African Journal of Mathematics and Statistics Studies
ISSN: 2689-5323
Volume 3, Issue 2, 2020 (pp. 14-36)

www.abjournals.org

TREND AND DETERMINANT OF CONTRACEPTIVE USE AMONG WOMEN OF REPRODUCTIVE AGE IN NIGERIA

Nkemakolam Hope Chioma and Olanrewaju Samuel Olayemi

Department of Statistics, University of Abuja, Abuja Nigeria

ABSTRACT: *This study examined the trend in contraceptive use among sexually active women of reproductive age in Nigeria. The study also investigated the socio-economic determinants of contraceptive use. Cross tabulations and regression analyses were performed on data from the Nigeria MICS, 2011/2012; 2016/2017 conducted by NBS in collaboration with UNICEF. The results indicate low contraceptive use among women with marked variation in contraceptive use across various socio-economic groups and administrative regions. Evidence from the regressions suggests that improving education and reducing poverty are critical in improving contraceptive use and reducing unmet need for family planning. Child survival, access to family planning services and knowledge of contraceptive methods were also found to be significant determinants of contraceptive use. A logistic regression analysis is also performed on the data to access the relationship between the dependent (women that use contraceptive) and independent variables I.e. age group, number of children, education, wealth index quartile and geo-political zone using the probit and logit regression estimation which indicate the same effects of the independent variables on contraceptive usage that; women older in age, having more children, educated, rich and are from the north central, south-south and south west of the country have more likelihood of using contraceptive while, women from north-east and north-west geopolitical zones are more likely not to use contraceptives. Hence, there is need to improve the knowledge of contraceptive use by creating awareness especially women from the north-east and north central and adequate training to community health workers should be done. The importance of improving financial and infrastructural access to contraceptives was confirmed by the findings of the study.*

KEYWORDS: Trend, Contraceptive, Productive, Probit, Logistic Regression

INTRODUCTION

In recent, numerous studies have been conducted in the analysis of factors associated with contraceptive. The use of contraceptives is widely considered as an important step in the efforts to control population growth. At the micro level, contraceptives serve as critical tools for spacing birth and controlling family size. Some forms of contraceptive also play the dual role of controlling family size and protection against sexually transmitted diseases (STDs). The benefits of a well-spaced child birth and controlled family size are enormous at the micro level. These include improved maternal and child health, reduced induced abortion cases and improved household welfare. At the macro level, the benefits of a well-controlled population growth include improved infrastructure and reduced burden on national budgets.

Contraceptives are agents, various devices, drugs, sexual practices and surgical procedures that prevent unplanned pregnancies. Condom is the only contraceptive known to protect individuals from sexually transmitted infections. Additionally, the most reliable or effective birth control

methods are sterilization in the form of vasectomy and tubal ligation, as well as implants and intrauterine devices. Hormonal contraceptives such as injections, vaginal rings, and oral pill might also be effective. The less effective ones are fertility awareness methods and the barriers including diaphragms, condoms and contraceptive sponges (World Health Organization [WHO], 2011).

The variation in contraceptive levels has caused change in fertility rates observed worldwide in different regions (Creanga et al, 2011). The social characteristics in the individual's environments that contribute to social cultural determinants of contraceptives use include factors like education, urban or rural residence, beliefs, culture, marital status, and social cognition features such as parents and peer influence, fertility preferences, economic levels of households and individual sex behaviors (Creanga et al., 2011).

Globally, there are differences in contraceptive use caused by low reproductive health knowledge, attitude and behavior among women of reproductive age (WHO, 2012 & UNFPA, 2003). Demographic factors which comprise population of women in the reproductive age, family size, birth rate, marriage age, family income, age, sex, and educational level of respective women in the reproductive age are responsible for the varying total fertility rates worldwide.

However, the research by the Guttmacher institute estimated that developing countries have more than 200 million women who would like their next pregnancy delayed or to stop bearing children altogether but only 64 million of these women relying on less effective methods while approximately 130 million use no method of contraceptives because they believe that they are not at risk of getting pregnant, are not fecund, are breastfeeding or are not having sex frequently or face other barriers to using contraceptive. This, in the long run, results into unintended and mistimed pregnancies thus the high parity which translates to high fertility that depletes resources even as young women miss to achieve universal education, and of course, low development (Creanga et al., 2011). As a result, the women's life has been impacted negatively since there are disparities in the ability to properly plan pregnancies as desired and this contributes to a cycle of disadvantages experienced

In Nigeria, several efforts have been made to reduce population growth and to reap its benefits through effective use of numerous methods including improved contraceptive use. Such efforts include the Nigerian Urban Reproductive Health Initiative (NURHI) projects; Phase I (2009-2014) and Phase II (2015-2020), Family Planning 2020 (since 2012), Society for Family Health (SFH) Nigeria projects, Nigeria Demographic and Health Survey (NDHS) to mention but few. NDHS (2013) found that 15% of married women of reproductive age use contraceptives in Nigeria, which is an increase of just 2 percentage points from the NDHS (2003); which is also lesser than the current sub-Saharan Africa average of 17%. Advance analysis of the total Contraceptive Prevalence Rate (CPR) shows wide state disparities, ranging from 0.3 in Jigawa to 41.6 in Lagos state, as well as zonal disparities ranging from 2.7 in the North West to 28.5 in the South West. Thorough review of the association between CPR and age groups within the reproductive years revealed different correlations (NDHS, 2013).

REVIEW OF RELATED LITERATURES

Jennifer J. Frost et al. (2004) examined the factors associated with contraceptive use and non-use in United States. They explained that each year, nearly one in four U.S. women at risk of unintended pregnancy experience one or more months of contraceptive non-use. Understanding what factors are associated with risky contraceptive use patterns can inform programs and policies designed to reduce levels of unintended pregnancy. They employed multiple logistic regressions which were used to identify factors associated with different contraceptive use patterns. Ambivalence about avoiding pregnancy was strongly associated with both contraceptive on use and having a gap in use while remaining at risk of unintended pregnancy (odds ratios, 2.4 and 2.0, respectively). Other significant predictors of either of these risky contraceptive behaviours we're having less than a college education, being black, being 35–44 years old, having infrequent sexual intercourse, not being in a current relationship, being dissatisfied with one's method and believing that contraceptive service providers were not available to answer method-related questions (1.7–3.8). They concluded on the note that providers could better help women avoid unintended pregnancy by initiating regular assessments of method use difficulties, improving counselling on method choice and pregnancy risk, and identifying and assisting women at higher risk for inconsistent method use because of disadvantage, relationship characteristics or ambivalence about pregnancy prevention. In addition to providers' efforts, broader societal commitment is critical for increasing contraceptive knowledge and expanding access to contraceptive care for all women who are at risk of having an unintended pregnancy.

John Bosco Asiimwe et al (2014) echoed that much of the research literature about the use of family planning generalizes contraceptive use among all women, using age as a covariate. In Uganda, a country with divergent trends in modern family planning use, their study was set to explore whether or not the predictors of contraceptive use differ by age. This was assessed by using data from the 2011 Uganda Demographic and Health Survey (UDHS). They restricted the sample from each round to fecund, non-pregnant married women age 15–34 who were sexually active within one year prior to the survey, resulting in a sample of 2,814 women. They used logistic regression with age variable used as an interaction term to model the relationship between selected independent variables and the outcome variable (modern contraception use) for each group of women. They found that the key factors associated with use of modern contraceptives varied among young and older married women age 15–24 and 25–34 respectively. Their results showed that perception on distance to health facility, listening to radio and geographical differences exhibited significant variability in contraceptive use among the young and the older women. Other key factors that were important for both age groups in explaining contraceptive use were; desire to have children after two years and education level. Addressing contraceptive use among old and young women in Uganda requires concerted efforts that target such women to address the socio-economic barriers that exist. There is need for increased access of family planning service to the population through strengthening the use of Village Health Teams (VHTs) whose service is currently limited in coverage (MoH, 2009). Given the variation in contraceptive use between the two age groups, their findings further suggested that there is need for variability in media targeting among the young and the older women categories for improved use of modern contraceptives, for instance using alternative media strategies to reach the young women, they recommended family planning policies that it should also be tailored to address the specific needs of different age groups of women with varied geographical locations.

Subsequently, JB Asiimwe et al (2013) explored socio-demographic factors associated with contraceptive use among young women in comparison with older women in Uganda. They stated that In Uganda a country with divergent trends in modern family planning use among younger and older married women we hypothesize that factors associated with contraceptive use operate in a fundamentally different way among married women in two age groups: 15-24 and 25-34. We tested this hypothesis using data from the Uganda Demographic and Health Survey (UDHS) in 2006 and 2011. They restricted the sample from each round to fecund non-pregnant married women age 15-34 who were sexually active within one year prior to the survey resulting in a sample of 2802 women in 2006 and 2814 women in 2011. In Uganda as in most countries the level of modern contraceptive use is much lower among younger married women compared with older women. They used logistic regression to model the relationship between selected independent variables and the outcome variable (current use of modern contraception) for each group of women in each year. We found that the key factors associated with current use of modern contraceptives among younger married women age 15-24 in both 2006 and 2011 were residence and desire for children while among women age 25-34 the significant factors associated with contraceptive use in both rounds were education level, household wealth and desire for children. Their findings suggest that increasing secondary education for women and improving the livelihood of the population overall is important. Family planning programs should be intensified to meet the needs of young married women in rural areas of the country.

Francis Obare et al (2012) examined the factors associated with experiencing unintended pregnancies, poor birth outcomes, and post-partum contraceptive use among HIV-positive female adolescents in Kenya. Their data are from a cross-sectional study that captured information on pregnancy histories of HIV-positive female adolescents in four regions of Kenya: Coast, Nairobi, Nyanza and Rift Valley provinces. Study participants were identified through HIV and AIDS programs in the four regions. Out of a total of 797 female participants, 394 had ever been pregnant with 24% of them experiencing multiple pregnancies. The analysis entailed the estimation of random-effects logit models. Higher order pregnancies were just as likely to be unintended as lower order ones (odds ratios [OR]: 1.2; 95% confidence interval [CI]: 0.8–2.0) while pregnancies occurring within marital unions were significantly less likely to be unintended compared to those occurring outside such unions (OR: 0.1; 95% CI: 0.1–0.2). Higher order pregnancies were significantly more likely to result in poor outcomes compared to lower order ones (OR: 2.5; 95% CI: 1.6–4.0).

In addition, pregnancies occurring within marital unions were significantly less likely to result in poor outcomes compared to those occurring outside such unions (OR: 0.3; 95% CI: 0.1–0.9). However, experiencing unintended pregnancy was not significantly associated with adverse birth outcomes (OR: 1.3; 95% CI: 0.5–3.3). There was also no significant difference in the likelihood of post-partum contraceptive use by whether the pregnancy was unintended (OR: 0.9; 95% CI: 0.5–1.5). The experience of repeat unintended pregnancies among HIV-positive female adolescents in the sample is partly due to inconsistent use of contraception to prevent recurrence while poor birth outcomes among higher order pregnancies are partly due to abortion. This underscores the need for HIV and AIDS programs to provide appropriate sexual and reproductive health information and services to HIV-positive adolescent clients in order to reduce the risk of undesired reproductive health outcomes.

Martha D. and Norman A. C. (2011) discoursed factors associated with contraceptive use in Angola. They validated that Angola had one of the highest rates of maternal mortality and

fertility in the world. Only 6 percent of women aged 15–49 used contraception, with substantial differences in use and access across the different provinces of the country. Their study used a mixed-methods approach, combining analyses of a nationwide cross-sectional survey to assess which factors are associated with contraceptive use, with data from qualitative, semi-structured interviews of health care providers and internally displaced women to better understand and illuminate the survey data. High educational level and living in the capital region were strongly associated with contraceptive use, while age below 20 years was negatively associated with use. During qualitative interviews, health professionals commonly mentioned rural living, young age, cultural beliefs, and power imbalances as reasons for not using contraception. Internally displaced women often described difficulty paying for services, lack of nearby services, and limited knowledge of methods as barriers to use.

Megan SC Lim et al (2015) deliberated on sexual and reproductive health knowledge, contraception uptake, and factors associated with unmet need for modern contraception among adolescent female sex workers in China. Their study described contraception use, pregnancy, and factors associated with unmet need for modern contraception among adolescent FSWs in Kunming, China. A cross-sectional study using a one-stage cluster sampling method was employed to recruit adolescents aged 15 to 20 years, and who self-reported having received money or gifts in exchange for sex in the past 6 months. A semi-structured questionnaire was administered by trained peer educators or health workers. Multi-variable logistic regression was conducted to determine correlates of low knowledge and unmet need for modern contraception. Results SRH knowledge was poor among the 310 adolescents surveyed; only 39% had heard of any long-acting reversible contraception (implant, injection or IUD). Despite 98% reporting not wanting to get pregnant, just 43% reported consistent condom use and 28% currently used another form of modern contraception. Unmet need for modern contraception was found in 35% of adolescents, and was associated with having a current non-paying partner, regular alcohol use, and having poorer SRH knowledge. Past abortion was common (136, 44%). In the past year, 76% had reported a contraception consultation but only 27% reported ever receiving SRH information from a health service. Their study demonstrated a low level of SRH knowledge, a high unmet need for modern contraception and a high prevalence of unintended pregnancy among adolescent FSWs in Kunming. Most girls relied on condoms, emergency contraception, or traditional methods, putting them at risk of unwanted pregnancy. This study identifies an urgent need for Chinese adolescent FSWs to be able to access quality SRH information and effective modern contraception.

RESEARCH METHODOLOGY

Source of Data

The nature of this study necessitated the use of secondary data. Data were sourced from the National Bureau of Statistic (NBS); the data covers the six geopolitical zones of the country, 2011-2012 and 2016-2017. Data were analysed using Excel and SPSS analysis packages.

Research Design

Research design is the conceptual structure within which research is steered. It establishes the blue print for the collection, measurement and analysis of data. The study utilized descriptive

research design; descriptive research design seeks to establish factors associated with certain occurrences, outcomes, conditions or types of behaviour.

The descriptive analysis includes frequency distribution tables, charts and graphs were generated from variables while cross tabulation and test statistics done where applicable. It also utilized chi-square test of independency and Regression Analysis. Consequently, to determine the presence or the absence of any statistical relationship of the outcome variable and the explanatory variables, Binary combined with logistic regressions were used.

Descriptive Analysis

Descriptive analysis is used to describe the basic features of the data in the study. Therefore, it was used to determine the frequency of dependent and independent variables. The descriptive analysis of data provides the following:

- The first estimates and summaries, arranged in tables and graphs, to meet the objectives.
- Information about the variability or uncertainty in the data
- Indications of unexpected patterns and observations that need to be considered when doing formal analysis

Logistic Regression Model

In logistic regression, a categorical dependent variable Y having G (usually G = 2) unique values is regressed on a set of p independent variables $X_1, X_2, \dots, X_P$. For example, Y may be presence or absence of a disease, condition after surgery, or marital status. Since the names of these partitions are arbitrary, we often refer to them by consecutive numbers. That is, in the discussion below, Y will take on the values 1, 2, … G. Let $X = (X_1, X_2, \dots, X_P)$ and $B_g = \begin{pmatrix} \beta_{g1} \\ \vdots \\ \beta_{gp} \end{pmatrix}$ The logistic regression model is given by the G equations

$$ln\left(\frac{P_g}{P_1}\right) = ln\left(\frac{P_g}{P_1}\right) + \beta_{g1}X_1 + \beta_{g2}X_2 + \cdots + \beta_{gp}X_p$$

$$= ln\left(\frac{P_g}{P_1}\right) + XB_g$$

3.12

Here, $P_g$is the probability that an individual with values $X_1, X_2, \dots, X_P$is in outcome g.

$$p_g = \Pr(Y = g|X)$$

3.13

Usually $X1 \equiv 1$ (that is, an intercept is included), but this is not necessary.

The quantities P_1, P_2 ,..., P_G represent the prior probabilities of outcome membership. If these prior probabilities are assumed equal, then the term ln(P_g/ $P1$) becomes zero and drops out. If the prior is not assumed equally, they change the values of the intercepts in the logistic regression equation. Outcome one is called the *reference value*. The regression coefficients

β_{11},β_{12} ,…,$\beta_{1p}$for the reference value are set to zero. The choice of the reference value is arbitrary. Usually, it is the most frequent value or a control outcome to which the other outcomes are to be compared. This leaves *G*-1 logistic regression equations in the logistic model.

The β*s* are population regression coefficients that are to be estimated from the data. Their estimates are represented by *b'*s. The β ' *s* represents unknown parameters to be estimated, while the *b'*s are their estimates.

These equations are linear in the logits of *p*. However, in terms of the probabilities, they are nonlinear. The corresponding nonlinear equations are

$$P_g = Prob(Y = g|X) = \frac{e^{XB_g}}{1+e^{XB_2}+e^{XB_3}+\cdots+e^{XB_G}} \qquad 3.14$$

since e^{XB_1}= 1 because all of its regression coefficients are zero.

Binary (Probit and Logit) Logistic Regression

Logistic regression analysis is the study of association between a categorical dependent variable and a set of independent (explanatory) variables. Logistic regression can be binomial, ordinal or multinomial. Binomial suitable when the dependent variable has only two values, such as 0 and 1 or 1 and 2 i.e. Use and Non-Use. Multinomial logistic regression is used for the case when the dependent variable has three or more unique values, such as Married, Single, Divorced, or Widowed. In this case our dependent variable has only two values (1 or 2 i.e. Use Contraceptive and Non-use contraceptive).

The Probit and Logit Transformation

In logistic regression, a mathematical model of a set of explanatory variables is used to predict a probit or *logit* transformation of the dependent variable.

Suppose the numerical values of 0 and 1 are assigned to the two outcomes of a binary variable. Suppose p is the proportion of observations with an outcome of 1, then 1-*p* is the probability of an outcome of 0. The ratio *p*/(1-*p*) is called the *odds* and the *logit* is the logarithm of the odds, or just *log odds*. The logit transformation is written as

$$l = logit\ p = ln\frac{p}{1-p} \qquad 3.9$$

Then the *logistic* transformation (the inverse of the logit transformation) is written as

$$p = logistic(l) = \frac{e^l}{1+e^l}$$
3.10

Redefining the dependent variable; $Y = \Phi(\mathrm{X}\beta + \mathrm{e}) = \Phi^{-1}(Y) = X\beta + e$

$$Y' = X\beta + e \qquad 3.11$$

Then the link function is $F(Y) = \Phi^{-1}(Y)$, this link is called **Probit function.**

African Journal of Mathematics and Statistics Studies
ISSN: 2689-5323
Volume 3, Issue 2, 2020 (pp. 14-36)

www.abjournals.org

Binary Logistic Regression

This estimates the probability that a characteristic is present (e.g. estimate probability of "success") given the values of explanatory variables, in this case a single categorical variable; $\pi = Pr\ (Y = 1|X = x)$. Suppose a physician is interested in estimating the proportion of diabetic persons in a population. Naturally she/he knows that all sections of the population do not have equal probability of 'success', i.e. being diabetic. Older population, population with hypertension, individuals with diabetes incidence in family are more likely to have diabetes. Consider the predictor variable *X* to be any of the risk factor that might contribute to the disease. Probability of success will depend on levels of the risk factor.

Variables:

i. Let *Y* be a binary response variable; $Y_i = 1$ if the trait is present in observation (person, unit, etc...) *i*, $Y_i = 0$ if the trait is NOT present in observation *I;*

ii. $X = (X_1, X_2, ..., X_k)$ be a set of explanatory variables which can be discrete, continuous.

In general, the logistic model stipulates that the effect of a covariate on the chance of "success" is linear on the log-odds scale, or multiplicative on the odds scale.

If $\beta_j > 0$, then $exp(\beta_j) > 1$, and the odds increase.

If $\beta_j < 0$, then $exp(\beta_j) < 1$, and the odds decrease.

Likelihood Ratio

The *Likelihood Ratio* test statistic is -2 times the difference between the log likelihoods of two models, one of which is a subset of the other. The distribution of the LR statistic is closely approximated by the chi-square distribution for large sample sizes. The degrees of freedom (DF) of the approximating chi-square distribution is equal to the difference in the number of regression coefficients in the two models. The test is named as a ratio rather than a difference since the difference between two log likelihoods is equal to the log of the ratio of the two likelihoods. That is, if *L full* is the log likelihood of the full model and *L subset* is the log likelihood of a subset of the full model, the likelihood ratio is defined as

$$LR = -2\left[L_{subset} - L_{full}\right]$$

$$= -2\left[ln\left(\frac{l_{subset}}{l_{full}}\right)\right] \quad 3.15$$

Note that the -2 adjusts *LR* so the chi-square distribution can be used to approximate its distribution. The likelihood ratio test is the test of choice in logistic regression. Various simulation studies have shown that it is more accurate than the Wald test in situations with small to moderate sample sizes. In large samples, it performs about the same. Unfortunately, the likelihood ratio test requires more calculations than the Wald test, since it requires that two maximum-likelihood models must be fit.

African Journal of Mathematics and Statistics Studies
ISSN: 2689-5323
Volume 3, Issue 2, 2020 (pp. 14-36)

www.abjournals.org

Deviance

When the full model in the likelihood ratio test statistic is the saturated model, *LR* is referred to as the *deviance*. A saturated model is one which includes all possible terms (including interactions) so that the predicted values from the model equal the original data. The formula for the deviance is

$$D = -2[L_{reduced} - L_{saturated}] \quad 3.16$$

The deviance may be calculated directly using the formula for the deviance residuals (discussed below). This formula is

$$D = 2\sum_{j=i}^{j}\sum_{g=1}^{G} w_{gj} ln\left(\frac{w_{gj}}{n_j p_{gj}}\right) \quad 3.17$$

This expression may be used to calculate the log likelihood of the saturated model without actually fitting a saturated model. The formula is

$$L_{saturated} = L_{reduced} + \frac{D}{2} \quad 3.18$$

The deviance in logistic regression is analogous to the residual sum of squares in multiple regression. In fact, when the deviance is calculated in multiple regression, it is equal to the sum of the squared residuals. Deviance residuals, to be discussed later, may be squared and summed as an alternative way to calculate the deviance, *D*. The change in deviance, Δ*D*, due to excluding (or including) one or more variables is used in logistic regression just as the partial *F* test is used in multiple regression. Many texts use the letter *G* to represent Δ*D*, but we have already used *G* to represent the number of groups in *Y*. Instead of using the *F* distribution, the distribution of the change in deviance is approximated by the chi-square distribution.

Note that since the log likelihood for the saturated model is common to both deviance values, Δ*D* is calculated without actually estimating the saturated model. This fact becomes very important during subset selection

DATA PRESENTATION AND ANALYSIS

Data Presentation

The data utilized in this research were secondarily sourced from National Bureau of Statistics Bulletin (MICS SFR-REVISED Edition-Feb 2012 & 2018-FINAL). Data comprised of two recent Contraceptive Usage surveys, 2011/2012 and 2016/2017 which are made up of 21741 and 24373 women age between 15-49 respectively.

Demographic Data of Respondents

Information on the demographic data of participants to the responses to contraceptive usage (Table 1) reveals the age pattern of women, for year 2011/12 majority were between 25-29years (22%), 30-34years (20%), 35-39years (16%), 20-24years (14%) and 40-44years (13%) while

15-19years (5%) and 45-49years (10%) were small or of few women. Similarly, for year 2016/17 it reveals that majority were also between 25-29years (24%), 30-34years (20%), 35-39years (16%), 20-24years (14%) and 40-44years (13%) while 15-19years (6%) and 45-49years (9%). Table 1 further reveals 44% (2011/12) and 46% (2016/17) of the women were with 4 or more children, 17% of women in both periods of study were with 3 children, and 39% (2011/12) and 37% (2016/17) of women were with zero, one or two child(ren). This implies majority of the women in both periods of study were with 4 or more children.

Table 1: Demographic Data of Women (%)

Variables	**2011/12 (%)**	**2016/17 (%)**
Age		
15-19	5.06	6.21
20-24	14.47	14.91
25-29	21.86	20.38
30-34	20.30	19.97
35-39	15.84	16.12
40-44	12.96	13.34
45-49	9.50	9.07
Number of Living Children		
0	7.49	7.20
1	14.73	13.93
2	16.88	16.43
3	16.54	16.90
4+	44.37	45.54
Education		
None	41.73	28.61
Non-formal	NA	20.68
Primary	20.10	16.46
Secondary	38.17	25.76
Higher	NA	8.50
Wealth Index Quantile		
Poorest	21.58	21.67
Second	20.26	21.31
Middle	17.86	18.81
Fourth	19.68	18.10
Richest	20.61	20.11
Geo- Political Zone		
North Central	14.48	17.35
North East	14.58	19.91
North West	28.53	36.17
South East	9.06	5.38
South-South	13.46	8.47
South West	19.89	12.73

Source: MICS SFR-Revised, 2012 & 2018, NBS

In addition, the education pattern of women in Table 1 depicts that 42%, 20%, 38% of women in 2011/12 had None, Primary and Secondary education respectively similarly, 29%, 21%, 16%, 26% and 9% of women in 2016/17 had None, Non-formal, Primary, Secondary and Higher education respectively. This simply means that majority of the women had no or little education. Table 1 also depicts that wealth index of the participant; the poorest index has the highest percentage of 22% for both periods of study while second, middle, fourth and richest wealth index were 20%, 18%, 20% and 21% respectively of women 2011/12 and 21%, 19%, 18% and 20% respectively of women 2016/17.

Lastly, the results in Table 1 reveals that in 2011/12, 14%, 15%, 29%, 9%, 13% and 20% of the women were from North Central, North East, North West, South East, South-South and South West respectively while in 2016/17, 17%, 20%, 36%, 5%, 8% and 13% of the women were from North Central, North East, North West, South East, South-South and South West respectively. Hence, the majority [29% (2011/12) and 36% (2016/17)] of the women were from the North West of the country. Therefore, the demographic results indicate that the respondents have the versatile requisite education to provide the required answers to achieve the aim and objectives of this research.

Trend and Pattern in Contraceptive Use

Table 2 and Figure 1 present the summary of the frequency and percentage distribution of contraceptive method for various survey years among sexually active women in Nigeria. The summary shows a huge proportion of sampled women (about 83%) not using any form of contraceptive in 2011/12. This proportion increased in the survey year 2016/17 to about 87%. This suggests that majority of sexually active women in Nigeria do not use any form of contraceptives with a consistent trend over the survey periods. Also, the proportion of women using traditional contraceptive methods increased from 7% in year 2011/12 to about 11% in year 2016/17 while the proportion of women using modern contraceptive methods reduced from 10% in year 2011/12 to about 3% in year 2016/17. Thus, it is alarming how modern contraceptives methods deteriorated over the survey years.

Table 2: Trend in contraceptive use by method

	2011/12		**2016/17**	
	Frequency	**Percent (%)**	**Frequency**	**Percent (%)**
No Method	18087	83	21101	87
Traditional Method	1540	7	2632	11
Modern Method	2114	10	640	3
Total No. of Women	**21741**		**24373**	

Source: Researchers' computations

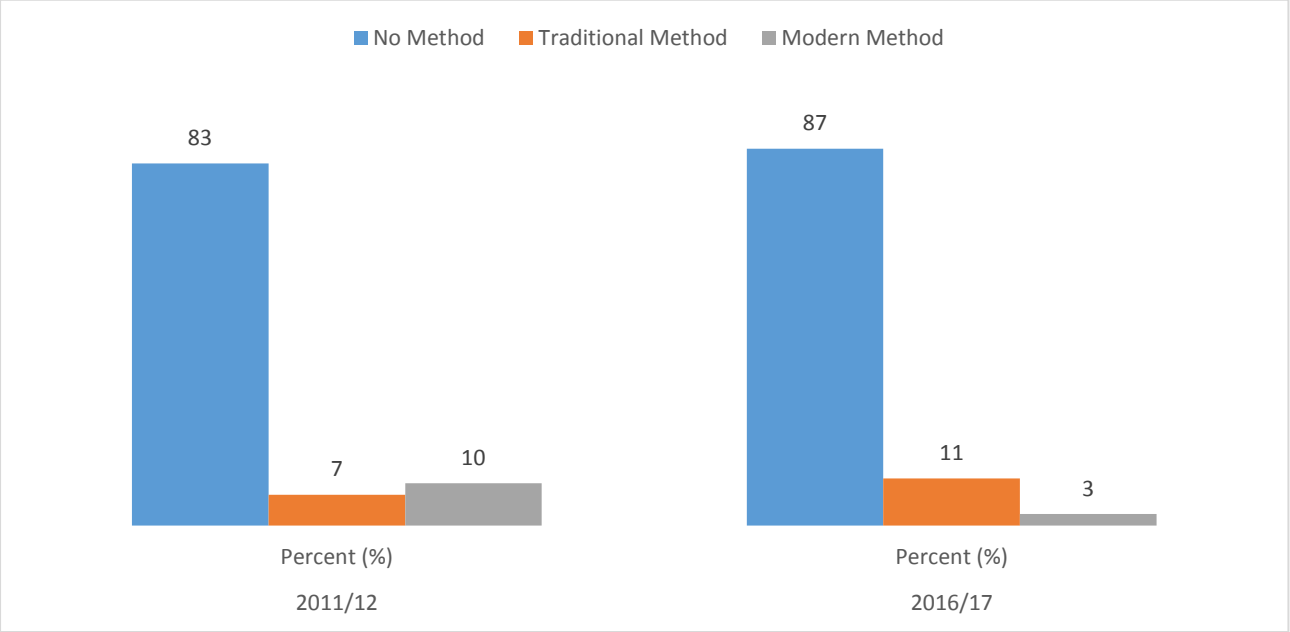

Figure 1: Trend in contraceptive use by method (%)

Trend in Contraceptive Use by Socio-Economic Characteristics

Table 3 depicts the pattern and trend in the association or relationship between contraceptive use and socio-economic characteristics of sexually active women in Nigeria. The Pearson's Chi-square values and probabilities estimated, which tested the hypothesis of no dependency, are reported to show the statistical significance of association or relationship. The findings suggest that contraceptive use was higher among women between the age groups 40-44 (22.8%) and 35-49 (22.2%) than their counterparts from other age groups in year 2011/12. Similarly, in 2016/17, about 17.6% and 16.3% of women between the age groups 40-44 and 35-49 respectively used contraceptives. This association is statistically significant and consistent across the survey years. However, it can also be observed that the proportion of women across the age groups, who used contraceptives reduced in 2016/17.

In addition, the number of living children with the women in Table 3 shows that strong significant association with the contraceptive usage in Nigeria; women with 2, 3, and 4+ children have higher contraceptive use than women with zero or one child.

Furthermore, women's educational attainment in Table 3 shows strong significant association with the use of contraceptives in Nigeria with higher education attainments associating positively with contraceptive use. For instance, in 2011/12, while about 5.8% of sexually active women without any educational attainment used contraceptives, about 20.7% and 28.7% of women with primary and secondary education, respectively, used contraceptives. Similarly, observation was made in the year 2016/17 where contraceptive use among women with secondary and tertiary education was about 21.4% and 29.0%, respectively, relative to 10.5% among women with none or non-formal education. Thus, the general trend deduces that contraceptive use among women increased with higher educational attainments.

The association between Wealth Index Quintile and contraceptive use is reported in Table 3, where strong significant associations were established between wealth index Quintile and contraceptive use.

Table 3: Trend in contraceptive use by socioeconomic characteristics

	2011/12 (%)		**2016/17**	
Age Group				
15-19	39	(3.5)	33	(2.2)
20-24	340	(10.8)	327	(9.0)
25-29	770	(16.2)	606	(12.2)
30-34	865	(19.6)	769	(15.8)
35-39	764	(22.2)	640	(16.3)
40-44	643	(22.8)	572	(17.6)
45-49	395	(19.1)	323	(14.6)
Chi-Square	**185 (P-value=0.010*)**		**122 (P-value=0.025*)**	
Number of Living Children				
0	49	(3.0)	30	(1.7)
1	429	(13.4)	251	(7.4)
2	613	(16.7)	461	(11.5)
3	705	(19.6)	688	(16.7)
4+	2016	(20.9)	1842	(16.6)
Chi-Square	**254 (P-value=0.003*)**		**234 (P-value=0.012*)**	
Education				
None	526	(5.8)	481	(6.9)
Non-formal	NA	NA	181	(3.6)
Primary	905	(20.7)	658	(16.4)
Secondary	2382	(28.7)	1343	(21.4)
Higher	NA	NA	601	(29.0)
Chi-Square	**414 (P-value=0.000*)**		**4.01 (P-value=0.002*)**	
Wealth Index Quintile				
Poorest	267	(5.7)	222	(4.2)
Second	467	(10.6)	416	(8.0)
Middle	660	(17.0)	523	(11.4)
Fourth	1031	(24.1)	812	(18.4)
Richest	1389	(31.0)	1294	(26.4)
Chi-Square	**314 (P-value=0.000*)**		**234 (P-value=0.000*)**	
Geo- Political Zone				
North Central	535	(17.0)	702	(16.6)
North East	219	(6.9)	369	(7.6)
North West	230	(3.7)	740	(8.4)
South East	925	(47.0)	305	(23.3)
South-South	667	(22.8)	345	(16.7)
South West	1237	(28.6)	801	(25.8)
Chi-Square	**406 (P-value=0.020*)**		**334 (P-value=0.012*)**	

Source: Researchers' computation *Note: * denotes significant at 5%*

Contraceptive use was highest among women from richest households. In 2011/12, about 5.7% of women in the poorest wealth quintile used contraceptives relative to about 31% usage among women in the richest quintile. Similarly, in 2016/17, about 4.2% and 26.4% contraceptive usage was recorded among sexually active women in the poorest and richest wealth quintiles, respectively. It also noted that the contraceptive usage is higher across the wealth index quintiles i.e. 'poorest' to 'second' to 'middle' to 'fourth' to 'richest'.

In terms of geo-political zone differences in the use of contraceptives in Nigeria, the results in Table 3 show marked variation across various zone. A trend analysis also suggests that some zones i.e. North West and North East, improved in the use of contraceptives while others showed deterioration. The South East and South West recorded the highest proportions of contraceptive usage in 2011/12 and 2016/17. The region with the lowest proportion of women who were using contraceptives varied over survey years. For instance, North West (3.7%) was the lowest in 2011/12 while North East (7.6%) recorded the lowest in 2016/17.

Regression Analysis Results

Table 4 shows two different regression results. The first results in column two shows the socio-economic factors that influence contraceptive use (regardless of the method type) while the results in the third column show factors that influence modern contraceptive use. Both analyses were done using combine data of the 2011/12 and 2016/17. The regression models were significant or both types ('all contraceptive use' and 'modern contraceptive use').

Table 4: Regression Analysis for the Determinants of Contraceptive Use

Variable	All Contraceptive Use			Modern Contraceptive Use		
	Coefficient	Std Error	P-value	Coefficient	Std Error	P-value
Constant	9.929	360.58	0.61	-5.275	449.290	0.04*
Age Group	0.077	0.396	0.002**	0.632	0.493	0.029*
Number of Children	0.067	0.959	0.036*	1.183	1.195	0.027*
Education	0.683	0.373	0.008**	0.753	0.464	0.046*
Wealth Index Quintile	1.089	1.754	0.002**	2.033	2.186	0.001**
Geo- Political Zone	0.331	0.361	0.045*	-0.439	0.450	0.032*
	R-Square = 0.610; F-Sat (Anova) = 0.012*			R-Square = 0.517; F-Sat (Anova) = 0.036*		

*Source: Researchers' computations Note: * and ** denote significant at 5% and 1% respectively.*

The regression results for 'all contraceptive use' show positive significant relationships between the dependent (all contraceptive use) and independent variables age group, no. of children, education, wealth index quintile and geo-political zone at 1%, 5%, 1%, 1% and 5% levels respectively. Among other independent variables, the women wealth status (108.9%) and education level (68.3%) had the highest predictions of contraceptive use. This implies

wealth status and education level are the major determinant of contraceptive use. Hence, age group, no. of children, education, wealth index quintile and geo-political zone favourably predicts the contraceptive use regardless of any methods. Table 4 also depicts that the model is statistically significant at 5% level (p-value < 0.05). Similarly, the regression results for 'modern contraceptive use' show both positive and negative significant relationships between the dependent (modern contraceptive use) and independent variables age group, no. of children, education, wealth index quintile and geo-political zone at 5% level except for wealth index quintile which is at 1%. Wealth quintile, no. of children, education and age group depict a positive impact of 203.3% 118.5%, 75.3% and 63.2% respectively to predict the modern contraceptive use. The geo-political zone of the women shows negative impact (of about 43.9%) in determining the modern contraceptive use. Also, the negative significant (at 5%) of the intercept (constant) shows the potency of other factors (are not included in the study) predetermining modern contraceptive use. Hence, age group, no. of children, education, wealth index quintile and geo-political zone favourably predicts the modern contraceptive use. Table 4 also depicts that the regression model for modern contraceptive is statistically significant at 5% level (p-value < 0.05).

The Binary (Probit and Logit) Regression Analysis Results

Table 5 to 8 present the binary (probit & logit) regression analysis results for contraceptive use. Table 5 presents the model information on the procedure models 'Use' as the response treating 'Not-use' as the reference category using the Probit and Logit functions.

Table 5: Model Information

Dependent Variable	Outcome
Probability Distribution	Binomial
Link Function	Probit
	Logit

Source: IBM SPSS 23

Table 6 shows the Omnibus test results. The results give a likelihood ratio chi-square of 15.807 with degree of freedom 18, significant at 5% level of significance. Table 6 results imply that adding the predictors (age group, no. of children, education, wealth index quintile and geo-political zone) have significant increase in the ability to predict the women that use contraceptive.

Table 6: Omnibus Test

Likelihood Ratio Chi-Square		**Df**	**Sig.**
Probit	15.807	18	.039
Logit	15.448	18	.042

Source: IBM SPSS 23
Dependent Variable: Outcome; Model: (Intercept), AG, NO, EDU, WEA, GEO
Compares the fitted model against the intercept-only model

Table 7 and 8 presents the results of models' effects test. The results show that age group (AG), no. of children (NO), education (EDU), wealth index quintile (WEA) and geo-political zone (GEO) are predictors whose effects are significant at 5% level. Table 9 and Table 10 present the probit and logit regression estimation of the parameters respectively.

Table 7: Tests of Model Effects (Probit)

Source	Type III		
	Wald Chi-Square	**Df**	**Sig.**
(Intercept)	3.822	1	.49
AG	18.333	6	.007
NO	16.350	2	.017
EDU	10.055	1	.025
WEA	15.087	3	.011
GEO	9.304	1	.038

Dependent Variable: Outcome; Model: (Intercept), AG, NO, EDU, WEA, GEO
Source: IBM SPSS 23

Table 8: Tests of Model Effects (Logit)

Source	Type III		
	Wald Chi-Square	**Df**	**Sig.**
(Intercept)	2.932	1	.048
AG	19.333	6	.013
NO	10.350	2	.017
EDU	9.454	1	.015
WEA	13.217	3	.032
GEO	7.322	1	.033

Dependent Variable: Outcome; Model: (Intercept), AG, NO, EDU, WEA, GEO
Source: IBM SPSS 23

Table 9: Parameter Estimation (Probit)

Parameter	B	Std. Error	95% Wald Confidence Interval		Hypothesis Test		
			Lower	Upper	Wald Chi-Square	Df	Sig.
(Intercept)	16.273	24.2559	-59.859	92.406	5.321	1	.028**
[AG=1.00]	.421	21.152	-2.439	2.281	4.031	1	.034**
[AG=2.00]	4.024	1.9646	-5.652	5.604	1.001	1	.089*
[AG=3.00]	2.336	1.5531	-4.614	7.286	4.000	1	.043**
[AG=4.00]	8.193	3.2888	-73.832	76.219	2.999	1	.0.56*
[AG=5.00]	5.403	2.987	-4.031	5.225	3.483	1	.498**
[AG=6.00]	8.037	2.324	-1.539	8.612	4.290	1	.044**
[AG=7.00]	1.435	4.3672	-2.5346	10.963	5.432	1	0.045**
[NO=1.00]	-17.246	6.188	-3.186	6.134	.000	1	.993
[NO=2.00]	3.851	34.0581	-5.102	4.402	.001	1	.999
[NO=3.00]	4.216	16.8229	-13.294	14.261	.023	1	.478
[NO=4.00]	13.032	12.422	-8.214	9.234	9.021	1	.024**
[NO=5.00]	18.092	9.229	-2.389	3.835	10.234	1	.012**
[EDU=1.00]	-4.216	2.891	-6.827	6.155	3.001	1	.059*
[EDU=2.00]	-15.140	4.401	-26.147	26.527	2.920	1	.052*
[EDU=3.00]	.902	.2192	-1.213	2.069	5.980	1	.019**
[EDU=4.00]	1.192	74.1827	-89.325	80.024	3.211	1	.047**
[EDU=5.00]	12.170	3.1737	-2.614	3.012	4.120	1	.039**
[WEA=1.00]	-18.272	11.821	-34.234	34.784	2.999	1	0.075*
[WEA=2.00]	-34.630	56.103	-23.231	24.214	.001	1	.999
[WEA=3.00]	.230	2.321	-4.346	4.993	3.021	1	.050*
[WEA=4.00]	.032	2.243	-8.216	9.012	4.201	1	.038**
[WEA=5.00]	.012	3.932	-3.035	4.021	2.991	1	.051*
[GEO=1.00]	.023	5.291	-2.035	2.991	3.321	1	.044**
[GEO=2.00]	-13.945	16.344	-23.451	22.935	8.012	1	.012**
[GEO=3.00]	-18.234	24.351	-25.352	24.992	7.920	1	.018**
[GEO=4.00]	.023	5.278	-.5.345	5.028	.003	1	.955
[GEO=5.00]	.062	7.832	-4.753	4.073	2.994	1	.054*
[GEO=6.00]	1.002	16.368	-63.823	64.002	6.372	1	.0.23
(Scale)	1[c]						

Dependent Variable: Outcome; Model: (Intercept), AG, NO, EDU, WEA, GEO
** and ** denote significant at 5% and 10% level respectively*
Source: IBM SPSS 23

Table 10: Parameter Estimation (Logit)

Parameter	B	Std. Error	95% Wald Confidence Interval		Hypothesis Test		
			Lower	Upper	Wald Chi-Square	Df	Sig.
(Intercept)	15.173	2234.2559	-9.852	9.406	4.981	1	.047**
[AG=1.00]	.042	19.252	-2.438	2.281	4.001	1	.039**
[AG=2.00]	4.123	1.8246	-5.653	5.604	.999	1	.088*
[AG=3.00]	2.516	1.4561	-4.623	7.282	3.083	1	.045**
[AG=4.00]	8.901	3.2728	-73.832	76.210	2.998	1	.0.66*
[AG=5.00]	4.402	3.048	-4.032	5.221	3.488	1	.497**
[AG=6.00]	8.037	2.310	-1.534	8.612	4.299	1	.044**
[AG=7.00]	1.235	4.2642	-2.5345	10.962	5.438	1	.049**
[NO=1.00]	-16.146	6.123	-3.18	6.134	.001	1	.999
[NO=2.00]	4.850	33.234	-5.106	4.400	.002	1	.999
[NO=3.00]	4.001	16.8229	-13.294	14.269	.022	1	.499
[NO=4.00]	12.992	1.432	-8.218	9.2348	8.021	1	.026**
[NO=5.00]	18.124	9.119	-2.382	3.832	11.002	1	.014**
[EDU=1.00]	-4.469	2.271	-6.822	6.159	3.000	1	.059*
[EDU=2.00]	-14.920	4.211	-26.148	26.524	2.832	1	.051*
[EDU=3.00]	.842	.262	-1.215	2.065	5.989	1	.018**
[EDU=4.00]	1.099	73.183	-89.328	80.027	3.210	1	.048**
[EDU=5.00]	12.169	4.1337	-2.612	3.014	4.100	1	.040**
[WEA=1.00]	-17.902	12.421	-34.235	34.788	2.909	1	0.081*
[WEA=2.00]	-34.992	55.903	-23.238	24.212	.000	1	.999
[WEA=3.00]	.199	2.209	-4.343	4.991	3.022	1	.051*
[WEA=4.00]	.0335	2.221	-8.215	9.019	4.209	1	.034**
[WEA=5.00]	.0119	3.422	-3.038	4.022	2.991	1	.054*
[GEO=1.00]	.022	5.231	-2.032	2.990	3.321	1	.048**
[GEO=2.00]	-12.915	14.999	-23.453	22.932	8.012	1	.013**
[GEO=3.00]	-17.999	21.242	-25.358	24.993	7.922	1	.022**
[GEO=4.00]	.025	5.243	-.5.344	5.027	.003	1	.998
[GEO=5.00]	.065	7.981	-4.752	4.074	2.999	1	.054*
[GEO=6.00]	1.000	16.389	-63.828	64.009	6.373	1	.0.24
(Scale)	1[c]						

Dependent Variable: Outcome; Model: (Intercept), AG, NO, EDU, WEA, GEO
** and ** denote significant at 5% and 10% level respectively*
Source: IBM SPSS 23

Table 9 and Table 10 presents the probit and logit regression estimations respectively. They both show the relationship between the dependent (women that use contraceptive) and independent variables; age group (AG), number of children (NO), education (EDU), wealth index quintile (WEA) and geo-political zone (GEO). The probit and logit regression

estimations are the same as they both indicate the same effects of the independent variables on contraceptive usage. The probit and logit results depict the following findings:

i. All the women age groups indicate positive significant effects on the contraceptive usage which implies women ageinghave more likelihood of using contraceptive;

ii. Women with 3 children (NO=4.00) and 4+ children (NO=5.00) have positive significant effects on the contraceptive usage which implies women with 3, 4 and more have more likelihood of using contraceptive;

iii. Women with none education (EDU=1.00) and non-formal education (EDU=2.00) have negative significant effects on the contraceptive usage this means women with none and non-formal education have more likelihood of not using contraceptive;

iv. Women with primary education (EDU=3.00), secondary education (EDU=4.00) and higher education (EDU=5.00) have positive significant effects on the contraceptive usage this implies that women with education have more likelihood of using contraceptive;

v. Women from the North-East (GEO=2.00) and North-West (GEO=3.00) have negative significant effects on the contraceptive usage this means women from these regions (North-East and North-West) have more likelihood of using contraceptive have more likelihood of not using contraceptive;

vi. And women from the North-Central (GEO=1.00), South-South (GEO=5.00) and South-West (GEO=6.00) this also mean that women from these regions have positive significant effects on the contraceptive usage have more likelihood of using contraceptive

In summary the findings depict that women that: are older in age; have more children; are educated; are rich; and are from the North Central, South-South and South West of the country have more likelihood of using contraceptive. While, women from North-East and North West Geo-political zones are more likely not to use contraceptive.

SUMMARY

The study aimed at providing a comprehensive analysis of factors associated with the use of contraceptive among sexually active women in Nigeria. In this regards it sought to explore the association between socio-economic status and contraceptive use. The study also investigated the socio-economic determinants of contraceptive use. Data from various survey years of the NBS was employed in the analysis with cross tabulations and multiple regression techniques used.

DISCUSSION AND CONCLUSION

The findings suggest that there exists significantly high proportion of women who do not use any method of contraception in Nigeria (see Table 2 and Figure 1). The proportion of women

who used modern contraceptive methods was also relatively more than traditional method in 2011/12 with the later reducing over time. The traditional contraceptive methods were more than modern methods. This is alarming as modern contraceptive methods are considered to be, relatively, more effective in family planning. Though some studies have reported low usage of modern contraceptives in sub-Saharan Africa as a whole, (United Nations Population Division, 2018).

The high proportion of non-use of contraceptives raises concerns but explains the high unmet need for contraception that perseveres among women in the country. Numerous reasons have been mentioned for non-use of family planning methods in Nigeria. Hence, there is need for increased public education on contraceptive usage and how to deal with women numerous reasons.

The results of Pearson's Chi-square values and probabilities estimated, which tested the hypothesis of no dependency of contraceptive usage on the socioeconomic status, generally suggest strong significant association. The findings show that there is statistical significance dependency of contraceptive use socioeconomic variables such as age group, no. of children, education, wealth quintile and geo-political zones.

Also, the multiple regression results for ‘all contraceptive use’ and ‘modern contraceptive methods use’ show positive significant relationships between the dependent (all contraceptive use) and independent variables age group, no. of children, education, wealth index quintile and geo-political zone (except for ‘modern contraceptive methods use’ which was negative). Hence, the econometric results suggest that education, wealth status, number of living children, age group and geo-political zones were significant determinants of contraceptive use.

Nevertheless, the probit and logit regression analysis depicted the same results. The findings from probit and logit regression results depict that women that: are older in age; have more children; are educated; are rich; and are from the North Central, South-South and South West of the country have more likelihood of using contraceptive. While, women from North-East and North West Geo-political zones are more likely not to use contraceptive.

RECOMMENDATIONS

i. While government has initiated various activities in the national policy, there is still need to improve the knowledge of contraceptive use i.e. family planning through public education programmes, especially in northern part of the country;

ii. There is also urgent need for national strategies to consider making contraceptive services more reachable or accessible with regards to both availability and cost;

iii. The government initiative in creating awareness on importance of FP use should be incorporated with other factors for the millennium development goals to be realized.

iv. Community health workers to be trained adequately and be provided with valuable family planning services to often bring information and supplies directly to people’s homes.

REFERENCES

Asiimwe, B. J., P. Ndugga and J. Mushomi (2013) 'Socio-demographic factors associated with contraceptive use among young women in comparison with older women in uganda', *Demographic and Health Surveys Working Papers No.9*

Creanga, A., Gillespic, O., Kolklins, S., & Tsui, A.,(2011). Low use of Contraceptives a mong poor women in Africa. Equity Issue. Bull World Health Organization, 89,258-266.

Francis Obare, Anke van der Kwaak and Harriet Birungi (2012). Factors associated with unintended pregnancy, poor birth outcomes and post-partum contraceptive use among HIV-positive female adolescents in Kenya. *BMC women's health* 12 (1), 34

Jennifer J. Frost, Susheela Singh and Lawrence B. Finer (2007). Factors Associated with Contraceptive Use and Non-use, United States, 2004. Perspectives on Sexual and Reproductive Health, 2007, 39(2):90–99

John Bosco Asiimwe, Patricia Ndugga, John Mushomi, James Patrick Manyenye Ntozi (2014). Factors associated with modern contraceptive use among young and older women in Uganda; a comparative analysis. *BMC public health* 14 (1), 926

Martha Decker, Norman A Constantine (2011). Factors associated with contraceptive use in Angola. *African journal of reproductive health* 15 (4), 68-77, 2011

Megan SC Lim, Xu-Dong Zhang, Elissa Kennedy, Yan Li, Yin Yang, Lin Li, Yun-Xia Li, Marleen Temmerman, Stanley Luchters (2015). Sexual and reproductive health knowledge, contraception uptake, and factors associated with unmet need for modern contraception among adolescent female sex workers in China PloS one 10 (1), e01154

Nigeria Demographic and Health Survey (2013). National Population Commission (NPC) [Abuja, Nigeria] and ICF International [Rockville, Maryland, USA]; 2014.

UNFPA, PRB. *Country Profiles for Population and Reproductive Health: Policy Developments and Indicators 2003*. New York: United Nations Population Fund and Population Reference Bureau, 2003.

United Nations (2019). World Population Prospects. Available from: https://esa.un.org/unpd/wpp/DataQuery/

World Health Organization. Trends in Maternal Mortality 2011 & 2012: Estimates developed by WHO, UNICEF, UNFPA and The World Bank, 2012

Fact sheet. Nigeria Demographic and Health Survey 2003. Available from: https://dhsprogram.com/pubs/pdf/GF5/nigeria2003generalfactsheet.pdf.

African Journal of Mathematics and Statistics Studies
ISSN: 2689-5323
Volume 3, Issue 2, 2020 (pp. 14-36)

www.abjournals.org

APPENDIX

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.610[a]	.527	.395	168.73093

a. Predictors: (Constant), Geo- Political Zone, Age, Number of Children, Education, Wealth Index Quintile

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	27239.211	5	54527.842	1.915	.012[b]
	Residual	56940.254	2	28470.127		
	Total	329579.465	7			

a. Dependent Variable: All Contraceptive use
b. Predictors: (Constant), Geo- Political Zone, Age, Number of Children, Education, Wealth Index Quintile

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	9.929	360.581		-.055	.061
	Age	.0768	.396	1.174	1.941	.002**
	Number of Children	.0673	.959	1.788	-.702	.036*
	Education	.683	.373	2.185	-1.833	.008**
	Wealth Index Quintile	1.089	1.754	1.884	.621	.002**
	Geo- Political Zone	.331	.361	.378	.918	.045*

a. Dependent Variable: All Contraceptive use

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.517[a]	.467	-.164	210.24131

a. Predictors: (Constant), Geo- Political Zone, Age, Number of Children, Education, Wealth Index Quintile

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	177305.469	5	35461.094	.802	.036[b]
	Residual	88402.819	2	44201.410		
	Total	265708.288	7			

a. Dependent Variable: Modern Contraceptive use

b. Predictors: (Constant), Geo- Political Zone, Age, Number of Children, Education, Wealth Index Quintile

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	-5.275	449.290		-.546	.040
	Age	.632	.493	1.075	1.281	.029
	Number of Children	1.183	1.195	-3.501	-.990	.027
	Education	.753	.464	-2.682	-1.621	.046
	Wealth Index Quintile	2.033	2.186	3.918	.930	.001
	Geo- Political Zone	-.439	.450	.558	.975	.032

a. Dependent Variable: Modern Contraceptive use