

FACTORS INFLUENCING ADOLESCENT FERTILITY IN URBAN KENYA

BY

MUSEVE K. AUDREY

(Q50/69606/2013)

**A PROJECT SUBMITTED IN PARTIAL FULFILMENT OF THE
REQUIREMENTS FOR THE AWARD OF A MASTER OF ARTS DEGREE AT
THE POPULATION STUDIES AND RESEARCH INSTITUTE, UNIVERSITY
OF NAIROBI**

NOVEMBER, 2015

DECLARATION

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

CANDIDATE: MUSEVE K. AUDREY

Sign.....

Date

This research project has been presented for examination with our approval as University Supervisors.

DR. ANNE KHASAKHALA

Sign

Date

DR. SAMUEL WAKIBI

Sign

Date

DEDICATION

I humbly dedicate this work to my dear mother, Mary Auma.

ACKNOWLEDGEMENT

I wish to thank God the Almighty for granting me strength and good health, and through whose mercy and grace I completed this study. My sincere appreciation goes to the Board of Postgraduate Studies (BPS) and the University of Nairobi for facilitating my completion of this course through an award of scholarship in 2013.

I deeply acknowledge the guidance of my research project supervisors; Dr. Anne Khasakhala and Dr. Samuel Wakibi for their constructive criticisms and insightful suggestions on different sections of this study. Their continuous support and counsel led to the realization of this work. Thank you so much and may God bless you. I am also appreciative of all the lecturers at the University of Nairobi's Population Studies and Research Institute (PSRI) for their guidance during the entire period of my studies. Thanks to my fellow postgraduate students at PSRI for their support of my work in different ways.

Special thanks to my great parents; Alexander Museve and Mary Auma, and siblings; Oscar, Eugene, Milcah, Beckie, and Zippy for their prayers, moral support, understanding, and sacrifices they had to make while I undertook my studies. Finally, I am grateful to everyone that contributed to the success of this study in one way or another.

ABSTRACT

Adolescent fertility is an issue of increasing concern in developed and developing countries. High adolescent fertility results in an increase in total fertility and leads to rapid population growth. The 2008/09 Kenya Demographic and Health Survey (KDHS) results indicated that urban adolescent fertility was slightly higher than the rural adolescent fertility. This study sought to establish the factors influencing adolescent fertility in urban Kenya. Specifically, it sought to determine the socio-demographic and economic factors influencing adolescent fertility in urban Kenya, and to identify the key proximate determinants of adolescent fertility in urban Kenya.

The study utilized the Kenya Demographic and Health Survey (KDHS) data of 2008/09. The main methods of data analysis were descriptive statistics, logistic regression, and the Bongaarts model of proximate determinants. Bivariate findings showed that years of schooling, current marital status, age at first sex, and contraceptive use were significantly associated with adolescent fertility in urban Kenya at the significance level of 0.05. The majority of births occurred among adolescents with 1-7 years of schooling ($P=0.001$), those that were married ($P=0.001$), those with age at first sex of <18 years ($P=0.002$), and those that used contraceptives ($P=0.001$). Results of the overall logistic regression model indicated that marital status and age at first sex were associated with adolescent fertility. Adolescents in urban Kenya who were not married ($OR=0.25$, $P<0.001$) and those whose age at first intercourse was 18-19 years ($OR=0.157$, $P<0.05$) were significantly less likely to have initiated childbearing. Results from the Bongaarts model of fertility indicated that marriage, contraceptive use, and postpartum infecundability were associated with adolescent fertility in urban Kenya. However, the index of marriage had the strongest fertility inhibiting effect, thus was the key proximate determinant of adolescent fertility in urban Kenya.

The main policy implication for these study findings is that the government should develop interventional programmes to delay marriage and age at first sex among adolescents. Such programmes should target urban areas where more adolescents have no education or have only a few years of schooling, and where many adolescents marry earlier. Additionally, sexual educational programmes for urban adolescents are necessary to inform them on the need to delay their onset of sexual intercourse.

TABLE OF CONTENTS

DECLARATION	ii
DEDICATION	iii
ACKNOWLEDGEMENT	iv
ABSTRACT	v
TABLE OF CONTENTS	vii
LIST OF FIGURES	x
LIST OF TABLES	x
CHAPTER ONE: INTRODUCTION	1
1.1 Background	1
1.2 Problem Statement	3
1.3 Research Question	4
1.4 Objectives of the Study	4
1.5 Justification of the Study	5
1.6 Scope and Limitations of the Study	6
CHAPTER TWO: LITERATURE REVIEW	7
2.1 Introduction	7
2.2 Studies on Socio-demographic and Economic Factors Influencing Fertility	7
2.2.1 Years of Schooling	7
2.2.2 Wealth Index	8
2.2.3 Frequency of Listening to Radio	9
2.2.4 Religion	10
2.2.5 Marital Status	11
2.2.6 Age at First Sex	12
2.2.7 Current Contraceptive Use	13
2.3 Studies on Proximate Determinants of Fertility using the Bongaarts Model	15
2.3.1 Asia	15
2.3.2 Sub-Saharan African Region	17
2.3.3 Kenya	18
2.3.4 Other Regions	19
2.4 Summary of Literature Review	20
2.5 Conceptual Framework	21

2.6 Operational Framework	22
2.7 Analytical Framework	23
2.8. Definition of Concepts.....	26
2.9 Definition of Variables and their Measurement.....	27
2.9.1 Adolescent Fertility	27
2.9.2 Socio-demographic and Socio-economic Variables.....	28
2.9.3 Proximate Determinants of Fertility Variables.....	30
CHAPTER THREE: DATA AND METHOD	31
3.1. Introduction.....	31
3.2. Data Source.....	31
3.3. Method of Data Analysis	31
3.3.1. Descriptive Statistics	31
3.3.2. Logistic Regression	32
3.3.3. Bongaarts Model of Proximate Determinants of Fertility	32
CHAPTER FOUR: FACTORS INFLUENCING ADOLESCENT FERTILITY IN URBAN KENYA.....	38
4.1. Introduction.....	38
4.2. Background Characteristics of the Survey Population	38
4.3. Fertility Characteristics/Pattern of Childbearing of Adolescents, 15 – 19 years in Urban Kenya	41
4.4. Association between Adolescent Fertility and Selected Background Characteristics in urban Kenya	42
4.5. Socio-demographic and Economic Factors Influencing Adolescent Fertility in Urban Kenya	44
4.6. Estimates of the Indices of Proximate Determinants of Female Adolescent Fertility in Urban Kenya	50
CHAPTER FIVE: SUMMARY, CONCLUSION, AND RECOMMENDATIONS	53
5.1. Introduction.....	53
5.2. Summary of findings.....	53
5.3. Conclusion	55
5.4. Recommendations.....	56

5.4.1 Recommendations for Policy.....	56
5.4.2 Recommendations for Further Research	57
REFERENCES	58

LIST OF FIGURES

Figure 2.1: Conceptual Framework (Bongaarts' Fertility Framework, 1984).....	22
Figure 2.2: Operational Framework.....	23

LIST OF TABLES

Table 2.1: Socio-demographic and Economic Variables used in the Study	29
Table 4.1: The percentage distribution of study population according to the Socio-demographic and economic variables, in urban Kenya, 2008/9 KDHS	40
Table 4.2: Fertility and pattern of childbearing of female adolescents aged 15-19 years in urban Kenya, 2008/9.....	41
Table 4.3: Association between Adolescent Fertility and Selected Background Characteristics in Urban Kenya, 2008/9 KDHS	43
Table 4.4: Socio-demographic Factors influencing Adolescent Fertility in Urban Kenya	45
Table 4.5: Economic Factors influencing Adolescent Fertility in Urban Kenya	46
Table 4.6: Socio-demographic and Economic Factors Influencing Adolescent Fertility in Urban Kenya	49
Table 4.7: Estimates of the Indices of Proximate Determinants of Female Adolescent Fertility in Urban Kenya	52

CHAPTER ONE

INTRODUCTION

1.1. Background

Adolescent fertility is an issue of increasing concern in developed and developing countries (Dutta & Sarkar, 2014). At the global level, 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 per cent of all births worldwide. More than 95 per cent of these adolescent births occur in developing countries. In 2010, the global adolescent fertility rate (15-19 years) 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 (Presler–Marshall & Jones, 2012).

Like many other countries in the sub-Saharan Africa, Kenya is characterized by high adolescent fertility. At 103 per 1000, the adolescent fertility of Kenya is higher than the global average of 53 per 1000 (Presler–Marshall & Jones, 2012). According to the 2008/9 Kenya Demographic and Health Survey (KDHS), about 18 per cent of young women aged 15–19 had already begun childbearing at the time of the survey while 26 per cent of women age 20–24 had given birth before reaching 18 years. The 2008/9 KDHS also found that almost one-third (32 per cent) of women in Kenya are married before reaching 18 years. In addition, almost half of the women surveyed of age 25–49 were sexually active by age of 18 years. Furthermore, 13 per cent of all the women surveyed had had sex before reaching 15 years (KNBS & ICF Macro, 2010).

Adolescent fertility is a major concern because of the implications it has at the individual, family, and societal levels. Due to their physiological immaturity, adolescent mothers have a

higher risk of premature labour and complications during and after delivery, resulting in high mortality and morbidity for themselves and their children (Rutaremwā, 2013). Additionally, early childbearing denies many adolescent mothers the opportunity to pursue education. This is detrimental to their future prospects and lowers their status in society (Oyefara, 2009). Most importantly, high adolescent fertility is a determinant of large family size and leads to rapid population growth especially in countries where contraceptive use is not well embraced. Early sexual debut lengthens the reproductive period and subsequently increases individual lifetime fertility (KNBS & ICF Macro, 2010).

Adolescent fertility varies with the place of residence. Evidence show that rural adolescents in most regions have higher fertility rates than urban adolescents (Dutta & Sarkar, 2014; Gomes, 2012; Presler–Marshall & Jones, 2012). In Kenya, however, the 2008/9 KDHS results indicated that the urban adolescent fertility was slightly higher than the rural adolescent fertility. 16.1 per cent of urban adolescents had had a live birth by the time of the interview compared to 14.1 per cent of rural adolescents (KNBS & ICF Macro, 2010). This implies that urban adolescents in Kenya experience some unique factors which are not experienced by the rural adolescents, hence making this an area of research interest.

Several studies have investigated the factors influencing adolescent fertility in developing countries and have established that adolescent fertility is associated with different socioeconomic, environmental and cultural factors (Dutta & Sarkar, 2014; Raj et al 2010; Beguy et al 2013; Gomes, 2012; Filho & Kawachi, 2015; Fonda, 2015 & Rutaremwā, 2012). Studies that focused on proximate determinants of adolescent fertility found delayed marriage and postpartum infecundability to be the most influential fertility inhibiting factors for adolescents (Abedin, 2011; Sahoo, 2011; Alemayehu et al 2010).

In Kenya, little attention has been paid to understanding the proximate determinants of adolescent fertility. Although evidence suggests that adolescent fertility contributes to total fertility rate at different levels (Dutta & Sarkar, 2014; Beguy et al., 2013), research attention has not been directed to understanding the factors that are associated with adolescent fertility specifically in urban Kenya. This study will attempt to fill this gap by focusing on the proximate determinants of adolescent fertility in urban Kenya together with the socio-demographic and economic factors associated with adolescent fertility in urban Kenya.

1.2. Problem Statement

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, 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), and much of the high fertility in sub-Saharan Africa can be attributed to first birth occurring at very young ages (Beguy et al 2013). At 103 per 1000 adolescent fertility in Kenya remains high as compared to the global average of 53 per 1000. Overall, to address the high total fertility rate in the country, attention must also be drawn to adolescent fertility. This study will explore the factors influencing adolescent fertility in urban Kenya.

The 2008/09 KDHS data indicate that according to type of residence, adolescent fertility is slightly higher in urban Kenya as compared to rural. The factors responsible for a higher adolescent fertility in urban Kenya are not well understood. It is thus important to understand the factors that are driving a higher urban adolescent fertility in Kenya in order to develop effective interventional programmes. This is necessary in order to avoid the persistence of a

higher urban adolescent fertility, which will have implications for the country's adolescent fertility rate, total fertility rate, population growth, and overall development.

Different studies on factors influencing adolescent fertility have been undertaken in Kenya (Beguy et al., 2013; Were, 2007; Kabiru et al., 2010; Magadi & Agwanda, 2009) and have generally examined the background determinants of adolescent fertility including educational attainment and household socioeconomic status. However, these factors can only affect adolescent fertility through intermediate variables such as use of contraception, marriage, postpartum infecundability, sterility and induced abortion. This study will therefore, fill the gap by determining the socio-demographic and economic factors influencing adolescent fertility in urban Kenya, and identifying the key proximate determinants of adolescent fertility in urban Kenya.

1.3. Research Question

This study answers the following research questions:

- What are the socio-demographic and economic factors influencing adolescent fertility in urban Kenya?
- What are the key proximate determinants of adolescent fertility in urban Kenya?

1.4. Objectives of the Study

The general objective of this study was to establish the factors influencing adolescent fertility in urban Kenya. The specific objectives were:

- To determine the socio-demographic and economic factors influencing adolescent fertility in urban Kenya
- To identify the key proximate determinants of adolescent fertility in urban Kenya

1.5. Justification of the Study

This study makes a contribution in three major ways. First, this contributes to a better understanding of the factors influencing adolescent fertility in urban Kenya. Reducing fertility is one of the country's major aims in a bid to improve development and human welfare. Higher adolescent fertility in urban Kenya contributes significantly to the already high total adolescent fertility in the country. Therefore, it is only by understanding the proximate and socio-demographic and economic factors influencing adolescent fertility in urban Kenya that effective interventions can be developed to address the concern of high fertility rate in the country.

From the literature reviewed, most studies on adolescent fertility in Kenya have focused on the indirect determinants, thus there is no knowledge on how proximate factors influence adolescent fertility in the country. Additionally, most studies have focused on Kenya as a whole, and on its different sub-regions. No focus is drawn to urban adolescent fertility yet this, according to current data, contributes slightly more to total adolescent fertility in the country compared to rural. This gap can thus only be filled by determining the proximate as well as socio-demographic and economic factors influencing adolescent fertility in urban Kenya. This research thus contributes to the body of knowledge that aids in reducing adolescent fertility.

Adolescent fertility holds a special place in the design and implementation of reproductive health strategies, policies, and programmes. Understanding factors influencing adolescent fertility in urban Kenya will generate knowledge that will be useful to researchers, policy makers, and program managers in designing better policies and programmes to address the challenge of high adolescent fertility in urban Kenya and avert its negative implications at the

individual, family and national levels. Thus this study is important because the alleviation of fertility is a major target in the country in order to control population growth and improve human welfare and development.

1.6. Scope and Limitations of the Study

This study focused on the proximate determinants and the socio-demographic and economic factors of adolescent fertility in urban Kenya. The 2008/9 Kenya Demographic and Health Survey (KDHS) data was used. A total of 433 female adolescents of age 15 – 19, married and unmarried, living in urban Kenya interviewed in the survey formed the scope of the study.

The proximate variables selected include proportion married, contraceptive use, and postpartum infecundability, while the socio-demographic and economic variables include years of schooling, wealth index, frequency of listening to radio, religion, current marital status, age at first sex, and current use of contraceptives. In the 2008/9 KDHS data, there was no data collected on induced abortion since abortion is illegal in Kenya. For this reason, induced abortion as a proximate determinant of fertility was not assessed in this study. Additionally, the influence of sterility on fertility is minimal in Kenya. Therefore, the index of sterility was considered 1 for this study. Furthermore, this study did not control for the effect of migration. The 2008/09 KDHS data is on current status, thus some of the recorded births might have occurred elsewhere other than urban Kenya.

CHAPTER TWO

LITERATURE REVIEW

2.1. Introduction

This chapter presents a review of literature on socio-demographic and economic factors influencing adolescent fertility, and proximate determinants of adolescent fertility. The first section focuses on studies undertaken on socio-demographic and economic factors influencing fertility; the second part looks at the studies undertaken on proximate determinants of fertility while the third part summarizes the literature review. This chapter also presents the conceptual, operational, and analytical frameworks that guided the study.

2.2 Studies on Socio-demographic and Economic Factors Influencing Fertility

2.2.1 Years of Schooling

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 that girls' education from the secondary level onwards was the only consistently significant covariate. This implied that improving girls' education is a key instrument for raising ages at first birth, but suggest that increases in schooling at lower levels alone bear only somewhat on the prospects for fertility decline among adolescents. Rutaremwa (2013) found that in Uganda, adolescents who had completed secondary school had lower pregnancy rates compared to adolescents who had no secondary education. 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) found that in most countries in sub-Saharan Africa, adolescents with no schooling had about two to three children more than those with secondary or higher education.

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 expanding access to formal education was generally seen as a crucial intervention for preventing early childbearing among adolescents. Were (2007), Alemayehu et al (2010), and Nyarko (2012) also found a relationship between adolescent fertility and adolescent girls' education. Female adolescents who had primary school education as well as those who had secondary school education or higher were less likely to have initiated childbearing compared to female adolescents who had no formal education. This is attributed to the dearth in knowledge of sexual and reproductive health issues among illiterate adolescents.

2.2.2 Wealth Index

The inability of adolescents to meet personal and basic needs exposes them to pre-marital 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, 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 compared to adolescents whose parents were in the middle to high income level. Manlove (2010) also found that adolescents from lower socio-economic status were more prone to engage in early sexual activities.

In a study in Uganda, Rutaremwa (2013) established that adolescents from poor households are more likely to become pregnant compared to adolescents from wealthier families. For the former, the pregnancy rate was 41 per cent and for the latter the rate was 16 percent. Additionally, it was found that the pathways of this influence could be that the poor tend to marry at an early age, while those in the richer groups continue with their education and other career goals. Magadi & Agwanda (2009) conducted a study in South Nyanza, Kenya and established that high socio-economic status of the household, high educational attainment of adolescents, high mothers' educational attainment and communication with parents and girlfriends was associated with 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.

2.2.3 Frequency of Listening to Radio

Exposure to media is known to have a significant influence on adolescent fertility. Mass media plays an important role in disseminating information and bringing social changes with respect to attitude towards fertility behavior. In Ghana, Nyarko (2012) found that childbearing was high among adolescents that were not exposed to the media and lower among those that were exposed to the media. Female adolescents who were not exposed the media were more susceptible to early child bearing, probably because of dearth of knowledge to make informed choices concerning their sexual and reproductive health matters. This is because the mass media are believed to play an important role in promoting social attitudes about fertility and reproductive behaviours. In another study, Ferrara et al (2008) explored the effects of television on fertility in Brazil. Results showed that exposure to the media among women led to a lower level of fertility. This effect was also experienced by women in the low socioeconomic status as well as those in their middle or late phases of childbearing.

Similarly, Gupta & Leite (1999) established a significant association between exposure to mass media and adolescent fertility in Northern Brazil and found that access to media was the most important predictor of fertility among adolescent females. Nahar & Min (2008) also found that frequent exposure to media had a significant delaying effect among adolescents in Bangladesh.

2.2.4 Religion

Religion can shape adolescent decision making related to sex. Different studies have investigated the relationship between religion and adolescent fertility and how religion influences adolescent fertility. Fonda (2015) studied the influence of religion on adolescent fertility in developed nations. Results indicated that adolescent fertility was higher in communities that claimed no spiritual path compared to the communities in developed nations. In another study, Sinha et al (2007) established that young people who attended church frequently and who valued religion in their lives had the least permissive attitudes and were less experienced sexually. Therefore, a higher level of religious participation resulted in a lower level of adolescent fertility at the individual and community level. On the other hand, Dutta & Sarkar (2014) found that in Maharashtra, India, adolescent fertility was higher among Muslim adolescents compared to other religious groups.

In Ghana, Nyarko (2012) found that female adolescents from Christian background constituted the majority of child bearers; however, child bearing was highest among the traditionalists or spiritualists and lowest among female adolescents that had no religious affiliation. Historical studies in North America suggested that Catholics have experienced relatively high fertility rates compared to other religious groups (Gupta & Leite, 1999). In Northern Brazil, Gupta & Leite (1999) did not find any significant association between

religious affiliation and adolescent fertility while Chike (2001) found that the conservative religion of Islam in the North promoted early marriage and childbearing.

2.2.5 Marital Status

Marital status of adolescents has an influence on their fertility. Several studies have been conducted to explore this relationship. In Uganda, Rutaremwa (2013) found marital status to be a strong predictor of the likelihood of having a child and being currently pregnant at the time of the survey. Similarly, Nyarko (2012) established that in Ghana, childbearing was highest among adolescents that were married or were in a union and lowest among those adolescents that were never married. In Zambia, Nwogwugwu (2013) found marital status to be significantly associated with adolescent fertility. Married adolescents were more likely to have one or more children compared to unmarried adolescents. 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) established that marital status was significantly associated with adolescent fertility. Married adolescents were more likely to have one or more children compared to their unmarried counterparts. On the other hand, Beguy et al (2013) conducted a study on entry into motherhood among adolescents in two informal settlements in Nairobi. These found that marriage was significantly associated with early childbearing among adolescent females aged 15-17 years and for adolescents aged 18 – 19 years, marriage hastened the timing of entry into motherhood. In another study, Chike (2001) found that much of the adolescent fertility in the South of Nigeria occurs outside marriage while in Northern Nigeria, most births occurred within marriage. The high level of

premarital fertility in Southern Nigeria was attributed to the existence of a sexual revolution among adolescents in search of intimacy and friendship, pleasure and money for self-maintenance under a crumbling moral and economic order.

Cesari & Vignoli (2006) also found that in Brazil, being married had a positive and significant effect on the probability of being an adolescent mother. Married adolescent females were predisposed 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.

2.2.6 Age at First Sex

Age at first sexual intercourse is a key determinant of teenage childbearing. In Malawi, 52 percent of adolescent females had first intercourse at the age of 17 (Malawi Demographic and Health Survey, 2004). In Zambia, 12 percent of adolescent females 15-19 had first intercourse by the age of 15 (Zambia Demographic and Health Survey, 2007). In 2008-9 KDHS, women were asked how old they were when they first had sexual intercourse. 12 per cent of women age 20-49 had sex before age 15, and about half had their first sex by their 18th birthday.

Several studies indicate that sexual activity is common and initiated early in adolescent years; family and peer pressure may influence the initiation of sexual intercourse. In a study of six sub-Saharan African countries, using data from the Demographic and Health Surveys, it was found that Ghana, Kenya, and Uganda experienced considerable decline in age at first sex

than Tanzania, Zambia, and Zimbabwe. Uganda and Zimbabwe had low rates of premarital sexual activity while Kenya and Zambia had high rates (Zaba et al 2004). The same study found that in Uganda there was a short interval between initiation of sexual activity and marriage; thus, in the absence of contraceptives early initiation of sexual intercourse can lead to high prevalence of adolescent childbearing.

Ikamari & Towett (2007) found that among female adolescents in Kenya, the onset of sexual activity was early, and this exposed adolescents to early marriage and early childbearing. Similarly, Cesari & Vignoli (2006) found that older age at the first sexual intercourse had a negative effect on the probability of being an adolescent mother as adolescents that had initiated sex at an older age were less likely to have initiated childbearing compared to those that initiated sex at an early age. In Ethiopia, Oljira et al (2012) found that 79 per cent of adolescents had initiated sex before age 18 years, and individual and ecological factors were found to be associated with this.

2.2.7 Current Contraceptive Use

Several studies have shown that contraceptive use by adolescents has an association with adolescent fertility. Oketch et al (2011) found that contraception use was low in Kenya's city slums compared to national level; and different factors use of the services varied in terms of demographic and socioeconomic factors of the women. Huda (2014) conducted a study on the prevalence of unintended pregnancy and needs for family planning among married adolescent girls living in urban slums of Dhaka, Bangladesh. Results indicated that the level of unintended pregnancy was high among married adolescents in urban slums compared to adolescents in all urban and rural areas of Bangladesh. The unintended pregnancy among married adolescents in the urban slums was largely due to improper use or non-use of family

planning arising from user-related factors. In Zambia, Nwogwugwu (2012) found that married adolescents who used contraceptives were 38 times more likely to have one or more children relative to married adolescents who did not use contraceptives. Among unmarried adolescents, those who used contraceptives were 2 times more likely to have one or more children than unmarried adolescents who did not use contraceptive. This could be due to adolescents who started using contraceptives after having one or more births and use of less effective contraceptives by adolescents.

In Kenya, Ikamari & Towett (2007) found that the use of contraceptives among adolescents in Kenya was fairly low and the contraceptive use was affected by a number of factors. Despite engaging in unprotected sex, adolescents in Kenya did not view themselves as being at the risk of contracting HIV/AIDS. Similarly, Malawi Demographic and Health Survey (MDHS 2004) indicated that contraceptives are not commonly used among adolescents, placing most of the adolescents at risk of childbearing. The reason(s) for not using contraceptives are consistent with findings from South Africa; poor quality of services, negative attitude from service providers, misconceptions, fear of side effects and stigma associated with the use of contraceptives as adolescents may be labeled as promiscuous (Paz Soldan, 2004). In developed world, countries such as United Kingdom, Kmietowicz (2002) reported that non-use of contraceptives among adolescents was due to feeling embarrassed about contraceptive services leading to an increased adolescent pregnancy and childbearing.

Tupange (2012) conducted a study on family planning trends in urban Kenya and found that differences in contraceptive use by education and region remain large. For instance, the proportion of urban women who used a modern method was 3.7 times greater among those with secondary or higher education than among those with no education. Less than one-third

of women in Nyanza and North Eastern provinces used modern contraception, compared with more than half of women in Central, Eastern and Rift Valley provinces. In another study, Islam et al (1998) established that contraceptives use played the most prominent role in reducing fertility in Bangladesh. Increased use of contraceptives resulted in a lower fertility level. However, adolescents are less likely to use contraceptives than older women.

2.3 Studies on Proximate Determinants of Fertility using the Bongaarts Model

The Bongaarts model of proximate determinants of fertility is one of useful tools in fertility analysis (Stover, 1998). A number of studies to examine the role of proximate determinants using Bongaarts framework have been carried out in various countries of the world at the population and sub-population levels. Literature review reveals that studies specifically on the proximate determinants of fertility among adolescents are scanty. Nonetheless, the model has been used in the continent of Asia, the region of sub-Saharan Africa and other regions as explained below:

2.3.1 Asia

A study done in Thailand to identify factors responsible for rapid fertility decline found that primary sterility and marriage did not influence the observed fertility decline. Only postpartum infecundability and contraceptive use had a significant effect on fertility (Knodel et al 1982). Haughton (1997) used the Bongaarts model to study the unexpected rapid fertility decline in Vietnam between 1989 and 1993. Findings showed that high rates of contraceptive use and induced abortion explained the drop in total fertility. Another study of proximate determinants of fertility in India by Shekhar (2004) revealed that fertility reduction was primarily a phenomenon of an increase in contraceptive use and longer duration of postpartum infecundability.

In a study to identify fertility enhancing and inhibiting factors of fertility among married adolescents in Bangladesh, Abedin (2011) found that among all proximate determinants, marriage was the most influential fertility inhibiting factor for adolescents. Findings also indicated that the use of contraception among adolescents in Bangladesh was generally low, but more urban adolescents as compared to rural adolescents used contraception. Sahoo (2011) analysed the proximate determinants of adolescent fertility in major states of India and found that marriage was the most influential proximate determinant in reducing adolescent fertility, followed by contraception use. Tanha et al (2011) found that contraception was the most prominent determinant in fertility reduction in Bangladesh, followed by marriage, lactational infecundability and induced abortion. The analysis revealed that although the fertility reducing effect of the marriage variable was increasing, its effect was offset by the declining trend in lactational amenorrhoea period.

In Peninsular Malaysia, Peng et al (2012) found that marriage and contraceptive use were the two most important proximate determinants of fertility, but the effects were not uniform across all ethnic groups. Postpartum infecundability and abortion also played a part in explaining ethnic fertility differentials. In a different study, Hossain & Karim (2013) estimated the four indices of proximate determinants of fertility and observed that marriage and lactational infecundability had the vital role to reduce fertility in Bangladesh, followed by contraception. On the other hand, Majumder & Ram (2015) found that fertility decline among the poor and non-poor in Asia was attributed to the increasing level of contraceptive use, especially among the poor women. Changing marriage pattern and induced abortion were also found to play an important role in reducing fertility among poor women.

2.3.2 Sub-Saharan African Region

In a study to examine the determinants of adolescent fertility in Ethiopia, Alemayehu et al (2010) found that in urban Ethiopia, the proximate determinant of marriage had strongest impact for the reduction of potential biological adolescent fertility followed by contraceptive use and postpartum infecundability, as compared to the rural Ethiopia where contraception use was very low in addition to early marriage among adolescents. Similarly, Alemayehu (2008) also found that marriage was the most significant proximate determinant of fertility among adolescents aged 15-19 years in Ethiopia.

In another study to explain fertility decline in urban Uganda, Lubaale & Kayizzi (2007) found that marriage had the highest reducing effect on fertility. In regions where fertility had declined, the index of marriage had the greatest effect followed by postpartum infecundability and contraceptive use. Similarly, findings of Chike (2001) established that in Nigeria, marriage was the most influential proximate determinant of adolescent fertility.

Getu & Alemayehu (2009) found that in two Gondar Zones of Ethiopia, postpartum infecundability was most influential proximate determinant of fertility followed by contraceptive use and non-marriage. Using the Ghana Demographic and Health Surveys data sets of 1988, 1993, and 1998, Chuks (2002) similarly found that postpartum infecundability had a far more dominant inhibiting effect on fertility than the effects of contraception, and marriage patterns. Madhavan (2013) found that across sub-Saharan Africa, contraceptive use made a greater contribution towards fertility decline followed by non-marriage. Postpartum infecundability was also found to account for a smaller proportion of the change in TFR in most countries. In Ethiopia, the analysis showed that contraceptive use achieved most of the fertility decline since 2000. In Ghana, the key driver was non-marriage, while Kenya an equal

mix of contraceptive use and non-marriage was evident. In all countries, the urban areas as opposed to rural areas exhibited high levels of contraceptive use and non-marriage.

Alemayehu (2008) in a study on proximate determinants of teenage fertility in Ethiopia found that delayed marriage and non marriage followed by postpartum infecundability were the major proximate determinants of adolescent fertility both in urban and rural part of the country. However, the inhibitory effect of contraceptive use and marriage was higher in urban than rural area. Adolescents in rural areas were more likely to marry and less likely to use contraception, as compared to their counterparts in urban areas. On the other hand, postpartum infecundability had a strong fertility inhibiting effect in rural compared to urban areas, as rural adolescent mothers breastfed their children for a longer duration than urban adolescent mothers.

2.3.3 Kenya

In Kenya, different studies have been conducted using Bongaarts' model with varying results. Kalule-Sabiti (1984) examined the effect of intermediate fertility variables on marital fertility in Kenya using Bongaarts model on group data from the Kenya Fertility Survey 1977/78 and found that variations in the proportion married among the population, level of contraceptive use and post-partum lactational infecundability could account for much but not all of the observed marital fertility differentials. In examining fertility change in Kenya using the proximate determinants, Kizito et al (1991) found postpartum infecundability to be the most important determinant of fertility between 1977-78 and 1989. The study also found that contraceptive use did not have any appreciable effect in 1977-1978, but its impact increased significantly over the study period. The effect of marriage was more important in 1977-1978 than 1989. Sterility was low and stable over time, and had no major effect on fertility.

In a study to determine the fertility levels and differentials of various subgroups in Kenya, Kavali (1998) found that at the national level and among all sub-groups, the most fertility inhibiting variable was postpartum infecundability followed by non-marriage then contraception. In urban areas, non-marriage took the leading role in reducing fertility. In another study, Anyara & Hinde (2006) found that between 1989 and 1993, increasing contraceptive use was the most important determinant of fertility change in Kenya. Primary sterility in Kenya was found to be very rare. The contribution of induced abortion to fertility reduction was not examined in the study due to lack of data, as the practice is illegal in Kenya. Njenga (2010), in a study to find the contribution of each of the principal proximate determinants of fertility to the change observed between 2003 and 2008/09, established that contraceptive use was the most important fertility inhibiting factor, followed by non-marriage then postpartum infecundability. At sub population level TFR decreased in all regions except in Central province where fertility increased, and this increase was attributed to the shortening of the duration of postpartum infecundability. Among all the regions, Western province had the highest decline in TFR and the highest increase in contraceptive practice, which accounted for the decrease in TFR.

2.3.4 Other Regions

Cesari & Vignoli (2006) conducted a micro analysis of proximate adolescent fertility determinants in Brazil and Colombia. They found that older age at the first sexual intercourse had a negative effect on the probability of being a teenage mother. On the other hand, being a first union (marriage) had a positive and significant effect on the probability of being a mother. The use of modern contraception (vs. no use or use of traditional contraception) had a negative effect on the probability of getting pregnant. The effect of contraceptive use as a proximate determinant was found to be weaker in Colombia than Brazil.

In Cuba, Hollerbach et al (1984) found that the effect of contraception was most significant followed by the effect of non-marriage. The fertility regulation contribution of these two factors was found to be greater than the effect of either abortion or postpartum infecundability. Similarly, findings of Vazquez (1987) showed that contraceptive use was the determinant of highest impact on the fertility level in Cuba.

2.4 Summary of Literature Review

Literature review has revealed different studies that have contributed significantly to the understanding of proximate determinants of fertility and the socio-demographic and economic factors associated with adolescent fertility. Many studies on proximate determinants of fertility have found marriage, contraceptive use and postpartum infecundability to be the major proximate determinants of fertility (Knodel et al 1982; Shekhar, 2004; Abedin, 2011; Sahoo, 2011; Tanha et al 2011; Peng et al 2012; Hossain & Karim, 2013; Cesari & Vignoli, 2006; Hollerbach et al 1984; Vazquez, 1987). Only a few studies found abortion to have an influence on fertility reduction (Haughton, 1997; Tanha et al 2011; Majumder & Ram, 2015).

Among all studies, only Knodel et al (1982), Kizito et al (1991) and Anyara & Hinde (2005) examined the contribution of sterility and found that sterility had no influence on fertility reduction. In sub-Saharan Africa, most studies have found marriage to have the highest reducing effect on fertility as compared to postpartum infecundability and contraceptive use (Lubaale & Kayizzi, 2007; Alemayehu et al 2010; Alemayehu, 2008). In Kenya, studies have found marriage, postpartum infecundability and contraceptive use to be the most significant determinants of fertility (Kalule-Sabiti, 1984; Kizito et al 1991; Kavali, 1998; Anyara & Hinde, 2005; Njenga, 2010). Sterility was found to have no effect on fertility in Kenya, as

this is rare (Kizito et al 1991; Anyara & Hinde, 2005). All studies in Kenya and sub-Saharan Africa region did not examine the contribution of abortion to fertility reduction due to lack of data.

On the other hand, several studies have established a significant association between adolescent fertility and different socio-demographic and economic factors. One can conclude that as far as adolescent childbearing is concerned these are the socio-demographic determinants: years of schooling, wealth index, religion, frequency of listening to radio, age at first sex, marital status and use of contraceptives. However, some socio-demographic and economic factors such as religion and frequency of listening to radio have shown mixed effect on adolescent fertility. Nonetheless, the literature review provided an essential foundation for this study.

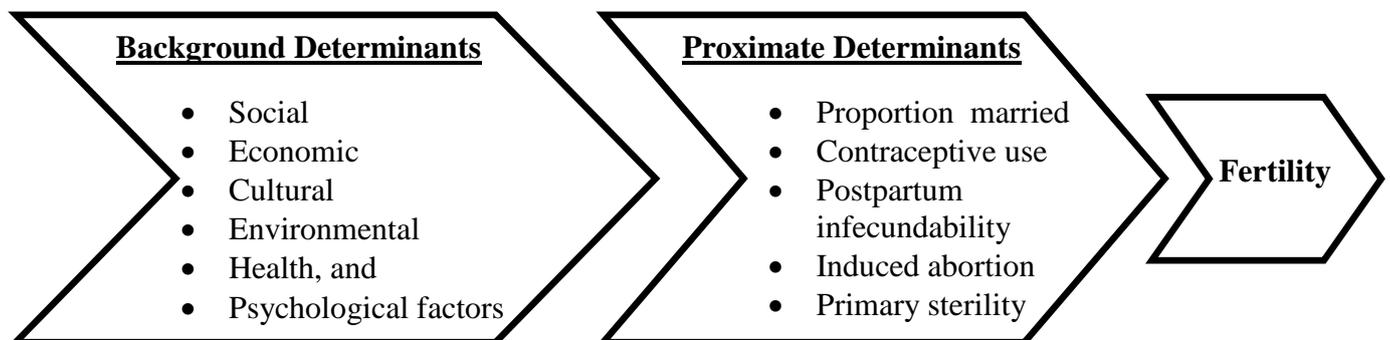
2.5 Conceptual Framework

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 impact of each of the proximate determinants 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).

Using data from 41 developed and developing countries Bongaarts and Potter (1983) observed that 96 per cent of the fertility variation among populations could be explained by four principal proximate determinants: 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 2.1) formed a base of an important aspect of this study on determinants of adolescent fertility in urban Kenya.

Figure 2.1: Conceptual Framework (Bongaarts' Fertility Framework, 1984)

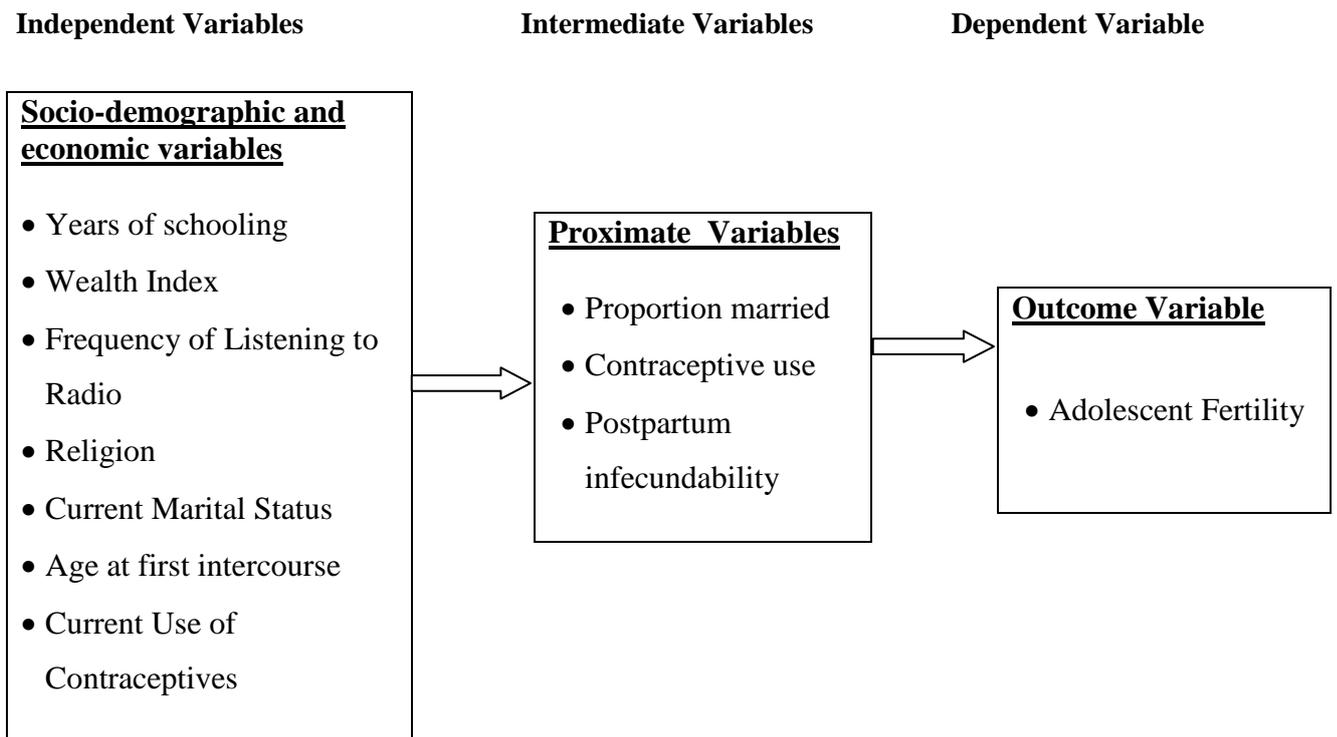


Source: Bongaarts (1984)

2.6 Operational Framework

In the operational framework, (Figure 2.2), this study only employed some social and economic factors. It was not possible to use all the variables in the conceptual framework, thus this study operationalised social and economic factors only. Nonetheless, this was relevant in showing the factors influencing adolescent fertility in urban Kenya

Figure 2.2: Operational Framework



Source: Adapted from John Bongaarts (1984)

2.7 Analytical Framework

The basic analytical technique that will be used in this study is the Bongaarts model, which summarizes the relationship between the total fertility rate and the proximate determinants of fertility. This relationship is explained by biological and behavioural factors (proximate determinants) through which socioeconomic, cultural, and environmental variables affect fertility.

Change in any of the proximate determinants results to change in fertility (assuming the other proximate fertility variables remain constant), but this is not necessarily the case for an indirect determinant. Consequently, fertility variations among populations, sub-population (specific age group), and trends in fertility over time can always be traced to variations in one or more of the principal proximate fertility variables. The five principal proximate determinants are considered inhibitory of fertility because fertility is lower than its biological

maximum value as a result of delayed marriage and marital disruption, the use of contraception, induced abortion, postpartum infecundability and primary sterility (Bongaarts, 1978).

In the Bongaarts model, the proximate determinants were quantified using five indices: the index of proportion married (C_m), index of contraception (C_c), index of induced abortion (C_a), index of postpartum infecundability (C_i) and index of primary sterility (C_p), which measure the fertility reducing effect of the respective proximate determinant. Each of these indices takes only a value between 0 and 1. A value of 1 means that the determinant has no effect on fertility while a value of 0 means that the determinant completely inhibits fertility. Thus the closer the index is to zero the more influential the associated proximate determinant is in reducing fertility rate. When all proximate determinants have no effect on fertility, fertility will reach its biological maximum (Total Fecundity Rate). In such condition the predicted total fertility rate (TFR) equals total fecundity (TF). Based on studies of historical populations with the highest recorded fertility, Bongaarts recommends using 15.3 as an estimate of TF, that is, the maximum number of births a woman could have over her reproductive life time is 15.3 children (Bongaarts & Potters, 1983). The main equation of the model which includes the fifth index of primary sterility is given by:

$$TFR = C_m C_c C_a C_i C_p TF$$

Where

C_m = index of married (equals 1 when all women of reproductive age are married and 0 in the absence of marriage)

C_c = index of contraception (equals 1 in the absence of contraception and 0 if all women use 100 per cent effective contraception)

C_a = index of abortion (equals 1 in the absence of induced abortion and 0 if all pregnancies are aborted)

C_i = index of post-partum infecundability (equals 1 in the absence of lactation and postpartum abstinence and 0 if the duration of infecundity is infinite)

C_p = index of primary sterility (equals one when no woman is sterile and zero when all women are sterile)

TF = total fecundity rate (the ideal number of children a woman would have if she is remained married from menarche to menopause, without practicing breastfeeding, postpartum abstinence, contraception and induced abortion)

TFR = total fertility rate (the number of births a woman would have at the end of the reproductive years if she were to bear children at prevailing age-specific fertility rates while living throughout the reproductive period (excluding illegitimate births but based on all women of reproductive age whether married or not)

The predicted TFR may typically differ from the observed TFR because of the underreporting of births, underreporting of any of the behaviors measured by the indexes, or the omission of proximate determinants that are influential in determining fertility levels in the population under study.

The Bongaarts model of proximate determinants can be adapted for other application related with determinants of fertility at total or sub-total population level such as analysis of determinants age specific fertility or trend overtime. For this study, the Bongaarts model was adapted for use to estimate indices of proximate determinants of adolescent fertility, which is at the sub-population level. Furthermore, if information is missing or not available for some of the indices, the model can be used with the available information. For instance, in this

study, the index of abortion could not be calculated because abortion is illegal in Kenya and there is no data on abortion, thus the model was applied by considering the index of abortion as 1 (Bongaarts & Potter, 1983).

For this study, adolescent fertility was the primary dependent variable; the proximate determinants were the intermediate variables while the socio-demographic and economic variables were the independent variables. The analysis used indices derived from Bongaarts model to show the relative contribution of each of the four measurable proximate determinants of fertility (marriage, contraceptive use, postpartum infecundability, and sterility) to adolescent fertility at the time of the survey.

2.8. Definition of Concepts

Total Fertility Rate (TFR): is the average number of children that a woman would have during ages 15-49 if she survived that age range and had children at the current age-specific fertility rates.

Total Fecundity (TF): is a hypothetical or potential value that the TFR would take if all four of the indices were exactly 1, that is, if there were no non-marriage (if all women were married from ages 15 to 49), no contraception, no postpartum infecundability (beyond a minimum of 1.5 months) and no induced abortion. It is the total fertility rate in the absence of the fertility-inhibiting effects of the proximate determinants. TF cannot be calculated directly. According to Bongaarts and Potter (1983), the TFs of most populations fall within the range of 13 to 17 births per woman, with an average of approximately 15.3. Therefore, multiplying all of the indices with 15.3 as the maximum number of births produces a predicted model TFR of the population.

Postpartum Amenorrhoea: Refers to the interval between child birth and the return of menstruation. The length and intensity of breastfeeding influence the duration of amenorrhoea, which offers protection from conception. The risk of conception in this period is very low.

Postpartum Abstinence: Refers to the period between child birth and the time when a woman resumes sexual activity. Delaying the resumption of sexual relations can also prolong protection. Women who gave birth in the 3 years preceding the survey were asked about the duration of their periods of amenorrhoea and sexual abstinence following birth.

Duration of postpartum insusceptibility: The duration of the postpartum amenorrhoea and the period of sexual abstinence following birth jointly determine the length of the insusceptibility period. Women are considered insusceptible if they are abstaining from sex following childbirth or are amenorrheic.

2.9 Definition of Variables and their Measurement

In this study, there were three types of variables i.e. Background variables, the proximate determinants of fertility variables and adolescent fertility. The background variables, which in this case are the socio-demographic and socio-economic variables, operate through the proximate determinants to influence fertility; they do not influence fertility directly.

2.9.1 Adolescent Fertility

Adolescent fertility (also known as teenage fertility) refers to a condition where a woman has given live birth before the age of 20 years. Two major categories exist; those that have had a live birth and those that have not had a live birth.

2.9.2 Socio-demographic and Socio-economic Variables

Year of Schooling: Refers to the number of years of formal schooling years completed. This study classified years of schooling into three categories: no education, 1-7 years of schooling and 8 years and above of schooling.

Wealth index: The wealth index is a composite measure of a household's cumulative living standard. The wealth index is calculated using easy to collect data on a household's ownership of selected asset. It uses Principal Component Analysis of household assets, amenities and services. In 2008/09 KDHS, to measure household wealth, an index was created from the following household assets data ranging from electricity, radio, TV, bicycle, motorbike and car as well as dwelling characteristics like source of water and sanitation facilities, and type of material used in flooring. In this study, women are grouped according to their wealth status under the categories Poor, Middle, and Rich.

Frequency of listening to radio: Is an indication of access to mass media weekly. Information increases an adolescents' knowledge of what is happening around them, which can affect their behaviour and make them aware of contraceptive practices.

Religion: In this study, religion is classified as Roman Catholic, Protestant/other Christian, and Muslim.

Current Marital Status: The Marital defined as either married or not married. Marital status for respondents aged 15 years to 19 and 20 to 24 years was included.

Age at first sex: Is the age at which an adolescent engages in sexual intercourse for the first time. This was classified into two categories: Below 18 years and 18 -19 years.

Current contraceptive use: Is a practice deliberately undertaken to reduce the risk of getting pregnant. Although breast-feeding and postpartum abstinence are a form of contraceptive given that they increase child spacing, they are, however, not included as contraception

because while they affect fertility, their primary aim is to improve maternal health and child development rather than regulation of childbearing (Bongaarts et al., 1984).

Table 2.1: Socio-demographic and Economic Variables used in the Study

VARIABLE NAME	MEASUREMENT
Adolescent Fertility	Have had a live birth = 1 Not had a live birth = 0
Socio-demographic and Economic Variables	
Years of schooling	1 = No education 2 = 1-7 years of schooling 3 = 8+ years of schooling
Wealth Index	1 = Poor 2 = Middle 3 = Rich
Frequency of listening to radio	1 = Not at all 2 = Less than once a week 3 = At least once a week 4 = Almost every day
Religion	1 = Roman Catholic 2 = Protestant/Other Christian 3 = Muslim
Current marital status	1 = Married 2 = Not married
Age at first sex	1 = <18 years 2 = 18 -19 years
Current use of contraceptives	1 = Using 2 = Not using

2.9.3 Proximate Determinants of Fertility Variables

Proportion Married: This variable is intended to measure the proportion of women of reproductive age that engages in sexual intercourse regularly. All women between 15 and 19 years who reported to be currently married during the surveys are included in this proportion.

Contraception: Any deliberate parity-dependent practice, including sterilization and abstinence, undertaken to reduce the risk of conception is considered contraception.

Postpartum infecundability: Postpartum infecundability is a situation where a woman is unable to conceive pregnancy after giving birth because of postpartum amenorrhea or sexual abstinence. Postpartum amenorrhea is the temporary disappearance of menstruation that a woman experiences in the period immediately following childbirth. Postpartum abstinence refers to the period of voluntary sexual abstinence that follows childbirth. The primary cause of prolonged postpartum infecundability is breastfeeding which results in postpartum amenorrhea. This is determined by the time elapsed since the woman began breastfeeding after birth to the time of survey (Bongaarts, 1978).

Sterility: Women are sterile before menarche, the beginning of the menstrual function, and after menopause, but a couple may become sterile before the woman reaches menopause for reasons other than contraceptive sterilization (Bongaarts, 1978).

CHAPTER THREE

DATA AND METHOD

3.1. Introduction

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

3.2. Data Source

This study was based on the analysis of the nationally representative secondary data obtained from the 2008/09 Kenya Demographic and Health Survey (KDHS). The 2008/09 KDHS was a survey of 8,444 women of reproductive age 15-49 years from 10,000 households covering 400 sample points (clusters) throughout Kenya, 133 in urban areas and 267 in the rural areas. 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 is limited to all married and unmarried women aged 15 – 19 in urban Kenya that were interviewed during the survey. A sample of 433 women was used in this study.

3.3. Method of Data Analysis

The study utilized descriptive statistics, multivariate logistic regression, and the Bongaarts model of proximate determinants of fertility as the main methods of data analysis. The results were presented in tables and narrative forms.

3.3.1. Descriptive Statistics

Descriptive statistics are used to show the distribution of the study population by different background characteristics. Frequency distribution is used to measure how often an occurrence of variables and its values occur in a data set of selected variable. Cross tabulation

is used to show association between the dependent and independent variables. Chi square test is used to show statistical significance of the association. However, chi square has limitations in that it just tells us the statistical significance but does not tell us the magnitude, thus to achieve that multivariate analysis using binary logistic regression is adopted.

3.3.2 Logistic Regression

Logistic regression is fitted to determine the socio-demographic and economic factors associated with adolescent fertility in Kenya. The basic logistic regression equation is:

$$Y = \beta_0 + \beta_1X_1 + \beta_2X_2 + \dots + \beta_iX_i$$

Where: Y = dependent variable

β_0 = intercept

$\beta_1, \beta_2, \dots, \beta_i$ = regression coefficients

X = independent variables (LaValley, 2008)

3.3.3 Bongaarts Model of Proximate Determinants of Fertility

Using the model, the various indices of proximate fertility determinants is estimated for adolescents in urban Kenya. In this study, only four proximate variables are considered namely: proportion married (C_m), contraception (C_c), postpartum infecundability (C_i) and Sterility (C_p). The index of abortion (C_a) is not considered since the practice is illegal in Kenya. Each one of these indices assumed a value of between 0 and 1. The original mathematical model by Bongaarts, 1978 is represented as;

$$\mathbf{TFR} = C_m * C_c * C_a * C_i * C_p * \mathbf{TF} \dots \dots \dots (1)$$

Where

TFR = Total Fertility Rate and

TF = Total Fecundability (the maximum biologically achievable level of fertility)

Fertility differences among populations, sub-populations (specific age group) and trends in fertility over time can be traced to variations in one or more of the principal proximate fertility determinants (Bongaarts, 1978; Bongaarts & Potter, 1983). Nonetheless, this aggregate model was adapted for other application related with determinants of fertility at total or sub-total population level (determinants of age specific fertility or trend over time). Thus, in this study, the mathematical equation below is adopted in the analysis of the proximate determinants of fertility for age group 15–19 years. This is a direct extension of the original Bongaarts model as recommended by Bongaarts & Potter (1983).

$$\text{ASFR} = C_m (15-19) * C_c (15-19) * C_i (15-19) * C_p (15-19) * \text{AF} \dots\dots\dots (2)$$

(Bongaarts & Potter, 1983; Alemayehu, 2008; Alemayehu et al., 2010)

Where

$C_m(15-19)$ = index of marriage for age group 15 – 19 years

$C_c(15-19)$ = index of contraception for age group 15 – 19 years

$C_i(15-19)$ = index of postpartum infecundability for age group 15 – 19 years

$C_p(15-19)$ = index of sterility for the age group 15 – 19 years

AF = age specific fecundity rate (the maximum biologically possible fertility)

ASFR = Age Specific Fertility Rate

The age specific fecundability (AF) of women aged 15 – 19 years is 511 per 1000 women (as 511 per 1000 is for five year age group, multiplying it with five will give 2.5 children per woman per year) (Bongaarts & Potter, 1983). Age specific fecundability of 2.5 per woman means theoretically that an adolescent who remained married continuously from age 15 to 19 and who did not breastfeed, as well as did not use family planning would have the maximum

potential to give 2.5 births by the age of 19 years. Substituting age specific fecundability (AF) with 2.5, equation 2 would become;

$$\text{ASFR} = C_m(15-19) * C_c(15-19) * C_i(15-19) * C_p(15-19) * 2.5 \dots\dots\dots (3)$$

The indices for the variables are estimated from the measures of the proximate variables and these estimates are given below (Bongaarts & Potter, 1983).

3.3.3.1. Estimation of Index of Marriage ($C_m(15-19)$)

The index of marriage measures the reduction in fertility that is caused by marriage. It has to be noted that the higher the level of marriage in the population the less the inhibiting effect and the reverse is true. In the Bongaarts model, the index C_m is calculated as the sum of age-specific proportions married, $m(a)$ (got by dividing the number of married women of a particular age group by the number of women in the same age group), times age-specific marital fertility rates, $g(a)$ (got by dividing the births of a particular age group by the number of women in the same age group), divided by the sum of age-specific marital fertility rates. In symbols,

$$C_m = \{ \sum m(a) \times g(a) \} / \sum g(a)$$

Where

- C_m = Index of marriage
- $m(a)$ = Age specific proportions of married females
- $g(a)$ = Age specific marital fertility rates

The marital ASFR at 15 -19 includes premarital conceptions and becomes unstable as ages at marriage change (Bongaarts & Potter, 1983, 81–3). Also because there are very few married women in the age group 15-19, the calculated $g(15-19)$ could be subject to large random errors. To overcome this problem, the index of marriage for this age group is computed as:

$$C_{m(15-19)} = 0.75 * m(20-24)$$

Where

$m(20-24)$ is the proportion married among women age 20-24 years

0.75 is the multiplication factor based on Leridon's observation of associations in marital fertility among age groups (Bongaarts & Potter, 1983).

3.3.3.2. Estimation of Index of Contraception ($C_c(15-19)$)

The index of contraception measures the inhibiting effect of contraception on fertility in the population. The higher the level of contraception use in a population, the higher the fertility-inhibiting effect of contraception and the lower the level of contraception use the lower the fertility-inhibiting effect. For this study, $C_c(15-19)$ is estimated using the equation:

$$C_c(15-19) = 1 - 1.08 * e * u$$

Where

e = Average use effectiveness of contraception by age and method.

u = Proportion of married women currently using contraception (in this study case proportion of currently married adolescents who were currently using contraceptives)

The coefficient 1.08 represents an adjustment for the fact that women do not use contraception if they know that they are sterile (Bongaarts & Potter, 1983).

3.3.3.3 Estimation of Index of Postpartum Infecundability ($C_i(15-19)$)

The index of postpartum infecundability measures the inhibiting effect of extended periods of postpartum amenorrhoea and postpartum abstinence on fertility. The fertility reducing effect of postpartum infecundability operates through the modification of birth intervals. The ratio of natural fertility in the presence and absence of postpartum infecundability equals the ratio of average birth interval without and with postpartum infecundability. If there is no lactation

or abstinence, the birth interval averages 20 months, which is the sum of 1.5 months of minimum postpartum anovulation, 7.5 months of waiting time to conception, 2 months of time added by spontaneous intrauterine mortality and 9 months for full term pregnancy that results to a live birth (Bongaarts & Potter, 1983).

In the presence of lactation and postpartum abstinence, the duration of postpartum anovulation will lengthen the average birth interval by i months, resulting in a total birth interval of $18.5 + i$ months, where i is determined by the duration and intensity of breastfeeding (Bongaarts & Potter, 1983). The fertility reducing effect of breastfeeding, C_i , is then expressed as the ratio of the average birth interval in the absence of breastfeeding to the average birth interval in the presence of breastfeeding plus post partum non-susceptibility. For this study, this is symbolically written as:

$$C_{i(15-19)} = 20/(18.5 + i)$$

The value of i can be derived as a ratio of prevalence (the number of married women amenorrheic or abstaining whichever is longer at the time of the survey) to incidence (average number of births per month to married women in a given window in months) (Jolly & Gribble, 1993). However, in the absence of information on amenorrhea most previous estimates of the mean or median duration of breastfeeding were made using the equation

$$i = 1.753 \exp^{0.1396B - 0.001872B * B}$$

Where

B is the mean or median duration of breastfeeding in months (Bongaarts, 1982; Bongaarts & Potter, 1983).

The mean rather than the median duration of breastfeeding is recommended in estimating i because the model is an aggregate model and other indexes of the model are based on means

or proportions (Anyara & Hinde, 2006). In this study, the index of postpartum infecundability was estimated using the mean duration of breastfeeding and this was obtained from a question which aimed at establishing the duration the most recent child was breastfed.

3.3.3.4. Estimation of the Index of Sterility (C_p (15-19))

Index of sterility in this analysis was considered 1 because the effect of primary sterility is very minimal in East African countries (Anyara & Hinde, 2006; Alemayehu, 2008; Alemayehu et al., 2010). Besides, as described in the literature review part above, its fertility inhibiting effect is very low in Kenya. So its value in this study is considered 1.

CHAPTER FOUR

FACTORS INFLUENCING ADOLESCENT FERTILITY IN URBAN KENYA

4.1 Introduction

This chapter presents results of the factors influencing adolescent fertility based on the 2008/09 KDHS data among urban adolescents in Kenya. The first section provides a description of key background characteristics of the study population while the second section describes the fertility characteristics and patterns of childbearing of the study population. The third section describes the differentials in urban adolescent fertility by key background characteristics obtained through the bivariate analysis. The fourth part presents results of multivariate analysis of the socio-demographic and economic factors associated with adolescent fertility in urban Kenya. The last section presents the results of the indices of proximate determinants of urban adolescent fertility based on the Bongaarts analytical model.

4.2 Background Characteristics of the Survey Population

Table 4.1 shows the socio-economic and demographic characteristics of women aged 15 – 19 in urban Kenya at the time of the interview. Overall, a total of 433 adolescent females aged 15 -19 participated in the 2008/9 KDHS. Of these, 20.6 per cent had had a live birth while 79.4 per cent had not had a live birth. With regard to years of schooling, 5.8 per cent of all the adolescents had no education, 26.3 per cent had between 1 and 7 years of education while 67.9 per cent had 8 or more years of schooling. On wealth index, most (91.7 per cent) of the adolescents were from highest wealth index; 3.5 per cent were poor while 4.8 per cent were from the middle wealth index. With regard to frequency of listening to radio, 67.8 per cent of the adolescents listened to the radio almost every day, while 10.9 per cent of them did not

listen to radio at all. 15.3 per cent of the adolescents listened to the radio at least once a week while 6 per cent of them listened to the radio less than once a week.

On the other hand, with regard to religion, 21.4 per cent of the adolescents were Roman Catholics, 54.2 per cent were protestant and other Christian while 24.4 per cent were of the Islamic religion. On marital status, most (82.2 per cent) of the adolescents were not married and only 17.8 per cent were married. In addition, about three quarters of the adolescents (84.7 per cent) had their first sexual intercourse aged below 18 years while only 15.3 per cent had their first sex aged between 18 and 19 years. Finally, majority of the adolescents (88.7 per cent) were not using contraceptives at the time of the interview.

Table 4.1: The percentage distribution of study population according to the Socio-demographic and economic variables, in urban Kenya, 2008/9 KDHS

Variable	Frequency	Percentage
Adolescent Fertility		
Ever had a live birth	89	20.6
Never had a live birth	344	79.4
Years of schooling		
0	25	5.8
1-7	114	26.3
8+	294	67.9
Wealth Index		
Poor	15	3.5
Middle	21	4.8
Rich	397	91.7
Frequency of listening to radio		
Not at all	47	10.9
Less than once a week	26	6.0
At least once a week	66	15.3
Almost everyday	293	67.8
Religion		
Roman Catholic	92	21.4
Protestant/Other Christian	233	54.2
Muslim	105	24.4
Current Marital Status		
15 – 19 years		
Currently Married	77	17.8
Not Married	356	82.2
20 -24 years		
Currently Married	319	47.6
Not Married	351	52.4
Age at First Sex		
<18 years	144	84.7
18-19 years	26	15.3
Current use of contraceptives		
Using	49	11.3
Not Using	384	88.7

Source: Analysis 2008/9 KDHS

4.3. Fertility Characteristics/Pattern of Childbearing of Adolescents, 15 – 19 years in Urban Kenya

Table 4.2 shows fertility and pattern of childbearing of urban female adolescents of 15-19 years. The proportion of adolescents that had given birth at least once prior to the survey and that were pregnant at the time of the survey were 89 (20.6 per cent) and 23 (5.3 per cent) respectively. Among those that had ever given birth, the majority, 77 (86.5 per cent) had given birth to one child while the rest, 12 (13.5 per cent) had given birth to 2 or more children. More than half of the adolescents (67.4 per cent) had given their first birth below the age of 18 years. The least age reported at first birth was 12 years. Similarly, close to three-quarters of the adolescents (84.7 per cent) had their first sex aged below 18 years while 15.3 per cent had their first sex at between 18 and 19 years old.

Table 4.2: Fertility and pattern of childbearing of female adolescents aged 15-19 years in urban Kenya, 2008/9

Fertility Characteristics	Frequency	Percentage
Ever given birth		
Yes	89	20.6
No	344	79.4
Currently Pregnant		
No	410	94.7
Yes	23	5.3
Pregnant for the first time		
No	420	97.0
Yes	13	3.0
Number of children ever born		
0	344	79.4
1+	89	20.6
Age at first birth		
<18 years	60	67.4
18-19 years	29	32.6
Age at first sex		
<18 years	144	84.7
18-19 years	26	15.3

Source: Analysis 2008/9 KDHS

4.4 Association between Adolescent Fertility and Selected Background Characteristics in urban Kenya

The results showing the differentials of adolescent births by key background characteristics in urban Kenya are presented in table 4.3. The results reveal that years of schooling was significantly associated with adolescent births in urban Kenya. The highest proportion of adolescent births at about (33 per cent) were observed among adolescents with between 1 to 7 years of schooling while the lowest proportion of adolescent births (15 per cent) was observed among adolescents with at least 8 years of schooling. Adolescents who had no education experienced 28 per cent of adolescent births.

Furthermore, results also showed that current marital status was a significant factor associated with adolescent fertility in urban Kenya. Majority (68.8 per cent) of adolescent births occurred to mothers that were currently married. On the other hand, only 10.1 per cent of adolescent births occurred to females that were not married. This implies that marriage was associated with increased adolescent births.

In addition, the results showed that age at first sex was an important factor associated with adolescent fertility in urban Kenya. Those adolescents that had not had sex did not contribute to the total births. Majority (54.9 per cent) of adolescent births occurred among those adolescents that had their first sex when they were aged below 18 years while 23.1 per cent of adolescent births occurred among adolescents that had their first sex when they were aged between 18 and 19 years. This implies that a low age at first sex was associated with increased adolescent births.

Finally, results showed that current contraceptive use was significantly associated with adolescent fertility in urban Kenya. Adolescents that had reported current use of contraceptives had majority (63.3 per cent) of births while those that reported non-use of contraceptives reported 15.1 per cent of births. Overall, the use of contraceptive among urban adolescents was low.

Table 4.3: Association between Adolescent Fertility and Selected Background

Characteristics in Urban Kenya, 2008/9 KDHS

Variable	Teenagers have had a live birth		Total (n)	Chi-Square, Df, Significance
	Yes	No		
Years of Schooling				
0	28%(7)	72%(18)	25	X ² = 17.872 Df = 2 Sig = 0.001
1– 7	33%(38)	67%(76)	114	
8+	15%(44)	85%(250)	294	
Wealth Index				
Poor	20%(3)	80% (12)	15	X ² = 0.869 Df = 2 Sig = 0.648
Middle	28.6%(6)	71.4% (15)	21	
Rich	20.1%(80)	79.9% (317)	397	
Frequency of Listening to Radio				
Not at all	27.7%(13)	72.3%(34)	47	X ² =7.866 Df=3 Sign. =0.48
Less than once a week	34.6%(9)	65.4%(17)	26	
At least once a week	25.8%(17)	74.2%(49)	66	
Almost everyday	17.1%(50)	82.9%(243)	293	
Religion				
Roman Catholic	18.5% (17)	81.5% (75)	92	X ² = 0.643 Df = 2 Sign. = 0.725
Protestant/other Christian	21.9% (51)	78.1% (182)	233	
Muslim	19% (20)	81% (85)	105	
Current Marital Status				
Currently married	68.8% (53)	31.2% (24)	77	X ² = 133.670 Df = 1 Sig = 0.001
Not married	10.1% (36)	89.9%(320)	356	
Age at First Sex				
Below 18 years	54.9%(79)	45.1%(65)	144	X ² = 8.9 Df = 1 Sign. = 0.002
18-19 years	23.1% (6)	76.9% (20)	26	
Current Use of Contraceptives				
Using	63.3% (31)	36.7% (18)	49	X ² = 61.725 Df = 1 Sign. = 0.001
Not Using	15.1% (58)	84.9% (326)	384	

Source: Analysis 2008/9 KDHS

4.5. Socio-demographic and Economic Factors Influencing Adolescent Fertility in Urban Kenya

This section presents results of multivariate logistic regression for socio-demographic and economic factors influencing adolescent fertility in urban Kenya. Three models were fitted. The first model was fitted by including the socio-demographic factors, i.e. religion, marital status, age at first intercourse, and current use of contraceptives. The second model was fitted by including economic factors, i.e. years of schooling, wealth index, and frequency of listening to radio. The final model was fitted by including all factors (socio-demographic and economic), i.e. religion, current marital status, age at first sex, current use of contraceptives, years of schooling, wealth index, and frequency of listening to radio. The results of the analysis were presented in tables 4.4, 4.5, and 4.6.

Table 4.4 shows the results of the analysis for socio-demographic factors influencing adolescent fertility in urban Kenya. This revealed that marital status was associated with adolescent fertility in urban Kenya. Adolescents that were not married were 76 per cent less likely to have initiated childbearing compared to the married adolescents.

Additionally, Age at first sex was also found to be associated with adolescent fertility. Adolescents who had their first sex aged between 18 to 19 years were 85 per cent less likely to have initiated childbearing compared to those adolescents that had their first sex aged below 18 years.

Table 4.4: Socio-demographic Factors influencing Adolescent Fertility in Urban Kenya

Variable	Urban Kenya		
	B	S.E. (B)	Exp (B)
Religion			
Roman Catholic (RC)	0.000		1.000
Protestant/Other Christian	.999	.615	2.715
Muslim	.968	.529	2.634
Marital Status			
Currently Married (RC)	0.000		1.000
Not Married	-1.426	.373	.240***
Age at First Intercourse			
Below 18 years (RC)	0.000		1.000
18-19 years	-1.871	.559	.154**
Current Contraceptive Use			
Using (RC)	0.000		1.000
Not Using	-.573	.413	.564
Constant	1.512	.666	4.537

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

Source: analysis 2008/9 KDHS

Table 4.5 shows results of the analysis for the economic factors influencing adolescent fertility in urban Kenya. This reveals that years of schooling and frequency of listening to radio were significantly associated with adolescent fertility. Adolescents that had 8 or more years of schooling were 64 per cent less likely to have initiated childbearing compared to those that had no education. On the other hand, adolescents that listened to radio at least once a week were 61 per cent less likely to have initiated childbearing compared to those that did not listen to radio at all.

Table 4.5: Economic Factors influencing Adolescent Fertility in Urban Kenya

Variable	Urban Kenya		
	B	S.E. (B)	Exp (B)
Years of Schooling			
0 years (RC)	0.000		1.000
1– 7	-.716	.497	.489
8+	-1.029	.269	.357***
Wealth Index			
Poor (RC)	0.000		1.000
Middle	-.641	.687	1.898
Rich	-.025	.523	.975
Frequency of Listening to Radio			
Not at all (RC)	0.000		1.000
Less than once a week	-.396	.384	.673
At least once a week	-.933	.453	.393*
Almost everyday	-.402	.331	.669
Constant	1.883	.186	6.571

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

Source: analysis 2008/9 KDHS

Table 4.6 presents the main findings of socio-demographic and economic factors influencing adolescent fertility in urban Kenya for the study. Results reveal that marital status and age at first sex were the two most important factors influencing adolescent fertility in urban Kenya. These two fall in the category of socio-demographic factors. Thus this overall model did not find any economic factor to be significantly associated with adolescent fertility in urban Kenya yet the second model for economic factors found years of schooling and frequency of listening to radio to be significantly associated with adolescent fertility. This therefore, implies that in urban Kenya, the economic factors work through the socio-demographic factors to influence adolescent fertility.

Nonetheless, the results show that marital status was an important factor associated with adolescent fertility in urban Kenya. Unmarried adolescents were found to be 75 per cent less likely to have initiated childbearing compared to those that are currently married. These findings are consistent with the study findings of Rutaremwa, 2013; Nyarko, 2012; Nwogwugwu, 2013; Alemeyehu et al, 2010; Cesari & Vignoli, 2006; Woldemicael, 2005; Alemayehu, 2008; Beguy et al, 2013, Chike, 2001) who established that unmarried adolescents were less likely to have initiated childbearing compared to the married adolescents.

This is attributed mainly to the fact that marriage exposes adolescents to pregnancy and childbearing. Thus adolescents that are married have a high probability of getting pregnant or bearing a child compared to their unmarried counterparts since they are already predisposed to start their reproductive life. Another possible explanation for this is that in sub-Saharan African countries, premarital sexual activity and pregnancy is seen as a taboo; for instance, findings from a study in Lesotho show that many aspects of Sesotho culture discouraged premarital pregnancy (Mturi & Moerane, 2001).

Furthermore, results also show that age at first sex is an important factor that is significantly associated with adolescent fertility in urban Kenya. Those adolescents that had their first sex intercourse while aged between 18 to 19 years were 84 per cent less likely to have initiated childbearing compared to those that had their first sexual intercourse at an age below 18 years. This implies that an early onset of sexual activity among adolescents is associated with more adolescent births. The results were consistent with the literature reviewed and contribution from different studies on age at first sex. These studies (Zaba et al, 2004; Ikamari & Towett, 2007; Woldemicael, 2005; Cesari & Vignoli, 2006; Oljira et al, 2012)

found that older age at first sexual intercourse had a negative effect on the probability of being an adolescent mother. This is mainly attributed to the fact that early initiation of sexual activity prolongs the period of exposure to risk of pregnancy during the reproductive span, thus leads to early childbearing.

Ikamari & Towett (2007) note that the process of urbanization and the influences of western precepts is considered to be responsible for the breakdown of traditional customs, especially among the young. Increase in premarital sexuality and adolescent pregnancies is thus a consequence of western values that have especially expanded more easily in the urban context and through media thus increasing the prevalence of sexual activity among adolescents as well as adolescent pregnancies. In addition, the “sugar daddies’ (older men offering gifts of cash or kind to young unmarried women in exchange for sexual favours) phenomenon is considered an explanation for early initiation into sex. Young adolescents may exchange sexual favours for gifts, school fees or clothes, while some may become pregnant to obtain financial help outside of sexual debut. Furthermore, Oljira et al (2012) found that early sexual initiation was more common among adolescents in the urban areas. Similarly, this study found that a majority of the adolescents had their first sex when aged below 18 years compared to age 18-19 years.

However, results of this study show that when taking all factors into consideration; years of schooling, wealth index, frequency of listening to radio, religion, and use of contraceptives lost their significance in influencing adolescent fertility. Thus the study did not establish any significant association of adolescent fertility in urban Kenya with years of schooling, wealth index, frequency of listening to radio, religion, and current use of contraceptives. This implies that these factors do not influence adolescent fertility in urban Kenya. Thus it seems

marital status and age at first sex are the major factors influencing adolescent fertility in urban Kenya.

Table 4.6: Socio-demographic and Economic Factors Influencing Adolescent Fertility in Urban Kenya

Variable	Urban Kenya		
	B	S.E. (B)	Exp (B)
Years of Schooling			
0 years (RC)	0.000		1.000
1– 7	.299	.960	1.348
8+	-.474	.421	.622
Wealth Index			
Poor (RC)	0.000		1.000
Middle	.593	.967	1.809
Rich	-.880	.904	.415
Frequency of Listening to Radio			
Not at all (RC)	0.000		1.000
Less than once a week	.019	.564	1.019
At least once a week	-.313	.642	.731
Almost everyday	-1.009	.605	.365
Religion			
Roman Catholic (RC)	0.000		1.000
Protestant/Other Christian	.868	.673	2.382
Muslim	.780	.603	2.182
Marital Status			
Currently Married (RC)	0.000		1.000
Not Married	-1.385	.393	.250***
Age at First Intercourse			
Below 18 years (RC)	0.000		1.000
18-19 years	-1.849	.609	.157*
Current Contraceptive Use			
Using (RC)	0.000		1.000
Not Using	-.592	.438	.553
Constant	1.935	.782	6.925

***p<0.001, **p<0.01, *p<0.05 *Source: analysis 2008/9 KDHS*

4.6. Estimates of the Indices of Proximate Determinants of Female Adolescent Fertility in Urban Kenya

This section presents results from the Bongaarts model of proximate determinants for proximate determinants of adolescent fertility in urban Kenya. The results of the analysis are presented in table 4.6. The results show that the observed age specific fertility rate (ASFR) of urban adolescents in Kenya is 0.48 children per woman. This implies that about 2.02 births per woman were averted from maximum potential fertility of an adolescent due to non-marriage, contraceptive use and postpartum infecundability.

The index of marriage (C_m) for adolescent fertility in urban Kenya was found to be 0.326. This means that delayed marriage and non marriage reduced adolescent fertility in urban Kenya by about 67 per cent below what it would otherwise be if marriage was universal among all adolescent women (15-19 years) in urban Kenya. At 0.326, marriage had the strongest impact for the reduction of adolescent fertility. This result is consistent with that of Alemayehu et al (2010); Chike (2001); Alemayehu (2008); Sarkar (2009); Sahoo (2011) and Abedin (2011) who also established that non-marriage had the strongest fertility-inhibiting effect on adolescents. Such a strong fertility-inhibiting effect of marriage on adolescent fertility can be explained basing on the fact that most adolescents have never been married.

The index of contraception (C_c) was found to be 0.714. This indicates that use of contraceptives had reduced urban adolescent fertility in Kenya by about 29 per cent of total marital fertility. This result was consistent with that of Alemayehu et al (2010) who found that in urban Ethiopia, use of contraceptives among adolescents reduced adolescent fertility by about 24 per cent. However, this finding was lower than some of the studies conducted previously in Kenya. Amin (2012) obtained 40 per cent as the fertility suppressing factor of

urban non poor women (15-49 years) in Kenya while Anyara (2005) found this to be 30 per cent among all women of the reproductive age group in Kenya. The difference in these findings can be attributed to the fact that adolescents were less likely to use contraceptives compared to the general population. In addition, adolescents were less likely to use the most effective contraceptives and long-term methods of family planning such as sterilization compared to the older women.

The index of postpartum infecundability (C_p) for urban adolescents in Kenya was found to be 0.781, meaning that this reduced adolescent fertility in urban Kenya by about 22 per cent. Of the three proximate fertility determinants therefore, postpartum infecundability had the least influence on reduction of adolescent fertility in urban Kenya. This can be attributed to the fact that adolescents in the urban areas breastfeed for a shorter period compared to those in rural areas who do it for a longer duration. This result is consistent with the findings of Alemayehu (2008) and Alemayehu et al (2010), who established that postpartum infecundability had the least fertility inhibiting effect among adolescents in urban areas. Njenga (2010) also found post partum infecundability, compared to non-marriage and contraceptive use, had the least influence in fertility reduction in Kenya.

The predicted ASFR of 0.48 for the urban adolescent population was substantially higher than 0.092 recorded in the KDHS report. Such variations between the observed and predicted level of fertility in urban areas have been documented in other studies using the Bongaarts model method. The big difference between the model estimate and the observed value can be attributed to the fact that there was omission of important proximate determinant from the model. The omission of abortion as a proximate determinant might have been a potential source of the overestimation of adolescent fertility. On the other hand, the underreporting of contraceptive use among the adolescents could have also contributed to the overestimation of adolescent fertility.

Table 4.7: Estimates of the Indices of Proximate Determinants of Female Adolescent Fertility in Urban Kenya

Index/Measure	Urban	Births Averted (per Woman)
Index of Marriage (C_m)	0.326	2.174
Index of Contraception (C_c)	0.714	1.786
Index of Postpartum Infecundability (C_i)	0.781	1.719
Index of Primary Sterility (C_p)	1.000	
Age Specific Fertility Rate ($ASFR_{15-19}$)	0.48	2.02

Source: analysis 2008/9 KDHS

The Bongaarts model showed that in urban Kenya, all the three proximal determinants of fertility had an impact for reduction of potential biological fertility among adolescents. Marriage had the strongest impact for the reduction of potential biological adolescent fertility, followed by contraceptive use and finally postpartum infecundability. The results of this study are consistent with those of Alemayehu et al (2010); Chike (2001); Alemayehu (2008); Sarkar (2009); Sahoo (2011) & Abedin (2011). In examining the proximate determinants of adolescent fertility, these studies found the proximate determinant of marriage to have the strongest impact for the reduction of potential biological adolescent fertility followed by either contraceptive use or postpartum infecundability. Nonetheless, in urban Kenya, increased urbanization and increased education open better economic alternatives (such as a higher education and a paid job) compared to getting married and bearing children to adolescent women.

CHAPTER FIVE

SUMMARY, CONCLUSION, AND RECOMMENDATIONS

5.1 Introduction

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

5.2 Summary of findings

This study set out to establish the factors influencing adolescent fertility in urban Kenya. The independent variables analysed include years of schooling, wealth index, frequency of listening to radio, religion, current marital status, age at first sex and current use of contraceptives. The intermediate variables in this study were postpartum infecundability, proportion married and contraceptive use. The dependent variable was adolescent fertility. The data for the study was obtained from KDHS 2008/9. The study consisted of 433 female married and unmarried adolescents in urban Kenya.

The conceptualization of the study was within the Bongaarts model of fertility determinants. The main methods of data analysis were descriptive statistics, multivariate logistic regression and Bongaarts model of proximate determinants of fertility. The preliminary analysis showed that the highest proportion of adolescents had 8+ years of schooling (67.9 per cent), were from the rich wealth index (91.7 per cent), listened to radio almost every day (67.8 per cent), and were Protestants/other Christians (54.2 per cent). Also, a bigger proportion of adolescents were not married (82.2 per cent) and had their first sex below the age of 18 years (84.7 per cent). Moreover, a majority (88.7 per cent) of the adolescents did not use contraceptives.

With regard to fertility characteristics and childbearing patterns of the adolescents, preliminary analysis indicated that most (79.4 per cent) of the adolescents had never had a live birth. The adolescents that were pregnant at the time of the interview and pregnant for the first time were only 5.3 per cent and 3.0 per cent respectively. Of those that had ever given birth, 86.5 per cent had at least one child, while 13.5 per cent had two or more children. Most adolescents (67.4 per cent) had their first birth while aged below 18 years. Similarly, most of adolescents (84.7 per cent) had their first sex while aged below 18 years.

The results of bivariate analysis showed that years of schooling, current marital status, age at first sex, and current use of contraceptives were significantly associated with adolescent fertility in urban Kenya. The results of multivariate logistic regression showed that marital status and age at first sex were the major factors influencing adolescent fertility in urban Kenya. The married adolescents had a higher risk of adolescent childbearing compared to their unmarried counterparts. On the other hand, adolescents that had their first sex aged below 18 years had a high risk of adolescent childbearing compared to those that had their first sex at an older age, between 18 and 19 years.

The study did not establish any statistical significant relationship between adolescent fertility and years of schooling, wealth index, religion, frequency of listening to radio, and current use of contraceptives. However, some economic factors, e.g. years of schooling and frequency of listening to radio seem to operate through the socio-demographic factors.

Results of the Bongaarts model of proximate determinants showed that non-marriage had the strongest fertility inhibiting effect among adolescents in urban Kenya hence this was the key proximate determinant of adolescent fertility. Contraceptive use had the second strongest

fertility inhibiting effect while postpartum infecundability had the lowest fertility inhibiting effect among adolescents in urban Kenya. From the model, the age specific fertility rate (ASFR) of adolescents was found to be 0.48. This implies that non-marriage, contraceptive use and postpartum infecundability averted about 2.02 births from the maximum potential fertility of adolescents of 2.5.

5.3 Conclusion

This study found marital status and age at first sex to be the major socio-demographic and economic factors influencing adolescent fertility in urban Kenya. Results showed that married adolescents were more likely to have adolescent fertility compared to their unmarried counterparts. Many studies (Rutaremwā, 2013; Nyarko, 2012; Nwogwugwu, 2013; Alemeyehu et al, 2010; Cesari & Vignoli, 2006; Woldemicael, 2005; Alemayehu, 2008; Beguy et al, 2013, Chike, 2001) have established that married adolescents were more likely to have initiated childbearing compared to their unmarried counterparts. Furthermore, the study showed that the percentage of married adolescents is lower than unmarried adolescents, but, the number of births to married adolescents is higher than unmarried adolescents. This could suggest that married adolescents are expected to start bearing children as early as possible; childbearing immediately after marriage is integral to a woman's social status (Ezeah, 2012). Childlessness may lead to divorce or the husband may marry a second wife.

With regard to age at first sex, this study found that those adolescents that had their first sex intercourse while aged between 18 to 19 years were less likely to have initiated childbearing compared to those that had their first sexual intercourse at an age below 18 years. Many studies (Zaba et al, 2004; Ikamari & Towett, 2007; Woldemicael, 2005; Cesari & Vignoli, 2006; Oljira et al, 2012) also found that older age at first sexual intercourse had a negative

effect on the probability of being an adolescent mother. Thus an early onset of sexual activity is associated with increased adolescent births mainly for the fact that early initiation of sexual activity prolongs the period of exposure to risk of pregnancy during the reproductive span, hence leading to early childbearing.

On the other hand, the proximate factors influencing fertility among adolescents in urban Kenya were found to include marriage, contraceptive use, and postpartum infecundability. Marriage was found to have the strongest fertility inhibiting effect among adolescents in urban Kenya hence this was the key proximate determinant of adolescent fertility. Different studies (Alemayehu et al 2010; Chike, 2001; Alemayehu, 2008; Sarkar, 2009; Sahoo, 2011; Abedin, 2011) have established marriage as the important proximate determinant of fertility among adolescents. This finding is attributed to the fact that a larger proportion of adolescents in urban Kenya have never been married. Furthermore, living in urban area provides better opportunities for adolescents such as education and different economic alternatives which most adolescents might choose as opposed to getting married and bearing children.

5.4. Recommendations

This section presents the recommendations emanating from the study finding both for policy and further research. This was discussed in regard to study findings.

5.4.1 Recommendations for Policy

This study indicates that marriage is an important factor influencing adolescent fertility in urban Kenya. Various policy implications can be drawn from this study finding. First, the government in collaboration with different non-governmental organizations should put up

programmes that will reach adolescents in urban Kenya, especially in areas where adolescents enter marriage earlier. These include offering scholarship opportunities for adolescents. Apart from improving on the literacy of adolescents, this will make adolescents to dedicate most of their time in studies thus keeping them away from engaging in social vices. As found, more years of schooling will also reduce the likelihood of adolescents of initiating childbearing hence this will also serve to delay their entry into marriage.

Findings also showed that age at first sex was an important factor influencing adolescent fertility in urban Kenya. There is therefore, need for government to develop sexual educational programmes for adolescents which will inform and educate them about responsible and healthy attitudes towards sexuality especially on the need to delay the onset of sexual intercourse. Young adolescents and children should be targeted when they are still fairly young, for instance, when still in primary school, so that they can grow up with this knowledge.

5.4.2 Recommendations for Further Research

More research should be conducted in urban Kenya on adolescent fertility in specific urban settings such as slums and peri-urban areas since these may have different adolescent fertility levels and could be having different variables that influence adolescent fertility. In addition, further research is needed using qualitative methodologies in urban areas on adolescent fertility in order to establish the actual causes of adolescent fertility. The use of qualitative data as opposed to quantitative data as in this study could also show other factors associated with adolescent fertility in urban Kenya. Finally, there is need for a comparative study to be conducted between urban and rural adolescents in order to establish the unique factors of adolescent fertility in the two settings for appropriate intervention to be taken.

REFERENCES

- Abedin, S. (2011). Identification of Fertility Enhancing and Inhibiting Factors: A Study on Married Adolescents in Bangladesh. *Asian Social Science*, 7(5): 191-196.
doi:10.5539/ass.v7n5p191
- Alemayehu, T., Haider, J. and Habte, D. (2010). Determinants of Adolescent Fertility in Ethiopia. *Ethiopian Journal of Health Development*, 24 (1): 3-38.
- Alemayehu, T. (2008). Determinants of Teenage Fertility and their Maternal Health Service Utilization in Ethiopia. Student Thesis. Addis Ababa University.
- Anyara, E. L. and Hinde, A. (2006). Fertility transition in Kenya: A regional analysis of the proximate determinants. Applications & Policy Working Paper A06/0 (2006). Southampton Statistical Sciences Research Institute.
- Beguy, D., Ndugwa, R. and Kabiru, C. (2013). Entry into Motherhood among Adolescent Girls in Two Informal Settlements in Nairobi, Kenya. *Journal of Biosocial Science*, 45:721-742.
- Bledsoe, C. H. and Cohen, B. (1993). Population Dynamics of Adolescent Fertility in sub-Saharan Africa. *National Research Council*, 1-40.
- Bongaarts, J. (1978). A Framework for Analyzing the Proximate Determinants of Fertility. *Population and Development Review*, 4, pp. 105-131.
- Bongaarts, J. (1982). The fertility-inhibiting effects of the intermediate fertility variables. *Studies in Family Planning*, 13:178-189
- Bongaarts, J. and Potter, R. G. (1983). *Biology and Behaviour: an Analysis of the Proximate Determinants*. New York: Academic press.
- Bongaarts, J. (1984). A simple method for estimating the contraceptive prevalence required to reach a fertility target. *Studies in Family Planning*, 15(4):184-90.

- Cesare, M. and Vignoli, R. J. (2006). Micro analysis of adolescent fertility determinants: the case of Brazil and Colombia. *CIEAP/UAEM Papeles de POBLACIÓN*, 48: 93–122.
- Chike, I. (2001). Adolescent Fertility Behaviour in Nigeria: Trends and Determinants. Paper Prepared For IUSSP. XVIV General Population conference, Salvador – Brazil 18-24 August 2001.
- Chuks, J. (2002). Ghana's Reproductive Revolution: Analysis of the Determinants of Fertility Transition. African, Ph.D. Regional Institute for Population Studies, Legon, Ghana. *Population Studies/Etude de la Population Africaine*: 17:47-67.
- Davis, K. and Blake, J. (1956). Social structure and fertility: An analytic framework. *Economic Development and Cultural Change*. : 4 (4):211-235.
- Dutta, P. and Sarkar, S. (2014). Trend and Differentials of a Socio-Demographic Scenario and Extent of Adolescent Fertility in Maharashtra, India. *Journal of Settlement and Spatial Planning*, 5(1):31–47.
- Ezeah, P. (2012). Marriage and Motherhood: A Study of the Reproductive Health Status and Needs of Married Adolescent Girls in Nsukka, Nigeria. *Journal of Sociology and Anthropology* 3(1):1-6.
- Ezeh, A., Mberu, B. and Emina, J. (2009). Stall in fertility decline in Eastern African countries: regional analysis of patterns, determinants and implications. *Philosophical Transactions of the Royal Society*, 364, 2991–3007.
- Ferrara, E., Chong, A. and Duryea, S. (2008). Soap Operas and Fertility: Evidence from Brazil. PDF.
- Filho, C. and Kawachi, I. (2015). Income inequality is associated with adolescent fertility in Brazil: A longitudinal multilevel analysis of 5,565 municipalities. *BMC Public Health*, 15 (103): 1-7.

- Fonda, M. (2015). The Potential Impacts of Religion and Spirituality on First Nation Teenage Fertility. *The International Indigenous Policy Journal*, 4(1):1-13.
- Getu, D. A. and Alemayehu W. (2009). Estimation of the total fertility rates and proximate determinants of fertility in North and South Gondar zones, Northwest Ethiopia: An application of the Bongaarts' model. *Ethiopian Journal of Health Development*, 23 (1):19-27.
- Gomes, C. (2012). Adolescent fertility in selected countries of Latin America and Caribbean. *Journal of Public Health and Epidemiology*, 4(5): 133 – 140.
- Gupta, N. and Leite, C. (1999). Adolescent Fertility Behaviour: Trends and Determinants in Northeastern Brazil. *International Family Planning Perspectives*, 25(3):125-130.
- Gupta, N. and Mahy, M. (2003). Adolescent childbearing in sub-Saharan Africa: Can increased schooling alone raise ages at first birth? *Demographic Research*, 8(4):93-106. DOI: 10.4054/DemRes.2003.8.4
- Haughton, J. (1997). Falling fertility in Vietnam. *Population Studies*, 51(2): 203-211.
- Hollerbach, P., Diaz-Briquets, S. and Hill, K. (1984). Fertility Determinants in Cuba. *International Family Planning Perspectives*, 10 (1); 12-20.
- Hossain, F. and Karim, R. (2013). Determination of Total Fertility Rate of Bangladesh using Bongaarts Model. *Journal of Biometrics & Biostatistics*, 4(5):1-4.
- Huda, F. A. et al (2014). Prevalence of unintended pregnancy and needs for family planning among married adolescents girls living in urban slums of Dhaka, Bangladesh. *STEP UP Research Report*. Dhaka: icddr,b.
- Ikamari, L. and Towett, R. (2007). Sexual initiation and contraceptive use among female adolescents in Kenya. *African Journal of Health Science*, 14:1-13.

- Islam, M., Mamun, A. and Bairagi, R. (1998). Fertility and Its Proximate Determinants in Bangladesh: Evidence from the 1993/94 Demographic and Health Survey. *Asia-Pacific Population Journal*, 13(3):1-6.
- Jolly, C. L. and Gribble, J. N. (1993) 'The proximate determinants of fertility'. In National Academy of Sciences, Demographic change in sub-Saharan Africa (Washington DC, National Academy Press) 68-116.
- Kabiru et al (2010). Transition into first sex among adolescents in slum and non-slum communities in Nairobi, Kenya. *Journal of Youth Studies*, 13(4):453–471.
- Kalule-Sabiti, M. (1984). Bongaarts' proximate determinants of fertility applied to group data from the Kenya Fertility Survey 1977/78. *Journal of Biosocial Science*, 16: 205-218.
- Kavali, M. (1998). The proximate determinants of fertility: Evidence from the 1993 Kenya Demographic and Health Survey. Unpublished MSc thesis in Population studies, University of Nairobi.
- Kenya National Bureau of Statistics and ICF Macro (2010). 2008–09 Kenya Demographic and Health Survey: Key Findings. Calverton, Maryland, USA: KNBS and ICF Macro.
- Kizito P.M.L., Obungo W. and Kibet M., Njogu W. (1991). Fertility Transition in Kenya: DHS Further Analysis Studies 11. Macro International Inc., Calverton, USA.
- Kmietowicz, Z. (2002). United States and United Kingdom are top in teenage pregnancy rates. *British Medical Journal*, 324(8):1354.
- Knodel, J., Chamrathirong, A. and Debavalya, N. (1982). Fertility in Thailand: trend, differentials and proximate determinants", Report no. 13, Committee on Population and Demography, Washington D.C. National Academic Press.
- LaValley, M.P. (2008). Statistical Primer for Cardiovascular Research: Logistic Regression. *Journal of American Heart Association* 117:2395-2399.

- Lubaale Y. A. and Kayizzi J. B. (2007). Using the Bongaarts model in explaining fertility decline in urban areas of Uganda. A paper presented during the Fifth African Population Conference, Session "Emerging issues in the Demography of East Africa".
- Madhavan, S. (2013). An Analysis of the Proximate Determinants of Fertility in Sub-Saharan Africa. Johns Hopkins Bloomberg School of Public Health, PFRH Jean-Pierre François GUENGANT, IRD Institut de Recherche pour le Development.
- Magadi M. and Agwanda A.O. (2009). Determinants of Transitions to First Sexual Intercourse, Marriage and Pregnancy among Female Adolescents: Evidence from South Nyanza, Kenya. *Journal of Biosocial Science*, 41(3):409-427. DOI: <http://dx.doi.org/10.1017/S0021932008003210>
- Majumder, N. and Ram, F. (2015). Explaining the Role of Proximate Determinants on Fertility Decline among Poor and Non-Poor in Asian Countries. *PLoS ONE*, 10(2): e0115441. doi:10.1371
- Malawi Demographic Health Survey (MDHS). (2004). National Statistical Office Zomba: Malawi.
- Manlove, J. (2010). The Influence of High School Dropout and School Disengagement on the Risk of School-age Pregnancy. *Journal of Research on Adolescence*, 8(2):187–220.
- Mturi, J. A and Moerane, W. (2001). Premarital Childbearing among Adolescent in Lesotho” *Journal of Southern African Studies* 27(2):259-275.
- Nahar, Q. and Min, H. (2008). Trends and Determinants of Adolescent Childbearing in Bangladesh. *DHS Working Papers*, No. 48.
- Njenga J. N. (2010). Impact of Proximate Determinants of Fertility on Change in Total Fertility Rate in Kenya between 2003 and 2008/09. Unpublished MSc Research project in Population studies, University of Nairobi.

- Nwogwugwu, N. C. (2013). Socio-Demographic Determinants of Adolescent Fertility in Zambia. Student Thesis. University of the Witwatersrand, Johannesburg.
- Nyarko, S. H. (2012). Determinants of Adolescent Fertility in Ghana. *International Journal of Sciences: Basic and Applied Research (IJSBAR)*, 5(1):21-32.
- Odimegwu C.O, Solanke L. B. and Adedokun A. (2002). Parental Characteristics and Adolescent Sexual Behaviour in Bida Local Government Area of Niger State, Nigeria. *African Journal of Reproductive Health*, 6: 95-106.
- Oketch, T. C., et al (2011). Contraceptive Use among Women of Reproductive Age in Kenya's City Slums. *International Journal of Business and Social Science*, 2(1):22-43.
- Oljira, L., Berhane, Y. and Worku, A. (2012). Pre-marital sexual debut and its associated factors among in-school adolescents in eastern Ethiopia. *BMC Public Health*, 12:375. doi:10.1186/1471-2458-12-375
- Oyefara, J. (2009). Socio-Economic Consequences of Adolescent Childbearing in Osun State, Nigeria. *KASBIT Business Journal*, 2 (1&2):1–18.
- Paz Soldan, V.A. (2004). How Family Planning Ideas are Spread Within Social Groups in Malawi. *Studies in Family Planning*, 35 (4):275-290.
- Peng, N., Tho, S. & Yong, S. (2012). Proximate Determinants of Fertility in Peninsular Malaysia. *Asia Pacific Journal of Public Health*, 24(3): 495-505.
- Presler – Marshall, E. and Jones, N. (2012). Charting the future: Empowering girls to prevent early pregnancy. Overseas Development Institute.
- Raj, A., Rabi, B., Amudha, P., Edwin, T. and Glyn, C. (2010). Factors associated with teenage pregnancy in South Asia: A systematic review. *Health Science Journal*, 4(1):1-14.

- Rutaremwya, G. (2013). Factors associated with adolescent pregnancy and fertility in Uganda: analysis of the 2011 demographic and health survey data. *Social Sciences*, 2(1):7–13.
- Sahoo, H. (2011). Fertility Behaviour among Adolescents in India. *The Journal of Family Welfare*, 57(1):22-33.
- Shekhar, C. (2004). Understanding reproductive changes and proximate determinants in India. Unpublished Ph.D. Thesis, International Institute for Population Sciences, Mumbai, India.
- Sinha, J. W., Cnaan, R.A. and Gelles, R.J. (2007). Adolescent risk behaviors and religion: findings from a national study. *Journal of Adolescence*, 30(2):231–249.
- Stover, J. (1998). Revising the Proximate Determinants of Fertility Framework: What Have We Learned in the Past 20 Years? *Studies in Family Planning*, 29(3):255-267.
- Tanha, M. & Imran, A. (2011). Analyzing Bongaarts model and its applications in the context of Bangladesh. Curtin University, Australia University of Dhaka, Bangladesh, 19th International Congress on Modelling and Simulation, Perth.
- Tupange (2012). Fertility and Family Planning in Urban Kenya: A Research Brief. MLE Research Brief 3.
- Vazquez, A. (1987). Proximate determinants of fertility in Cuba: The Bongaarts model. *Rev Cuhana Adm Salud*, 13(4):437-54.
- Were, M. (2007). Determinants of teenage pregnancies: The case of Busia District. *Economics and Human Biology*, 5(2):322-339.
- Woldemicael, G. (2005). Teenage Childbearing and Child Health in Eritrea. MPIDR Working Paper WP 2005-029.
- Zaba, B., Pisani, E., Slaymaker, E. and Ties Boerma, J. (2004). Age at first sex: understanding recent trends in African demographic surveys. *Sexually Transmitted Infection*, 80:28-35.

Zambia Demographic and Health Survey (2007). Central Statistics office Lusaka: Zambia.