SOCIO-ECONOMIC DIFFERENTIALS IN ADOLESCENT FERTILITY IN KENYA: EVIDENCE FROM THE 2014 KDHS

BY

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DECLARATION

This research proposal is my own original work and has not been presented to any other university for an award of a degree.

CANDIDATE: GERO ANYANGO CHRISTABEL

Sign…………………………………...

Date …………………………..........

This research proposal has been presented for supervision to me as University Supervisor:

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Sign ……………………………………

Date …………………………………

DEDICATION.
I humbly dedicate this work to myself.

ACKNOWLEDGEMENT

ABSTRACT

This study aimed to quantify the intensity of repeated adolescent pregnancy in Kenya. The main research objective was to identify adolescents who undergo repeat pregnancy during the adolescence period and their characteristics. The main data source was the 2014 KDHS dataset, and the study population was women aged 15-24 years. The analysis was based on the number of births to individual women during adolescence which is count data. These births were cross classified by select characteristics of the adolescents.

Poisson regression model was used to determine differentials in adolescent fertility. The final analysis was to identify differentials in the incidence of repeat pregnancy which involved a multinomial logistic regression. About 9.2% of the adolescent births obtained from women aged 15-24 were repeat adolescent pregnancies. Chances for repeat adolescent pregnancy appeared to decline with wealth index. The propensity for repeat adolescent pregnancy was higher among women with no or low education compared to those with higher education. Never married adolescents were less likely to experience repeat adolescent pregnancy compared to ever married adolescents.

 Included in the National Adolescent Sexual and Reproductive Health Policy should be a special program for monitoring the incidence of repeat adolescent pregnancy and prevention of the same. The Ministry of Education should also speed up the adoption of age-appropriate comprehensive sexuality education into the school curriculum. Further research should be conducted to find out whether repeat adolescent pregnancy occurs by choice or not and to identify incidences of rapid repeat pregnancies.

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CHAPTER ONE: INTRODUCTION

1.1 Background

The period of change from being a child to an adult is referred to as adolescence. Adolescence is mainly defined by a progressive change in physical, biological, emotional and social status. The age range from 10-19 years is considered an adolescence period, while people in the 10-24 year age range generally are called youth (World Health Organization, 2011). Adolescence period is the most critical stage in life of any individual; the changes that adolescents go through in their lives in terms of family structure, livelihood, schooling, communities, and identities are unmatched in any other period of their lives. Studies on adolescents' state that it is important to handle the adolescence phase of life in a different way as compared to childhood and adulthood (Jokela & Keltikangas-Jarvinen, 2009).

Adolescents need to find alternatives to cope with diverse and rapid changes that occur in their lives. They ought to meet their age-mates and mentors in safe environment so as to encourage each other to live better and safer lives. They also need to find alternatives to pressure of bailing out on college and university, getting married early, engaging in unprotected sex, engaging in illegal work, abuse substances or practice prostitution (United Nations Population Fund, 2011).

Adolescent fertility is a state whereby a woman has a live birth during the adolescent ages. It is also referred to as teenage fertility. Adolescent fertility is tabulated as the percentage of women aged 15-19 who have ever had a live birth as at the time of the survey (Central Statistical Agency, 2006). Adolescent fertility is an issue of increasing concern in developed and developing countries (Dutta & Sarkar, 2014). At the global level, the adolescent fertility rate is falling but remains high. There are approximately 18 million births by adolescents (15-19 years) annually, and this accounts for 11 percent of all births in the world. Developing countries experience more than 95 percent of these adolescent births (Sapna Nanda, 2019). In 2010, the global adolescent fertility rate was 53 per 1000, 143 per 1000 in sub-Saharan African countries, 72.8 per 1000 in South Asia, and 71.9 per 1000 in Latin America and the Caribbean (Springer N., 2014; Presler–Marshall & Jones, 2012).

Women begin childbearing at an early age in Kenya; almost one-quarter of women giving birth by 18 years of age and nearly half by 20 years of age. Among adolescent women aged 15-19, eighteen percent are already mothers or are pregnant with their first child. Premarital sexual activity often results in unwanted pregnancies. The increasing low age at menarche lengthens the period of time where the adolescents are prone to indulge in premarital sex

while increasing cases of unwanted pregnancies. The consequences of unwanted pregnancies include unsafe abortion, school dropouts and other health complications to the mother due to premature physiological development that may end in maternal morbidity, mortality and infant mortality. It is estimated that about 11,700 teenage girls in Kenya get pregnant monthly and 40% of the pregnancies are terminated through abortion (NCPD, 1993). Teenage pregnancy in the last five years has remained unchanged (KNBS, 2015).

Adolescent girls aged 10-19 years experienced 19.4 million births in 2015. Approximately 1-2 million of these births occurred to girls under age 15. Between 1990-1995 and 2010-2015, adolescent fertility declined in every world region. However, one out of every five women globally in the age group 20-24 stated that they had begun childbearing during their adolescence period. Sub-Saharan Africa, among all the regions in Africa, has the highest adolescent birth rates and the highest percentage of adolescent births (Presler–Marshall & Jones, 2012). Kenya, compared to other sub-Saharan countries, is characterized by high adolescent fertility. At 96 per 1000, the adolescent fertility of Kenya is higher than the global average of 44 per 1000 (KNBS, 2015; WHO, 2018).

A subsequent pregnancy occurring to adolescents during the adolescence period is referred to as repeat adolescent pregnancy. It affects almost 18% of adolescent mothers in Europe *(Rowlands S. 2010/24(5):605–16.)*, the USA *(Warner L, O'Neil M, Gavin L, et al./2007-2010)*, and Australia *(Lewis LN et al./2010;193(6):338–42)*. Current research publications have not yet quantified the intensity of repeated adolescent pregnancy nor how the trends in repeated adolescent pregnancy have changed over time in Kenya, even though there is possible chance of it occurring, especially within two years after the first birth. For example, Maravilla et al (2017) reported that there is lack of epidemiological studies in low and middle-income countries and there are no measures on the extent and characteristics of repeated teenage pregnancy across more varied settings. More importantly, adolescent pregnancy and especially repeat pregnancy is now considered a global challenge (Govender and Naidoo, 2018) because it is an influencer of child and maternal deaths and to the unending loop of poverty and poor health (Springer N., 2014).

During the 1994 International Conference on Population and Development (ICPD), governments agreed to "promote the rights of adolescents to reproductive health education, information, care and greatly reduce the number of adolescent pregnancies" (ICPD Program of Action 7.46). Earlier actions on reducing adolescent fertility had targeted adolescent girls

as being the main cause of the problem and aimed at changing their way of life as the solution. Those interventions failed to bring down the levels of adolescent pregnancy since they did not address the underlying causes of the problem, i.e. the socio-economic, cultural norms and values, legal and other factors that propel adolescent pregnancy. (UNFPA, 2013).

1.2 Problem Statement

Not all births occurring to adolescents are first births. A good percentage of adolescents who begin childbearing very early in life stand a high chance of having a repeat pregnancy during the adolescence period. In 2017, it was established that of the 22.5 million pregnancies among adolescents that occurred in 60 USAID-assisted countries, almost 4.1 million were repeat pregnancies. The percentages of adolescents who have repeat pregnancies leading to birth may be relatively small (e.g. 0.1% in Kyrgyzstan and Albania; 9.2% in Niger). The proportions can also be large, such as in India where the repeat adolescent births reach nearly 1.6 million (Neal et al., 2012)

First-time adolescent mothers are at an elevated risk of having a repeat pregnancy. After one or two years of having their first child, a considerable number of adolescent mothers go on and have a repeat pregnancy. Interventions that have been established such as peer counselling programs, abstinence and education mostly focus on preventing pregnancy among adolescent girls who are not yet mothers. Little or no attention has been directed towards reducing pregnancy among adolescents who are already mothers, yet the existing data states that adolescent girls who go on and have another pregnancy within two years of the birth of their first child may totally vary from those adolescent girls who do not. In most instances, an adolescent mother who has a repeat pregnancy usually report that the repeat pregnancy was more of a "planned affair" and not an "accident"(Matsuhashi, Felice, Shragg & Hollingsworth, 1989).

Repeat pregnancies among adolescent mothers should not be assumed as it indicates lack of commitment to protect adolescents from having repeat pregnancies during their adolescence period. Studies recently undertaken among women of similar parities who are in their 20s also state that the risk of neonatal mortality for repeated birth is way more than for the first birth. Despite the adolescent fertility rate in Kenya being very high, limited studies have been carried out to explain the magnitude of repeated adolescent pregnancy among adolescent mothers.

1.3 Research Questions

This study answered the following research questions:

1. What are the differentials in adolescent fertility among women aged 15-24 in Kenya?
2. What is the proportion of repeat adolescent pregnancies among adolescents in Kenya?
3. What are the characteristics of adolescents who have repeat pregnancies during adolescence period in Kenya?

1.4 Research Objectives

This study aimed at establishing differentials in adolescent fertility in Kenya among adolescent girls with special focus on those who have repeated pregnancies in the adolescent age (below 20 years of age). The extent of repeat pregnancies among adolescent girls is still unknown in Kenya despite the negative socio-economic and health effects posed by adolescent pregnancy.

The specific objectives were:

1. To establish differentials in recent adolescent fertility among women aged 15-24 in Kenya.
2. To estimate the proportion of recent repeat adolescent pregnancies during adolescence period among women aged 15-24.
3. To identify characteristics of adolescents who have repeat pregnancies during adolescence period among women aged 15-24 in Kenya.

1.5 Justification

Over the past two decades, the world's agenda on development has been focused on reducing maternal and child mortality, promoting women empowerment and gender equality, eradicating poverty and hunger, combating diseases such as HIV/AIDS, developing global partnership for universal development, ensuring environmental sustainability, and providing quality education for all and among other goals (UN, 1994; UNFPA, 2002). Reducing unintended adolescent pregnancy stands as an important target for the Sustainable Development Goals (SDGs) one (no poverty), three (good health and well-being), three (quality education) and five (gender equality). It was also made a global priority at the International Conference on Population and Development (ICPD) IN 1994. Adolescent pregnancy hinders the realization of the Sustainable Development Goals (SDGs).

Kenya has experienced a decline in total fertility rate; from 8.1 children per woman in the 1960s to 4.6 in 2009, but this has stalled at the national level since the late 1990s (Ezeh et al 2009). At 4.6, the total fertility rate in Kenya remains high and above the set target of 2.6 (Oketch et al, 2011). Adolescent fertility contributes significantly to a country's total fertility rate (Beguy et al, 2013; Dutta & Sarkar, 2014). In sub-Saharan Africa, the ever-rising fertility

rate is as a result of early childbearing (Beguy et al, 2013). At 96 per 1000, adolescent fertility in Kenya remains high as compared to the global average of 53 per 1000 (KDHS 2014). Overall, to address the high total fertility rate in the country, attention must also be drawn to adolescent fertility.

This study makes a contribution in two major ways. First, this contributes to a better understanding of the variations in adolescent fertility among the regions in Kenya. The second aspect is about repeat pregnancy during adolescent period. Repeated adolescent pregnancy is a determiner of adolescent reproductive health. It depicts health differentials, especially in the vulnerable adolescent group. Repeat adolescent pregnancy proves that there is unequal distribution and access to reproductive health services. Repeat adolescent pregnancy mostly happens as a result of poverty, few available employment opportunities and low educational attainment of the adolescent mothers.

1.6 Scope and Limitations of the Study

This study focused on the differentials in adolescent fertility in the different regions of Kenya with special focus on the incidence of repeat births/pregnancies. The 2014 Kenya Demographic and Health Survey (KDHS) data was used. Women of age 15-24, married and unmarried, living in the different regions in Kenya interviewed in the survey formed the study population. The reason as to why my target population in this study was women of age 15-24 and not 15-19 alone is that there are those who had an adolescent birth but turned 20 at the time of the survey; so they were no longer aged 15-19 as at the time of the survey, yet they had pregnancies during their adolescence period that should be factored in for analysis. Also, for the repeat adolescent births, using the current adolescent age group of 15-19 alone would not give me significant results as these adolescents ought to have been exposed for quite some time to experience a repeat pregnancy. Most repeat pregnancies occur during the late adolescent years.

The socio-demographic and economic variables selected for analysis included education, wealth index, religion, region of residence, ethnicity, current marital status and place of residence. The selection of these variables was based on the literature I reviewed on this topic.

This study did not control for the effect of migration. The KDHS samples women between the ages 15-49 as at the time of the survey. It stands a chance of missing out on the live births that occurred to girls below 15 years during the survey period. There is a possibility that this

effects a slight underestimation of the adolescent live births to all live births. Also, age underreporting and misreporting is a common mistake during data collection among this vulnerable population.

CHAPTER TWO: LITERATURE REVIEW

2.1 Introduction

This chapter presents a review of literature on socio-demographic and economic factors responsible for the differentials in adolescent fertility. The consequences of adolescent fertility on population components will also be explored.

2.2 Theoretical Perspective of Adolescent Fertility

Demographers resorted to social interaction theories to help them explain individual childbearing and observed fertility behavior among women. They assume that individual behaviors and belief systems are interdependent and dictated by social groups and interactions. They also assume that childbearing is a social act. Social network effects are important theoretically as they offer reasons that justify individual fertility behavior as a form of social action. Social network effects are also important at empirical level in that they contribute to explanations and models of individual level outcomes of fertility and macro level fertility dynamics. Social learning is discussed as one of the foundation theories for diffusion models of fertility change.

Social learning is a social mechanism, and is the exchange and sharing of evaluated information among a network of people. It is used widely as a concept in social psychology (e.g., Bandura 1962; Miller et al, 1941). Social learning happens in social networks. Social learning states that individuals ought to watch the behavior and actions of others and learn from the mistakes and achievements made. They can either reject, adopt or learn from behavioral models of other people. Social learning brings about a change in behavior once observations and analyses in a network transform the views of individuals along the consequences of specific course of actions. Innovative ideas such as fertility postponement and voluntary childlessness are examples of results of social learning.

The widest research body on social effects is on adolescent fertility-their contraceptive taking, sexual behavior and other decision-making aspects. Udry (1993) observed that the fertility related decisions of adolescents in the USA were influenced by their kin and parents. This observation was unanimously agreed upon. Adolescents strive, in their sexual behavior, to conform to their friends' behavior. They are also influenced by the behavior and attitudes of their parents.

Another form of social effect on adolescent fertility operates through schooling and related activities. Intriguing literature is available concerning peer effects on educational achievement and aspiration. However, its main conclusions have not been properly incorporated in models of adolescent fertility. The degree that peers and parents influence adolescents' educational aspirations and how their influence dictates the opportunity costs of adolescent pregnancy and childbearing is clear. An adolescent from a poor background who has good professional networks may view her labor market potential very differently than an adolescent without such connections. The adolescent may have better strategies to follow to realize their labor market potential as compared to the adolescent without such proper networks. The variance in the two information sets of the adolescents may lead to different perceived opportunity costs of childbearing and different attitudes on contraceptive use (Mark R. Montgomery et al, 1996).

High chances are that social effects have been exaggerated in most research concerning adolescents (Wilcox and Udry, 1986). However, the social effects are important in defining adolescent fertility. Social effects can be used to explain surprising differences between trends in fertility and trends in the underlying determinants of fertility. It can also explain sudden fertility changes and the slow response of fertility to changes occurring in underlying fertility determinants.

2.3 Levels of Adolescent Fertility

The World Health Organisation (WHO) reports that 16 million girls in the age group 15-19 and about 2 million girls below 15 years give birth every year. About 11% of the births occur to women aged15- 19 years (Iqbar H. et al, 2012). Approximately 95% of teenage pregnancies occur in low- and middle-income countries, where 36.4 million women initiate childbearing before turning 18. The global average adolescent fertility rate was 50 births per 1,000 women aged 15–19 years in 2012, highest in Africa with 116 births and 122 births in low-income countries. The world's highest adolescent pregnancy level is in sub-Saharan Africa (SSA) estimated at 101 births per 1,000 women aged 15-19 years. More than half of all births in the SSA region is as a result of adolescent fertility (WHO, 2011).

Estimates from the UN Population Division indicate that adolescent fertility declined from 134 live births per 1,000 women aged 15-19 years in 1995-2000 to 115 in 2005-2010 and has continued to decline to 101 births per 1,000 women aged 15-19 years. Evidence from the various Demographic and Health Surveys and Multiple Indicator Cluster Surveys since 2000 on the proportion of women in the age group 20-24 who had initiated childbearing before age

18 shows that almost one in five women aged 20-24 (19%) had a live birth and 3% had the live birth by age 15 (UNFPA, 2011).

The proportion of women in the age group 20-24 who had a live birth before age 18 varies by regions, with the highest rates observed in Central and West Africa (28%) and Southern and Eastern Africa (25%) while Eastern Europe and Central Asia have the least (4%). Latin America and the Caribbean have an adolescent fertility rate of 18%, which is almost close to the global estimate. The top 10 countries with women aged 20-24 who had a live birth before age 18 are all found in sub-Saharan Africa, with Niger having the highest (51%), followed by Chad (28%) and Mali (26%) (UNFPA, 2011).

As indicated in the Kenya Demographic and Health Survey of 2009 and 2014 and other studies elsewhere; teenage pregnancies are a major problem not only in Kenya but also in Africa. In the next quarter of the century, about 325 million adolescent births are likely to occur in developing countries if the problem of adolescent fertility is not arrested (Advocates for youth, 1997; Focus, 2000; Teenage, tm; NCPD, 1998; Children and Children Service Review, 1977). Adolescent fertility has numerous demographic, social, economic and health consequences. Adolescent fertility is associated with adverse consequences related to unplanned pregnancies.

2.4 Factors Associated with Adolescent Fertility

Although young women are marrying later due to schooling, more are engaging in premarital sex. In as much as the majority of the adolescent births are experienced in marriage where sex and childbearing are justified, it is possible that majority of the closely spaced pregnancies are not planned for. Several reports indicate that many adolescent pregnancies occur within a year after first sexual intercourse and most are unintended. A study carried out in Harare indicated that 200 sixteen-year-olds had become pregnant in three months of engaging in sexual activity (Pop report, 1997).

The risks of childbearing on a pregnant adolescent begin right after delivery. The adolescent is more often forced to step out of school to care for their young ones. They end up achieving less education as compared to those adolescents who delay childbearing until their 20s. They are also more likely to separate from or divorce their partners (Rahim & Ram, 1993). In developing countries, pregnant adolescents seldom return to school (Gorgen et al., 1993). The social and economic repercussions of early childbearing affect the adolescent girl for the rest of her life. Thus adolescents who dream of having higher income and better jobs in the future ought to prioritize their education so as to achieve their desired literacy levels.

Bearing in mind that the opportunities available to women for economic advancement are scarce, adolescent childbearing may render them unable to obtain quality health for their young families and attain higher education. In extreme scenarios, single adolescent mothers may be compelled to drop out of school and practice prostitution in order to provide for their young families (Weis & Muller, 1990). This makes them unable to further their education and increases their vulnerability to contract diseases such as STIs and even HIV/AIDS which may lead to their death at very young ages. This hinders efforts aimed at improving the productive skills, knowledge and wage levels of adolescent girls in the future.

2.4.1 Education

Different studies have established an association between years of schooling and adolescent fertility. Gupta & Mahy (2003) examined whether increased years of schooling consistently delayed childbearing in sub-Saharan Africa. The results showed the only consistent and significant covariate was girls' education from the secondary level onwards. This implied that pursuing higher education is an important way of raising the age of childbearing among adolescent girls. Increase in schooling at primary level, however, did not impact much on the fertility decline among adolescents. Rutaremwa (2013) found that in Uganda, adolescents who had completed secondary school, compared to those with no secondary education, had lower pregnancy incidences.

In another study in Maharashtra, India, Dutta & Sarkar (2014) found that those adolescents that had no education exhibited a higher level of fertility compared to their counterparts with some education. Similarly, Bledsoe & Cohen (1993) concluded that in most countries in sub-Saharan Africa, uneducated adolescents, compared to those with secondary school and above level of education had about two or three more children. Furthermore, Manlove (2010) conducted a study among white and Hispanic adolescents and found that young school dropouts were likely to have a school-age pregnancy. Thus, a crucial measure for preventing repeat adolescent childbearing is expanding access to formal education. Were (2007), Alemayehu et al (2010), and Nyarko (2012) also found a relationship between adolescent fertility and adolescent girls' education. Adolescent girls who had some level of education were less likely to have initiated childbearing compared to female adolescents who had no formal education. This is attributed to the dearth in the knowledge of sexual and reproductive health issues among illiterate adolescents.

In a study of adolescent pregnancy in a rural area in Nigeria, adolescent pregnancy was statistically significantly associated with primary and secondary education compared to those

with beyond secondary education (Nyakubega P. 2008/2009). A negative relationship between adolescent pregnancy and girls' level of education was also reported, but in this case it was those adolescents with no education at all or those with primary education who were more vulnerable to adolescent pregnancy (Were M., 2007).

Far beyond this, adolescent childbearing negatively affects adolescent girls' educational attainment (Klepinger et al., 1995; Lloyd and Barbara, 2006). This eventually affects their economic status and financial independence in the future. Their ambitions and aspirations end up being halted as the young mothers drop out of school to take care of their young ones. They lose out on precious opportunities that would have helped shape them to be of importance in the future (McDevitt et al., 1996). Adolescent mothers, once having dropped out of school, end up doing risky activities such as commercial sex work to be able to fend for their young families. Some start portraying undesirable behavior and eventually resort to drugs to help them forget their problems.

2.4.2 Household Wealth Index

Wealth index is a clear indicator of the socio-economic status of an individual. The inability of adolescents to meet personal and basic needs exposes them to early sex in exchange for money and material gains, and such factors are likely to predispose them to unwanted pregnancies and childbearing. Were (2007) found that in Kenya, a lack of access to sex education predisposes adolescent females to pregnancies. This mostly affected adolescents from the poor wealth index, as most could not access sex education. Furthermore, studies in Bida local government in Nigeria by Odimegwu et al (2002) revealed that adolescents whose parents were poor or had attained only primary level education were more likely to engage in premarital sex which led to adolescent childbearing than those adolescents that had parents who were middle to high-income level earners. Manlove (2010) also found that adolescents from poorer families were prone to engage in early sexual activities.

In a study in Uganda, Rutaremwa (2013) established that the pregnancy rate for adolescents from poor households was 41 percent. They were found to be more likely to fall pregnant as compared to those adolescents from wealthier families whose pregnancy rate was 16 percent. Additionally, it was found that the justification of this might be that the poor usually marry early whereas the rich pursue higher education and other career goals.

Magadi & Agwanda (2009) conducted a study in South Nyanza, Kenya and established that high socioeconomic status of the household, high educational attainment of adolescents, high

mothers' educational attainment and communication with parents and girlfriends was linked to delayed initiation of sexual intercourse. In Ghana, Nyarko (2012) also established that childbearing was high among adolescents from poor households compared to those from rich households.

Poverty has always been linked to early marriage and pregnancy. In Tanzania, Nyakubega P. (2008/2009) found out that adolescent pregnancy is closely associated to low socio-economic status. Teenage pregnancy can be a result of poverty because some of the adolescent women are involved in sexual relationships with older men who give them gifts such as money, clothes, and other goods in exchange of sex. In addition, girls get involved in sexual affairs with older men for financial and material gains, such as the "3 Cs", i.e. cellphone, cash and car (Nwogwugwu N.C. 2013.) In most cases, they are not able to negotiate safe sex and thus end up pregnant.

Adolescents who grow up in poverty may end up in prostitution as a way of earning money. The inability of adolescents to meet personal and basic needs expose them to pre-marital sex in exchange for money and material gains, such factors are likely to predispose them to unwanted pregnancies and childbearing Were M., 2007). A study in Malawi indicates that 66% of adolescents have accepted money in exchange for sex (Kost K. and Henshaw S. 2014). In Nigeria, adolescents whose parents were poor were more likely to engage in premarital sex which can lead to adolescent childbearing as compared to adolescents from middle and high income families (Odimegwu et al.2002).

Many of these characteristics are inherently associated with poverty and disinvested communities. Poverty has significant systematic effects on the occurrence and distribution of adolescent childbearing across populations. Unfavourable community and family socioeconomic influences that may result from poverty and increase the probability of getting pregnant as an adolescent include exposure to single-parent homes at age 14, low educational attainment of the adolescent's parent(s), having a mother who gave birth as an adolescent, family disorganization, residence in disinvested communities with limited employment opportunities and availability of affordable and comprehensive health care, neighbourhood physical disorder, and neighbourhood-level income inequality.

Adolescent pregnancy and childbearing can carry high financial, health, social and emotional costs for both adolescent mothers and their children. Adolescent mothers always desire good health both for them and their children. However, they can be overwhelmed by life as a

parent. Having a repeat pregnancy as an adolescent can reduce the adolescent mother's chances of pursuing further education or even acquiring a job. Children born as a result of a repeat adolescent pregnancy are usually born pre-term or when they are too small. This can cause more health complications to the baby's health.

2.4.3 Religion

Several studies have been carried out to determine the relationship between religion and adolescent fertility. A study by Sinha et al (2007) found out that youths who frequented church and were religious were less sexually experienced. Thus, high levels of religious involvement led to lower adolescent fertility rates both at the individual and community levels. Christian adolescents in Ghana were the majority child bearers according to a study carried out by Nyarko in 2012. In Maharashtra, India, Dutta and Sarkar (2014) found that Muslim adolescents had more adolescent births compared to other religions. Another study by Fonda (2015) stated that among developed nations, adolescent fertility rate was higher among those communities that had no clear spiritual allegiance. This study will seek to find out the relationship between religious affiliation and repeat pregnancy among adolescents in Kenya.

2.4.4 Place of Residence and Region of Residence

According to the 2014 KDHS report, "While rural-urban differences are small, the prevalence of early childbearing varies by region, ranging from 10 percent in Central province to 21 percent in the Rift Valley and Coast and 22 percent in Nyanza" (KDHS 2014). This study therefore seeks to determine whether repeat adolescent pregnancy is influenced by type of place of residence and region of residence in Kenya.

2.4.5 Marital Status

Adolescent fertility is greatly influenced by the marital status of adolescents. A study done by Rutaremwa (2013) in Uganda found marital status to be a positive influencer of the probability of either having a child or being pregnant as at the survey period. Nyarko (2012) found out that in Ghana, childbearing was highest among married adolescents or those in a union and lowest among the never married adolescents. In Zambia, Nwogwugwu (2013) found out that married adolescents, compared to the unmarried adolescents, were more likely to have one or more children. However, a report from the National Research Council on adolescent childbearing showed an increase in childbearing among unmarried female adolescents in sub-Saharan Africa which raised religious and cultural concerns (Bledsoe and Cohen, 1993).

In Ethiopia, Alemayehu et al. (2010) and Alemayehu (2008) found out that married adolescents were more likely to have one or more children compared to their unmarried counterparts. A study conducted by Beguy et al (2013) on motherhood among adolescents in two informal settlements in Nairobi found that marriage was significantly associated with early childbearing among adolescent females aged 15-17 years. For adolescents aged 18 – 19 years, marriage hastened the timing of entry into motherhood. Chike (2001) in another study found that much of the adolescent fertility in the South of Nigeria occurs out of wedlock. This was majorly attributed to the sexual revolution among adolescents due to the crumbling moral and economic order among them. Most births occurred within marriage in Northern Nigeria.

Cesari & Vignoli (2006) also found that in Brazil, marriage positively affected the probability of being an adolescent mother. Married adolescent females were bound to start their reproductive life and hence had higher probability of being mothers than their unmarried counterparts. Results of Woldemicael (2005) in Eritrea also indicated that married adolescents were more likely to have initiated childbearing compared to unmarried adolescents, even as 97 per cent of all first births occurred among married adolescents.

This study will also find out the relationship that exists between ethnicity and repeat adolescent fertility in Kenya.

2.5 Adolescent Repeat Pregnancies
An adolescent is said to have undergone repeat pregnancy if she has had two or more pregnancies, altogether with their current pregnancies that culminated in a live birth or a pregnancy loss. A repeat adolescent birth is more likely to occur if the teen mother was younger at sexual debut and first birth, has lower educational expectations, intended her first birth, is living with a husband/partner, did not graduate high school after her first birth, and was unemployed or not enrolled in school after her first birth (Manlove, J. et al, 2000).

Repeat adolescent pregnancy reduces the adolescent's ability to become self-sufficient and improve her and her children's socioeconomic future. Relative to women with first adolescent births, women with repeat adolescent births are less likely to work or maintain economic self-sufficiency, receive prenatal care, complete school, and have school-ready children (Leslie F. et al, 2017). Repeat adolescent mothers are also more likely to have a preterm delivery, receive welfare, and have children with emotional and behavioural problems (Elfenbein et al, 2003).

While many adolescent mothers are able to complete high school education at a later time, those that fail to enrol in school after delivery stand a greater risk of falling pregnant again. Adolescent childbearing also impacts the wellness of adolescent fathers. Adolescent fatherhood is correlated with low educational attainment, limited earnings, substance abuse and trouble with the law. Many do not maintain a long-term relationship with the adolescent mother or their child or rarely provide their child with the basic necessities of life (South Carolina Department of Health and Human Services, 2012).

 Further, second-born children of adolescent mothers, especially those resulting from short inter-pregnancy intervals, are exposed to infant homicide, poorer behavioural and educational development and adverse pregnancy outcomes (as a consequence of limited time and resources) than his or her older sibling (Meade, C. S. & Ickovics, J. R. 2005). Studies of the inter-pregnancy interval, which is the time from the completion of one pregnancy to the conception of the next, suggest an optimal interval of 18 to 23 months, but it may vary for subgroups of women (Zhu, B. P., 2005). Inter-pregnancy intervals of at least one year is recommended for women who had a live birth (Carol J., 2011). Short inter-pregnancy interval has been shown to be associated with preterm delivery, infants who are small for gestational age, early infant death, and congenital malformations (Grisaru-Granovsky et al, 2009).

Having a repeat pregnancy during the adolescence period adds on to the challenges that an adolescent and their young family undergo. According to (Martin JA et al., 2005), 84570 births out of the 421,241 US adolescent births in 2003 were repeated births. Studies conducted in the 1980s and 1990s on repeat adolescent pregnancy showed that 28 percent to 63 percent of adolescents who are already mothers have a subsequent pregnancy after 18 months of their first birth, and 20 percent to 37 percent of adolescent mothers have a subsequent birth 2 years after their first birth (Meade CS and Ickovics JR, 2005). Adolescent mothers that have a subsequent pregnancy risk receiving less prenatal care, delivering premature babies and having still births. They are also less likely to enrol or complete high school as compared to adolescent mothers who avoid a repeat pregnancy. This makes them stand a high chance of being in long-term poverty and financial dependence (Polit DF and Kahn JR, 1986).

According to Gillmore MR et al.; 1997, repeat pregnancy is evidently witnessed among those adolescents that have friends who have ever experienced an adolescent pregnancy. Important factors that have been associated with repeat adolescent pregnancy include having low

educational aspirations (Davis TM,2002), dropping out of school before falling pregnant, and failing to enrol in school after birth of the first child (Matsuhashi Y et al., 1989). Adolescents whose partners are older or whose partners want another child (Bull S and Hogue CJ, 1998) and being married before or after the first birth (Kalmuss DS and Namerow PB, 1994) are also associated with repeat adolescent pregnancy. Characteristics such as having a weak or non-existent mother-daughter relationship (Bull S and Hogue CJ, 1998), an unsupportive family and a mother who never completed high school (Kalmuss DS and Namerow PB, 1994) or who was an adolescent parent herself (Maynard R and Rangarajan A, 1994) are also linked to repeat pregnancies during adolescence.

Studies have found that the likelihood of adolescent mothers to experience a subsequent pregnancy is influenced by their positive attitudes and intentions towards childbearing (Stevens-Simon C.et al, 1996). Some adolescent mothers experience repeat pregnancy due to their ambivalence about using contraceptives to prevent unwanted pregnancy (Stevens-Simon C et al., 1998; K. Nitz,1999). Others may opt for early motherhood as not being problematic since they feel that their occupational and educational options are limited (Merrick EN, 1995). Hence, lack of a reason to avoid repeat pregnancy, in one way or another, is reason enough to intentionally fall pregnant (Stevens-Simon C et al., 2005). Adolescents in marriage or in serious long-term relationships are more vulnerable to experience repeat pregnancy (Kalmuss DS and Namerow PB, 1994).

Adolescent mothers have an increased risk of experiencing a repeat pregnancy two years after their first pregnancy (Stevens-Simon C. et al., 1998). Adolescents who experience repeat pregnancy within 2 years of their first pregnancy are less likely to further their education or be financially stable as compared to those who postpone childbearing till their 20s. The children of those adolescents who experience repeat pregnancy stand a higher chance of having emotional and behavioral problems as compared to other children. Adolescents who begin childbearing during the adolescence period end up having more children (Padin MDFR, 2012).

2.6 Summary of Literature Review
Adolescent pregnancy has become a major problem, especially in Africa. Adolescent pregnancy is related with high maternal and child morbidity and mortality. It affects the socio-economic development of both the nation and the adolescent. It is also linked to

adverse pregnancy and childbirth outcomes. Adolescents who fall pregnant find it hard to continue with their education after delivery, and they opt to drop out of school. Adolescent fertility still remains high, especially in SSA because the age at menarche continues to fall and adolescents still engage in premarital sex. Were (2007) found that in Kenya, a lack of access to sex education predisposes adolescent females to pregnancies. This mostly affected adolescents from the poor wealth index, as most of them could not access sex education. Other factors associated with adolescent fertility that will be included in the analysis include religion, ethnicity and age.

A repeat adolescent pregnancy occurs when an adolescent falls pregnant and gives birth more than once during the adolescence period. A repeat adolescent birth is more likely to occur if the teen mother was younger at sexual debut and first birth, has lower educational expectations, did not graduate high school after her first birth, and was unemployed or not enrolled in school after her first birth (Manlove et al, 2000). Adolescent mothers who undergo a repeat pregnancy might not enrol or finish their high school studies as compared to those adolescents who avoid repeat pregnancy. Having a repeat pregnancy during the adolescence period compounds the challenges faced by the adolescent and her young family.

2.7 Conceptual Framework

Davis and Blake (1956) classified the factors affecting fertility into background determinants and intermediate or proximate determinants. The background determinants (cultural, psychological, economic, social, health and environmental factors) operate through the proximate determinants to influence fertility. Davis and Blake identified a framework with 11 proximate determinants of fertility but their classification failed to receive a wide acceptance because it was not easily incorporated into the analysis of fertility. In 1978, Bongaarts reorganized the ideas of Davis and Blake and developed the proximate determinants framework and a model for assessing the effect of every proximate determinant on fertility. Bongaarts' new classification comprised eight proximate determinants of fertility, namely proportion married, contraception, induced abortion, lactational infecundability, frequency of intercourse, sterility, spontaneous intrauterine mortality and duration of the fertile period (Bongaarts, 1978).

Bongaarts and Potter (1983) used data from 41 developing and developed countries and found out that 96 percent of the fertility variation among populations could be explained by four principal proximate determinants: the proportion of women married, contraceptive use and effectiveness, induced abortion, and postpartum infecundability. In 1984, Bongaarts

added a fifth variable, primary sterility to the proximate determinants model. Thus this framework (Figure 2.7.1) will be an important aspect of this study.
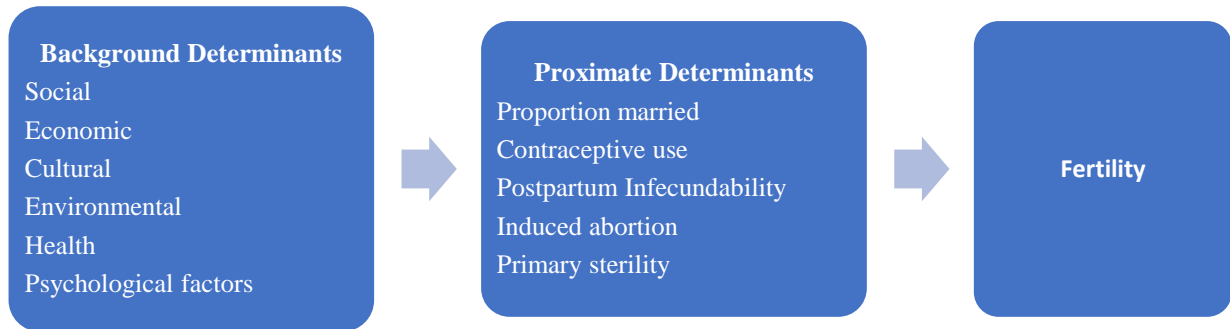
Figure 2.1: Conceptual Framework (Bongaarts' Fertility Framework, 1984)

Source: Bongaarts (1984)

2.8 Operational Framework

This study, in its operational framework, (Figure 2), will only employ some socio-economic factors. It will not be possible to use all the variables in the conceptual framework; thus this study will operationalize some socio-economic factors. This is as a result of the literature reviewed in this topic and data availability of the specific variables under study. Nonetheless, this is relevant in showing the factors responsible for differentials in adolescent fertility in Kenya.

Independent Variables   Dependent Variable

| **Socio-Demographic Variables.**

- Educational level
- Wealth index
- Place of residence
- Region of residence
- Religion
- Ethnicity
- Age
- Current marital status

| **Outcome Variable.**

Adolescent Fertility:

- Incidence of adolescent birth
- Occurrence of repeat pregnancy
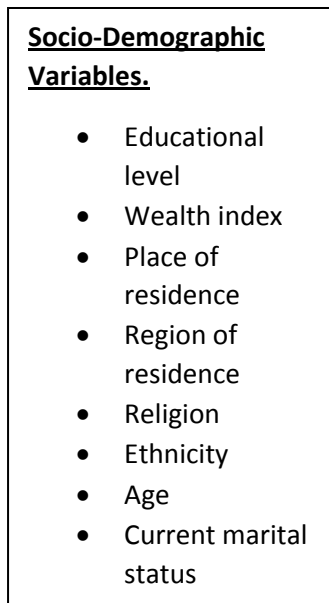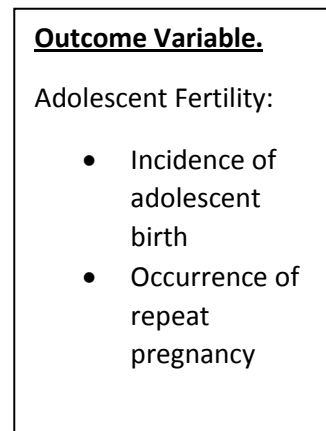
Figure 2.3: Operational Framework

Source: Bongaarts (1984)

CHAPTER THREE: DATA AND METHODS

3.1 Introduction

This chapter discusses the methodology of the study. It is grouped into three categories. The first category describes the study design, the second category describes the main sources of data used for the analysis, while the third category describes the procedure and methods used in data analysis. Multivariate Poisson regression is the main statistical method applied to the data.

3.2 Data Source

This study was based on the analysis of the nationally representative secondary data obtained from the 2014 Kenya Demographic and Health Survey (KDHS). The 2014 KDHS was a survey of 31079 women of reproductive age 15-49 years from 40,300 households covering 1612 sample points (clusters) throughout Kenya. The survey gathered detailed information on fertility levels, marriage, use of family planning methods, birth histories, and characteristics of eligible women within the age range of 15-49. This study was limited to all married and unmarried women aged 15 – 24 in Kenya that were interviewed during the survey. A total of 11483 women aged 15-24 formed the sample size of this study.

A complete birth history is a full list of all the children a woman has delivered during her reproductive period, including their birth date, age if alive, survival status and age at death if they are deceased. Majority of DHS surveys have birth histories that take this format. Birth histories contain information of all live births, including deceased children. It omits miscarriages, still births and abortions. Birth histories are recorded in descending order of birth. In this study, truncated birth history was used, where birth history is limited to all births as of ten years preceding the survey date to capture births for women in age group 20-24 which happened during the adolescence period (i.e. during ages 15-19) (Croft, Trevor N. et al, 2018)

3.3 Data Requirements

All married and unmarried women aged 15-24 years formed the study population. For the ten years prior to the survey, live births were calculated to form the numerator.

The specific data was:

1. To obtain the numbers of live births at the time of each birth as per exact ages of women: "Date of birth of child"   -   b3

   "Date of birth of respondent"   -   v011

   "Date of interview"   -   v008

"Woman's individual sample weight"-   v005

2. "Year/month of each live birth"   -   B1/B2

"Year/month of woman's birth"   -   V009/V010

"Exact age of woman at time of each live birth" – This is obtained by obtaining the difference between the mother's date of birth and the child's date of birth, both in CMC. The difference (b3-V011) should give us the woman's exact age at the time of each live birth.

3. To obtain the total number of live births at the time of birth for each specific birth order by exact ages of women:

"Month/year of each live birth"   -   B1/B2

"Birth order of each live birth "   -   BORD

The exact age of woman at the time of each live birth OR the year/month of the woman giving birth. (Macquarie et al, 2017; Moultrie, T., 2013).

Births to multiples such as twins or more were taken as one birth "event". They were therefore grouped as being in the same birth order. Therefore, births leading to more than one child contributed only one live birth. This was so as to avoid several live births having similar birth order numbers. In essence, a woman who delivered twins then a single baby afterwards, while being considered as parity 3, contributed one live birth of first birth-order and one live birth of higher birth-order to the analysis (Benova L. et al, 2018).

Key indicators that were used to explain the differentials in adolescent fertility include education level, wealth index, type of place of residence, region of residence, religion, marital status, ethnicity and age-the duration of exposure as a control variable.

3.4 Method of Data Analysis
This section presents methods used in the analysis of quantitative data, which is Poisson regression, multinomial logistic regression and descriptive statistics. The results were presented in tables and narrative forms.

3.4.1 Estimation of Person Years of Exposure
The duration of exposure was determined using CMC and was estimated as the time exposed to pregnancy from age 12 to age 20. In order to estimate the desired indicators, the first level of analysis was to estimate time years of observation (duration of exposure). For women aged 20-24, the exposure was computed from age 12 to 20, so 8 years =8*12 to convert it to

months. This gives 96 months for each woman. For the women under age 20, the formula ((v008 v011)-144 months)-1 was used, whereby (v008-v011) is the current age in months, 144 is the number of months from birth to age 12. One month is subtracted for truncation, i.e. the month of interview is omitted.

The above variable X was computed using the following variables:

v011	CMC date of birth of respondent
v008	CMC date of interview

The next step involved computing the exposure period in the window period from age 12, taking into account the periods of pregnancy. This variable Y was computed using the formula, Variable Y= ((Variable X-(no. of births *9))/12, to convert period of exposure in months to years of exposure in the period between age 12 and current age (if under 20 years) or age 12 to 20 years (if above 20 years).

3.4.2 Frequency Distribution and Cross-Tabulations

In this study, descriptive statistics were employed to show the distribution of the study population by different background characteristics. Frequency distribution was used to measure how often an occurrence of variables and its values occurred in a data set of the selected variable. Cross-tabulation were used to bring out the relationship that exists between the dependent and independent variables.

The key measures of adolescent fertility that were used in cross tabulation included:

1. The percentage of women in the age group 15-24 who deliver a baby before attaining age 20.
2. The proportion of women aged 15-24 who had one or two or three or more births before attaining age 20. (Macquarie et al, 2017).

Cross tabulation was done by the proportion of births and current pregnancies to women aged 15-24 as the dependent variable and the independent variables being educational attainment of mother, wealth index, type of place of residence, region of residence, religion, ethnicity and age.

3.5 Multivariate Analysis
3.5.1 Poisson Regression

The dependent variable for measuring fertility in this study was the number of births that occurred to the individual women randomly sampled from households. The number of births is a count event and it is assumed to randomly occur to each woman. Thus the number of

children belonging to each woman at any given time is a result of these random events. In this context, Poisson modeling was preferred as explained by Winkelmann and Zimmermann (1995) and Rodriguez and Cleland (1988). They observed that the Poisson regression model is suitable when one's intention is to investigate the relationship between childbearing and demographic, cultural and socio-economic variables among women obtained from a given survey.

The model has gained wide application in a number of biological, biomedical and social sciences. In the field of social sciences, Poisson model is widely applied in various disciplines including economics, political science, sociology, and demography. For example, Nguyen-Dinh (1997) used the Poisson model to analyze the determinants of fertility in Vietnam. Tsegaye (2010) studied the socio-economic factors that influence women's fertility in Zambia in comparison to various other African countries, including Kenya, Lesotho, Rwanda, Uganda, and Malawi, and used the Poisson model.

The Poisson model is advantageous when used in fertility analysis. It is superior to any other linear models when the outcome variable is count. Long and Freese, (2006) stated that a linear regression model can cause "inefficient, inconsistent and biased estimates" on count outcomes and is thus not appropriate to use. Poisson regression provides strong models in analyzing data that is discrete in nature. The Poisson model assumes that the logarithm of the dependent variable is a linear function of the independent variables, and that the dependent variable is Poisson distributed.

Another advantage of using Poisson probability distribution is that it takes into account the discrete and non-negative nature of the data and allows inferences to be made on the possibility of the outcome taking place. Poisson model can produce estimates that are not biased by the heteroscedastic and skewed distribution, which is a common feature in non-negligible possibility and non-negative data to the zero outcomes (Zimmermann and Winkelmann, 1995). Poisson regression also allows one to have control over the duration of exposure in the models through the offset term. The coefficient of the independent offset variable is set to one (Rodriguez et al, 1990). Adding the offset term in the model is like making an assumption that the risk and the duration are proportional.

3.5.1.1 Model Specification
According to Poisson probability distribution, the dependent variable is discrete, i.e. count data, and the probability of an occurrence is random and independent. It is assumed that the

distribution of a random and independent event follows a Poisson distribution when the occurrence of such an event is directly observed. There are three possibilities with respect to an event occurring: The event might occur more often or less frequently fewer than average, and sometimes it may not occur at all.

In relation to fertility, the number of births (y_i) among women aged 15-24 during their adolescence period is the dependent variable. The probability that the number of births (y_i) is equal to the random variable Y_i is thus Poisson distributed with mean μ_i:

$$P\,(Y_i = y_i\,/\mu_i) = \; e^{\mu i}\mu_i{}^{yi}\,/y_i! \qquad\qquad [1]$$

Average births during adolescence, μ_i, are disintegrated as the product of a duration of exposure (t_i) and the rate of fertility (λ_i):

$$\mu_i = t_i\lambda_i \qquad\qquad [2]$$

The sum of the logarithms of the fertility rate (λ_i) and the length of exposure (t_i) is thus equal to the logarithm of the mean (μ_i).

$$\ln\,(\mu_i) = \ln\,(t_i)\,\ln\,(\lambda_i) \qquad\qquad [3]$$

The offset is the logarithm of the length of exposure, and the logarithm of the adolescent fertility rate (λ_i) is modeled as a linear function of k explanatory variables:

$$\ln\lambda_i = \sum_{k=1}^{k} \beta_k x_{ki} \qquad\qquad [4]$$

Where:

$$\ln\mu_i = \ln t_i + \sum_{k-1}^{k} \beta_k x_{ki} \qquad\qquad [5]$$

By taking exponentials on both sides of equation 4, we find out that the explanatory variables have multiplicative effects on the rate (λ_i), since:

$$\lambda i = \exp \sum_{k-1}^{k} \beta_k x_{ki} = \prod_{k=1}^{k} \exp\,(\beta_k x_{ki}) \qquad\qquad [6]$$

Where λ is taken to mean the average number of children born to a group /category between age 12 and age 20.

3.5.2   Multinomial Logistic Regression

Multinomial Logistic Regression is used when you have a categorical dependent variable with two or more unordered levels. The multinomial logistic regression is a predictive analysis that is similar to multiple linear regression and practically identical to logistic regression, except that it has multiple possible outcomes instead of just one. Multinomial regression is used to explain the relationship between one nominal dependent variable and one or more independent variables.

It assumes that the model is correctly specified with no extraneous variables, the independent variables have no multicollinearity between them and that all the cases are independent. Multinomial logistic regression is usually performed with software, which runs a series of individual binomial logistic regressions for M-1 categories. For each category, one calculation is performed excluding the reference category. When M=2, then multinomial logistic regression reduces to logistic regression.

CHAPTER FOUR: DIFFERENTIALS IN ADOLESCENT FERTILITY IN KENYA.

4.1 Introduction.

This chapter presents results of the differentials in adolescent fertility in Kenya based on the 2014 KDHS data among women aged 15-24 in Kenya. The first part gives a description of key background characteristics of the study population. The next part touches on the differentials in adolescent fertility by select background characteristics obtained through Poisson regression analysis. The third part presents results of multivariate analysis of the socio-demographic and economic factors associated with repeat adolescent pregnancy in Kenya.

The variables that were included in the analysis are wealth index, type of place of residence, region, level of education, age in 5-year age groups, religion, ethnicity and current marital status. Level of education was recoded into no education, primary education and higher education. Ethnicity was recoded into groups as to whether the tribes are Nilotic, Cushitic, Bantu or other. Current marital status was recoded as either never married or ever married. The dependent variable that was used in this study is the adolescent births that occurred to women aged 15-24 during the adolescence period. The offset variable used for the Poisson regression was the exposure period of the women under study to pregnancy.

4.2 Distribution of number of women age 15-24 by number of births or pregnancies during adolescent period

The total sample size was 11483 out which 883 (7.7 %) had no information and were therefore omitted from further analysis. About 67 .5% had no birth while 23.3% had only one child. The total births and pregnancies that occurred to the women aged 15-24 was 8820, out of which 5924 were repeat adolescent births.
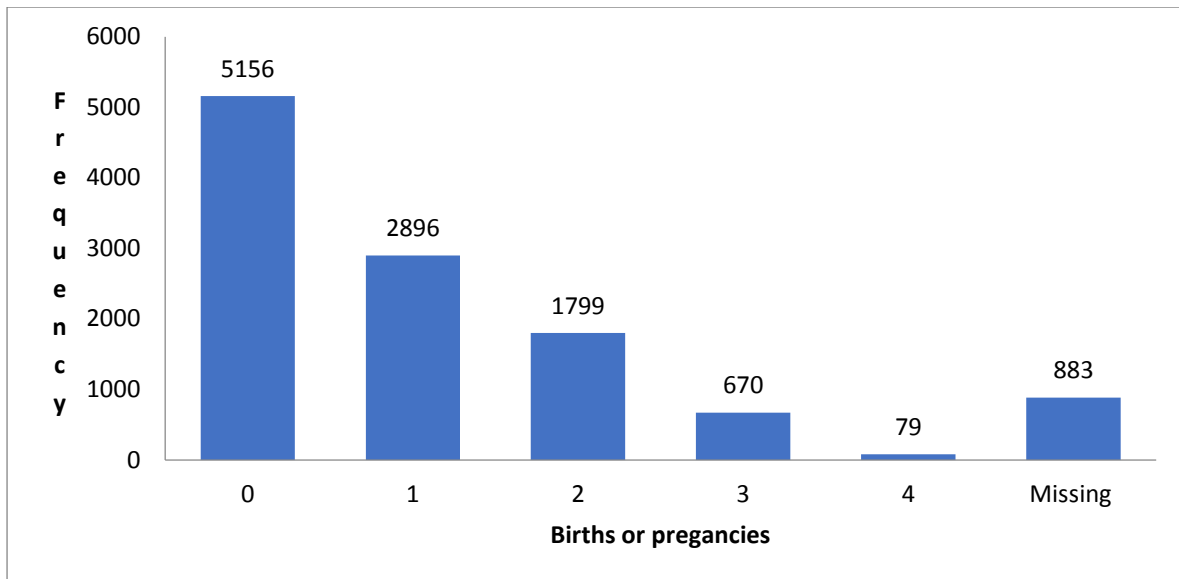
Figure 4.1: Frequency distribution of women age 15-24 by number of births or pregnancies during adolescent period

4.3 Distribution of study population by socio- demographic characteristics and number of birth/pregnancies during adolescent period

Table 4.1 shows the distribution of women aged 15 – 24 in Kenya by number of children born and socio-economic and demographic characteristics. Overall, of 10600, about 49% of women aged 15-24 had never given birth before age 20 while about 24% had 2 or more children before age 20. Among those aged 15-19 and belonging to the 1995-1999 birth cohort, 82% had no children while 4% had 2 or more children during adolescence. For those aged 20-24 of the 1990-1994 birth cohort, only 4% had no children while 51% had 2 or more children before age 20.

Table 4.1: <u>Percent Distribution of Women Age 15-24 by Number of Children Born and Pregnancies that Occurred Between Age 15 and 20 and Socio-Demographic Characteristics</u>

Characteristic	Categories	Number of pregnancies and births during adolescent period						No of cases
		0	1	2	3	4	2 or more	
Age	15-19 (1995-1999)	81.9	14.4	3.4	0.3	0	3.7	6078
	20-24(1990-1994)	4.0	44.7	35.2	14.4	1.7	51.3	4522
Region	Coast	48.4	29.6	16.4	5	0.6	22.0	1399
	North Eastern	54.2	26.4	13.2	5.2	1.0	19.4	592
	Eastern	53.3	26.8	13.9	5.3	0.8	20.0	1714
	Central	56.8	27	13.6	2.5	0.1	16.2	811
	Rift Valley	43.6	29	19.8	6.8	0.8	27.4	3152
	Western	54.1	22.3	15.9	7.2	0.5	23.6	1077
	Nyanza	45.9	24.1	18.9	9.9	1.2	30.0	1542
	Nairobi	37.7	39.3	18.2	4.5	0.3	23.0	313
Place of Residences	Urban	44.1	32.1	17.8	5.4	0.6	23.8	3857
	Rural	51.2	24.6	16.5	6.9	0.8	24.2	6743
Religion	Roman Catholic	48.9	28.7	16.4	5.3	0.7	22.4	2153
	Protestant/ Other Christian	48.4	27.2	17.4	6.4	0.6	24.4	6702
	Muslim	51.6	26.5	14.2	6.6	1	21.8	1566
	No religion	21.4	26.2	35.9	14.5	2.1	52.5	145
	Other	54.5	9.1	4.5	18.2	13.6	36.3	22
wealth index	Poorest	45.6	24.3	19.2	9.4	1.5	30.1	2573
	Poorer	51.2	21.3	18.1	8.8	0.7	27.6	2171
	Middle	51.8	25.8	16.5	5.1	0.7	22.3	2097
	Richer	48.7	30.2	16.5	4.2	0.4	21.1	1933
	Richest	46.2	37.4	13.5	2.7	0.2	16.4	1826
Ethnicity	Nilotic tribes	43.2	26.5	20.6	8.6	1	30.2	3550
	Cushitic tribes	54.2	24.9	13.5	5.9	1.4	20.8	930
	Bantu tribes	51	28.1	15.5	5	0.5	21	5869
	Other tribes	50.4	28.6	13.7	6.9	0.4	21	248
Education	No education	29.7	24.5	27.1	15.7	3	45.8	886
	Primary	48.5	21.7	20.4	8.6	0.9	29.9	5167
	Sec or higher	52.5	34.3	11.1	2	0.1	13.2	4547
Marital status	Never Married	70.1	25.2	4.1	0.6	0.04	4.74	6930
	Ever Married	8.2	31.4	41.2	17.1	2.1	60.4	3670
Kenya		48.6	27.3	17	6.3	0.7	24	10600

Nyanza region had the highest proportion (30%) of young women age 15-24 with the repeat pregnancy or birth while North Eastern region the lowest (19%). The difference by place of residence was negligible, since 24% of adolescents from both urban and rural type of

residence   experienced repeat pregnancy.   The gap in the proportion with 2 or more births/pregnancies was highest by wealth index of the household, as about 30% of adolescent from the poorest wealth index as compared to 16% of adolescents from the richest wealth index had two or more children during adolescence. On religion, adolescents of no religion had the highest proportion of repeat pregnancy at 53%, while those of Muslim faith were the lowest at 22% having repeat pregnancy.

About 30% of adolescents of Nilotic tribes experienced repeat pregnancy during adolescence as compared to 21% of adolescents of Bantu and other tribes. Adolescents with no education exhibited the highest proportion of repeat adolescent births at 46%, while 13% of adolescents with secondary and above level of education experienced repeat adolescent pregnancy. On current marital status, about 5% of never married adolescents and about 60% of ever married adolescents had two or more births during adolescence.

4.4 Differentials in Adolescent Fertility Rates
Table 4.2 presented results on the first objective of the study. Poisson regression analysis was used with the number of adolescent births as the dependent variable and the exposure period to birth during adolescence as the offset variable. From the results, it was clear that the mean number of adolescent births that occurred among adolescents was 0.427, meaning that the average number of births that an adolescent was likely to experience was slightly less than 1 during the adolescence period. The minimum number of births recorded during adolescence was 0 and the maximum 3 among adolescents under study. The average exposure time to pregnancy and birth among adolescents under study was approximately 6 years, with the least being 2 and the maximum being 8 years.

Table 4.1: <u>Poisson Regression results on average number of children ever born between ages 15 and 19</u>

Variables	Parameter	B	Std. Error	Exp.(B)
AGE (YEARS)	(Intercept)	-8.176	0.2757	0
	15-19 (1995-1999)	0.781	0.0366	2.184*
	20-24 (1990-1994)	0^a		1
REGION	COAST	-0.171	0.1132	0.843
	NORTH EASTERN	-0.097	0.1473	0.907
	EASTERN	-0.03	0.1083	0.971
	CENTRAL	-0.135	0.1212	0.874
	RIFT VALLEY	0.054	0.1043	1.056
	WESTERN	0.211	0.1104	1.235***
	NYANZA	0.449	0.1058	1.567*
	NAIROBI	0^a		1
TYPE OF PLACE OF RESICENCE	URBAN	0.025	0.0376	1.026
	RURAL	0^a		1
WEALTH INDEX	POOREST	0.516	0.0667	1.676*
	POORER	0.524	0.065	1.689*
	MIDDLE	0.418	0.0647	1.519*
	RICHER	0.218	0.0629	1.244*
	RICHEST	0^a		1
EDUCATION	NO EDUCATION	0.871	0.0637	2.39*
	PRIMARY EDUCATION	0.791	0.0407	2.205*
	HIGHER EDUCATION	0^a		1
CURRENT MARITAL STATUS	NEVER MARRIED	-1.804	0.0453	0.165*
	EVER MARRIED	0		1

***p<0.05, **p<0.01, *p<0.001

On age, the 1995-1999 cohort of adolescents (aged 15-19) were 118.4% more likely to obtain higher mean number of births than the 1990-1994 cohort of adolescents (aged 20-24) (p≤0.0001). The findings clearly state that younger adolescents (aged 15-19) appear to have higher birth rates compared to those age 20 -24. This means that the propensity to have children during adolescence may have increased. The region variable was analysed in comparison to Nairobi province. Adolescents from Western province were 23.5% more likely to obtain higher mean number of births than Nairobi (p=0.056). Adolescents from Nyanza province were 56.7% more likely to obtain higher mean number of births than those from

Nairobi (p=0.000). Thus, adolescent birth rates were highest in Nyanza province. Rural-urban differentials in adolescent fertility were negligible and thus not significant.

In comparison to adolescents from the richest wealth index, adolescents from the poorest wealth index were found to be 67.6% more likely to obtain higher mean number of births. Those from the poorer wealth index were 68.9% more likely to obtain higher mean number of births than adolescents from the richest wealth index. Those from the middle wealth index were 51.9% more likely to obtain higher mean number of births than adolescents from the richest wealth index, while those from the richer wealth index were 24.4% more likely to obtain higher mean number of births than adolescents from the richest wealth index. All the findings were significant at 0.0001 level.

Low maternal educational status was associated with adolescent pregnancy in this study. Compared to adolescents with higher level of education, adolescents with no education were 139% more likely to obtain higher mean number of births, while those with primary level of education were 120.5% more likely to obtain higher mean number of births/pregnancies. All the findings were significant at 0.000 level. Adolescents who were never married were found to be 83.5% less likely to obtain higher mean number of births/pregnancies than the ever-married adolescents (p=0.000).

4.5 Characteristics of respondents who had repeat pregnancies during adolescence period

In this section, results relevant to the third objective were outlined as in table 4.3. The variable on total adolescent births was recoded into a variable separating the repeat births from the single births that occurred to adolescents during the adolescent period. Multinomial logistic regression was then conducted with the dependent variable being the recoded variable distinguishing the repeat pregnancies from those that were not. The independent variables included in the regression were ethnicity, region, type of place of residence, age in 5-year age groups, wealth index, religion, current marital status and highest level of education. The reference category in this analysis was the adolescents with no repeat adolescent births nor pregnancy during the adolescence period.

Table 4.3: Multinomial Logistic Regression analysis of adolescent repeat pregnancy by select background characteristics

		B	Std. Error	Exp(B)
EDUCATION	NO EDUC.	1.334	0.164	3.795*
	PRIMARY EDUC.	1.053	0.114	2.866*
	HIGHER EDUC.	0[b]		
AGE (YEARS)	15-19 (1995-1999 COHORT)	-0.975	0.102	0.377*
	20-24 (1990-1994 COHORT)	0[b]		
REGION	COAST	-0.397	0.314	0.673
	NORTH EASTERN	-0.189	0.377	0.828
	EASTERN	-0.076	0.301	0.927
	CENTRAL	-0.406	0.349	0.666
	RIFT VALLEY	0.058	0.29	1.06
	WESTERN	0.431	0.304	1.539
	NYANZA	0.66	0.293	1.935***
	NAIROBI	0[b]		
TYPE OF PLACE OF RESIDENCE	URBAN	-0.009	0.098	0.991
	RURAL	0[b]		
RELIGION	ROMAN CATHOLIC	-1.293	0.587	0.274***
	PROTESTANT/OTHER CHRISTIAN	-1.069	0.584	0.343
	MUSLIM	-0.479	0.603	0.619
	NO RELIGION	-0.871	0.617	0.419
	OTHER RELIGION	0[b]		
WEALTH INDEX	POOREST	0.641	0.179	1.899*
	POORER	0.686	0.176	1.985*
	MIDDLE	0.43	0.178	1.537***
	RICHER	0.229	0.175	1.257
	RICHEST	0[b]		
CURRENT MARITAL STATUS	NEVER MARRIED	-2.816	0.146	0.06*
	EVER MARRIED	0		

***p<0.05, **p<0.01, *p<0.001

With reference to higher education, adolescents with no repeat pregnancy during adolescence and with no education were 279.5% (3.795 times) more likely to undergo repeat adolescent pregnancy. Those adolescents with no repeat pregnancy and with primary education were 186.6% (2.866 times) more likely to undergo repeat adolescent pregnancy. All the findings were significant at 0.000 level. Thus, the propensity for repeat adolescent pregnancy was higher among women with no or low education than those with higher education. On age, the 1995-1999 cohort of adolescents (aged 15-19) with no repeat adolescent pregnancy were 62.3% less likely to undergo repeat adolescent pregnancy as compared to the 1990-1994 cohort of adolescents (aged 20-24) ($p \leq 0.0001$). This is as expected, since older adolescents normally have a higher propensity to have repeat adolescent pregnancy than younger ones.

Adolescents with no repeat adolescent pregnancy from Nyanza province were 93.5% more likely to undergo repeat adolescent pregnancy than adolescents from Nairobi (p=0.024). Results on type of place of residence were insignificant, thus adolescents from both urban and rural places of residence were equally predisposed to experience repeat adolescent pregnancy. Among the religions, adolescents with no repeat adolescent birth of Roman Catholic faith were 72.6% less likely to undergo repeat adolescent pregnancy than adolescents of other religion (p=0.028). However, the other religions showed insignificant results on the propensity to experience repeat adolescent pregnancy.

Adolescents with no repeat pregnancy from the poorest wealth index were 89.9% more likely to undergo repeat adolescent pregnancy than adolescents from the richest wealth index. Adolescents with no repeat adolescent pregnancy from the poorer wealth index were 98.5% more likely to undergo repeat adolescent pregnancy than adolescents from the richest wealth index. These two findings were all significant at 0.000 level. Adolescents with no repeat adolescent pregnancy from the middle wealth index were 53.7% more likely to undergo repeat adolescent pregnancy than adolescents from the richest wealth index (p=0.016). Thus, the propensity for repeat adolescent pregnancy seems to decline with increase in wealth index levels. Those adolescents with no repeat pregnancy and were never married were 94% less likely to undergo repeat adolescent pregnancy than the ever-married adolescents (p=0.000).

4.6 Discussion of the Findings
In this study, the main objective was to determine the differentials in adolescent fertility in Kenya with special focus on the repeat adolescent pregnancies. The independent variables

analysed were educational level, wealth index, region, religion, type of place of residence, age in 5-year age groups, current marital status and ethnicity. The dependent variable was the total number of adolescent births ever occurred to women aged 15-24.

The data for the study was obtained from KDHS 2014. 11483 women aged 15-24 in Kenya were analysed in this study. The conceptualization of the study was within the Bongaarts model of fertility determinants. The data analysis methods in this study were descriptive statistics, Poisson regression analysis and multinomial logistic regression. From the study findings, out of a total of 11483 women aged 15-24, a total of 977 women had repeat adolescent births during the adolescence period, giving a total of 2064 births. This was 9.2% of the total births experienced by the women during the adolescence period.

Women aged 15-19, of the 1995-1999 cohort, were found to be more likely to obtain higher mean number of births/pregnancies than the women aged 20-24 of the 1990-1994 cohort of adolescents. The women with no repeat pregnancy aged 15-19 were however 62.3 less likely to undergo repeat adolescent pregnancy than those aged 20-24. This indicated that the propensity to have children during the adolescent period increased over the years. Also, women aged 20-24 had higher propensity to have repeat adolescent pregnancy as compared to those aged 15-19. This is probably because they had longer exposure periods to experience repeat adolescent pregnancy.

Chances for repeat adolescent pregnancy appeared to decline with increasing wealth index. In a study in Uganda, Rutaremwa (2013) established that the pregnancy rate for adolescents from poor households was 41%. The adolescents were more likely to fall pregnant than adolescents from wealthier families. Another study by Magadi & Agwanda (2009) conducted in South Nyanza also established that high socio-economic status of a household was linked to delayed initiation of sexual intercourse and thus early childbearing. Odimegwu et al (2002) also revealed that adolescents whose parents were poor were more likely to engage in pre-marital sex which led to adolescent childbearing than those adolescents that had parents who were middle to high-income level earners. These studies concur with the findings in this study, which show that adolescents from the poorest wealth index were 67.6% more likely to obtain higher mean number of births/pregnancies. They were also about 89.9% more likely to undergo repeat adolescent pregnancy/birth.

A study by Sinha et al (2007) observed that youth who frequented church and were religious were less sexually experienced. This concurs with the findings of this study, as adolescents of

Roman Catholic faith were found to be 72.6% less likely to experience repeat adolescent pregnancy as compared to those adolescents of no religion. Another study by Fonda (2015) stated that among developed nations, adolescent fertility rate was higher among communities with no clear spiritual allegiance. However, this study found inconclusive results on the effect of religion on the likelihood of experiencing repeat adolescent pregnancy.

Dutta and Sarkar (2014) observed that those adolescents with no education exhibited a higher level of fertility than their counterparts with some education. From this study, adolescents with no education were found to be 2.39 times more likely to obtain higher mean number of births/pregnancies; those with no repeat adolescent pregnancy were 3.795 times more likely to undergo repeat adolescent pregnancy than adolescents with higher level of education. Magadi & Agwanda (2009) also established that high educational attainment of adolescents was linked to delayed initiation of sexual intercourse and thus adolescent pregnancy. From this study, it is clear that the propensity to experience a repeat adolescent pregnancy reduced with increase in the education levels of an adolescent. Adolescents with no repeat pregnancy during adolescence and with no education were 3.795 times more likely to undergo repeat adolescent pregnancy, while those with primary education were 2.866 times more likely to undergo repeat adolescent pregnancy.

Adolescents from different regions were exposed differently to adolescent pregnancy. Compared to adolescents from Nairobi, adolescents from Nyanza and Western provinces were most likely to obtain higher mean number of births/pregnancies at 56.7% and 23.5% respectively. Those adolescents with no repeat adolescent pregnancy from Nyanza provinces were found to be 93.5% more likely to undergo repeat adolescent pregnancy respectively. Thus Nyanza province showed significantly consistent positive results on the likelihood to experience repeat adolescent pregnancy.

Current marital status was a high determiner of repeat adolescent pregnancy and birth. Nyarko (2012) found out that in Ghana, childbearing was highest among married adolescents or those in a union and lowest among the never married adolescents. In Zambia, Nwogwugwu (2013) found out that married adolescents, compared to the unmarried adolescents, were more likely to have one or more children. Results of Woldemicael (2005) in Eritrea also indicated that married adolescents were more likely to have initiated childbearing compared to unmarried adolescents. In this study, never married adolescents were 83.5% less likely to obtain higher mean number of births/pregnancies than the ever

married adolescents. The adolescents with no repeat pregnancy that were never married were also 94% less likely to undergo repeat adolescent pregnancy than the ever-married ones. Thus, the findings of this study concur with the literature reviewed on this topic.

One limitation of this study is that it did not investigate whether occurrence of repeat birth and pregnancy was by choice of the adolescent or not. The study did not also consider whether rapid repeat pregnancy occurred (Burke et al,2018). These aspects require further investigation.

CHAPTER FIVE: SUMMARY, CONCLUSION AND RECOMMENDATIONS

5.1 Introduction

This chapter presents summary, conclusion, and recommendations of the study. The first part describes summary of findings, the second presents conclusion, and lastly recommendations on policy and further research are presented in the last part of the chapter.

5.2 Summary

The mean number of adolescent births that occurred among adolescents was 0.427 over an average exposure time to pregnancy and birth of 6 years. From the study, it was evident that the younger adolescents (aged 15-19) appeared to have higher birth rates than those aged 20-24. Those aged 15-19 were 2.184 times more likely to obtain higher mean number of births/pregnancies than those aged 20-24. Also, the women aged 20-24 had a higher propensity than those aged 15-19 to undergo repeat adolescent pregnancy. The findings stated that the 1995-1999 birth cohort of adolescents (aged 15-19) with no repeat adolescent pregnancy were 62.3% less likely to undergo repeat adolescent pregnancy (p≤0.0001).

Chances for repeat adolescent pregnancy declined with wealth index. Adolescents from the poorest wealth index were most likely to obtain higher mean number of births/pregnancies than those from the richest wealth index. The adolescents from the poorest wealth index were also most likely to than repeat adolescent pregnancy/birth. For regions, the results were as expected. Adolescents from Nyanza and Western provinces were the most likely to obtain higher mean number of births/pregnancies as compared to adolescents from Nairobi province. Adolescents from Nyanza province were also most likely to undergo repeat adolescent pregnancy than adolescents from Nairobi county. Occurrence of repeat adolescent pregnancy was also more among adolescent with lower educational level. Adolescents with no education were most likely to obtain higher mean number of births and to undergo repeat adolescent pregnancy than those with secondary and higher education levels.

Never married adolescents were 83.5% less likely to obtain higher mean number of adolescent births/pregnancies and 94% less likely to undergo repeat adolescent pregnancy than the ever- married adolescents. This study however found inconclusive results on the effect of type of place of residence, religion and ethnicity on repeat adolescent pregnancy.

5.3 Conclusion

Adolescence is one of the most rapid phases of human development. The key measure of adolescent fertility in this study was the extent to which some adolescents go on to have second and higher order births before age 20. Nationally as per the 2014 KDHS, 9.2% of the

total births experienced to women aged 15-24 during the adolescence period were repeat adolescent pregnancies. In this study, wealth index, education level, age and current marital status stood out as the major socio-economic factors bringing about the evident differentials in adolescent fertility as per the repeat adolescent births were concerned in Kenya.

Results showed that of the adolescents with no repeat adolescent pregnancy, 89.9% from the poorest wealth index, 98.5% from the poorer wealth index, 53.7% from the middle wealth index were more likely to undergo repeat adolescent pregnancy as compared to those adolescents from the richest wealth index. This finding concurs with what Nyarko (2012) found out, that childbearing tends to be high among adolescents from poor households as compared to those from rich households.

On the educational level, of the adolescents with no repeat adolescent pregnancy, 279.5% of these adolescents with no education and 186.6% of these adolescents with primary education were more likely to undergo repeat adolescent pregnancy than those adolescents with higher level of education. This finding concurs with what Were M., 2007 observed, that a negative relationship exists between adolescent pregnancy and girls' level of education; in that those adolescents with no education at all or those with primary education were more vulnerable to adolescent pregnancy. Those aged 15-19 appeared to obtain higher adolescent birth rates than those aged 20-24. This implied that the propensity to have children during adolescence had increased over the years.

 Never married adolescents were 83.5% less likely to obtain higher mean number of births/pregnancies than ever married adolescents. They were also 94% less likely to undergo repeat adolescent pregnancy than the ever-married adolescents. Adolescent development has implications for adolescent health. The changes in adolescence have health consequences not only in adolescence but also over the life-course.

5.4 Recommendations
Adolescence is one of the most rapid phases of human development. Biological maturity provides psychosocial maturity. This has implications for policy and program responses to the exploration and experimentation that takes place during adolescence. Younger adolescents may be particularly vulnerable when their capacities are still developing and they are beginning to move outside the confines of their families. The unique nature and importance of adolescence mandates explicit and specific attention in health policy and programs.

5.4.1 Recommendations for Policy

The most comprehensive and perhaps relevant intervention is implementing the National Adolescent Sexual and Reproductive Health Policy. The policy, which was published and launched in 2015, provides a clear roadmap of actions that the stakeholders need to take to tackle teenage pregnancies. It has a 14- point action plan, ranging from providing adolescents with accurate information through an age appropriate comprehensive sexuality education curriculum, to invest in youth-friendly reproductive healthcare. Since Kenya doesn't have a clearly set out policy or program on repeat adolescent pregnancy as in some US states (Maravilla et al, 2017), included in this policy should be a special program for monitoring the incidence of repeat adolescent pregnancy and prevention of the same.

The Ministry of Education also has a role to play in reducing cases of repeat adolescent pregnancy by speeding up the adoption of age-appropriate comprehensive sexuality education into the school curriculum. The conversation about a sexuality education curriculum somehow stalled. Thus, high-level intervention is needed to unlock the impasse. In general, a broad partnership involving parents, education officials, community and religious leaders can help reduce cases of repeat adolescent pregnancy and adolescent pregnancy as a whole in Kenya.

5.4.2 Recommendation for Further Research.

Further research should also be done on this topic of repeat adolescent pregnancy so as to establish whether repeat adolescent pregnancy occurs by choice of the adolescent or not. The incidence and occurrence of rapid repeat pregnancies (repeat pregnancies that occur within short intervals) should also be researched on.

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