use leading to an increased use of modern contraceptives as compared to women with no education level. In addition, modern contraceptives can easily appeal to more educated women than traditional family planning methods.

The number of children born and alive has a positive influence on the likelihood of modern contraceptives usage. The number of children born and alive increases the probability of modern contraceptive use. One additional birth increases the probability of modern contraceptives use increases by 2.6%. This can be explained by such women with children having or about to achieve their fertility preference desiring to use modern contraceptives to limit and or space the number of births. Women with children are likely to space and limit births as opposed to those without children.

A visit to the health facility and told about family planning methods increases the chance of a woman using modern contraceptives. The probability of a woman who has visited a health facility and was made conscious of family planning methods using modern contraceptives increases by about 15% compared to a woman who has not visited a health facility and therefore has not received family planning information from any health centre. The result is attributed to the fact that a woman who has interacted with reproductive health information will have the appropriate information on contraceptives as regards their use, effectiveness, types and the

associated side effects. Therefore, they will be better placed to decide to acquire modern contraceptives to enable them plan their families well.

A woman who is in the age bracket of 20-34 has a higher probability of using modern contraceptives that those who are in the age bracket of 15-19 years, that is, teenagers. The probability of a woman aged twenty to thirty four (20-34) years using modern contraceptives increases by 26% as compared to a woman who is in the age bracket of 15-19 years. Women who are in the age bracket of twenty to thirty four are mostly in the prime age of child bearing have heightened sexually activity and are therefore more likely to use modern contraceptives to: prevent sexually Transmitted Diseases, avoid pregnancy especially if not married and on the other hand, to limit and space births when married.

A married woman is more likely to use modern contraceptives than a single woman. The probability of a married woman using modern contraceptives increases by 12% compared to a woman who is single. This can be explained by married women in the sample having increased utilization of modern contraceptives to either space or limit the number of births and to prevent unwanted births for those who have achieved their fertility preference.

Wealth index influences modern contraceptive use positively. The probability of modern contraceptive use increases as the wealth index increases. The probability of a woman classified as poorer using modern contraceptive increases by 15% compared to a woman classified as poorest. A woman classified as middle has a higher chance of using modern contraceptives by 16% in comparison to a woman in the poorest category. The probability of a woman classified as richer and richest using modern contraceptives increases by 24% and 18% respectively than the women who are in the poorest category. Women who are in the richer category have a higher probability of using modern contraceptives more than any other group in the wealth index classification compared to those in the poorest lot. As wealth index of women increases, they are able to purchase modern contraceptives according to their tastes and preferences more than women in the poorest group who lacks the financial ability to buy modern contraceptives to plan their families.

By religion, a woman who is a protestant is likely to use more modern contraceptives. The probability of a protestant woman using modern contraceptives increases by 24% compared to those with no religion. This may be attributed to the fact that protestant beliefs may not be aggressively against modern contraceptive (contraceptives) use and therefore such women are not constrained by their religious affiliation, hence the increased probability of modern contraceptive use.

CHAPTER FIVE: SUMMARY, CONCLUSIONS AND POLICY RECOMMENDATIONS

5.1. Summary and Conclusion

The study evaluated the determinants of the uptake of modern contraceptives in Baringo County in Kenya using the Kenya Demographic and Health Survey 2014 (KDHS, 2014). Probit model was used to achieve the study's objectives. The results showed that level of education-Secondary and higher education, Number of children, Visit to the health facility and was told about family planning, Married; Poorer; Middle, Richer, Richest and Protestant are all statistically significant in determining the uptake of modern contraception by women in the Results have shown that education level has a significance influence on the uptake of modern contraceptives. Improved standards of education increase the probability of the uptake of modern contraceptives. Improving the education standards of women in Baringo County will greatly expose them and enable them to see the merits of modern contraceptives.

Women who already have children have higher chance of the uptake of modern contraceptives. Actors in the reproductive health sector needs to focus more on this category by enrolling them more on modern contraceptives which are essentially effective in controlling the number of births. Encouraging women in this category can be driven by making contraception available to them at more affordable rates and organizing for more seminars with them to sensitize them on the need to space their children well and or to limit the number of births they may want to have. This is similar to Gereltuya, et al (2007) study findings.

Closely related to number of children is age, women who are in the age bracket of 20-34 years have a higher likelihood of up taking modern contraception. Policy actors should thus target women in this category of ages by making contraception more available to them at more affordable rates and also increasing information dissemination to those in this category. This will encourage many to see the need of family planning. This is in tandem with Clement and Madise (2004) findings in Ghana, Zimbabwe and Tanzania.

Women who attended health centers and were told about family planning had higher probability to use modern contraceptives. The national government in conjunction with Baringo county

governments should ensure the health centers in the county disseminates more information to women in the reproductive ages who visits health centers for various cases on family planning methods, especially on effective utilizations, and the need to practice family planning. This is vindicated by Tobin- West et, al (2016) and Okech et, al (2011) studies

A woman who has secondary and higher levels of education, has children, in the age bracket of 20-34 years, classified as poorer, or middle, or richer, or richest, visits the health facility and told about Family Planning and is a protestant has a higher probability of up taking modern contraceptives for use. However, all the variables that had negative correlation with the uptake of modern contraceptives were not statistically significant. We have therefore left them in our interpretations.

5.2. Policy Recommendations

Population growth rate that is above 2% births per woman has been shown to hamper economic growth and expose a country to myriad socio-economic challenges. There is pressure on arable land in the rural areas while those in the urban areas are faced with shortages of decent and affordable housing and enough social amenities (Ajayi and Kovole, 1998).

Nearly 40% of the total pregnancies in Kenya are unintended, that is mistimed or unwanted. These types of pregnancies are fueled largely by the widening gap of unmet needs for contraceptives. Surveys have documented that more than 25% of married women in Kenya have unmet needs for contraceptives while the national prevalence of modern contraception stands at nearly 40% (KNBS, 2010). Pregnancies that are not planned have serious negative maternal health outcomes affecting even the unborn child psychologically and can hinder their economical usefulness in future. Majority of such pregnancies ends in abortions that are largely unsafe leaving the affected women with life threatening complications of which some they bear permanently. Currently, Kenya loses nearly 2600 women and teenage girls due to abortions that are largely unsafe (CRR, 2010).

Even though the national figures indicate that the knowledge of contraceptives is above 95%, counties such Baringo are way far from this rate. It is therefore imperative to document policies that will lead to more availability and affordability of modern contraception and robust dissemination of information on the effective usage of contraception.

The national government thus needs to invest more on the educational standards of women in Baringo County. Baringo County on the other hand can do more by encouraging the local communities to embrace education and allow the girl child access education without being made to face barriers that are largely fueled by the prevailing cultural practices.

5.3 Areas for further research

It is important to acknowledge at the onset that the study has achieved all the objectives set forth. However, our study like any other before had some limitations:

- The first limitation stems from the fact that KDHS 2014 data sets lacks information on the respondent's incomes. Thus we were not able to examine the influence income has on the uptake of modern contraceptives. We therefore recommend future studies on this when data on incomes can be found.
- Also the information on the actual distances to different health centres was also missing. This makes any analysis on how distance to the health centers affect the uptake of modern contraceptives impossible. We used the variable "access to the health centers**."** Future research therefore can be done to detail the influence of distance to the health centers on the uptake of modern contraceptives in Baringo County.

REFERENCES

Ajayi, A. and Kovole, J. (1998). Kenya's Population Policy: From Apathy to Effectiveness. Do Population Policies Matter? New York: Population Council, .pp 13-25.

Alvergne, A., Lawson, D. W., Clarke, P. M.R., Gurmu, E., and Mace, R. (2012). Fertility, Parental Investment, and the Early Adoption of Modern Contraception in Rural Ethiopia. American Journal of Human Biology.

Becker, G.S. (1965). A theory of the allocation of time: Economic Journal. Vol. 71, No. 299. Pp. 493-511. Becker, G. S., 1960.

Beegle, K. (1995). The quality and Availability of Family Planning Services and Contraceptive use in Tanzania. Living Standards and Measurement Survey. Working Paper No. 114. Policy Research Department, World Bank, Washington.

Center for Reproductive Rights. In Harm's Way: The Impact of Kenya's Restrictive Abortion Law. New York: Center for Reproductive Rights; 2010.

Clement, S. and N. Madise (2004) 'Who is being served least by family planning providers? A study of modern contraceptive use in Ghana, Tanzania and Zimbabwe', African Journal of Reproductive Health, 8, 124-136.

Darroch JE, Singh S, Nadeau J: In Brief (No.5) New York. In Contraception: an investment in lives, health and development. New York: Guttmacher Institute and UNFPA; 2008.

Douthwaite, M., and Ward, P. (2005). Increasing contraceptive use in rural Pakistan: An evaluation of the Lady Health Worker Programme. Journal of Health Policy Planning. Vol. 20, No. 2, Pp. 117-23.

Easterline, R.A (1975). An Economic Framework for fertility analysis. Studies in Family Planning. Vol. 6. Pp. 54-63.

Easterline, R.A (1978). The Economics and Sociology of fertility: A synthesis. Pp. 57-133 in Charles Tilly, ed., Historical Studies of changing fertility. Princeton. Princeton University Press.

Espey, E., Ogburn, T. (2011). Long-acting reversible contraceptives: intrauterine devices and the contraceptive implant. Journal of Public Medicine. Vol. 117, No. 3. Pp. 705-19.

Gereltulya, A., Falkingham, J., and Brown, J. (2007). Determinants of current contraceptive use and method choice in Mongolia. Journal of Biological Science. Vol. 39, No. 6, Pp. 801-17

Greene, W.H. (2002). Econometrics Analysis. 5th Ed. New York: Macmillan.

Guttmacher Institute (2012), Costs and benefits of Investing in Contraceptive services Sub-Saharan Africa, Fact Sheet, October 12.

https://www.theguardian.com/global-development/datablog/2016/mar/08/contraception-and-family-planning-around-the-world-interactive- on 23rd August, 2016.

Hubacher, D., Mavranezouli, I., McGinn, E., (2008). Unintended pregnancy in sub-Saharan Africa: magnitude of the problem and potential role of contraceptive implants to alleviate it. Journal of Contraception, Vol 78, No. 1. Pp.73–78.

Joint United Nations Programme on HIV/AIDS (2013). Global report: UNAIDS report on the global AIDS epidemic. –

Kenya National Bureau of Statistics (KNBS), ICF Macro. Kenya Demographic and Health Survey 2008-09. Calverton, Maryland: KNBS and ICF Macro; 2010.

Kimani, M., Njeru, M., and Ndirangu, G. (2013). Regional variation in contraceptive use in Kenya: comparison of Nyanza, Coast and Central Provinces. African Population Studies, Vol 27, No.1. PP. 43-52.

Malalu, P. K., Koskei, A., Too, R., Chirchir, A. (2014). Determinats of Use of Modern Family Planning Methods: A case of Baringo North District, Kenya. Science Journal of Public Health. Vol. 2, No. 5, Pp. 424-430.

McCoy, S.I., Buzdugan, R., Ralph, L. J., Mushavi, A., Mahomva, A., and Hakobyan, A. (2014). Unmet need for family planning, contraceptive failure, and unintended pregnancy among HIV-infected and HIV-uninfected women in Zimbabwe. PLoS One. Vol. 9, No. 8.

Morse, A., R. (2015). Controlling Women's Desires in Kenya. Population Research Institute.

Nonvignon, J., and Novignon, J. (2014). Trend and determinants of contraceptive use among women of reproductive age in Ghana. African Population Studies Vol. 28, No. 2 .Supplement July 2014. Accessed from: http://aps.journals.ac.za 956.

Ochako, R., Temmerman, M., Mbondo, M., Askew, I. (2017). Determinants of Modern Contraceptive Use among Sexually Active Men in Kenya. Journal of Reproductive Health.

Okech, T. C., Wawire, N. W., and Mburu, T. K. (2011). Contraceptive Use among Women of Reproductive Age in Kenya's City Slums. International Journal of Business and Social Science. Vol. 2, No.1

Oliver, R. (1995). Contraceptive use in Ghana-The Role of Service Availability, Quality, and Price. Living Standards and Measurement Survey Working Paper No. 111. Policy Research Department, World Bank.

Population Reference Bureau (PRB). 2011 World Population Data Sheet. Washington DC: PRB; 2011.

Rosenweig, M.R., and Schultz, T.P. (1983). Estimating a household production: Heterogeneity, The demand for health inputs, and their effects on birth weight. Journal on political Economy. Vol. 91, No. 5. Pp. 723-46.

Saleem, S. and Bobak, M. (2005). Women's autonomy, education and contraception use in Pakistan: a national study. Accessed from: doi: 10.1186/1742-4755-2-8.

Shoran, Mona, Saifuddin, A., May, J., and Soucat, A. (2009). Family Planning Trends in SubSaharan Africa: Progress, Prospects, and Lessons Learned. World Bank: 445–469.

Singh, S., and Darroch, J. E. (2012) Adding It Up: Costs and Benefits of Contraceptive Services—Estimates for 2012. New York: Guttmacher Institute.

Tobin-West, C. I., Maduka, O., Okpani, A. O. U., Okon, B. I., Ezedinachi, E. N. U. (2016). Determinants of Modern Contraceptives Uptake among Women in Peri-Urban Communities of Port Harcourt City, Nigeria. British Journal of Medicine & Medical Research. Vol 1, No. 17, pp. 1-10.

UNFPA. Global Need for Family planning (no date). Retrieved on 24/08/2016; from: http://www.unfpa.org/rh/planning/mediakit/docs/new_docs/sheet1-english.pdf.

United Nations (2011). World Population Prospects: The 2010 Revision. New York: department of Social affairs, Population division, United Nations.

United Nations, Department of Economic and Social Affairs, Population Division (2015). World Population Prospects: The 2015 Revision, custom data acquired via website.

USAID: Repositioning Family Planning in Sub- Saharan Africa (August 2006). Retrieved on 24/08/2016.www.usaid.gov/our_work/global_health//pop/techareas/repositioning/briefs/repo_sbafr.pdf.

USAID: Repositioning Family Planning in Sub- Saharan Africa (August 2006). Retrieved on 24/08/2016.www.usaid.gov/our_work/global_health//pop/techareas/repositioning/briefs/repo_sbafr.pdf.

World Health Organization (2012). Family planning. Occasional Paper, Geneva.

www.statalist.org/forums/forum/general-stata-discussion/general/1315821-probit-model.

www.unaids.org/sites/default/files/en/media/unaids/contentassets/documents/epidemiology/2013/gr2013/UNAIDS_Global_Report_2013_en.pdf. Accessed 23 August, 2016.