

**TRENDS IN INEQUALITIES IN USE OF FAMILY PLANNING AMONG WOMEN  
OF REPRODUCTIVE AGE IN KENYA**

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## DECLARATION

This masters research project is a product of my own thinking. It has not been used in any institution of learning or university, to acquire any degree or certificate.

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### **Approval**

This research project has been submitted for examination with approval of university supervisors.

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## **DEDICATION**

This research project is dedicated to my parents, Mr. Patrick and Mrs. Dorothy Jumba. Their efforts to ensure I went to school are greatly appreciated.

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## ABSTRACT

This study focused on inequalities in use of family planning among women of reproductive age in Kenya with the main objective of the study being to assess the performance and thus the effectiveness of the national family planning programme. To assess the effectiveness of the FP programme, emphasis was placed on the extent the programme had narrowed down the inequalities gap by socioeconomic factors and by regions from the 2003 survey to the 2014 survey. This is a departure from the usual methods that place emphasis on averages of contraceptive prevalence levels and total fertility levels at the national level, to measure the effectiveness of the FP programme. The study used secondary data. The data were derived from three national surveys in Kenya conducted in the year 2003, the year 2008-09 and the year 2014. The survey captured information on background characteristics and health issues from a sample of women from the reproductive ages of 15 to 49 years. The attention of this study was on fecund women in Kenya. Methods of data analysis used were descriptive statistics, logistic regression and multilevel logistic regression. Bivariate analysis was used to test for associations between the dependent variable and independent variables through cross-tabulation and the Chi-square statistic. A logistic regression analysis was conducted to estimate the crude coverage gap with multilevel logistic regression being conducted to estimate the adjusted coverage gap by background factors among fecund women in Kenya. The technique was deployed to determine the extent of the inequality gap after controlling for confounding. This study established that the percentage of women using contraceptives significantly increased from the year 2003 to the 2014 survey. The most preferred contraceptive methods were the modern ones such as injections and pills with their sources being from government clinics or pharmacies and private clinics. Also, background characteristics at the individual, community and family planning programme level were seen to have a significant effect on modern contraceptive use by women. Results from the three surveys have confirmed that the direction of the national family planning programme's performance in increasing contraceptive use among women is positive—from 28 per cent in the 2003 survey, 30 per cent in 2008/09 survey and 39 per cent in 2014 survey. Background characteristics of a woman such as age, marital status, education, wealth index, employment status, region and place of residence were found to have a significant influence on use. Additionally, women who heard information on family planning through radio and television were more likely to use contraceptives compared to those who read newspapers/magazines. However, despite the improved use over time even by background characteristics, inequalities in use by socio-economic factors still exist in all the three surveys. Inequalities in modern contraceptive use were therefore found to be an important indicator to consider in assessing the performance and thus the effectiveness of the FP programme.

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# CHAPTER ONE

## INTRODUCTION

### 1.1 Background of the study

Since attaining her independence, Kenya has registered a steady increase in population (KNBS et al., 2015). In 1969, the population in Kenya was recorded at 10.9 million while 16.2 million was the population captured in 1979. In 1989, the population slightly increased to 23.2 million (CBS et al., 2004). In 1999 however, the population was recorded at 28.9 million a figure almost triple the population recorded in 1969 (KNBS and ICF Macro, 2010). A further increase was noted in 2009, with the population being recorded at 38.6 million- marking a point where Kenya's population had increased fourfold (KNBS, et. al., 2015). In 2014, the population was projected to 43.0 million people in the Kenya Demographic and Health Survey of 2014 and is expected to continue to increase (KNBS et al., 2015). However, contrary to the upward trend of the national population growth, the fertility levels have reduced over time (CBS et al., 2004; KNBS, 2010; KNBS, et. al., 2015). According to data in the findings report of KDHS 2014, the total fertility level recorded in 1969 was 7.6 while that of 1979 was 7.8 registering a slight increase (CBS et al., 2004). However, since 1989, the fertility levels have steadily reduced from 6.7 to 5.0 and 4.8 in 1999 and 2009 respectively. A further decrease of 3.9 of fertility level was noted in the 2014 KDHS (KNBS, et al., 2015).

With a fertility level of 3.9 in 2014 still being considered to be high, it presents significant negative consequences for the health of women, children and economic development (Portner, 2011). In particular, Maura (2012) notes that with a high fertility rate of this nature, consequences such as poor health, maternal deaths as a result of unsafe abortions, poverty,

gender inequality, unemployment, environmental degradation and the inability to realize the Kenya Vision 2030 due to the overburden on the economy among other social services, await the nation. As a solution to the problem, Malthus (1803); supported by Bongaarts et al., (2012) proposed that the effective use of modern methods of birth control can greatly solve this problem. Effective contraceptive use can eliminate the number of maternal deaths as a result of unsafe abortion, can bring down the percentage of pregnancies that pose health risks to women's survival, can decrease the burden on national expenditures on health, education among other social services, including lessening the strain on natural resources and the environment broadly (Bongaarts, et al., 2012; Okech, 2012). Effective family planning programmes have been seen to increase modern methods of birth control to these ends (White and Speizer, 2007; Miller and Babiarz, 2014).

The Kenya national family planning programme is among the most robust in Sub-Saharan Africa, having been established in 1967 (Ngethe, 2014; Ojaka 2008). It boasts several achievements with the ones at the centre being, having increased contraceptive use levels over the years and the gradual fertility decline not to mention, several policies meant to improve reproductive health care (Ministry of Health, 2012). Evidence in literature shows that CPR increased steadily from the year 2003 to 2014-these successes being attributed to the investments made in the national FP programme over the years, and now paying of (Ministry of Health, 2012; KNBS, et. al., 2015). However, despite these successes, some setbacks still linger (Ministry of Health, 2000; KNBS, et. al., 2015). The most notable of these setbacks being the unmet need for family planning remaining high, the high variations in use by background characteristics while the inequalities in use gap by socioeconomic factors and by regions still being wide (KNBS et al., 2015). As a consequence, policymakers

among other stakeholders are often motivated by these challenges to put more effort on helping even more individuals manage, with the aim of significantly lowering their fertility while the effectiveness of family planning programmes is given less attention thus continuing with the same cycle of systematical errors of setting new targets for increasing CPR while at the same time fostering on the lowering of TFR further (Portner, 2011).

Although it makes programmatic sense to set these new CPR and TFR targets with intentions of demonstrating progress, the limited availability of supporting evidence on the inequalities in contraceptive use by background factors of a woman has left a playground that is being exploited by both speculators and family planning programme critics to discredit the gains made by the family planning programme with their usually prejudiced views and assumptions (Portner, 2011; Johnson, et al., 2011). It is therefore of both programmatic, policy and monitoring and evaluation importance, to refocus our attention on the effectiveness of the national family planning programme, by assessing the inequality gaps as a way of measuring the coverage gap in birth control use by background factors among fecund women of all age groups (Muhoza, et al., 2013). This could reveal whether the inequality gap of each background factor (such as education, age, marital status, employment status, region and place of residence), is narrowing down or widening further through logistic regression and multilevel logistic regression analysis thus showing the direction of the performance of the national family planning programme (Muhoza, et al., 2013; Worku, et al., 2014; Ngome and Odimegwu, 2014; Ezeh, et al., 2009).

### **1.1.1 An overview of Kenya's Family Planning Programme**

The national family planning programme is a Ministry of Health programme under the Directorate of Preventive Services in the Division of Family Health; nested under the

Reproductive and Maternal Health Services Unit, that was started in 1976 (See Figure 1.1 in Appendix A). The programme is being implemented at the counties, with support from both local and international partners (Reproductive and Maternal Health Services Unit, 2016). The programme was designed to address several factors that have serious effects for the health of women and children as well as the Country's development namely: early marriage and early childbearing; the unmet need for family planning and the high total fertility level (Reproductive and Maternal Health Services Unit, 2016). Other groups targeted by the programme are the youth, the unmarried, people living with disabilities, the poor and hard-to-reach groups such as the refugees and pastoral communities (Reproductive and Maternal Health Services Unit, 2016).

The main aims of the programme are to enhance maternal health, children health and a reduction of fertility by: removing barriers that impede access to FP information and services such as cost, distance, religion, culture, rumours and misconception, provider bias and legal and medical regulations (Reproductive and Maternal Health Services Unit, 2016). There are eight priority areas the national family planning programme focuses on. These are advocacy for family planning services, demand creation, focus on adolescents, the youth and vulnerable populations, capacity strengthening, incorporating of family planning into HIV and to other development programmes, family planning commodity security and monitoring and evaluation of family planning services (Reproductive and Maternal Health Services Unit, 2016).

With regards to mandate, the programme at the Ministry of Health is mandated to develop: policies regarding quality family planning services, monitor effective and efficient family planning quality services, develop guidelines and strategies for family planning services,

develop communication materials for counties to customize, build capacities of counties in the delivery/provision of family planning services and guiding research (Reproductive and Maternal Health Services Unit, 2016).

Since the programme was started, several achievements have been realised. They include: the anchoring into law policies regarding population and development, and CPR having moved from 39% in 1978 to 58% at the moment. Moving forward, the goal of the programme is to increase CPR to 60% by 2020, 66% by the year 2030 and 70% by the year 2050. This means the programme is effective in increasing modern contraceptive use. However, with regards to efficiency, the programme is very expensive to implement i.e. it requires a bulk of funds to implement. Further, counties heavily rely on short-term methods such as injectables as opposed to long-term ones. To be more efficient and effective, the programme needs to focus and invest more in long-term methods while reducing the inequalities in use gap (Reproductive and Maternal Health Services Unit, 2016).

The key indicators that are used to measure impact of the FP programme are: Contraceptive Prevalence Rate (CPR), the Unmet Need for Family Planning, Total Fertility Rate (TFR), Source of supply by method, Method Mix, Couple-year of Protection (CYP), Analysis of trend of modern contraceptive use, Number of Acceptors New to Modern Contraception and Knowledge of Benefits of Adequate Birth Spacing (MEASURE Evaluation, 2019).

Kenya's Family Planning (FP) programme is not only a key intervention for improving health; it is a key strategy for the achievement of international development goals at the national level. One of these goals is Sustainable Development Goal (SDG) number 3, that aims at achieving a healthy global population by promoting the well-being of everyone

(Reproductive and Maternal Health Services Unit, 2016; WHO, 2019). Under this SDG one target is relevant to this study. According to target 3.7, universal access to reproductive health services such as family planning should have been realised by the year 2030. This also includes incorporating reproductive health into national strategies and development programmes (WHO, 2019; FP2020, 2019).

## **1.2 Problem Statement**

While there has been continued commitment in the promotion and provision of adequate reproductive health services, a number of background factors of a woman such as poverty, a lack of empowerment and social-cultural beliefs and practices hinder the demand for and utilization of reproductive health care (Ministry of Public Health and Sanitation; Ministry of Medical Services, 2009). According to KDHS 2014, the demand for family planning services varies by background factors of women such as age, education, wealth index and by regions. For example, the region with the highest demand for family planning services was the Eastern region at 83 per cent, followed by Central at 82 per cent (KNBS et al., 2015).

Although significant achievements in family planning programme efforts are in evidence, there have not been parallel gains in knowledge about the relative importance of the inequalities in use by background factors of a woman as a measure of programme effectiveness (Tsui and Hermalin, 1997; Johnson, et al., 2011). Kenya's national family planning programme has often been assessed by setting new targets to succeed earlier ones, with more attention being accorded to a reduction in births and increase in contraceptive use levels-a fallacious way of assessing performance thus effectiveness of the programme (Ministry of Public Health and Sanitation; Ministry of Medical Services, 2009). This is because these targets are based on averages that give less attention to inequalities in use

which is a key objective of UHC and target 3.7 of SDGs. This calls for a paradigm shift from a focus on assessing the national family planning programme using fertility levels and contraceptive use levels, at the national level, but also to focus on inequalities in use by background characteristics of women to measure the coverage gap and thus performance and the effectiveness of the programme across all population segments over time.

Evidence available in literature to support this kind of research shows that Sharma et al (2011) conducted a study in Nepal, that used multilevel logistic regression analysis of background characteristics of married women nested within clusters to study the effect of ethnicity on contraceptive use with the main objective of the study being to evaluate the impact of the Nepal national family planning programme. Evidence from this study showed that modern birth control use varied significantly across clusters and with regards to ethnicity. This information suggested that the family planning programme efforts were reaching some groups more than others (Sharma, et al., 2011).

Because Kenya is a signatory to the global development agenda; the Sustainable Development Goals (SDGs), the current focus of all national development programmes are on realising these goals. Of relevance to this study is SDG number three that endeavours at achieving healthy lives and promoting the well-being of everyone in all ages. One of the targets of this SDG is target 3.7 whose main objective is to realise universal access to reproductive health services among them family planning by the year 2030. In this regard, this study sought to establish to what extent is everybody who needs family planning services getting the family planning services according to ICPD plus 5 and target 3.7 of SDG number 3. To do this, inequalities in use were examined, using socio-economic factors

of a woman and community variables as tracer indicators used to measure the coverage gap (WHO, 2019; UNFPA, 2019).

### **1.3 Research Question**

- i. How did the national family planning programme perform in terms of narrowing down the inequalities in use of modern contraceptives among women in Kenya (2003 to 2014)?

### **1.4 Objectives of the study**

The general objective of the study was assessing the performance of Kenya's national family planning programme by examining the inequalities by socioeconomic and community-level factor of modern contraceptive use among women from the year 2003 to the year 2014.

#### **The specific objectives were:**

- i. To establish trends in factors that are associated with modern contraceptive use among women in Kenya between (2003and 2014).
- ii. To estimate trends in the inequalities in use as a measure of the coverage gap in access to modern contraceptives between 2003 and 2014.

### **1.5 Justification of the Study**

This study was both of policy and monitoring and evaluation relevance. From a policy point of view, the findings of this study have provided evidence required to formulate appropriate strategies that will enable the Ministry of Health to realize target 3.7 of SDG number 3 that seeks to ensure universal access to reproductive health services such as family planning, are



achieved by the year 2030. Particularly, this is to be facilitated by target setting and refocusing the FP programme efforts to ensure that FP needs of every woman are met without any financial discomfort (United Nations, 2014).

With regards to relevance to monitoring and evaluation, the national family planning programme is not only a core reproductive health programme that focuses on the health of the mother and child and fertility reduction; it is a development programme. Therefore, by assessing the performance of the programme, we measure the extent to which the programme is delivering desired results. Further, the Sustainable Development Goal (SDG) number 3.7 focuses on achieving optimal access to family planning services by the year 2030. As such, the focus on the performance of the national family planning programme should not only be on averages of modern contraceptive use levels but also how various groups vary by other forms of inequality. If we assess the performance between the best and the worst, then this is one of the indicators of how the performance could be measured. This should give us an idea of the coverage gap (See section 1.7 on the definition of coverage gap). Understanding the coverage gap is important because at the end of the day, if the family planning programme is effective, then people at the lower level should have the same use levels as those at the upper level.

### **1.6 Scope and Limitations of the Study**

The study focused on all fecund women in Kenya in the three surveys. The study estimated inequalities in use of modern contraceptives by background factors among women from Kenya Demographic and Health Survey (KDHS) data, as a way of assessing to what extent the national FP programme performance has improved over time. The data that were used for purposes of this study were derived from three national surveys, KDHS 2003, KDHS

2008-09 and KDHS 2014. The 2003 KDHS data was used as the baseline for the study, while the KDHS 2008-2009 data and KDHS 2014 data were used to establish the trends of inequalities from the baseline. Thereafter, inequality levels were examined to establish whether they were narrowing down or widening.

With regards to limitations, This study did not include family planning service delivery factors such as supply, quality of service delivery among others, factors which are part of the programme's inputs. Also, there being inadequate knowledge on the history of programme operations in each community, it prevents proper alignment of programme inputs with each woman's fertility history (Hermalin, 2003).

To address the constraints above, a multilevel logistic regression modelling technique was used for the analysis, whereby factors that wield influence on programme variables were introduced into the model in a series of equations of background characteristics of interest (Hermalin, 2003). Also, the confounding effect of invariant factors unique to each geographic area, and which could affect the outcome of the study was largely controlled for (Hermalin, 2003; PSU, 2017; LaMorte and Sullivan, 2017; McDonald, 2014; Yu, et al., 2015).

### **1.7 Definition of Concepts**

**Contraceptive Prevalence level/Rate (CPR):** A family planning programme indicator used to measure the number of women who reported using or having used any modern contraceptive method at a particular point in time.

**Contraceptive use:** Refers to the actual use of any type of modern contraceptives.

Modern contraceptive methods: Modern contraceptive use by method type e.g. Injections or pill.

**Contraception:** Birth control by way of using devices such as diaphragm, IUD, condom, drugs or surgery.

**Unmet need:** A family planning programme indicator for measuring women who are not using any modern contraceptive method, yet they need to use modern contraceptives.

**Kenya's family planning programme:** All organized activities by government and partners that are designed to promote the use of family planning services within Kenya.

**Monitoring:** Routine collection and recording of programme data for purposes of tracking how well a project or Programme is being implemented.

**Evaluation:** Measure how successfully a programme or project achieved its desired objectives and overall goal.

**Baseline data:** In this study, it's the reference point upon which the assessment was based.

**Coverage gap:** The inequality gap between the highest and the lowest users of modern contraceptives by socioeconomic factors and by regions in all three surveys.

**Inequality gap:** The size of the gap between the best modern contraceptive users and the worst users by background factors in all the three surveys.

**Family Planning:** In this study, it refers to the use of modern contraceptives to limit or space pregnancies. Enables both individual and married women to plan their desired number of children by spacing and limiting of births.

## **CHAPTER TWO**

### **LITERATURE REVIEW**

#### **2.1 Introduction**

The chapter presents literature reviews on how family planning programmes have been assessed. It comprises of the theoretical perspectives, a review of methods used to assess family planning programmes, factors that influence contraceptive use among women, monitoring and evaluation, indicators for monitoring and evaluation, key FP programme impact indicators and their definitions, sustainable development goal 3, a summary of literature review, the conceptual framework, operational framework and lastly, the operational hypotheses.

#### **2.2 Theoretical Perspectives**

Several theories have been instrumental in explaining changes in population in different contexts. This study relied on the theory of demographic transition.

The theory of demographic transition has been extensively used to characterize stages of fertility and mortality and their levels as consequences of development or modernization (Tietelbaum 1975). According to the first stage of the theory, a country suffers from high deaths and birth rates (Nielsen, 2016). As a consequence, the population is kept low by Malthusian "preventatives" such as diseases, famine, war and pestilence (Malthus, 1803; Nielsen, 2016). In addition to the Malthusian preventatives, family planning was poor; the population relied on traditional contraceptive methods that were ineffective, coupled with little medical and technological advancements that contributed to the high death rates (Kirk, 1996). Since children were seen as "labour commodities" (more hands to till the land for food), and there being no other option to check high death rates, the high births was a

strategy that seemed to work at the time (Tietelbaum 1975). During the second stage of the theory, a country experiences a period of natural population increase, a consequence of crude birth rates remaining constant, but with rapidly declining crude death rates (Lesthaeghe, 2010). Reasons for the increase include: deaths rates decline due to better sanitation, living conditions, medical (including reproductive health solutions) and technological advancements begin to improve (Bruijin 2006).

Stage three of the theory is marked by a gradual fall in births towards equilibrium with low death rates a consequence of individuals beginning to consciously control their fertility (Tietelbaum 1975). Some of the reasons being attributed to gradual fall are: standards of living having increased, women are educated therefore know family planning benefits, women started working, therefore, have less time to take care of children resulting in fewer children (Lee, 2003). Besides, the effect of industrialization and urban lifestyle begins to influence the family unit where the high cost of education, forces parents to have fewer children while fewer children are favoured to help in family businesses rather than for purposes of labour (Bongaarts, et al., 2012). During this stage, there is a lot of information on family planning and the accompanying benefits are circulating through various media, while variety, number and access to modern contraceptive commodities also improve compared to the previous stages (Bongaarts, et al., 2012; Nielsen, 2016).

In stage four of the demographic transition theory, birth rates and death rates converge creating a "stable size" population that is widely referred to as the post-industrial society, with delayed degenerative diseases, resulting in a stable population but with more ageing people (Warf, 2010). Reasons for this population trend include: extensive knowledge on family planning benefits and contraceptive commodities, individuals have internalized the

need to lower their fertilities, women are more empowered than ever before, therefore play a more pronounced role in decision making especially with regards to number of children, the effects of industrialization and urbanization influence on the family unit and the rise of individualism and materialism (Lehr, 2009; Lutz and Qiang, 2002).

### **2.3 A Review of Methods used to Assess Family Planning Programmes**

Like the programmes themselves, the evaluative techniques for family planning programmes have also evolved over time in response to available data, the questions posed, and the increased understanding of the dynamics of fertility control on the individual, community and national level (Tsui & Hermalin, 1997). To be more responsive, strong evaluation evidence is needed to inform these country-level family planning strategies (Ilene, et al., 2014). For this to be a reality, measures of performance of family planning programme efforts give insight on the current context of the programme environment (Bertrand, et al., 1996). A diverse of methods and approaches exist for measuring family planning programme effort, which are unique in several ways such as in terms of the types of outcomes measured, the number of assumptions required, among other operational data requirements (Bertrand, et al., 1996).

*At the onset of family planning programme efforts (roughly 1960 to the early 1970s), the emphasis was on developing the supply to meet the level of existing demand, recruiting and training personnel, developing service points, setting up appropriate supervision and reporting procedures, and so on (Tsui and Hermalin,1997). Methods of evaluating family planning programmes tended to put more emphasis quantitative outputs at the programme monitoring level, for instance, new couple-year of protection (CYP), new acceptors or*

outcomes at the population level such as total fertility levels and contraceptive prevalence levels (Bertrand, et al., 1996). In essence, positive results of the aforementioned parameters were translated to mean that family planning programmes were having an impact (Hermalin, 2003).

*Crude rates, standardizations and decompositions.* The very crudest method that has been used in ascertaining the impact of a family planning programme on fertility rates is simply to compare rates before and after implementation of a programme. However, such a naive approach ignored, among other things, the effects of changing age structure of the population or changes in nuptiality (Haaga, 1985). These methods which do not directly employ any family planning programme-level data used standardised demographic techniques to control the influence of a single or several variables to assess the effect of another variable (Hermalin, 2003). For example, Yoo (2014), conducted a study in South Korea that sought to explain the patterns of fertility by the level of education. The study used demographic decomposition techniques and cohort parity progression ratios by level of education to estimate Cohort fertility for women born between 1926 and 1970. Results from this research revealed differences in fertility by educational attainment; with the trend being a gradual decline over time. Women educational attainment, therefore, became an important factor in the further decline in fertility. Data for the study was obtained from the Korean census conducted between 1970 and 2010.

*Experimental designs* were partially used in the initial stages of family planning programme evaluation, with evidence suggesting that well designed experiments have the ability to provide reliable insight as to whether a programme's efforts are yielding desired results while also providing reliable information on the levels of influence of those effects



(Hermalin, 2003; Bongaarts, et al., 2012; Kirby, 2008; Schultz, 2005). A good example of experimental designs is the famous Matlab experiment of Bangladesh where 141 villages were part of an experiment that involved a treatment and control group. During the experiment from 1977 to 1996, half of the villages were covered by a door-to-door reproductive health care outreach programme and maternal and child health care services. Results indicated that fertility declined in the programme villages compared to the control villages by 1996 (Joshi, 2007; Schultz, 2009).

*Quasi-experiments.* Other techniques used were data at the level of the village, or service area of a clinic, or other geographic units (Haaga, 1985). Though it may be impossible to assign different areas randomly to experimental treatments or control groups, researchers could take advantage of the variation that exists among roughly similar units in the timing of introduction, intensity or type of family planning programme operating in them. Multivariate statistical methods could then be used to hold constant (account for variance in fertility outcomes caused by) some of the non-programme factors. The independent effects of the programme variables on fertility could then be estimated, subject to the completeness and correctness of the specification of the causal model used (Haaga, 1985). For example, Hennink and Clements, (2004) conducted a study in Pakistan on franchised family planning clinics to determine the impact among the urban poor. The study assumed a quasi-experimental approach to ascertain the impact of new family planning clinics on modern contraceptive use knowledge and the unmet need for family planning, amongst married women in urban poor areas of six secondary cities of Pakistan.

*Substitution effects.* A more difficult problem has to do with estimating the degree to which a programme substitutes public for private sources of modern contraceptives or modern for

traditional contraceptives (Haaga, 1985). Part of the service statistics of the programme represent such substitution rather than a net increase in the total amount of contraception, and some of what should be attributed to the programme is not measured, so the issue can be dropped (Haaga, 1985). Since a public programme may have had a "catalytic" effect on couples who do not get their contraceptive supplies from the programme, by spreading the ideas of fertility regulation, some analysts have ignored the substitution effect or progress in techniques of evaluation has been motivated by the research for a more sophisticated way of handling this problem (Haaga, 1985). For instance, in a study done by Angeles, et al., (2004), the estimated effect of education on fertility was compared from a simple model that treated education as an external factor while allowing schooling to be an endogenic factor of an individual woman. Results showed how education of a woman as a determinant factor in reducing fertility has been overstated in Indonesia. The results would have been different, had a naive model been used, that did not account for the effect of a woman's education status.

*Trend analysis.* A preliminary approach to this problem is what the UN manual calls "trend analysis": graphing fertility rates against years, then fitting separate lines to the points from pre-programme years and to the points for programme years, to see if the rate of decline has increased (Haaga, 1985). The foundation of trend analysis is on demographic data through which a time series is used to make observations on the fertility trend to make conclusions about programme effects (Hermalin, 2003). The fundamental component of this method lies in the projection of fertility rates before an intervention is initiated, after which, the data that was projected is compared with observed programme data-with the difference between the two being concluded to be the impact of the programme (Hermalin, 2003). For example,

Neeru, et al. (2003) conducted a study in Uganda whose primary data was derived from the 1997 and 1999 Delivery of Improved Services for Health Evaluation Survey while data from the 1995 Demographic and Health Survey was used for additional analysis. The study sought to examine how multi-media behaviour change communication campaigns influence women's and men's use of modern contraceptives using a time trend analysis.

*The second phase of family planning programme evaluation evolution was (roughly between the mid-1970s to mid-1980s).* This phase is characterised by family planning programmes having becoming complex in their structure thus undermining the use of acceptor-based approaches to measure impact (Hermalin, 2003). Besides, family planning programmes were increasingly asked to provide more detailed data of programme interaction with the social-cultural and economic contexts in the developing world in mind (Tsui & Hermalin, 1997). For instance, in an article by Ross, et al. (1986), an analytical approach by Bongaarts and Potter was used to study background factors that influence fertility among three populations in Kathmandu Valley of Nepal that comprised the following characteristics: the influence of caste system, place of residence as urban and urban fringe and users and non-users of modern contraceptive methods. Longitudinal data for this assessment were derived from two national surveys: the Nepal Fertility Survey of 1976 (part of the World Fertility Survey) and Nepal Contraceptive Prevalence Survey of 1981.

*Components models.* Another method that has been used to assess the impact of FP interventions at the macro level is by using simulation or "components" models to disaggregate sources of fertility decline or differences between current rates and those that would prevail with natural fertility in a population (Haaga, 1985). First, estimates are obtained of the total amount of contraception (from all sources) that must have been

practised to bring about an observed fertility decline. Next, programme service statistics and assumed continuation and failure rates for different programme-supplied contraceptives are applied to simulated cohorts of women. Finally, the sensitivity of the estimates of the net impact of the programme can be tested by varying assumptions about induced abortion, private sector contraceptive supply, breastfeeding, and other traditional contraceptive measures (Haaga, 1985). Simulation models appear to be useful in programme evaluation when at least some of the intermediate steps in the causal chain linking programme output to demographic or health outcomes are known fairly precisely and are readily quantifiable (Haaga, 1985). For example, in a study conducted by Tumlinson, et al. (2013), simulations by customers in the study exposed the barriers to contraceptive use in Kisumu County of western Kenya. The study used qualitative data drawn from simulated client visits to establish programmatic barriers to modern contraceptive use from a sample of 19 reproductive health service centres. Evidence from the simulated client reports revealed inadequacies in provider competence, with the main one being poor relations between service providers and clients. Also, it was noted that service providers were present occasionally during normal working hours and charged informal fees for services rendered. As a solution to the problem, one of the recommendations made by the study was service providers to undergo customer relations training.

*Multivariate analyses.* The second phase of family planning programme evaluation was also marked by the use of several multivariate analyses that took into account geographic subdivisions, social, economic and cultural factors as a way of estimating programme impact (Hermalin, 2003). In order for one to evaluate a programme using this method, the following conditions have to be met: one must select some geographic division within a

country or territory, one ought to have measures of programme input (often obtained from programme monitoring records), one ought to select independent variables that reflect socio-economic characteristics of the selected geographic area and a desired outcome variable of study with the geographic level chosen being dependent on availability of data and scope of the analysis (Hermalin, 2003). For example, Angeles et al. (1996) conducted a meta-analysis to examine the impact of family planning programmes on three key outcomes namely: fertility preferences, contraceptive method choice and fertility were delivering desired results. A broad geographic area was selected and covered countries with large populations such as Morocco, Tunisia, Tanzania, Kenya, Zimbabwe, Bolivia, the Philippines, Peru, China, Indonesia and India. In addition to the selected geographic units, a set of explanatory variables were also used with data being drawn from Demographic and Health Surveys with the method of data analyses being Multivariate analysis.

*In this latest phase, of family planning programme evaluation evolution, (since the mid-1980s to date), family planning programmes have become much more sophisticated in combining attention both to the determinants of demand, and the ways of influencing it, and in giving closer scrutiny to the components of the supply environment and their effects on FP programmes (Tsui and Hermalin, 1997). During this phase and in particular the year 1984, Demographic and Health Surveys (DHS) arrived and with this arrival, begun what was termed as "full marketing strategy" in the assessment of family planning programme effects (Hermalin, 2003). Full marketing strategy in the context of family planning programmes evaluation means the tracking of how elements of programme input relate to the utilization of services while at the same time taking account of the characteristics of the target population (Lepham and Simmons, 1987). The main purpose of the DHS programme*

is to provide governments, among other stakeholders with highly, reliable and quality data on a myriad of issues which can be of assistance in the planning and design of programmes, and the monitoring and evaluation of the programmes (Martin, 1997). For example, in a study conducted by Justin and Ilene, (2007) in Zambia, Demographic and Health Survey (DHS) data, collected between 2001 and 2002 were used to answer questions relating to Zambia's success in fostering modern contraceptive use.

*Multilevel regression methods.* Multilevel regression methods are founded upon the principle of not having a treatment and control group (Bertrand, et al., 1996). In this methodology, family planning programme inputs are measured at a higher level i.e. at the country or community level while taking into account social, economic and cultural factors at these levels that are seen to wield influence on the behaviour of the target population; after which, individual-level characteristics that affect the outcome of interest are included to the model thus allowing for interactions across levels (Hermalin, 2003). For example, Tuoane, et al., (2003) conducted a study in which a multilevel model was used to identify and examine background factors seen as affecting modern contraceptive use and method choice of women in Lesotho. The study relied on data from three sources namely: the 1995 Lesotho Safe Motherhood Initiative Women's Health Survey; information captured in the 1997/98 Lesotho family planning facilities survey and Focus Group Discussions (FDGs) with FP commodity users. In another study by Mishra, (2011), data captured during the Nepal Demographic Health Survey (NDHS) 2006 was used. Thereafter, a multilevel logistic regression model was deployed to estimate use among 10,793 married women of reproductive age nested within 264 clusters. Individual, household and programme variables

were included in the multilevel logistic regression model was fitted into statistical software to generate the results.

*Proximate determinants framework.* John Bongaarts developed a simple statistical framework in which he argued that fertility is a consequence of direct factors such as marital status, age at marriage and abortion while indirect factors that comprise socio-economic factors such as education and income only influence fertility in proxy by modifying the direct factors (Boerma and Weir, 2005; Conley, et al., 2007). For example, Islam, et al., (1998) conducted a study that examined the proximate determinants of fertility in Bangladesh using the Bongaarts framework. The study sought to assess four proximate determinants of fertility namely: contraception, marriage, induced abortion and lactational infecundity and their influence on fertility. Data for the study was drawn from the 1993/94 Bangladesh Demographic and Health Survey.

This section of the literature review looked at how family planning programmes were evaluated in chronological order from the earliest methods to the very latest method-the proximate determinants framework. This study adopted the proximate determinants framework method and combined it with the multi-level regression method. Discussed below, are background factors which influence contraceptive use among women and which are fundamental components in the proximate determinants framework method.

## **2.4 Factors that influence contraceptive use among women**

*Education.* Education is among the variables that have been widely used to measure the empowerment of women by way of shaping their attitudes and increasing their knowledge on the benefits of having small families (Larsson and Stanfors, 2014). Evidence in literature

shows that women with education are expected to delay marriage, and childbearing thus have lower fertility levels than those with less education (Larsson and Stanfors, 2014). For example, results from research conducted in Ethiopia seem to concur with this fact. In the study, 27% of women who had at least secondary education has a need in spacing that had not been met. This, however, increased to 53% among uneducated women. The need in limiting that had not been met increased with no education from 12% in women with secondary education or higher, to 36%, those having less or no education (Antenane, 2002).

*Occupation.* Evidence in literature shows the employment of a woman is correlated with increased knowledge, more exposure and thus use of modern birth control (Martin, 2014). An employed woman is regarded as empowered woman-having information of what happens around her and equally, having the ability to make decisions concerning her life, household such as the number of babies she prefers to have (Martin, 2014). Evidence in various studies shows that the employment of women has an association with women having small families. A key ingredient in having small families is using modern birth control methods (Anguko, 2014). Indeed Gupta (2013) notes that childbearing can take a toll on women's labour-force participation, productivity, and lifetime earnings, thus reducing their financial independence.

*Place of residence.* The place where an individual resides, whether rural or urban, has been found to influence how they use contraceptives. (Jesman, 2013). These variations in use may be caused by factors such as differences in infrastructure and the availability of reproductive health services-consequences of which can either influence the use or limit the methods available (Martin, 2014). Urban areas, for instance, offer a wide range of modern birth control methods by virtue of having more facilities that offer services and are easily



accessible compared to rural areas (Chitereka and Busiku, 2010). Evidence of this reality can be seen in a study conducted by Remare and Catherine (2012), where women who were resident 5 km or less to the nearest health facility had a higher probability at 26%, of using modern contraceptives than those residents at distances over 5 km. (Remare and Catherine, 2012).

*Region of residence.* Despite birth limiting and spacing having increased in Kenya over the years, regional differences in use still linger (Murungaru, et al., 2013). Evidence in the Kenya Demographic and Health Survey (KDHS) of 2008-09 shows that use of modern contraceptives was highest in Nairobi and Central provinces while very low in North Eastern regions at only 3 per cent (Murungaru, et al., 2013). In another study conducted by Asiimwe et.al, (2014) in Uganda, regional differences and use was among the variables that were studied. In this study, regional differences in use were influenced by community-level social-cultural values and beliefs like the value attached to a child, the presence and quality of service by reproductive health centres, the remoteness of the area including nature of transport routes (Asiimwe, et al., 2014).

*Age.* According to Dawit (2013), the likelihood of younger women using is higher because they have high sexual exposure and a better understanding of various methods of contraception. On the contrary, with older age fecundity is low with less frequent sexual contact, reducing motivation to use (Dawit, 2013). For example, evidence from a study in Malawi revealed that modern birth control use increased with the age of the woman peaking at ages 40-44 then the trend slightly reversing in the age group 45-49. Contraceptive use level was lowest in ages 15-19 years. This was caused by the fact that most women in the

age group had just entered matrimony, an institution that is viewed as purely designed for producing children (Martin, 2014).

*Wealth Index.* In countries where there exist wide socio-economic gaps between the wealthy and those living in poverty, the well-being of those living in poverty including their health is usually in jeopardy (Stephen, et al., 2014). The overall inequality levels within such a country increase health vulnerabilities leading to a decrease in life expectancy for the poor (Dias and Oliveira, 2015). For instance, results from a study in Malawi indicate that women in the richest wealth category had ease of limiting their births to four children per woman, while achieving the same target is still a tall order among poorest wealth category (Adebowale, et al., 2014).

*Marital Status.* Being in marriage has been seen to influence higher incidences of sexual contact therefore, higher use in modern birth control methods to limit and space births (Dawit, 2013). According to literature, this is because marriage allows for the onset of a higher likelihood of conception (Saira, 2014). Populations with low age during the first marriage tend to experience early childbirths and thus have high fertility levels (African Population and Health Research Center, 2013). In these scenarios, contraceptive use is motivated by factors such as partners communicating about their desired number of children than in any other marital status groups (Dawit, 2013).

*Method Mix.* Eric, et al. (2007) defines method mix as the percentage of individuals using represented by each contraceptive by method type. It is an important indicator in measuring the quality of care, with evidence in the literature showing that an over-emphasis on contraceptive prevalence by family planning research with little attention being given to

method mix (Bertrand, et al., 2000). Contraceptive preferences by different methods vary by factors such as regions and country residence. In developing countries, for example, the preferred method types are short term ones such as injections, the pill, IUD and female sterilization (Eric, et al., 2007).

## **2.5 Monitoring and Evaluation**

Monitoring and Evaluation (M&E) are two different concepts that support one another (Niyivuga, Alfred, and Tuyishime, 2019). Monitoring involves tracking progress regarding previously identified plans or objectives, using data easily captured and measured on an on-going basis (Djalaliniaet al., 2014; Jamaal, 2018; Maendo, James, and Kamau, 2018). While monitoring most frequently makes use of quantitative data, monitoring qualitative data is also possible (Perrin, 2012). Monitoring is carried out for various reasons namely; for internal use by project managers and staff to better understand and track how things are proceeding; internal organisational use, at the regional, national and/or international headquarters level so the agency/organisation/government entity can track a project's or activity's status against plans and expectations, for planning and management purposes and to address accountability requirements of an agency/organisation/government entity's board, funders including the public (Kimweli, 2013). Besides, monitoring is undertaken to address external requirements for compliance and control, such as donor demands for reporting and accountability (Perrin, 2012).

Monitoring could take other forms that are outside organisational needs (Perrin, 2012; UNDP, 2009). For example, monitoring could include citizen report cards concerning public services, advocacy services of many organisations that may track corruption practices,

among others (Perrin, 2012). However, monitoring alone is insufficient for drawing conclusions about attribution or for identifying the reasons why changes have or have not taken place (Perrin, 2012; Tuckermann, 2007). Again, monitoring alone is not sufficient to show the direction an intervention is headed, whether results will be positive or negative; this, therefore, makes evaluation relevant and a necessity (Perrin, 2012; IUCN, 2008).

Evaluation involves the systematic, evidence-based inquiry that seeks to interrogate any aspect of a policy, programme or project (Perrin, 2012; UNDP, 2009). Evaluation uses a wide variety of qualitative and quantitative techniques to provide more comprehensive data regarding the intervention context (Perrin, 2012). Evaluations are undertaken for many different purposes and take several forms (Perrin, 2012). The following are some examples of evaluations: (i) needs assessment; involves assessing the needs or problem situation; (ii) Process evaluation: describe working of an intervention, and are carried out partway through implementation and is intended to improve performance during the subsequent steps of an intervention; (vi) Impact evaluation: seeks to attribute change on a target population to an intervention (Perrin, 2012).

When M&E are combined, they become one fundamental asset to encourage continuous learning for designing better development programmes (Chachu, 2019). Advantages of conducting good M&E include: promoting transparency, fostering accountability, improvement in management and performance regarding effectiveness, efficiency interventions and value for money (Chachu, 2019). Additionally, Essa (2014) outlined the features of successful M&E, as M&E that: is incorporated into an intervention during the early planning stages; focuses on outcomes relevant to the aims and objectives of the intervention and above all, examine them efficiently and without bias (Essa, 2014). When

it's all said and done, the ultimate aim of M&E is to learn what has worked, and what has not, by using the twelfth (12th) component of a functional M&E system (UNAIDS, 2009; Essa, 2014).

### **2.5.1 Indicators for Monitoring and Evaluation**

At the centre of monitoring and evaluation are indicators (Bloom, 2008; Rioux, 2011; Naswa, et al., 2015). In simple terms, an indicator provides a sign or signal that something is true (Bloom, 2008). In addition to measuring programmatic aspects, indicators ought to reflect the objectives and stated goals of an intervention. They demonstrate that activities were implemented as planned, or the intervention influenced a change in the desired outcome (Bloom, 2008).

When choosing indicators for M&E, they need to be planned and selected for all intervention levels namely: inputs, activities, outputs, outcome level and programme impact level (Lamhauge, Lanzi, and Agrawala, 2013). Indicators provide parameters against which to assess project/programme performance and achievement in terms of quality (how many or how much?), time (when?) target group (who?) and quality (how good?) (Rioux, 2011). Indicators can be quantitative (number of people, number of ha, percentage of adoptions), semi-quantitative (scale, ranking) or qualitative (perceptions, opinions or categories) (Rioux, 2011). Measuring and assessing the impact of an intervention through appropriate indicators is a challenging task (Naswa et al., 2015). M&E indicators enable comparison with respect to a baseline for different periods, as well as comparisons across interventions (Naswa et al., 2015).

Choosing indicators depends on the processes that have to be monitored and how accurately the indicators capture the progress (Naswa et al., 2015). M&E indicators focusing on the process and intermediate targets help identify unanticipated problems. This means that corrective action is possible while the programme or project is ongoing, instead of realising that at the actual output is far away from the desired output at the end of the programme (Naswa et al., 2015). Choosing M&E indicators entails several considerations among them: the baseline survey data, priorities based on the availability of resources, tools to be used during measurements, resource requirements and data sources and assumptions. Another important consideration when selecting indicators is the context; local or national (Naswa et al., 2015). In summing up, monitoring and evaluation cannot exist minus appropriate indicators (UNAIDS, 2010).

### **2.5.2 Key FP Programme Impact indicators and their Definitions**

Several indicators have been used to measure the impact of family planning programmes depending on the various evaluation objectives. However, this study will focus on the six discussed below (K4HEALTH, 2019; MEASURE Evaluation, 2019).

*The first indicator is Contraceptive Prevalence Level (CPR).* CPR is the proportion of women of reproductive age who are using a modern contraceptive method (or whose partners are using) at a certain point in time. The indicator is reported for women aged 15 to 49, or who are either married or in a union. (MEASURE Evaluation, 2019). The data requirements for this indicator are the overall number of reproductive-age women, by marital status; and of these, the number that are using modern contraceptives at the moment. Data sources for the indicator are population-based surveys. Besides, the indicator also

provides a measure of population coverage of contraceptive use, taking into account all sources of supply and all contraceptive methods; It has been popular in measuring the performance of family planning programmes at the population level (MEASURE Evaluation, 2019).

The second main indicator that has extensively been used to measure the impact of family planning programmes is the *Unmet Need for family planning*. This indicator is defined as the per cent of fertile women in a union or marriage who desire to either postpone or terminate childbearing but are not using any contraceptive method at the moment (MEASURE Evaluation, 2019). The total of number of or overall percentage or number of women with an unmet need for family planning (U) comprises those with an unmet need for spacing (US) and those with an unmet need for limiting (UL) (MEASURE Evaluation, 2019). The indicator is calculated as follows:  $UL + US = U$  (MEASURE Evaluation, 2019; CBS, 1996).

With regards to data sources for the indicator, population-based surveys are used. This indicator captures data on women at risk of pregnancy with a need for FP because they plan to space or limit births in the future, but do not use any conventional contraceptives. Such women have an "unmet demand" or "unmet need" for FP and are the logical primary audience of programme efforts (MEASURE Evaluation, 2019; CBS, 1996). This indicator was not used in the analyses of this research (CBS, 1996).

The third indicator used to measure the impact of FP programmes is the *Total Fertility Rate (TFR)*. Total Fertility Level (TFR) is the average number of live births women would have if they are lucky enough to survive all their reproductive years. Total Fertility Level is estimated using age-specific birth levels. Age-specific birth level is the number of births

with an increase of five years in reproductive years. TFR is calculated by adding up all age-specific birth rates for a population and multiplying by five (CBS, 1996).

The data Requirements for this indicator are a current schedule of age-specific fertility rates (ASFRs), for one- or five-year age groups while the data Sources are vital statistics (numerator only), population censuses or surveys at the population level (CBS, 1996).

With regards to use of this indicator, TFR is the most widely used fertility measure in FP programme impact evaluations for two main reasons: (1) it is unaffected by differences or changes in age-sex composition, and (2) it provides an easily understandable measure of hypothetical completed fertility (MEASURE Evaluation, 2019; CBS, 1996). The indicator has been widely mentioned in the reviewed literature this study but was not used during the analysis.

Trend analysis is the fourth indicator that has been widely used to measure the impact of family planning programmes (Bartrand, Magnani and Rutenberg, 1994). However, before discussing this indicator, we must flash back to M&E and distinguish the two types of outcomes within the category of population-based evaluation: intermediate and ultimate (long-term). Effect (intermediate outcome) refers to what is a relatively direct and immediate result of programme process and output (e.g., contraceptive prevalence). On the other side, impact (ultimate outcome) refers to the anticipated result of programme process and output in the long-term (e.g., change in fertility rates), but also subject to effects of many non-programme factors (such as socio-economic conditions or status of women) (Pasanen and Shaxson, 2016). Many family planning programmes endeavour to reduce fertility; however, it often takes years to produce this impact. Moreover, if and when it is



achieved, it is difficult to establish the relationship between the family planning programme in question and the fertility decline (given that other factors such as increased levels of education or improved economic conditions may also contribute to the outcome). Thus, programme evaluations often concentrate on the intermediate outcome (effects), which are seen as more directly linked to intervention effort and which are expected to deliver change within a short period. The most common and widely used family planning programme intermediate outcome indicator is contraceptive prevalence level (Bartrand, Magnani and Rutenberg, 1994). Fast forward to trend analysis, the main purpose of the indicator is to reveal the direction of the trend of the chosen intermediate indicator.

The fifth and final indicator used to assess the impact of family planning programmes is *Coverage Gap*. The coverage gap is the gap between the best and worst users of modern contraceptive. Thereafter, we examine the trend of the inequality gap from the baseline, to the end-line to ascertain whether the gap is narrowing down, remained constant or widening further (WHO and World Bank, 2017; Sherri, et al., 2012). To increase the coverage of basic health-care as envisaged in SDG number 3, the number of individuals who are covered by basic health services becomes relevant. Ideally, the method for estimating this number should have two features: i) reflects the people who receive all the basic services they would need (vs affiliation with a health service scheme); and, ii) changes in this number must be measurable. The indicator has gained popularity since the adoption of Sustainable Development Goals (SDGs) and in the year 2015, and was used in a monitoring report of Universal Health Coverage (UHC) (WHO and World Bank, 2017; Sustainable Development Goals, 2019).

In the 2015 UHC monitoring report, it was noted that over 400 million people lacked access to at least 1 of 7 essential services representing MDG priority areas (family planning, antenatal care, births attendance by a skilled health professional, DTP3 immunization, HIV treatment, TB treatment, and ITN use among children). This calculation did not encompass the broad range of basic health-care individuals should receive, and considering an expanded list of services would yield a long list of individuals without coverage for at least one of them. Moreover, this number did not reflect whether any particular individual has full coverage of all the essential services they may need. (WHO, 2015).

At the centre of this indicator is the reliance on tracer indicators that measure coverage of the full package of basic health interventions that should be provided in every nation. The small set of tracer indicators, which measure coverage of essential services over an inclusive range of disease areas and service delivery platforms such as coverage of services among those in need (i.e., the percentage of individuals requiring a service that receive the service), versus access to the actual services (i.e. affiliation with a health coverage scheme, or versus effective coverage with services (i.e. the percentage of those in need who receive services of sufficient quality to realize the potential health gains) among others. These tracer measurements reflect coverage with but do not define, the comprehensive set of basic health-care that should be provided in every country. The calculation has the following steps: i) Select a small set of tracer indicators of health-care coverage with good data availability, drawing from and modifying the tracer measures in the SDG 3.8.1 index. Compute average coverage in every country using these indicators; and, ii) Convert this average coverage to the percentage of people with full coverage (defined as receiving most needed services) in

each country. This is then multiplied by the total population to get the number of individuals with full coverage of basic health-care (WHO and World Bank, 2017; Hogan et al., 2017).

## **2.6 Sustainable Development Goal (SDG) Number 3**

In the year 2015, world leaders from over 150 countries around the globe came together and developed a plan for the future. The plan was meant to succeed the Millennium Development Goals (MDGs) and will expire in the year 2030. This new plan is called the Sustainable Development Goals (SDGs). The SDGs is a set of 17 goals that aspires a world that is devoid of poverty, hunger and safe from the worst effects of climate change by the year 2030. The organisation that is spearheading the implementation of the SDGs is the United Nations Development programme (UNDP). The organisation is present in nearly 170 countries and territories around the globe and is working round the clock to help nations make the goals a reality (UNDP, 2019).

Among the seventeen goals of the Sustainable Development Goals blueprint is goal number three; A world with everyone in good health. In the formulation of this SDG, it was noted that despite the achievements that had been made in achieving the MDG targets with regards to health such as MDG goal 4 Reducing child mortality, MDG goal 5 Improving maternal health and MDG goal 6 Combat HIV/AIDS, Malaria among other diseases, approximately 6 million children still lose their lives before reaching their sixtieth month. Furthermore, over ten thousand children die daily from preventable diseases such as tuberculosis and measles. Besides, women die during pregnancy or from child-birth related complications every day (WHO, 2019).

As a way of checking these deaths, it was proposed that prevention and treatment, education, immunization campaigns and reproductive and sexual healthcare become key strategies of SDGs. The SDG endeavours to eliminate epidemics like tuberculosis, malaria, AIDS among other communicable ailments by the year 2030 (WHO, 2019). Thus the broad goal of this SDG is to achieve Universal Health Coverage (UHC) for all by the year 2030 by providing access to safe besides affordable drugs and vaccines (WHO, 2019).

Under this SDG, there are nine health targets. Of relevance to this study is target number 3.7 that seeks to attain universal access to reproductive health-care among them, family planning by the year 2030 (WHO, 2019). Thus the current focus of the national family planning programme is in achieving the targets of SDG number 3.

## **2.7 Summary of literature review**

Literature review of research was introduced by theoretical perspectives that discussed the demographic transition theory. According to the first stage of the theory, a country experiences high mortality rates and equally high birth rates. High deaths are as a result of limitations in medical technology. As a consequence, individuals die of diseases. Besides, children were regarded as labour commodities. The high birth is a strategy to offset the high death rates, thus assuring the constant supply of labour is maintained. Stage two is characterised by a constant high birth level as death rates decline rapidly thus population increases. This is attributed to improvements in medications and advancement in technology. Stage three is characterised by natural population increasing rapidly as a consequence of continued slow death rates. However, birth rates begin to decline towards equilibrium with the low death levels. Reasons are that the standards of living have immensely improved as a

result of advances in medical technology. Also, women are more educated than before, therefore have immense knowledge on family planning. During stage four of the theory, birth rates and mortality levels converge creating a "balanced and ideal population" that results in more elderly people. Reasons for this trend are: medical technology advancements are at an all-time high, women are more empowered and thus have knowledge on the dividends of family planning, individualism is on the rise, children are viewed as "economic commodities" i.e. the more you have the more you will spend in their education, and influences of urbanization.

The literature review then looked at empirical studies on the methods of assessing family planning programmes in chronological order from the very earliest to recent ones. During the earliest stage (roughly 1960 to the early 1970s), methods that were looked at include Use of acceptor data, Crude rates, standardization and decomposition, Experimental methods, Quasi-experimental methods, Substitution effect methods, and Trend analysis. During the second phase of FP programme evaluation (from the mid-1970s to mid-1980s), FP programmes had become complex in structure. In this regard, programmes were being asked to present more in-depth estimates of programme effects that took to account contextual changes. More attention was paid to understand demand thus large-scale surveys like World Fertility Surveys (WFS) were favoured. In the latest phase (the Mid 1980s to date), FP programmes have become more sophisticated in combining attention both to the determinants of demand and ways of influencing use, while giving closer scrutiny to the components of supply environment and their effects. This marked the start of Demographic Health Surveys (DHS) and what is now termed as the "full marketing strategy" in the assessment of FP programmes and their resulting impacts. As a consequence, multilevel

analysis models and the background factors of women were combined into a more suitable approach of measuring impact that yielded more reliable results.

Background factors influencing use were reviewed. Evidence from literature indicates that background factors like education of a woman, place of residence, region, occupation, wealth category, age, marital status and method mix; in their unique ways, cause contraceptive use among women. From the literature, it would be erroneous to evaluate the performance of the national FP programme using crude rates. This is because the effect of individual-level factors and regions will have not been captured.

Literature review summed up with a section on what monitoring and evaluation entail, the monitoring and evaluation of family planning programmes, indicators for monitoring and evaluation, key family planning programme outcome level indicators, the sources of data for evaluating family planning programmes and a brief discussion of target 3.7 of sustainable development goal number 3.

## **2.8 Conceptual Framework**

This study used a conceptual framework developed under the Evaluation Project by Tsui et al (1992) for measuring family planning demand and programme effect on fertility. The indicators in this conceptual framework measure the following areas: contraceptive practice, service delivery, service output, the policy environment, demand for children, demand FP, service utilization and lastly, fertility (Bertrand, Magnani and Rutenberg, 1994).

According to the conceptual framework, in any country, there are several social economic and cultural factors that operate at a societal level to influence family size. These factors

combine with socio-demographic characteristics and psycho-social factors to influence the preferred family size. Additionally, level of socio-economic development, degree of urbanization, the demand for child labour, old-age support and economic security, the cost of raising children, status of women, kinship structures, conjugal patterns and religious customs are all examples of key factors that determine the demand for children in a given society (Bertrand, Magnani and Rutenberg, 1994; Bongaarts, 1978).

Other than the determinants in society, the demand for children is also affected by the FP supply environment. By making FP services more accessible, one can create demand for these services of achieving pregnancy prevention besides fulfilling a latent demand for spacing or limiting children (Bertrand, Magnani and Rutenberg, 1994).

A comprehensive FP programme consists of several operations. These operations correspond closely to the divisions found in most governmental or private FP programmes which include: supervision, training, commodities and logistics, management, advocacy efforts, and research/evaluation. Specifically, these programmes strive to improve the quantity and quality of FP services available to clients in both the public sector (government programme) and private sector (NGO-sponsored services, private doctors, pharmacies or other commercial outlets). Through Information-Education-Communication (IEC) efforts they seek to create a social climate where FP is acceptable, such that clients will receive social support for their decision to use (Bertrand, Magnani and Rutenberg, 1994).

Adequacy of FP services is measured in terms of service output at the programme level to improve service delivery. By making FP easily accessible and satisfactory to potential clients, the programmes endeavour to achieve the second key output which is enhancing the

utilization of these services. The success of the programme is evaluated by several indicators of service utilization. Service utilization is key because it is closely linked with the key behavioural change sought i.e. increased contraceptive practice among the target population. Contraceptive prevalence level has been the indicator that has been widely used to assess changes in use in the target populations with regards to impact assessment. In analyses of the factors responsible for fertility decline in countries like Kenya, contraceptive use and other intermediate variables or proximate determinants of fertility as presented by Bongaarts (1978) have emerged as the most important considerations in evaluating FP programmes impact evaluation (Tsui, 1992; Bongaarts, 1978).

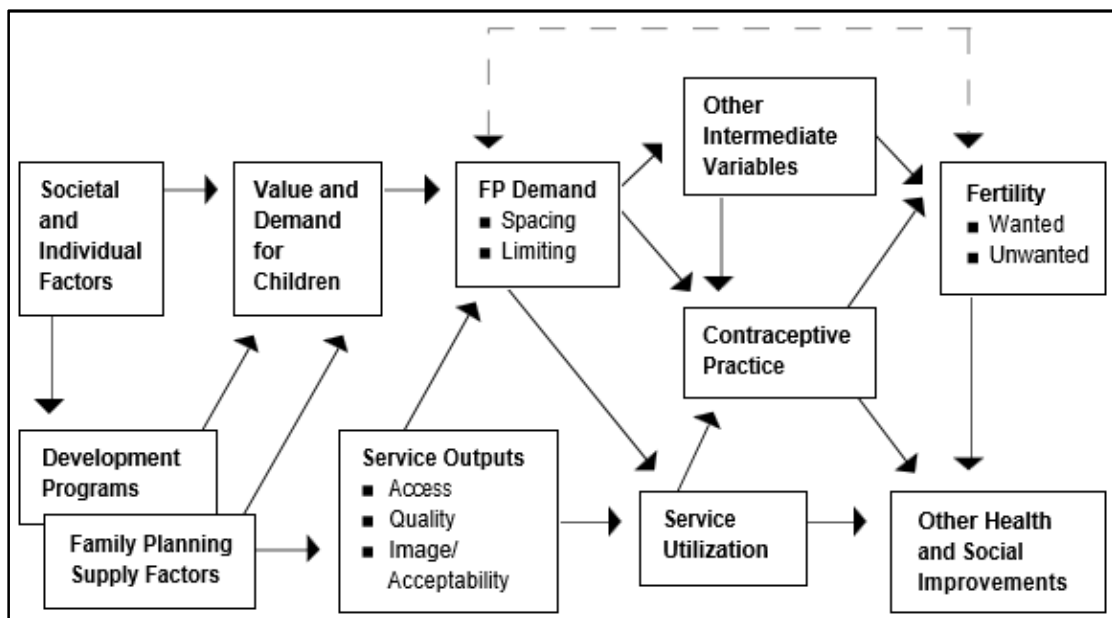


Figure 2.1: Conceptual Framework of Family Planning Demand and Programme Impact on Fertility.

Source: (Bertrand, Magnani and Rutenberg, 1994) page 16.

## 2.9 Operational Framework

The operational framework of this study was modified from the conceptual framework by Tsui et al. (1992) above. The modification focused on social-economic, cultural, socio-



demographic characteristics and psycho-social factors that operate at the societal and individual level to influence use that then will be examined to assess the inequality gap in each. These factors combined with knowledge of and access to FP influence desired family size at the individual level.

The framework has two categories of variables: Direct determinants and indirect determinants. The direct determinants are selected family planning programme variables while indirect determinants are selected socio-economic characteristics and region of a woman. In this regard, the selected FP programme variables for the study are the intervention that is meant to promote contraceptive use among reproductive women in Kenya. The background characteristics were further divided into two categories-individual factors and community/societal factors. Individual-level factors included: age, marital status, level of education, employment status and wealth index. Community-level factors that were considered were region and place of residence. These variables (direct determinants and indirect determinants) operate individually or collectively to cause a woman not to use or use contraceptive in Kenya.

To measure demand for FP services, the variable desire for more children was used where respondents were asked whether they plan to have more children within a certain period. Those who did not desire to have no more children and those who planned to postpone child bearing were considered as having the greatest demand for family planning.

Contraceptive use is the outcome variable and has a dichotomous response of "0" for not using and "1" for use. The results of the association with the independent variables enabled the examination of the inequality gap by each background factor as a way of estimating the

coverage gap. All the direct and indirect determinants as explained in the foregoing paragraph were independent (See figure 2.2 below for illustration).

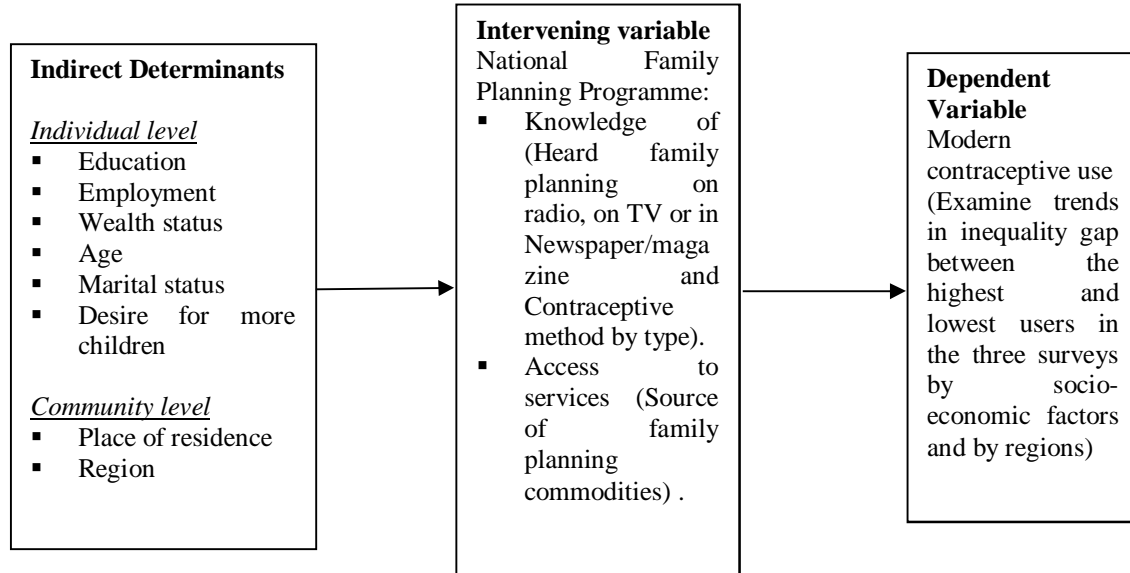


Figure 2.2: Operational Model of the Study

## 2.10 Operational Hypotheses

Following the review of literature under section 2.4 of this chapter, the following hypotheses were formulated for each variable:

- i. Higher education is likely to influence modern contraceptive use in a woman.
- ii. Employment is correlated with contraceptive use in a woman.
- iii. A woman in the richest wealth category is more like to use modern contraceptives compared to a woman from the poorest category.
- iv. Age is likely to influence contraceptive use of a woman.
- v. Marriage is positively correlated with modern contraceptives use.

vi. A woman living in an urban area is likely to use modern contraceptive methods than a woman living in a rural area.

vii. Region of residence is likely to influence modern contraceptive use of a woman.

viii. Knowledge of family planning has a positive effect on contraceptive use of a woman.

The overall hypothesis of this study is presented below as:

- i. The national family planning programme has reduced the inequality gap in modern contraceptive use by socio-economic factors and by regions from the baseline to the end-line and thus has increased the coverage gap.

## **CHAPTER THREE**

### **METHODOLOGY**

#### **3.1 Introduction**

This chapter presents the source of data and methods of data analysis that were used in this study.

#### **3.2 Sources of Data for Evaluating Family Planning Programmes**

The evaluation of family planning programmes usually entails both population-based and programme-based data. Although there are several data sources for evaluating FP programmes, the vast majority of programme evaluation is centred on the following data sources: Output programme-based measures rely on programme records, especially service statistics, facility surveys, commercial sector data and special studies while outcomes which are largely population-based rely on Demographical Health Surveys (DHS)-type household surveys (Bertrand, Magnani, and Rutenberg, 1996; DHS, 2019).

Because this study relied on population-based data, the author focused more on this source of data for FP programme evaluation. The primary tool for collecting population-based data for FPP assessments is by way of survey such as the Demographic Health Survey (DHS, 2019). Following in the footsteps of the Contraceptive Prevalence Survey (CPS) and World Fertility Survey (WFS), the Demographic and Health Survey (DHS) is conducted among a representative sample of women in their reproductive ages in a given country (Bertrand, Magnani and Rutenberg, 1996). The Demographic Health Survey (DHS) core questionnaire consisting of some 250 questions that provide comprehensive data on fertility and FP, on top

of information on mother and child health, services utilization, and related topics (Bertrand, Magnani and Rutenberg, 1996; DHS, 2019).

Several indicators are used to measure the impact of Kenya's family planning programme during the Kenya Demographic and Health Surveys (KNBS, 2015). These indicators include: Knowledge of a contraceptive method in Kenya; Current use; Use of contraception by background characteristics; Trends in use of contraception at the moment; Timing of sterilization; Source of contraception; Informed choice; Contraceptive discontinuation rates; Reasons for discontinuation of use; Knowledge of fertile period; among others (KNBS, 2010; CBS, 2004; KNBS, 2015).

The Kenya Demographic and Health Surveys have provided a wealth of information that has been instrumental in the evaluation of population and health interventions in Kenya. A programme that has heavily been evaluated with these data is Kenya's Family Planning Programme (FPP) (CBS, 2003; KNBS, 2010; KNBS, 2015; The World Bank, 2016).

### **3.3 Source of Data for the Study**

This study relied on secondary data from three Kenya National Demographic and Health Surveys (KDHS) conducted in the year 2003, 2008-09 and 2014. The surveys captured information on background factors, among other health issues, from a sample of women in the reproductive ages of 15-49 (KNBS et.al, 2010). Of the samples selected in all the three surveys, 8,561 were successfully interviewed in 2003; 8,444 in 2008-09 and 36,430 in 2014. Due to the devolved structure of government that paved the way for the counties, the sample for the year 2014 was increased to include more households for purposes of producing estimates in the new administrative units. In all the three surveys, the response rates were

96% or above. The study focused on all women in Kenya in their reproductive ages. The main objective was to estimate the trends of inequalities in the use of modern contraceptives among women in Kenya by background factors from the year 2003 to the year 2014. The data for KDHS 2003 was used as the baseline data for this study while data for KDHS 2008-2009 and KDHS 2014 as the second and third points in time respectively. Data for the two last points were used to determine the extent to which the national FP programme improved modern contraceptive use from the baseline within that period by showing the direction of the trend of inequalities in use.

During the three demographic and health surveys, the women's Questionnaire captured information from all women in ages 15-49 years and covered the following topics: respondent's background characteristics (e.g., residential history, education, media exposure) and knowledge and use of family planning methods (KNBS et.al, 2009; KNBS et.al, 2015; CBS et.al, 2004).

### **3.4 Methods of Data Analysis**

The main methods of data analysis that were used for this study include descriptive statistics, logistic regression and multilevel logistic regression. The reason why two types of logistic regressions are being used in the study is to control for confounding during analysis. Two techniques are used to control for confounding during analysis. The first one is by way of multivariate analysis and the second one is by stratification. In multivariate analysis, logistic regression is used to control more than a single confounder simultaneously. In stratification, the association between the independent variables and the dependent variable are examined in different strata of the confounder. The methods are discussed below.

### 3.4.1 Descriptive Statistics

For purposes of this study, descriptive statistics were used to describe the distribution of background characteristics of women in the study population. Besides, Cross tabulations with Chi-Square statistic were used to measure the strength of relationships between the outcome variable of interest (Contraceptive use) and selected explanatory variables, while at the same time, testing hypotheses. The basic computational equation is given as:

$$X^2 = \sum_{i=1}^n \frac{(O - E)^2}{E}$$

Where:

**O** = Observed frequency for each cell.

**E** = Expected frequency for each cell.

**Σ** = Sum (Sigma).

Because data analysis at the individual level ignores the nesting of people within clusters (regions), which may lead to the underestimation of standard errors thus increasing the chances of incorrect results, further analysis is was required. Additionally, the Chi-Square is also limited since it only gives the strength of the association between the dependent and explanatory responses. It doesn't indicate the magnitude of the association and also the direction of effect of the association. To establish both the magnitude and the direction of effect of the explanatory variables and the dependent variable, this study used multilevel logistic regression a derivative of logistic regression (Pourhoseingholi, et al., 2012).

However, before discussing multilevel logistic regression, a look at logistic regression is necessary.

### 3.4.2 Logistic Regression

Logistic regression sometimes called the logistic model or logit model, analyses the relationship between multiple independent variables and a dichotomous outcome variable. It estimates the probability of an event taking place (Menard, 2001). The two main types of logistic regression include multinomial logistic regression as well as binary logistic regression. Binary logistic regression is used to estimate the odds of being a case based on the independent variable values. When the outcome variable is non-dichotomous, a multinomial logistic regression is applied (Bewick, Cheek, and Ball, 2005). In logistic regression, odds are important. Odds of an event are the probability ratio that the event will happen against not happening. With the chance of an event occurring being  $p$ , the chance of the event not occurring is  $(1-P)$ . The resulting odds are a value given by:

$$\text{Odds of \{Event\}} = p/1-p$$

Logistic regression measures the likelihood of an event taking place against the probability of an event not occurring (Long, 1997). With logistic regression, we model the natural log odds as a linear function of the explanatory variable as:

$$\text{Logit}(y) = \ln(\text{odds}) = \ln(p/1-p) + a + \beta x \dots \dots \dots (1)$$

Where:

- $P$  =Probability of interested outcome
- $X$  = Explanatory variable
- $a$  and  $\beta$  = Parameters of the logistic regression

Taking the antilog of equation (1) on each side of the equation, an equation for prediction of the probability of the occurrence of interested outcome is derived as:



$$P = P(Y = \text{Interested outcome}/X = x, \text{ a specific value})$$

$$\frac{e^{a+\beta x}}{1+e^{a+\beta x}} = \frac{1}{1+e^{-(a+\beta x)}}$$

To extend the logic of the simple logistic regression to multiple predictors, one may construct a complex logistic regression as:

$$\text{Logit } (y) = \ln \left( \frac{P}{1-p} \right) = a + \beta_i X_i + \dots + \beta_k X_k$$

Therefore:

$$P = P(Y = \text{Interested outcome}/X_1 = X_1, \dots, X_k = X_k)$$

$$= \frac{e^{a+\beta_1 X_1 + \dots + \beta_k X_k}}{1+e^{a+\beta_1 X_1 + \dots + \beta_k X_k}} = \frac{1}{1+e^{-(a+\beta_1 X_1 + \dots + \beta_k X_k)}}$$

An important component of logistic regression is odds ratio (Park, 2013) Odds ratio (OR) is a comparative measure of two odds relative to different events. For two event A and B, the corresponding odds of A occurring relative to B occurring is:

$$\text{Odds ratio } \{A \text{ vs } B\} = \text{odds}\{A\}/\text{odds}\{B\} = P_A/(1-P_A)/P_B/(1-P_B)$$

An OR is a measure of association between an exposure and an outcome. The OR represents the odds an outcome (e.g. disease) will occur given a particular exposure (e.g. health behaviour), compared to the odds of the outcome occurring in the absence of that exposure (Menard, 2001). When a logistic regression is calculated, the regression coefficient (bi) is the estimated increase in the logged odds of the outcome per unit increase in the value of the outcome variable. OR can also be deployed to estimate if a particular exposure is a risk factor for a particular outcome, and to measure the magnitude of various risk factors for that outcome. OR = 1 indicates exposure does not affect odds of outcome; OR >1 indicates exposure associated with higher odds of outcome while OR <1 indicates exposure associated with lower odds of outcome (Peng and So, 2002).

Several assumptions ought to be considered in logistic regression. Some include: it requires the outcome variable to be dichotomous; the model should be fitted correctly i.e. should not be fitted with irrelevant variables and should not be under fitted with relevant variables excluded; logistic regression requires each observation to be independent; the explanatory variables should be linearly related to the log odds of event of interest and finally logistic regression requires large sample sizes (Hosmer and Lemeshow, 2000).

### 3.4.3 Multilevel Logistic Regression

During this stage of analysis, a multilevel analysis was employed by way of multilevel logistic regression to test the relationship between the outcome variable of interest and independent variables. The reasons of using multilevel modelling are a) the data (DHS) that have been used have several levels (community level, programme level, individual level); b) social phenomena are not independent-they are nested in hierarchies, which make them dependent on each other (Eini, 2005). Using traditional methods such as "Ordinary Least Square" (OLS) ignores "Intra Cluster Correlation" (Proportion of the total variance that is between clusters), and c) utilization of single-level variance component model ignores per cent of the total variance of fertility which is related to intra clusters proportion.

The multilevel analysis involved three levels (individual, community and Family Planning Programme factors). At the onset, the units of analysis were individuals and were analysed by the following equation:

$$y_{ij} = b_{0j} + b_{1j}I_{ij} + \varepsilon_{ij} \quad \varepsilon_{ij} \sim N(0, \sigma^2); \dots \text{Equation 1}$$

Where:

$$b_{0j} = \text{Constant}$$

$Y_{ij}$  = Outcome variable of the  $i^{th}$  individual in context (which in this case is the log odds ratio)

$I_{ij}$  = Individual level variables for the  $i^{th}$  individual in context

$\epsilon_{ij}$  = Individual level errors assumed to be independent and normally distributed with a mean of 0 and a variance of  $\sigma^2$

In the second stage, the units of analysis were groups and were given by the equations:

$$b_{oj} = y_{00} + y_{0j}c_j + u_{oj} \quad u_{oj} \sim N(0, \tau_{00}); \dots \text{Equation 2}$$

$$b_{ij} = y_{10} + y_{11}c_j + u_{ij} \quad u_{ij} \sim N(0, \tau_{11}); \dots \text{Equation 3}$$

$$Cov(u_{oj}, u_{ij}) = \tau_{10}$$

Where:

$C_j$  = Community level factors

$(U_{oj}, U_{ij})$  = Errors in the group level equations assumed to spread normally with mean 0 and variance  $\tau_{00}$  and  $\tau_{11}$

$$y_{ij} = y_{00} + y_{01}c_j + y_{10}I_{ij} + y_{11}c_jI_{ij} + u_{oj} + u_{1j}I_{ij} + \epsilon_{ij}; \dots \text{Equation 4}$$

Where:

$Y_{ij}$  = Is the outcome variable of interest of the  $i^{th}$  individual in the  $j^{th}$  region

$Y_{00}$  = Constant

$y_{01}$  = Fixed effect of group level variables

$y_{10}$  = Variables at the individual level

$u_{oj}$  = An intercept component that is random

$u_{1j}$  = A random slope component

$(\epsilon_{ij})$  = The individual level errors

The advantage of multilevel analyses is that they allow examining a variety of interrelated variables. The fixed-effects coefficients in the equation can be used to estimate the independent effects of group-level variables ( $\mathbf{y}_{o1}$ ), individual-level variables ( $\mathbf{y}_{10}$ ), and their interaction with individual-level outcomes. Besides, errors for observations within groups are correlated because  $\mathbf{u}_{oj}$  and  $\mathbf{u}_{1j}$  are common for observations within each group and the variance of the complex error is not constant because it depends on ( $\mathbf{u}_{oj}$ ) and ( $\mathbf{u}_{1j}$ ), as well as on the value of ( $I_{ij}$ ) (Ana, 2000).

### **3.5 Variables and their measurement**

Contraceptive use was the outcome variable for this study and was dichotomous. Secondary analysis began with logistic regression to get the crude odds then followed by multilevel logistic regression for the adjusted odds. The independent variables were: background factors specific to individual women such as, education, wealth index, age, marital status, occupation and desire for more children; community-level factors which were represented by region and place of residence and finally, variables that were used to measure the impact of family planning programme in proxy such as source of contraceptive commodities, source of family planning information and contraceptive use by method type. The main indicator that was used in this study is inequality gap and was used to measure the performance of the national family planning programme by examining the inequality gap by socioeconomic factors and by regions to ascertain the coverage gap (*see Table 3.1 for elaboration*). To do this, the difference between the crude odds ratios and adjusted odds ratios of the highest and lowest users were calculated and converted to percentages from the baseline survey to the end line survey and their trend examined to assess whether the inequality gap is narrowing

down or widening. With regards to adjusted coverage gap, the odds ratios of the highest and lowest users were converted to probabilities, multiplied by 100; with the difference being the adjusted coverage gap.

Sustainable Development Goal 3.8 focuses on more than just population coverage. The goal seeks to realise Universal Health Coverage (UHC) by eliminating financial barriers, enhancing access to quality key health services including access to safe, affordable yet effective medicines including vaccines for everybody globally. One of the two indicators adopted for this goal by the United Nations Statistical Commission is Coverage of essential health services. The measure is described by the provision of health services on the basis of tracer measures such as maternal and child health; infectious diseases and access by the entire and marginalised individuals/groups in society (WHO, et al., 2017; GBD SDG Collaborators, 2017; WHO, 2017; WHO, 2017).

In this regard, when assessing performance towards Universal Health Coverage (UHC), the indicator used should not only focus on the proportion of the population able to access Family Planning Services but also measure effective service coverage. Further, the indicator should also be able to be disaggregated by key dimensions of inequality such as by wealth quantile, education attainment, place of residence, by region, by gender and by age (WHO, 2017).

Table 3. 1: Summary of variables that were used for the study and their measurements

Objective	Variable Name	Measurement	Type of variable
<b>Outcome variable</b>			
Examine gap between the highest and lowest users in the three surveys by socio-economic factors and by regions.	Modern contraceptive use (Examine trends in inequality gap between the highest and lowest users in the three surveys by socio-economic factors and by regions)	0 = Not Using 1 = Using	Dependent
<b>Determinants of contraceptive use</b>			
Establish whether education level has influence on modern contraceptive use	Education level	0 = No Education 1 = Primary 2 = Secondary 3 = Higher	Independent
Investigate whether occupation has influence on a woman using contraceptives	Employment status	0 = Not Working 1 = Working	Independent
Ascertain whether age plays a role in influencing a woman to use modern contraceptive use	Age group	1 = 15-19 2 = 20-24 3 = 25-29 4 = 30-34 5 = 35-39 6 = 40-44 7 = 45-49	Independent
Establish whether wealth status of a woman has influence on use of modern contraceptives	Wealth	1 = Poorest 2 = Poorer 3 = Middle 4 = Richer 5 = Richest	Independent
Establish use of contraceptives by marital status	Marital status	0=Never in Union 1=Married 2=Living with partner 3=Widowed 4=Divorced 5=Separated	Independent
Estimate demand for family planning in Kenya	Desire for more children	1= Wants within 2 years 2= Wants after 2 years 3= Wants, unsure timing 4= Undecided 5= Wants no more	Independent
<b>Community-level factors</b>			
Examine whether regional differences play a role on how women in Kenya use modern contraceptives.	Region of residence	1 = Nairobi 2 = Rift Valley 3 = Western 4 = Nyanza 5 = North Eastern 6 = Central 7 = Coast 8 = Eastern	Independent

*Continuation of Table 3.1*

Ascertain whether place of residence has influence on modern contraceptive use	Place of residence	1 = Urban 2 = Rural	Independent
<b>Proxy variables for measuring family planning programme performance</b>			
Establish the most preferred modern contraceptive methods	Contraceptive method by type	0 = Not using 1 = Pill 2 = IUD 3 = Injections 4 = Diaphragm 5 = Condom 6 = Female sterilization 7 = LAM 8 = Other	Independent
Ascertain the sources of family planning contraceptives for women in Kenya	Source of family planning commodities	1 = Government 2 = Private clinic 3 = Pharmacy 4 = NGO 5 = Shop, Church Friend 6 = Other	Independent
Establish the source used by most women to get family planning information	Heard family planning on radio	0 = No 1 = Yes	Independent
	Heard family planning on TV	0 = No 1 = Yes	Independent
	Heard family planning in newspaper/magazine	0 = No 1 = Yes	Independent

## CHAPTER FOUR

### TRENDS IN INEQUALITIES IN USE OF FAMILY PLANNING AMONG WOMEN OF REPRODUCTIVE AGE IN KENYA KDHS 2003, 2008/09 AND 2014

#### 4.1 Introduction

The results of this study are discussed in this chapter. The chapter comprises the following sections: descriptive characteristics of the study population, bivariate analysis results of the proportion of women using contraceptives, logistic regression results presenting crude odds ratios and multilevel logistic regression analysis results presenting the adjusted odds ratios.

#### 4.2 Descriptive Characteristics of the Study Population

This section describes the distribution of characteristics in the study population by individual level, community level and selected family planning programme factors in the three surveys. The results of this analysis are presented in *Table 4.1*.

Results from the three surveys show that 27.8 per cent of respondents in the 2003 survey were using modern contraceptives, 30 per cent were using in the 2008/09 survey, while 38.7 per cent were using in the 2014 survey.

With regards to age, the age group 15-19 registered the highest number of respondents in 2003 at 22.2 per cent with the age group 45-49 having the least sampled use at 6.2 per cent. Similar results were registered in the 2008/09 and 2014 surveys. However, in the 2014 survey, there was a slight reduction in the number sampled in the age group 15-19 at 19.6 per cent.



Women with no education were 15.8 per cent in the 2003 survey, those with primary level education were the highest at 53.1 per cent, secondary education 24.1 per cent, with those having higher education at 7.1 per cent. There were low education levels among respondents with about half having primary school as their highest level in all the three surveys (*Table 4.1*). Additionally, between 13% and 16% of the women had no formal education; the proportions however reduced with time. On the other hand, the percentage of women who achieved higher education (above secondary level) increased from 7.1% in 2003 to 8.5% in 2008/09 and finally 8.6% in the 2014 survey. This shows that literacy levels are improving.

With regards to employment, there was a significantly low per cent (56%) of working women in the 2008/09 survey compared to the other surveys. Unexpectedly, the proportion of women classified in the richest wealth index showed a downward trend from 31% in 2003 to 28% in 2008/09, then 19% in 2014.

Concerning marital status, the proportion of use by married women increased from 54% in 2003 to 55% in 2008/09 and 57% in 2014. The per cent of separated women (no longer living with husband) also increased with time.

With regard to desire for more children, an indicator that was used to measure demand, women who did not want more children were the highest users in all the three surveys at 35.9 per cent in 2003, 37.1 per cent in 2008-09 and 38.8 per cent in 2014 respectively. This group was followed by those who want children after two two years at 31.8 per cent in 2003, 31.9 per cent in 2008-09 and 36.3 per cent in 2014. The least users were the undecided group in all the three surveys at 3.6 per cent in 2003, 4.3 per cent in 2008-9 and 5.3 per cent in 2014 respectively.

As far as community-level factors such as region and place of residence are concerned, the highest number of the sampled women in 2003 lived in the former Central Province (16%) and Rift Valley (16%) while the lowest lived-in North-Eastern (5%) as shown in *Table 4.1*. In 2008, Nyanza and Western provinces recorded the highest number of women who were sampled, while North-Eastern had the lowest with a percentage of 16%, 15% and 7% respectively. A significantly higher percentage (29%) of women sampled in 2014 lived in the Rift valley, followed by Eastern Province (17%) while Nairobi Province had the lowest (3%). Majority of the women (more than 60%) who participated in the study were living in rural areas in all the three surveys. Particularly, the 2008/09 survey had the highest percentage (69%) of women living in rural areas compared to the other two surveys.

The common specific types of contraceptive methods being used were found to be injections followed by the pills in the three surveys. The use of condoms was low (1.8%) in the 2003 survey but increased to 3.1% in 2008/09 then reduced to 2.5% in 2014. The most popular source of contraceptives was from the government clinic or pharmacy; however, a large proportion of women also acquired contraceptives from private clinics. The use of contraceptives from the government clinics/pharmacy increased significantly over the years (from 52% in 2003 to 65% in 2014), while acquisition from private clinics reduced, from 36% in 2003 to 19% in 2014.

The results from two surveys (2008/09 and 2014) showed that radio stations are the most effective method of creating awareness on contraceptives compared to other methods. This was due to increased media communication in the form of radio programmes and advertisements mainly from the government among other stakeholders, meant to increase awareness on family planning (Ministry of Health, 2012). Over 65% of the women in the

two surveys reported that they had accessed family planning information via a radio station in the previous few months while approximately a third, heard from the televisions and newspaper/magazines (Table 4.1).

Table 4.1: Descriptive characteristics of the study population during the three surveys

Study variables	KDHS YEAR					
	2003 (n=8,195)		2008/09 (n=8,444)		2014 (n=31,097)	
	Frequency	Percent	Frequency	Percent	Frequency	Percent
<b>Individual level factors</b>						
<b>Current use</b>						
Not using	5919	72.2	5913	70.0	19047	61.2
Using	2276	27.8	2531	30.0	12032	38.7
<b>Age group</b>						
15-19	1820	22.2	1767	20.9	6078	19.6
20-24	1710	20.9	1744	20.7	5405	17.4
25-29	1400	17.1	1423	16.9	5939	19.1
30-34	1116	13.6	1180	14.0	4452	14.3
35-39	859	10.5	930	11.0	3868	12.4
40-44	780	9.5	730	8.6	2986	9.6
45-49	510	6.2	670	7.9	2351	7.6
<b>Education level</b>						
No education	1291	15.8	1242	14.7	4183	13.5
Primary	4348	53.1	4402	52.2	15613	50.2
Secondary	1975	24.1	2084	24.7	8595	27.7
Higher	581	7.1	714	8.5	2688	8.6
<b>Employment Status</b>						
Not working	3247	39.7	3739	44.4	5630	38.4
Working	4939	60.3	4684	55.6	9034	61.6
<b>Wealth index</b>						
Poorest	1376	16.8	1699	20.1	7262	23.4
Poorer	1306	15.9	1284	15.2	5970	19.2
Middle	1381	16.9	1455	17.2	5946	19.1
Richer	1568	19.1	1617	19.1	5948	19.2
Richest	2564	31.3	2389	28.3	5943	19.1
<b>Marital status</b>						
Never in union	2466	30.1	2540	30.1	8575	27.6
Married	4449	54.3	4682	55.4	17751	57.1
Living with partner	427	5.2	359	4.3	1285	4.1
Widowed	337	4.1	351	4.2	1191	3.8
Divorced	143	1.7	118	1.4	721	2.3
Separated	373	4.6	394	4.7	1556	5.0
<b>Desire More Children</b>						
Wants within 2 years	1047	13.6	1000	12.4	1558	10.9
Wants after 2 years	2445	31.8	2562	31.9	5165	36.3
Wants, Unsure timing	1167	15.2	1156	14.4	1242	8.7
Undecided	275	3.6	343	4.3	749	5.3
Wants no more	2763	35.9	2981	37.1	5515	38.8

Continuation of Table 4.1

<b>Community level factors</b>						
<b>Region of residence</b>						
Nairobi	1169	14.3	952	11.3	999	3.2
Central	1314	16.0	973	11.5	3114	10.0
Coast	938	11.4	1149	13.6	3902	12.6
Eastern	993	12.1	1127	13.3	5247	16.9
Nyanza	1025	12.5	1318	15.6	4254	13.7
Rift Valley	1328	16.2	1278	15.1	9059	29.1
Western	991	12.1	1039	12.3	2840	9.1
North Eastern	437	5.3	608	7.2	1664	5.4
<b>Type of residence</b>						
Rural	5444	66.4	5829	69.0	19465	62.6
Urban	2751	33.6	2615	31.0	11614	37.4
<b>Family Planning Programme factors</b>						
<b>Type of Contraceptive method</b>						
Injections	828	10.1	1092	12.9	5516	17.7
Pill	399	4.9	390	4.6	1439	4.6
Periodic abstinence	347	4.2	222	2.6	813	2.6
Female sterilization	250	3.1	242	2.9	652	2.1
Condom	145	1.8	259	3.1	786	2.5
IUD	136	1.7	105	1.2	614	2.0
Implants/Norplant	95	1.2	108	1.3	1969	6.3
Withdrawal	30	0.4	44	0.5	143	0.5
Lactational amenorrhea (LAM)	0	0.0	28	0.3	20	0.1
Other	45	0.5	39	0.5	51	0.2
<b>Source for Current users</b>						
Government clinic/pharmacy	970	52.3	1192	54.5	7139	65.3
Government home/community delivery	na	na	18	0.8	55	0.5
NGO	na	na	29	1.3	235	2.2
Private clinic/delivery	664	35.8	541	24.7	2088	19.1
Pharmacy	125	6.7	252	11.5	964	8.8
Shop, church, friend	92	5.0	142	6.5	401	3.7
Other	2	0.1	14	0.6	47	0.4
<b>Source of FP information</b>						
Radio	na	na	5484	65.0	9944	67.5
Television	na	na	3098	36.7	5477	37.2
Newspaper/magazine	na	na	2716	32.2	3417	23.8

Source: Primary analysis KDHS 2003, KDHS 2008/09 and KDHS 2014  
na: Not applicable

### **4.3 Bivariate Analysis Results of Proportion of women using**

A Bivariate analysis was conducted in all the three surveys with the sole purpose of identifying the proportion of women who use modern contraceptives in Kenya and thus enable the assessment of the trends in the coverage gap. The results of the bivariate analysis using Chi-square test showed significant relationships between all background characteristics of the study and contraceptive use in the three surveys. Also, it was established that inequalities in use by socio-economic factors and by regions exist in all the three surveys. The results of this analysis are presented in *Table 4.2*.

According to the bivariate analysis results, there is one advantage of the programme. Throughout time, the proportion of women who used modern methods of contraception has increased. However, there are still differences with regards to the coverage gap by socioeconomic factors and by regions.

With regards to age and marital status, they were also significantly associated with modern contraceptive use. The proportion of women using contraceptives was higher (44%) among women of 35-39 years in 2003 than any other age group. In the 2008/09 and 2014 surveys, women of the 30-34 age group had a significantly high use of contraceptives. In the 2003 KDHS, married women (39%) mostly used contraceptives followed by those living with their partners (35%). This trend however reversed in 2008/09 and 2014 surveys whereby, more women living with their partners used contraceptives followed by married women. Also, the percentage of women using modern methods increased with time.

With regards to education, it is the first socio-economic indicator of measuring inequality in modern contraceptive use of the family planning programme commodities. The proportion

of women using contraceptives was directly correlated with education level in the first two surveys (2003 and 2008/09); the higher the education level, the higher the proportion of women who use modern contraceptives. The 2014 survey followed the same trend, however, more women (44%) whose highest education level was primary school, used contraceptives compared to the ones whose highest level was secondary school (40%). In the 2003 survey, the coverage gap was 39.6, it then increased slightly to 36.9 in the 2008/09 survey and registered a further slight reduction to 36.4 in the 2014 survey. This is an indicator showing that inequalities in modern contraceptive use by education remained between 2003 and 2014.

With regards to employment status and use, it is the second indicator of measuring inequality in use. The employment status of a woman was seen to be positively related to contraceptive use in all surveys. A higher percentage of working women used contraceptives than those not working. Further, this percentage increased from 35% in 2003 to about 51% in 2014. Even though the use of modern contraceptives improved over time from the baseline, inequalities in access still exist. In the 2003 survey, the coverage gap was 19 followed by a slight widening of 21.2 in the 2008/09 survey. However, in the 2014 survey, the coverage gap widened even further to 30.3.

Desire for more children was an indicator used in the study to measure demand for FP services in the three surveys. According to the findings, the use of family planning by women who do not want more children was 40.4 per cent in 2003; it then slightly dropped to 31.2 per cent in 2008-09, then increased to 40.9 per cent in 2014. In the 2003 survey, those in the group that wanted children but were unsure of the timing were the least users at 8.7%. However, the trend changed in the 2008-09 and 2014 surveys with the group with the least users being those who were undecided at 26.8 per cent and 26.0 per cent respectively. With

regard to the coverage gap of this indicator, the year 2003 had a gap of 31.7% that dropped to 4.4% in the 2008-09 survey then rose to 18.8% in 2014. Although the gap seems to be narrowing down, inequalities in use still remain.

The third socio-economic indicator that this study used to measure the coverage gap of the national family planning programme is the wealth index. It was noted that a positive correlation existed between wealth index and current use of contraceptives. Increase in wealth led to an increase in proportions of women using contraceptives in all the three surveys. However, a slight change was observed in the 2014 survey whereby the proportion of women using contraceptives peaked in the middle category (46%) then slightly declined towards the richest category (44%). In all the three surveys, while the use of modern contraceptives improved over time, inequality in use remained, with a coverage gap 23.4 in 2003, 25.8 in 2008/09 and 25.3 in 2014.

Another key indicator that was studied was coverage gap by regions. According to the results, the regions that registered the lowest use in all three surveys was North Eastern barely at 3%; with Central being the region with the highest users in all the three surveys at 42.2% in 2003, 44.3% in 2008/09 and 51.3% in 2014 respectively. In the 2003 and 2008/09 surveys, the coverage gap stood at 42 while in the 2014 survey the coverage gap widened to 48.5. This is an indicator of inequality in use by regions widening further.

The final indicator examined in this study was coverage gap by place of residence. With regards to this indicator, urban areas registered the highest use compared to rural areas in all the three surveys. Regarding the coverage gap between the rural areas and urban areas, in the 2003 survey, it was 5.9, it then widened to 7.3 in the 2008/09 survey then reduced to 4.7

in the 2014 survey. This is an indicator of inequalities in use still existing by place or residence but coverage gap reduced and is the smallest compared to other social groups.

Overall, it was noted that there has been a great improvement in modern contraceptive use from the baseline to the 2014 survey. The increased use of contraceptive in 2014 survey can partly be accredited to efforts by the national government to scale up family planning programme in the year 2008-09 (Ministry of Medical Services, 2009). One of the efforts by the government was the revision of the national reproductive health strategy covering the period 1997-2010, with a new one, that covered the period 2009-2015, with purpose for the revision being to provide clear guidelines and the alignment of the new strategy with the implementation of the National Reproductive Health Policy which was launched earlier in the year 2007 (Ministry of Public Health and Sanitation; Ministry of Medical Services, 2009). Besides, Kenya made her FP2020 commitment during the London 2012 Summit on Family Planning that included specific investments in policy, financial, and programme service delivery to meet the family planning goals of the country (Family Planning 2020, 2016). However, despite all these efforts, inequalities in use by socio-economic factors and by regions still exist.

The trends in contraceptive use among women by their source of information on family planning the previous few months before the surveys were analysed. These variables were used to measure elements of the family planning programme effort. Use of contraceptives was significantly higher among women who heard about family planning through the media- specifically on radio, television, newspaper or magazine a few months before the surveys than those who did not; for both surveys (2008/09 and 2014). The proportion of women using contraceptives increased over the years (*See Table 4.2*).



Table 4.2: Bivariate analysis results of the proportion of women using modern contraceptive in the study.

Study variables	KDHS YEAR		
	2003 (%)	2008/09 (%)	2014 (%)
<b>Individual level factors</b>			
<b>Age Group</b>			
15-19	6.5	6.5	8.6
20-24	20.9	26.7	37.9
25-29	35.4	37.5	49.8
30-34	40.9	45.6	53.1
35-39	43.9	41.4	50.9
40-44	40.5	40.4	45.6
45-49	30.6	30.0	34.6
Coverage gap	34.4	39.1	44.5
<i>X<sup>2</sup> P value &lt;0.001 df = 1</i>			
<b>Education</b>			
No education	8.6	7.9	11.2
Primary	27.1	31.3	44.0
Secondary	35.7	35.3	39.7
Higher	48.2	44.8	47.6
Coverage gap	39.6	36.9	36.4
<i>X<sup>2</sup> P value &lt;0.001 df = 1</i>			
<b>Employment Status</b>			
Not working	16.3	18.2	20.5
Working	35.3	39.4	50.8
Coverage gap	19	21.2	30.3
<i>X<sup>2</sup> P value &lt;0.001 df = 1</i>			
<b>Wealth index</b>			
Poorest	11.0	12.0	20.6
Poorer	23.3	27.7	42.2
Middle	29.7	33.1	45.9
Richer	33.7	36.2	45.4
Richest	34.4	37.8	43.5
Coverage gap	23.4	25.8	25.3
<i>X<sup>2</sup> P value &lt;0.001 df = 1</i>			

Continuation of Table 4.2

<b>Marital status</b>			
Never in union	8.7	9.9	12.5
Married	38.7	40.8	51.4
Living with partner	35.4	46.2	55.2
Widowed	16.0	21.4	25.5
Divorced	20.3	13.6	29.1
Separated	29.0	28.4	39.7
Coverage gap	30	36.3	42.7
<i>X<sup>2</sup> P value &lt;0.001 df = 1</i>			
<b>Desire for more children</b>			
Wants within 2 years	15.9	28.8	31.8
Wants after 2 years	24.2	29.0	42.8
Wants, Unsure timing	8.7	30.4	27.0
Undecided	15.6	26.8	26.0
Wants no more	40.4	31.2	40.9
Coverage gap	31.7	4.4	16.8
<i>X<sup>2</sup> P value &lt;0.001 df = 1</i>			
<b>Community level variables</b>			
<b>Region</b>			
Nairobi	33.4	39.0	45.2
Central	42.2	44.3	51.3
Coast	21.0	25.7	31.8
Eastern	35.4	33.1	44.0
Nyanza	21.4	29.4	43.0
Rift Valley	24.2	27.3	36.8
Western	24.4	29.8	43.2
North Eastern	0.2	2.3	2.8
Coverage gap	42	42	42.4
<i>X<sup>2</sup> P value &lt;0.001 df = 1</i>			
<b>Place of residence</b>			
Urban	31.7	35.0	41.7
Rural	25.8	27.7	37.0
Coverage gap	6.4	7.3	4.7
<i>X<sup>2</sup> P value &lt;0.001 df = 1</i>			

Continuation of Table 4.2

<b>Family Planning Programme factors</b>			
<b>Heard family planning on radio</b>			
No	na	16.2	24.7
Yes	na	37.4	46.1
Coverage gap	-	21.2	21.4
<i>X<sup>2</sup> P value &lt;0.001 df = 1</i>			
<b>Heard family planning on TV last few months</b>			
No	na	24.1	34.8
Yes	na	40.2	46.4
Coverage gap	-	16.1	11.6
<i>X<sup>2</sup> P value &lt;0.001 df = 1</i>			
<b>Heard family planning in newspaper/magazine</b>			
No	na	25.9	37.2
Yes	na	38.5	45.2
Coverage gap	-	12.6	8.0
<i>X<sup>2</sup> P value &lt;0.001 df = 1</i>			

Source: Primary analysis KDHS 2003, KDHS 2008/09 and KDHS 2014  
na: Not applicable

#### 4.4 Logistic Regression Results presenting crude odds

This section presents the crude odds of contraceptive use by background characteristics. The purpose was to identify the women who were likely to use by background characteristics before adjusting the odds, thus assess the trends of the coverage gap. The results are presented in *Table 4.3*.

With regards to the individual level factors such as age and marital status, women in the 35-39 age group were 11.282, 10.243 and 11.082 times more likely to use modern contraceptive methods than the 15-19 age group in the three surveys. Those in the 30-34 age group were 9.965, 12.151 and 12.101 times more likely to use than the 15-19 age group. With regards to marital status, married women were 6.633, 6.289 and 7.403 times more likely to use than

those never in union category in all the three surveys. The married women were closely followed by those living with their partners at 5.757, 7.844 and 7.403 times more likely to use than the reference group.

With regards to education level, one of the socio-economic indicators used to measure the coverage gap of the national family planning programme, women with higher education were 9.889, 9.481 and 7.188 times more likely to use than those with education. However, the coverage gap shows from 9.889 in 2003 to 7.188 although inequalities in use still exist.

With regards to employment status, a second socio-economic indicator used by this study to measure the coverage gap of the national family planning programme, women who were working were 2.807, 2.910 and 4.002 times more likely to use compared to those not working. The trend of this indicator shows that the coverage gap was widening further in the 2014 survey.

A third socio-economic indicator used in this study to measure the coverage gap of the FP programme is wealth index. According to the results of this indicator, those in the richest wealth category were 4.223 and 4.461 times more likely to use in the 2003 and 2008/09 surveys. However, the trend changed in the 2014 survey with the middle wealth category being the highest likely users with odds of 3.272. Even though the results show a trend of narrowing down of the coverage gap, inequalities in use still remain.

Concerning desire for more children, women in the group that did not desire to have more children had their odds reduce from 3.591 in 2003 to 1.123 in 2008-09 and then slightly increased to 1.487 in 2014. A similar trend was observed with the group that desired children

after 2 years with the year 2003 having odds of 1.696, 2008-09 1.01. and 2014 1.606. In a similar fashion, the coverage gap of this indicator narrowed over time. In 2003 the coverage gap was 3.088 it then dropped to 0.217 in 2008-09 then to 0.119 in 2014.

Region was another indicator this study used to measure the coverage gap of the FP programme. According to results of this analysis, women in North Eastern were least likely to use modern methods of contraception with odds of 0.005, 0.037 and 0.034 in 2003, 2008/09 and the 2014 survey. They are followed by Coast with odds of 0.531, 0.541 and 0.564 more likely to use. Women in Central were the highest users with odds of 1.456, 1.245 and 1.277 followed by women in Eastern at 1.097, 0.775 and 0.950 more likely to use than their North Eastern and Coast Counterparts. Even though the results of this indicator show a narrowing of the coverage gap from the baseline, inequalities in use still continue to linger.

With regards to place of residence, the final indicator used to measure the coverage gap, results indicate that women who are living in urban areas were 0.751, 0.714 and 0.821 times more likely to use modern contraceptives than their rural counterparts. From the results, while the odds of use were improving, inequalities in use still remain.

Women who got family planning information through the three Media were more likely to use contraceptives in reference to those who did not. In the 2008/09 survey, women who heard family planning on radio were 3.105 times more likely to use compared to those who did not while women who heard about family planning on television were 2.12 times likely to use modern contraceptives with respect to those who did not. On the other hand, women who read family planning on newspaper/magazine were the least likely to use contraceptives at

1.793 times, compared to those who did not. A similar trend was observed in 2014 (*see Table 4.3*).

*Table 4.3: Crude odds of contraceptive use by background characteristics in 2003, 2008-9 and 2014*

<b>Study variables</b>	<b>KDHS 2003</b>	<b>KDHS 2008/09</b>	<b>KDHS 2014</b>
	<b>Exp (B)</b>	<b>Exp (B)</b>	<b>Exp (B)</b>
<b>Individual level factors</b>			
<b>Age</b>			
15-19 (reference)			
20-24	3.819*	5.272*	6.526*
25-29	7.889*	8.684*	10.592*
30-34	9.965*	12.151*	12.101*
35-39	11.282*	10.243*	11.082*
40-44	9.823*	9.833*	8.952*
45-49	6.356*	6.214*	5.650*
Coverage gap	7.463	6.879	6.451
<i>95% CI, df 1, P value 0.000</i>			
<b>Education level</b>			
No education (reference)			
Primary	3.960*	5.316*	6.232*
Secondary	5.901*	6.360*	5.203*
Higher	9.889*	9.481*	7.188*
Coverage gap	5.929	4.165	1.985
<i>95% CI, df 1, P value 0.000</i>			
<b>Wealth index</b>			
Poorest (reference)			
Poorer	2.443*	2.811*	2.818*
Middle	3.400*	3.619*	3.272*
Richer	4.088*	4.165*	3.208*
Richest	4.223*	4.461*	2.965*
Coverage gap	1.78	1.65	0.39
<i>95% CI, df 1, P value 0.000</i>			
<b>Employment Status</b>			
Not working (reference)			
Working	2.807*	2.910*	4.002*
Coverage gap	2.481	2.529	3.487
<i>95% CI, df 1, P value 0.000</i>			

Continuation of Table 4.3

<b>Marital Status</b>			
Never in union (reference)			
Married	6.633*	6.289*	7.403*
Living with partner	5.757*	7.844*	8.624*
Widowed	2.008	2.478	2.401
Divorced	2.677	1.431	2.879
Separated	4.289*	3.622*	4.616*
Coverage gap	4.625	4.858	5.002
<i>95% CI, df 1, P value &lt;0.000</i>			
<b>Desire for more children</b>			
Wants within 2 years (reference)			
Wants after 2 years	1.696*	1.010	1.606*
Wants, Unsure timing	0.503*	1.082	0.792
Undecided	0.984	0.906	0.754
Wants no more	3.591*	1.123	1.487*
Coverage gap	3.088	0.217	0.119
<i>95% CI, df 1, P value &lt;0.000</i>			
<b>Factors at the community level</b>			
<b>Region</b>			
Nairobi (reference)			
Central	1.456	1.245	1.277
Coast	0.531*	0.541*	0.564*
Eastern	1.097	0.775	0.950
Nyanza	0.543	0.653	0.913
Rift Valley	0.637	0.588	0.704
Western	0.645	0.666	0.919
North Eastern	0.005*	0.037*	0.034*
Coverage gap	1.451	1.208	1.243
<i>95% CI, df 1, P value 0.000</i>			
<b>Place of residence</b>			
Rural (reference)			
Urban	0.751*	0.714*	0.821*
Coverage gap	0.35	0.26	0.174
<i>95% CI, df 1, P value 0.000</i>			

Continuation of Table 4.3

<b>Family Planning Programme factors</b>			
<b>Heard about FP on Radio</b>			
No (Reference)			
Yes	na	3.105*	2.606*
Coverage gap	-	2.783	2.222
95% CI, P value 0.000 df = 1			
<b>Heard about FP on TV</b>			
No (reference)			
Yes	na	2.120*	1.617*
Coverage gap	-	1.648	0.999
95% CI, P value 0.000 df = 1			
<b>Heard about FP on Newspaper/Magazine</b>			
No (reference)			
Yes	na	1.793*	1.389*
Coverage gap	-	1.235	0.669
95% CI, P value 0.000 df = 1			

\* Significant in all the three surveys  
na: Not applicable

#### 4.5 Multilevel Logistic Regression Results presenting Adjusted Odds Ratios of Modern Contraceptive Use

A Multilevel logistic regression analysis was conducted at three different levels-individual, community and using selected family planning variables to estimate the coverage gap when all other factors are controlled for. The results are presented in *Table 4.4*.

According to the results of this analysis, individual socio-economic factors such as age, marital status, education level, wealth index and employment status are positively correlated with modern contraception use in Kenya. In addition, the results show that contraceptive use in Kenya has improved over the years even by background factors of women.



With regards to age, results indicate that while holding other factors constant, women in the 35-39 age group were 4.204, 3.573 and 3.667 times more likely to use than the 15-19 age group. However, the odds of this group showed a downward trend from the baseline. The 35-39 age group was closely followed by the 30-34 age group who had odds of 3.308, 3.909 and 4.059 more likely to use than the 15-19 age group; registering a positive trend with regards to odds of use.

According to the results, women who were married or living with a partner, divorced or separated at the time of the 2003 survey were more likely to use contraceptives in reference to those who were never in a union. In the 2008/09 survey, the odds of divorced women using contraceptives had no significant difference with those who were never in a union at adjusted odds of 0.991, while in 2014, those who were never in a union had the lowest odds in terms of using contraceptives than any other marital status categories.

As far as education is concerned, women with higher education were 7.991, 6.623 and 4.434 times more likely to use than women without education. The odds of use showed a positive trend from the baseline although inequalities in use still exist. With regards to wealth index, results of the adjusted odds show that in the first two surveys, women in the richest category were 3.163 and 2.716 times more likely to use than the poorest category. However, in the 2014 survey, women in the middle category were 2.338 times more likely to use than the reference group making them the highest users. The results are a confirmation that even though the use has improved from the baseline to the 2014 survey, inequalities in use among the different categories of wealth still exists.

With regards to employment status, results showed that working women were 1.605, 1.559 and 1.849 times more likely to use modern contraceptives than women who were not employed. While in the 2014 survey the odds improved compared to those of the previous surveys, inequalities in use by employment status still linger.

Keeping other community-level factors constant, in the 2003 survey, women in Central and Eastern provinces were significantly more likely, at 2.206 and 1.707 times respectively, to use contraceptives with reference to those in Nairobi province. These odds gradually reduced over the years to 1.494 times more for Central and 0.649 times for Eastern province in 2014. Just as in logistic regression analysis, the latest survey shows insignificant differences between Nairobi, Nyanza and Western regions. Inequalities in use by regions showed a widened coverage gaps in all the three surveys.

According to the results, women who lived in urban areas during the 2003 KDHS survey were more likely to use contraceptive than those who lived in rural areas with an adjusted odds ratio of 0.611. These odds increased to 0.775 in the 2014 survey. The results showed a positive trend from the baseline, but still, inequalities in use are existing.

Contraceptive use was analysed by family planning programme factors i.e. the media through which information about family planning was relayed to the masses, a few months before the surveys. Women who heard about family planning on the radio a few months before the 2008/09 survey were 2.662 times more likely to use contraceptive than those who had not heard. In the 2014 survey, the odds reduced to 2.447 times. A similar trend was observed for those who heard about family planning on TV. They were 1.485 times, and

1.231 times more likely to use contraceptives than those who did not hear about family planning on TV in 2008/09 and 2014 respectively.

Women who heard about family planning in a newspaper/magazine were 0.903 and 0.946 times more likely to use contraceptives than those who did not learn about family planning through this media in 2008/09 and 2014 surveys respectively. However, the odds were not significant ( $P>0.05$ ). The 2003 survey did not capture information on the selected family planning programme factors (*See Table 4.4*).

The results of this study indicate that when tracking the progress towards Universal Health Coverage (UHC), development programmes such as the national family planning programme need to put emphasis not only on increasing the proportion of the population using modern contraceptive methods while setting new contraceptive use target once previous ones are achieved but also on increasing the service coverage.

With regards to evaluating family planning programmes, the selection of indicators should consider achieving UHC. Specifically, these indicators should be able to assess the coverage gap of the national family planning programme over time. Further, the selected indicators should be able to measure the coverage gap both in the general and disadvantaged populations. Lastly, the indicators should be able to be disaggregated by key dimensions of inequality such as by wealth quantile, by education level, employment status, place of residence, region and by age.

Table 4.4: Adjusted odds ratios for contraceptive use among fecund women

Study variables	KDHS 2003	KDHS 2008/09	KDHS 2014
	Exp(B)	Exp(B)	Exp(B)
<b>Individual level factors</b>			
<b>Age</b>			
15-19 (reference)			
20-24	1.723*	2.305*	3.112*
25-29	2.873*	3.072*	3.914*
30-34	3.308*	3.909*	4.059*
35-39	4.204*	3.573*	3.667*
40-44	4.178*	3.409*	3.02*
45-49	2.907*	2.443*	1.954*
Adjusted Coverage gap %	17.5	9.9	14.1
<i>95% CI, P value 0.000</i>			
<b>Education</b>			
No education (reference)			
Primary	4.137*	4.676*	4.927*
Secondary	5.894*	6.121*	5.312*
Higher	7.991*	6.623*	4.434*
Adjusted Coverage gap %	8.3	4.4	2.3
<i>95% CI, P value 0.000</i>			
<b>Wealth index</b>			
Poorest (reference)			
Poorer	1.901*	1.898*	1.838*
Middle	2.752*	2.459*	2.338*
Richer	3.256*	2.735*	2.193*
Richest	3.163*	2.716*	2.15*
Adjusted Coverage gap %	11	7.7	5.3
<i>95% CI, P value 0.000</i>			
<b>Employment Status</b>			
Not working (reference)			
Working	1.605*	1.559*	1.849*
Adjusted Coverage gap %	23.2	21.9	29.79
<i>95% CI, P value 0.000</i>			

Continuation of Table 4.4

<b>Marital Status</b>			
Never in union (reference)			
Married	5.212*	4.849*	5.069*
Living with partner	4.733*	5.884*	5.805*
Widowed	1.342	1.752	1.691
Divorced	1.748	1.003	1.717
Separated	2.442*	1.975*	2.293*
Adjusted Coverage gap %	26.6	35.4	22.5
<i>95% CI, P value &lt;0.000</i>			
<b>Factors at the community level</b>			
<b>Region</b>			
Nairobi (reference)			
Central	2.206*	1.734*	1.494*
Coast	0.674*	0.657*	0.649*
Eastern	1.707	1.119	1.126
Nyanza	0.784	0.884	1.08
Rift Valley	0.949	0.82	0.833
Western	0.926	0.902	1.102
North Eastern	0.006*	0.049*	0.039*
Adjusted Coverage gap %	68.2	58.8	56.2
<i>95% CI, P value 0.000</i>			
<b>Place of residence</b>			
Rural (reference)			
Urban	0.611*	0.672*	0.775*
Adjusted Coverage gap %	24.15	19.6	11.43
<i>95% CI, P value 0.000</i>			

Continuation of Table 4.4

<b>Family Planning Programme factors</b>			
<b>Heard about FP on Radio</b>			
No (Reference)			
Yes	na	2.662*	2.447*
Adjusted Coverage gap %	na	45.37	41.96
<i>95% CI, P value 0.000</i>			
<b>Heard about FP on TV</b>			
No (reference)			
Yes	na	1.485*	1.231*
Adjusted Coverage gap %	na	19.53	10.36
<i>95% CI, P value 0.000</i>			
<b>Heard about FP on Newspaper/Magazine</b>			
No (reference)			
Yes	na	0.903*	0.946*
Adjusted Coverage gap %	na	5.11	2.77
<i>95% CI, P value 0.000</i>			

*\*Significant in all the three surveys*

*na: Not applicable*

## **CHAPTER FIVE**

### **SUMMARY, CONCLUSION AND RECOMMENDATIONS**

#### **5.1 Introduction**

This chapter presents the summary, the conclusion, the recommendations of the study and a recommendation for further research.

#### **5.2 Summary of Findings**

The overall objective of this study was to assess the performance of the national family planning programme by using the trends of background characteristics of modern contraceptive use among women in Kenya; to estimate the coverage gap of socio-economic factors and by region. Data used in the study was derived from the Demographic Health Survey (DHS) website. The datasets used were of Kenya Demographic and Health Survey (KDHS) 2003 which acted as the baseline for the assessment, Kenya Demographic and Health Survey (KDHS) 2008-09 which was used as the mid-line and Kenya Demographic and Health Survey 2014 for the end-line. The extent to which the coverage gap was widening or narrowing was used to conclude how the national family planning programme performed. The methods that were deployed during analysis were Chi-square and Cross tabulation for primary analysis; and multilevel logistic regression for further analysis. The outcome variable was modern contraceptive use while the independent variables were: age, education, employment status, wealth index, marital status, region and place of residence. The variable woman's knowledge of contraception and method mix was used as proxy variables to measure the family planning programme related efforts.

This study established that modern contraceptive use as advocated by the national family planning programme was positive. The proportion of women using contraceptives has

significantly increased from 2003 to the 2014 survey. The most preferred contraceptive methods were the modern ones such as injections and pills; their use having increased over the years. These contraceptives were mostly sourced from the government clinics or pharmacies while a considerable number from private clinics. The results from two surveys (2008/09 and 2014) showed that radio stations are the most effective method of creating awareness on contraceptives compared to other methods.

Individual-level and community-level factors were found to influence modern contraceptive use in women in Kenya significantly. With regards to community-level factors such as place of residence and region, women living in urban areas were more likely to use modern contraceptives than their rural counterparts. With regards to region, variations in modern contraceptive use by region still linger. For example, it was established that women from former Central province were more likely to use modern contraceptives with women from North Eastern being the least likely to use. Also, individual-level factors such as age, education level, wealth index, marital status and employment status of women influence their modern contraceptive use. For example, with regards to education, a woman with higher education are more likely to use modern contraceptives than those whose education is lower. This also holds for working women who had higher odds of using.

With regards to the coverage gap, evidence from this study shows it's narrowing down. However, inequalities in use remain. Specifically, once other factors are controlled for, the largest gap occur in the indicator geographic residence and the most affected regions are those in the North Eastern part of Kenya followed by the Cost regions respectively. The programme therefore needs to expand regional access especially in the North Eastern part.



### **5.3 Conclusion**

Even though the national family planning programme efforts have improved the use of family planning from the baseline to the 2014 survey, inequalities in use remain. While evidence in the study suggests that the inequalities are narrowing down, the national family planning programme has not achieved that required level of access that should make it even more effective. If the current coverage gaps are not narrowed down, the realization of target 3.7 of SDG number 3 will be an uphill task for the programme managers.

In monitoring and evaluation, indicators are central to its success. Measurements of the national family planning programme impact should not only focus on improving the use of family planning while reducing the fertility levels, but also focus on improving the inequalities in the use of family planning. Therefore, the national family planning programme should develop indicators that measure the trends in inequality in use by background factors such as age, education level, employment status, marital status, region and place of residence as a way of estimating the coverage gap of the programme; thus enabling the programme managers to ascertain level of effectiveness.

### **5.4 Recommendations**

Evidence from this study revealed that inequalities in use of family planning exist. In this regard, the following recommendation was made:

- i. In this era of Sustainable Development Goals, development programme efforts are focused on achieving the targets set for achieving these goals. If the national FP programme is to meaningfully achieve target 3.7 and 3.8 of SDG number 3 that seek to realise universal access to reproductive health services such as family planning by

the year 2030, then the programme managers need to develop and use tracer indicators that measure the extent to which the programme is narrowing down inequalities in use gaps by examining their trends.

### **5.5 Recommendations for further research**

- Because this study focused on the trends of inequalities in use of family planning by background factors of fecund women in Kenya, other studies could focus on the estimating the trends of inequalities in use of family planning by regions.

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## APPENDICES

Appendix A: Figure 1.1: Structure of the National Family Planning Programme

