

EFFECTS OF EDUCATION ON AGE AT FIRST BIRTH IN KENYA

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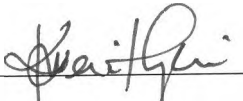
**A RESEARCH PROJECT SUBMITTED IN PARTIAL FULFILMENT OF
THE REQUIREMENTS FOR THE AWARD OF DEGREE OF MASTER
OF ARTS IN POPULATION STUDIES**

**POPULATION STUDIES AND RESEARCH INSTITUTE
UNIVERSITY OF NAIROBI**

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DECLARATION


This project is my original work and has not been presented for a degree in any other University.

Signature 

Date 12/11/2010

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This project has been submitted for examination with our approval as the University supervisors:

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Date 17/11/10

MR. ANDREW MUTUKU

DEDICATION

This is especially dedicated to my son Rafael for his understanding.

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I give thanks to Almighty God for the strength and good health during my coursework and the time I was researching and writing this project.

My very sincere appreciation goes to my supervisors Dr. Murungaru Kimani and Mr. Andrew Mutuku without whose positive criticism, motivation and guidance this project would not have been completed. Many were the times I almost gave up but they encouraged me to soldier on as they advised me on the way forward. I express my gratitude to other members of PSRI teaching staff, Dr. Lawrence Ikamari, Dr A.O. Agwanda, Dr. Ann Khasakhala, Dr, Wanjiru Gichuhi, Prof John Oucho, Mr. George Odipo and all the other members of PSRI fraternity who gave me the base to prepare for project the during the coursework, and fellow students for the co-operation and assistance of all aspects extended to me. Though I have not mentioned all of you by name accept I will always be grateful for what you have done for me.

To my family members and colleagues I do extend my most sincere gratitude for your invaluable encouragement and support both morally and financially during the course of my studies. God bless you all!

ABSTRACT

Education is a significant factor in influencing the onset of childbearing by women. This study examined the effects of education levels on the timing of the first birth in Kenya using data from the Kenya Demographic and Health Survey of 2003. This was a nationally representative survey that collected data on fertility and education from sample size of 8195 women all over the country. Age at first birth measured in completed years was the dependent variable for this study while the independent variable was the level of education categorized into three categories namely, no education, primary and secondary and above levels. Type of place of residence, ethnicity, religion, and region, age at first marriage and age at first sexual intercourse were used as control variables and operationalised using the Bogaarts framework of 1978. The life table approach was used to estimate median age at first birth among women by levels of education. On the other hand the estimation of the risk of a woman experiencing a first birth given her background characteristics was carried out using Cox Proportional Hazard Model. The results of the lifetable show that women with higher levels of education have higher median age compared to women with no education. The analysis using Cox Regression show that education is a significant factor in reducing the risk a first birth even in the presence of the other factors which served as controls in this study. Education especially secondary education remained a key factor in determining the risk of experiencing a first birth among women in Kenya. Interesting result was that catholic women were found to have a higher median age at first birth compared to women belonging to other religions. Similarly, Catholic women were found to have a lower risk of having a first birth compared to women belonging to other religions. In addition, women belonging to Somali ethnic group found to be less likely to experience early age at first birth compared to the Kikuyu women. The study recommends further research to establish why catholic women had a higher median at first birth and low risk of having a first birth. The study further recommends that more efforts to provide education should be made in order to ensure that girls achieve at least secondary and above levels of education. This may necessitate full enforcement of the children's Act of 2001 to retain women in school to benefit from subsidized secondary education.

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CHAPTER ONE INTRODUCTION

1.1 Background

Educational attainment has been regarded as one of the major determinants of age at first birth because it facilitates the shortening of reproductive period by increasing the number of years a woman spend in schooling (Gyimah, 2003; Gupta et al.; 2003; Ferre, 2009). Schooling and childbearing are not compatible and women who stay longer in the school system delay the initiation of childbearing (Beets, 1999). By delaying the onset of childbearing education influences fertility because early age at which first birth occurs is known to lengthen the reproductive period and subsequently increases the number of children born to a woman at the end of her childbearing age (Gupta et al., 2003). Recent decline in fertility in parts of Sub-Saharan Africa has been attributed partly to the rising age at first birth (Kirk and Pillet, 1998; Gyimah, 2003). The level of education is believed to have a strong influence on the timing of first births. As higher educational achievements tend to go hand in hand with stronger preferences for labour force participation, education may be an important factor explaining the delay in first childbirth. Rising economic activity rates may thus yield greater incompatibility between labour and family careers (Beets, 1999). Age at first birth is therefore one of the major determinants of fertility among women.

Moreover early age at first birth is associated with unstable start to family formation as women are too young to make decisions, single parenthood, unstable marriages and increased risks of depression together with lower status among women (Gyimah, 2003). Postponement of childbearing therefore is associated with the improvement of status of women because it allows them take advantage of opportunities such education and modern employment hence helping them to enhance their autonomy and improvement of social status (Gyimah, 2003; Morgan and Rindfuss, 1999).

In Kenya a number of reforms on education have been initiated including the introduction of free primary education in public schools in order to increase enrolment rate especially among poor

households who constitute approximately 56 per cent of the population (Republic of Kenya, 2006). In addition the government of Kenya has also secondary school bursary scheme and subsidized secondary education in all public schools in order to improve access, equity, quality retention, and completion rates at both primary and secondary school levels of education (Republic of Kenya, 2006).

These initiatives have resulted in increased primary education completion rate for females from 49.5 per cent in 2003/2004 to 54.9 per cent in 2004/2005 (Republic of Kenya, 2006). The transition rate to secondary school for both boys and girls also increased from 41.7 per cent to 60 per cent between 2002 and 2005 respectively (Republic of Kenya, 2007). In addition, at secondary levels the transition rate increased from 42 per cent in 2002 to 60 per cent in 2006 (Republic of Kenya, 2007). The reforms which have been introduced in the education sector by the government therefore are likely to influence age at first marriage and hence a decline in fertility in the country.

1.2 Problem Statement

The age at which women begins child bearing influences the number of children a woman bears throughout her reproductive period in the absence of any active fertility control (Ngalinda, 1998). The age at first birth among women is influenced not only by the contraceptive use but also by the levels of education among other factors (Ferre, 2009; Gyimah, 2003; Ikamari 2008; Nahar et al., 2008). Most of studies on the effects of education on age at first birth in Kenya have focused on adolescents and have hardly considered those whose age at first birth occurred after adolescence age (Ferre, 2009). There exist few studies on the effect of education on age at first birth among women at older ages (Gyimah, 2003; Ikamari 2008).

There are mixed findings on studies on the influence of education on age at first birth with some (Nahar et al., 2008; Ferre, 2009) indicating that that all levels of education from primary to secondary and higher levels have significant effect on age at first birth. Others (Gyimah, 2003; Gupta et al., 2003; Ikamari, 2008) have found that the effect of education on age at first birth is only significant beyond primary levels of education that is, at secondary and above levels.

The results of the Demographic and Health Survey show there has been an increase in age at first birth in Kenya in the recent years from median age of 19.6 years in 1998 to 20.1 years in 2003 (CBS, et al., 2004) is a clear indication that first births are now increasingly occurring at older ages.

In order to get the full effect of education on age at first birth it is important to consider all women who are exposed to the risk of childbearing while controlling for other factors that are known to influence age at first birth among women such as age at first marriage and age at first sexual intercourse among others.

This therefore is an indication that the extent to which different levels of education influence age at first birth among women is not clearly known. The main question therefore which this study attempted to answer is “to what extent has education influenced age at first birth in Kenya?” The influence education has had on age at first birth is important if appropriate recommendations are to be made to address the issue of early age at first birth hence improving status of women and consequently reducing fertility in the country.

1.3 Objective of the Study

The main objective of the study was to examine the effects of education levels on the timing of the first birth in Kenya. Specific objectives were to:

1. Examine the gross effect of education and on age at first birth among women in Kenya
2. Explore the effect of education on age at first birth in the presence of the other factors in Kenya.

1.4 Study Justification

Since 1985 a number of educational reforms have been introduced in Kenya such as introduction affirmative action to enroll more women in schools and lowering the entry points for girls in universities among others in order to increase the levels of education among women. However, the extent of effects to which these educational reforms has had on age at first birth among women in Kenya is not clearly known.

Moreover, an understanding on benefits of education in delaying early age at first birth may provide a justification for committing more resources in the provision of bursaries and special scholarships for girls to enhance female education in the country and hence improvement of the status of women.

Studies have not been conclusive on the effect of education on age at first birth. While some studies show significant effect of all levels of education on age at first birth (Nahar et al., 2008; Ferre, 2009) others concluded that the effect of education on age at first birth is only significant at higher levels, that is beyond primary education (Gyimah; 2003; Gupta et al., 2003; Ikamari, 2008).

This is an indication that no clear understanding exist on the role of education in delaying the onset of childbearing. The study therefore attempted to fill this gap by using the 2003 Kenya Demographic and Health Survey data. The findings of this study can be used by policy makers and programme implementers to enhance female education and hence delay in early childbearing and reduction of fertility in the country.

1.5 Scope and Limitations of the Study

The data used in this study was obtained from Kenya Demographic and Health Survey 2003. This was a nationally representative sample of which included 8195 women aged 15-49 years. The accuracy of information on age at first birth depends on the accuracy of the information on respondent's birth data and the date of her first child (Gage, 1995). However, in Kenya due to incompleteness of vital registration and low levels of education among women erroneous reports of dates of first birth are common. Omissions of children who died in early infancy may also result into biases on the timing of first birth and also errors in the reporting of the respondent's age (Gage, 1995). Nevertheless despite the errors associated with age data researchers have found the DHS data to be fairly accurate (Nahar et al; 2008; Gyimah 2003).

Moreover, although data on age at first birth is usually based on retrospective reports from women which are susceptible to misplacement and omission biases, age at first birth which is the

focus of this study minimizes this problem since first births tends to be accurately reported than births of higher order (Casterline and Trussell , 1980; Gyimah, 2003).

Another limitation in this study is women who terminated their schooling after giving birth to a first child and also in the Kenyan context first births may occur before marriage. These women may continue schooling after the birth of the child or completely drop out of school. These are factors that may have an influence in the study however were not considered in the case of this study as they were not the focus of the study.

CHAPTER TWO

LITERATURE REVIEW AND CONCEPTUAL FRAMEWORK

2.1 Overview

The literature reviewed in this section focuses on various studies that have been undertaken on the effect of education on age at first birth among women. The review focuses on the effect of education and other socio-economic and cultural factors on age at first birth among women.

2.2 Theoretical Link between Education and Age at First Birth

The past 50 years have seen immense transformations in the educational and the reproductive expectations of women in the developing world: educational levels have been increasing everywhere and fertility trends have been downward (Ferre, 2009). Numerous studies report strong associations between female education and early fertility behaviour: teenage pregnancy, age at first birth and contraception use (Beets, 1999). This evidence has been used as an argument in favour of targeting educational expenditures towards girls. However, most of these studies are based on correlations between years of education and early fertility behaviour, often after controlling for community, household and individual characteristics.

A number of theories have been advanced by scholars on how education influences age at first birth among women. Gyimah (2003) argued that education among other economic and cultural factors influence age at first birth through the proximate determinants namely, age at first marriage and contraceptive use. Economic factors according to him involves the value and cost of children which may depend on the relative priority given to various possible life pursuits while cultural considerations include variations in norms and ideas on women's roles as mothers and wives. Therefore economic factors and cultural considerations influence age at first birth among better educated women by increasing investment cost in children due to their higher socio-economic and cultural aspirations for children decisions to postpone the first birth until they feel sufficiently secure to provide for their children (Gyimah, 2003; Dewit et al., 1992).

According to Kasarda et al., (1986) and Maxwell (1987) the effects of education on the timing of first birth occur through changes in real and perceived costs and utilities of children. This

therefore increases the opportunity costs for women leaving the labour market to become a mother for educated women often resulting into postponement of childbearing or foregoing it altogether as is the case in western countries (Rajulton et al., 1990).

A woman with little education typically becomes a mother earlier and has more children than one with better education, and because of a similar well-established relationship between current education and current fertility at the societal level; one might expect such education reversals to raise fertility. However, a study by Oystein in 2007 found if there is an additional negative effect of low educational level among currently young women compared with that in the past, which would accord with ideas about the impact of relative deprivation, the total effect of an education reversal may run in either direction.

Long years of formal education according to Gyimah (2003) therefore invariably delay a woman's entrance into marriage which indirectly rises age at first birth. Similarly Westoff (1992) argues that higher education delays marriage which ultimately postpones childbearing among women. Moreover education indirectly affects age at first birth through the use of more effective contraceptive methods common among highly educated women (Gyimah, 2003; Addai, 1999; Khan and Rahman, 1997).

Age at first birth is influenced by a number of factors that could be social, economic, cultural and demographic. Among these are the background determinants and the proximate determinants of age at first birth. Social background has a moderate yet significant effect upon the timing of the first birth, but it seems that education also has a strong influence on age at first birth. Higher education provides women with status or opportunities that reduce the importance of early child bearing (Beets, 1999). As the use of contraception becomes more prevalent, age at first intercourse will decrease while the age at first birth will vary independently of age at first marriage, and fertility may be lowered (Ngalinda, 1998). Studies indicate that culture and education of women are incompatible in that girls attending school are taken out of the domestic environment which favours early marriage and childbearing and this offers them literacy and exposure to new ideas that favour late marriage and later age at childbearing (Westoff, 1992).

Gyimah, (2003) argues that the exposure of women to non traditional roles and providing them with alternatives to motherhood through education helps to expands women's life choices. Therefore as the duration of women's education increases, the decision to become a mother is delayed because the cost of motherhood will decrease the benefits realised by her career goals. This argument by Gyimah (2003) is a clear demonstration that women's aspirations for better education and career prospects exerts pressure to them to delay entry into motherhood through the use of more effective contraceptives and delay in age at first marriage.

2.3 Empirical Evidence on the Effect of Education on Age at First Birth

Studies indicate that age at first marriage and contraceptive usage directly influence age at first birth among women (Gyimah, 2003). According to Gyimah, (2003), other factors including education therefore must operate through the age at first marriage and contraceptive use in order to influence at first birth. Education therefore serves as one of the background variables while age at first marriage and contraceptive use are proximate determinants of age at first birth among women.

The gross effect of education on age at first birth results from an analysis where no other factors are considered. This specifically focuses on how women's education level impact on the timing of their first child and will not consider other factors that may contribute to the timing of a first birth. Studies have shown that women who start child bearing at early ages are likely to have lower levels of education (Ngalinda, 1998). This is so given the fact that education is known to bring in a new outlook on life as well as skills for taking advantage of new opportunities (Ngalinda, 1998). A rise in the level of women's education leads to a rise in age at first birth and consequently to a decline in fertility (Ngalinda, 1998).

Education indirectly influences age at first birth, and change in the traditional work role in that women with gainful employment may be more likely to postpone marriage and even child bearing within marriage ((Ngalinda, 1998). The importance of the spread of education as a determinant of social change has often been pointed out, and the diffusion of mass education in particular has also been linked to a broad range of social transformations including the

demographic transition. Education is a key determinant of fertility preferences and behaviour. The important question however is how it affects fertility and influences onset of child bearing. A number of hypotheses have been generated linking education and childbearing at the individual level (Axinn and Barber, 2001). One group of propositions suggests that an individual woman's own schooling experience influences subsequent fertility behaviour. As future parents, children who attend school learn something that alters their attitudes and plans and so they limit their childbearing later on when they are of childbearing age. A second suggestion is that the experience of sending children to school changes parents' subsequent fertility behaviour. Thus, changes in costs, benefits, or other consequences of childbearing affect parents' decisions.

Education delays childbearing since schooling and childbearing are not compatible (Ferre; 2009). According to Gaisie (1984) the median age at first birth for women with secondary or tertiary education was 25 years compared to 19 years for women with primary education. Similar studies in Kenya for example by Konogolo (1985) have also shown that post-primary schooling (especially of 9 or more years) has a strong effect in postponing the onset of fertility often by 3 to 4 years.

In Malawi the pattern of the recent surveys suggests that there has been no significant change in age at first birth in the recent past years and however the DHS data shows that the median age of women with secondary education and above was higher than those with no education and primary education (NSO 2004).

According to Gyimah (2003), median age at first birth is highly influenced by the level of education. In a study carried out in Ghana using the 1998 Ghana Demographic and Health Survey dataset, he found that the median age at first birth was much higher 23.7 years for women with 11 or more years of education compared with 19.8 for those with no education, 19.6 years for those with 1-6 years of education and finally 20 years for those women with 7-10 years of education. Evidence on the cumulative proportion attaining first birth at all durations has been found to be higher among women with no education. Using the 1998 Ghana Demographic and Health Survey dataset, Gyimah (2003) found that at age 20 years 53 per cent of women with no education had experienced a first birth compared with only 20 per cent of those with 11 or more years of education. He also found that at 25 years, 87 per cent of women with no education had given birth compared with about 60 per cent of those who had secondary and above education.

Gupta et al., (2003) using DHS data sets for eight countries including Kenya carried out between 1987 and 1999 also had similar findings. In this study it was found that better educated adolescents in all the eight countries studied were less likely to have an early first birth and girls with eight or more years of schooling were at least 50 per cent less likely to initiate childbearing before their 18th birthday than those with no education.

Gyimah (2003) after controlling for age at first marriage in a study on educational attainment and age at first birth using Ghana Demographic and Health Survey 1998, found that there was a reduction of the effect of higher levels of education on age at first birth. This was an indication that there exists an association between age at first marriage and education and also early age at first marriage results in a higher risk of first birth and vice versa (Gyimah, 2003). It is therefore important to examine the effect of education on age at first birth in the presence of other factors that affect the age at first birth.

Similar findings were also observed by Gupta et al., (2003) using DHS data sets for eight countries including Kenya carried out between 1987 and 1999. In this study, they found that after controlling for other variables, the effect of education on age at first birth, though still statistically significant registered a reduction with some countries such as Cote d'Ivoire and Senegal.

A study carried out in Kenya using a combined Kenya Demographic and Health Survey of 1998 and 2003 by Ikamari (2008) found that the net effect of education on age at first birth was statistically significant among young birth cohort that is, those born in 1974-1988. It was also found that the odds of first birth among women with primary education were significantly different from those for women with no education and also higher than those for women with no education in the older cohorts (1948-1962 and 1963-1973). In this study the effect of education was reduced when age at first marriage was introduced in the analysis, an indication that education influences age at first birth through the age at first marriage.

2.4 Other Factor Influencing Age at First Birth among Women

Studies indicate that increasing girls' education alone is not sufficient in raising ages at first birth because there other factors which also influence age at first birth (Gupta et al., 2003). These factors include, religion and type of place of residence (Gyimah, 2003; Ikamari, 2008), region of residence (Ikamari, 2008) and ethnicity (Gyimah, 2003).

Gyimah (2003) in Ghana using the Ghana Demographic and Health Survey 1998 dataset found that the risk of first birth was higher among the Catholics girls compared with girls belonging to other religions. However, other studies (Ikamari, 2008) have found no significant effect of religion on age at first birth.

Ikamari, (2008) using a combined Kenya Demographic and Health Survey of 1998 and 2003 datasets showed that type of place of residence had a net effect on age at first birth among younger cohorts (those who were born in 1974-1988) whose risk of childbearing was significantly higher among rural women compared to urban women. This is an indication that younger women living in rural areas are more likely to initiate childbearing early compared with those living in urban areas.

Ethnic affiliation has been found to influence age at first birth. Gyimah (2003) using the Ghana Demographic and Health Survey 1998 data, compared with Akan, the risk of a first birth was 15 and 28 per cent lower for Ga-Adangbe and Mo-Dagbani ethnic communities in Ghana. Hence ethnicity plays a role in influencing the timing of a first birth.

Region of residence has been found to have significant effect on age at first birth among women. In a study carried out in Kenya by Ikamari using a combined Kenya Demographic and Health Survey of 1998 and 2003 datasets found that the effect of region of residence on age at first birth was statistically significant in each of the birth cohorts studied in Kenya.

However, this effect diminished in the presence of the controls for the age at first marriage and education indicating that age at first marriage and education has some effect on age at first birth.

2.5 Summary of the Literature Review

Literature reviewed in this study indicates there is a strong relationship between education and age at first birth. Education influences women's economic and cultural aspirations and act through age at first marriage and use of contraception among other factors to influence age at first birth.

The effects of education on the timing of first birth occur through changes in real and perceived costs and utilities of children. Delay of a woman's entrance into marriage as a result of long years of education indirectly rises age at first birth. Moreover, education is associated with the use of more effective methods of family planning and exposure to new ideas that favour late marriage and later age at first birth among women. In addition, women's exposure to modern roles as a result of education offers them alternatives to motherhood and this may delay her entry into motherhood.

In some studies the effects of all levels of education are found to have a significant effect on age at first birth (Ferre, 2009) while in others only higher levels of education were found to have been significant influence (Gyimah, 2003). Further studies found the effect of education on age at first birth has been found to be significant among younger ages while in older ages it was not found to be statistically significant (Ikamari, 2008). Other factors such as religion, type of place of residence, region of and ethnicity have been found to act through age at first marriage and age at first sexual intercourse to influence age at first birth among women independent of the levels of education (Ngalinda, 1998).

The mixed findings on the effect of education levels on age at first birth confirmed a need to undertake further research to gauge the effects of education on age at first birth for all levels of education for women aged 15-49 years which was the major objective of the study.

2.6 Conceptual Framework

This framework of proximate fertility determinants (Bongaarts, 1978) was used in conceptualization as this study focuses on age at first birth as a proxy for fertility. In the

framework Bongaarts used three categories: exposure aspects (the proportion of women married), deliberate marital fertility control (contraceptive use and abortion), and aspects related to natural marital fertility (lactational infecundability, frequency of intercourse, sterility, spontaneous *intrauterine* mortality, and the duration of the fertile period). This study however is interested in how education influences age at first birth which in the case of this study is a proxy for fertility. The intermediate variables that will be examined in this paper are age at first marriage and age at first sexual intercourse.

Economic factors involves the value and cost of children which may depend on the relative priority given to various possible life pursuits while cultural considerations include variations in norms and ideas on women's roles as mothers and wives. These considerations influence age at first birth among better educated women by increasing investment cost in children due to their higher socio-economic and cultural aspirations for children making them to decide to postpone the first birth until they feel sufficiently secure to provide for their children.

Moreover, education causes changes in real and perceived costs and utilities of children among women which increase the opportunity costs for the labour market to become a mother. This often results into postponement of childbearing or foregoing it altogether.

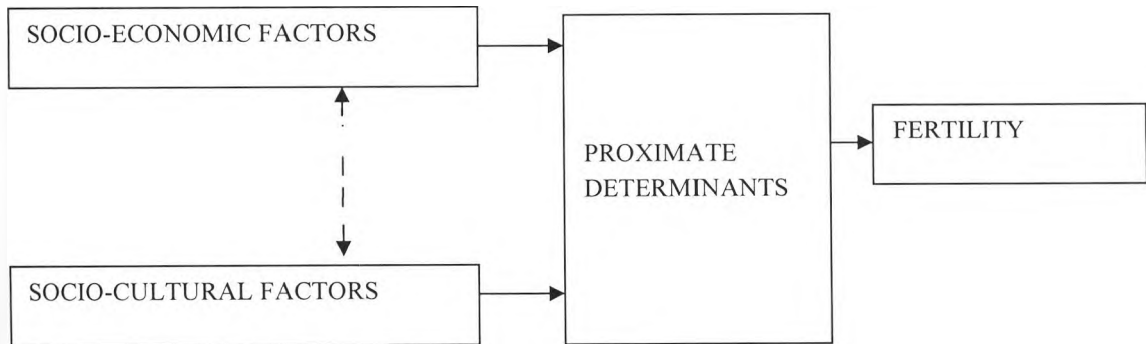
Long years of formal education therefore invariably delay a woman's entrance into marriage which indirectly rises age at first birth. In addition education indirectly affects age at first birth through the use of more effective contraceptive methods common among highly educated women.

The incompatibility of education and culture ensures that girls attending school are taken out of the domestic environment which favours early marriage and childbearing and this offers them literacy and exposure to new ideas that favour late marriage and later age at childbearing. The exposure of women to non traditional roles and provision of alternatives to motherhood through education helps them to expand their life choices. Therefore as the duration of women's

education increases, the decision to become a mother is delayed because the cost of motherhood will decrease the benefits realised by her career goals.

2.7 Conceptual Model

Figure 1. Conceptual model for studying the effect education on age at first birth among women in their reproductive ages in Kenya.

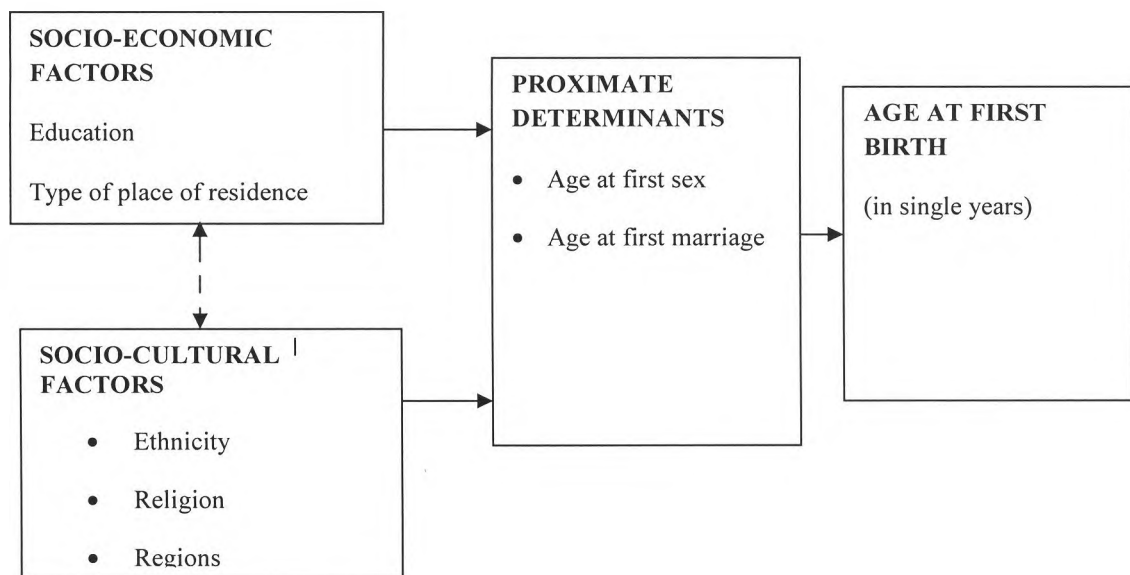


Source: Bongaarts Framework 1978 (Modified).

The above conceptual model was derived from Bongaarts framework (1978.) The model is simply a diagrammatic presentation of the interrelationships between the dependent (age at first birth which is a proxy for fertility) and the independent variables (Socio-economic, Socio-cultural and proximate factors). Education of women acts through economic and cultural factors which operate through the proximate determinants namely age at first marriage and contraceptive use to influence age at first birth among women.

2.8 Operational Model

Figure 2. Operational model for studying the effect of education on age at first birth among women in their reproductive ages in Kenya.



Source: Bongaarts 1978 framework (Modified)

Education levels act through other factors which also act through the proximate determinants namely age at first marriage and age at first sex to influence age at first birth among women in their reproductive ages.

2.9 Study Hypotheses

1. Education levels influence the age at first birth among women through direct determinants such as age at first marriage and age at first sexual intercourse in Kenya.
2. Education levels influence the age at first birth among women by influencing cultural and economic factors which act through direct determinants of age at first marriage and age at first sexual intercourse in Kenya.
3. Secondary and above level of education significantly influenced women's age at first birth irrespective of other factors

2.10 Summary of Variables and Their Measurement

Table 2.1 Summary of Variables and Their Measurements

NAME	MEASUREMENT	TYPE OF VARIABLE
Age at first birth	Completed years	Dependent
Education	0= No education (RC)	Main Independent
	1 = Primary	
	2 = Secondary+	
1. Age at first sexual intercourse	1 = Below 20 years (RC)	Control
	2 = 20-24 years	
	3= 25 years and above	
2. Age at first marriage	1 = Below 20 years (RC)	Control
	2 = 20-24 years	
	3= 25 and above	
3. Type of place of Residence	0 = Urban (RC)	Control
	1 = Rural	
4. Religion Affiliation	1=Roman Catholic (RC)	Control
	2 = Protestants/Other Christians	
	3 = Muslim	
	4 = No religion /Other	
5. Region of residence	1 = Nairobi (RC)	Control
	2= Central	
	3= Coast	
	4 = Eastern	
	5= Nyanza	
	6=Rift Valley	
	7= Western	
	8= North Eastern	
6. Ethnicity	1 = Kikuyu (RC)	Control
	2= Kamba	
	3 = Luhya	
	4 = Luo	
	5 = Embu/Meru	
	6 = Kalenjin/Masai/Turkana	
	7= Kisii/Kuria	
	8=Coastal Bantus	
	9= Somali	
	10= Others	

The summary of variables in table 2.1 above is explained below.

Dependent Variable.

The dependent variable in this study is the age at first birth which is measured in completed years. The starting time for this variable is 11 years which may be interpreted as the time that women started experiencing a first birth.

A. Independent Variables.

Socio-economic factors

Education levels. This is the main independent variable of this study. It is measured by level of education attained by a woman. Three categories will be considered in this study that: No education, Primary and Secondary and higher levels of education.

Type of place of residence. This variable refers to the type of residence of a woman is either Urban or Rural. Two categories were considered in this study namely, type of place of residence is urban and type of place of residence is rural

Socio-cultural factors

Women Religious Affiliation. This refers to the religious faith a woman belonged to. The major categories that are considered in this study are Catholics, Protestant/other Christians, Muslims and other. 'Other' includes no religion, Hinduism etc).

Region of residence. This variable refers to the region of residence and this is categorized into eight categories namely, Nairobi, Central, Coast, Eastern, Nyanza, Rift Valley, Western and North Eastern province.

Ethnicity. This variable refers to the ethnic affiliation of the women. Ten categories are considered namely Kikuyu, Kamba, Luhya, Luo, Embu/Meru Kalenjin/Masai/Turkana, Kisii/Kuria, Coastal Bantus Somali, and others

CHAPTER THREE

DATA AND METHODS

3.1 Introduction

This section presents a description of data and methods that were used for the analysis in the study. The study uses life table technique to estimate the median age at first birth and Cox proportional hazard model to estimate the risk of experiencing a first birth.

3.2 Data Source

The data used in this study was drawn from 2003 Kenya Demographic and Health Survey (KDHS). This data was a national representative sample of 8195 women in their reproductive age 15 – 49 years. The survey collected information on fertility, family planning, maternal health, child health and information about HIV/AIDS and other STIs information on malaria and use of mosquito nets and domestic violence. The country report of the Kenya Demographic and Health Surveys has extensively described the survey and sampling methodology (CBS et al; 2004) and therefore no attempt will be made to discuss these aspects.

Among the information collected in the KDHS were the current age of the woman and the age of her first child. This was used to calculate the age of the woman at the age of her first child. The respondent age in the questionnaire is obtained by asking both the date and completed years. A detailed birth history is collected including all live births in a woman's lifetime along with age, birth date, and sex survival status and living arrangement of each child. Age at first birth is derived from the date of birth of the women and that of her first child. Respondents were also asked about demographic, socio-cultural and socio-economic characteristics which included education attainment, region of residence, marital status, type of place of residence, ethnicity, religion, age at first birth among others.

3.3 Methods of Data Analysis

The study employed the life table approach to estimate the median age of age at first birth among women. For multivariate analysis the study utilized the Cox regression to estimate the risk of a woman experiencing a first birth. These methods are discussed below.

4 Life Tables

A life table is a presentation of the life history of a cohort commencing with the starting event as the cohort is progressively thinned out over time by failures. Failures are the terminating events which in the case of this study was the time a woman gives birth to her first child. The actuarial life table was used in this study therefore to show transition from a state of childless to first birth derived from reproductive histories of women in the 2003 Kenya Demographic and Health Survey. The starting event was 10 years and terminating event was age at first birth for women aged 15-49 years.

Life tables were originally developed for mortality analysis but they have become the standard procedure for tracking the duration specific likelihood of experiencing an event in this case giving birth to the first child. Life table was applied to data that specify the time elapsed until the event occurs. The basic idea in the use of a life table was to follow a group of people from a specified time until they experience the event. In this study, the terminating event is experiencing the birth of the first child among women in Kenya. The study sets out to find out how long a woman survives before she experiences a first birth.

The median age at first birth was the time half of the women are expected to have experienced the birth of their first child.

Quantities which were estimated in this study were:

- t = time elapsed since the starting event in years from 10-49 years
- q_t = estimated conditional probability of failure between t and $t+1$, given survival to t (the interval t to $t+1$ ranges from t up to but not including $t+1$)
- P_t = estimated conditional probability of surviving from t to $t+1$ given survival to t
- S_t = estimated conditional probability of surviving from starting event to time t
- F_t = estimated conditional probability of failure between the starting event and time t

The life table technique involves classifying the sample in the basis of covariates of interest and estimating the function in each class separately. When none of the cases are small these procedures are workable. But very often the many cases are likely to be small, especially when

co covariates are taken into account simultaneously. When there are many covariates, cell sizes become too small for the computation of life tables. Under such circumstances, it is advisable to use for comparison comprehensive models in which effects of factors affecting failure time are represented by unknown parameters, hence use of hazard models.

Life table technique has a weakness in that one is required to divide the sample into cross-tabulated (on the basis of covariate of interest) sub sample and calculate separate life tables for each sub sample. When none of the classes (sub-sample) is small the procedure works perfectly, but often the sample size becomes very small with several classification ending up with numerous results and high standard errors. Under such situations, it is good to use more comprehensive and complex models for comparisons in which factors affecting failure times are represented by unknown parameters. This is the reason why the study makes uses hazard model since it economizes cases so that there is no need for such a large sample to get statistically meaningful results.

Education will be measured in three levels; no education, primary and secondary and above levels of education to estimate the median age at first birth for women of each level. The median age of women were estimated using the levels of education to examine whether there was variation in age at first birth. The life table technique is best suited to calculate the differentials of median age at first birth by level of education and by other control variables as it takes care of the censored cases.

3.6 Cox Proportional Hazard Model

This is a statistical tool which allows analyzing the effect of several risk factors on survival. Risk factors in the case of this study being the occurrence of the first birth while survival being the transition from childless state to motherhood among women.

The probability of the occurrence of an event, a first birth, in the case of this study which was a terminating event is the hazard modeled as:

$$H(t) = H_0(t) \times \exp(b_1 X_1 + b_2 X_2 + b_3 X_3 + \dots + b_k X_k)$$

where $X_1 \dots X_k$ are a collection of predictor variables and $H_0(t)$ is the baseline hazard at time t , representing the hazard for a person with the value 0 for all the predictor variables.

By dividing both sides of the above equation by $H_0(t)$ and taking logarithms, we obtain:

$$\ln\left(\frac{H(t)}{H_0(t)}\right) = b_1 X_1 + b_2 X_2 + b_3 X_3 + \dots + b_k X_k$$

$H(t) / H_0(t)$ is called the hazard ratio. The coefficients $b_1 \dots b_k$ are estimated by Cox regression, and can be interpreted in a similar manner to that of multiple logistic regression.

In the case of a dichotomous covariate (risk factor) it is coded 1 if present and 0 if absent. Then the quantity $\exp(b_i)$ can be interpreted as the instantaneous relative risk of an event, at any time, for an individual with the risk factor present compared with an individual with the risk factor absent, given both individuals are the same on all other covariates.

Where the covariate is continuous, then the quantity $\exp(b_i)$ gives the instantaneous relative risk of an event, at any time, for an individual with an increase of 1 in the value of the covariate compared with another individual, given both individuals were the same on all other covariates. Values less than one indicate that the relative risk of having a first birth is lower than that of the reference group.

The model is useful for this study because the dependent variable age at first birth was measured in completed years and can be interpreted as survival time from childless state to state of motherhood. Throughout the interval, women may either experience a birth or be right censored. The study uses hazard models to overcome the problem of censoring.

Cox proportional hazard regression model was first introduced by Cox (1972) and further developed by many authors (Allison, 1995; Kalbfleisch and Prentice, 1980). The model can be used to explain the effect of covariates on survival times (Rutherford and Choe, 1993). The method has been applied in demographic research and work has been done on timing of births and birth intervals (Rodriguez et al, 1984; Gyimah, 2003). Some demographers and statisticians have expressed the view that the hazards technique is well suited in fertility studies or timing of first births.

The Cox model recognizes that occurrences of first births are age dependent and not constant overtime. It does not make any assumptions about the functional distribution of the timing function, hence appropriate for events whose empirical is unknown (Gyimah, 2003). It is based on assumption that the ratio of the hazard functions of two individuals is constant throughout the period of observation (Armitage, et al., 2002). Cox's proportional hazards model is analogous to a multiple regression model and enables the difference between survival times of particular groups of patients to be tested while allowing for other factors. In this model, the response (dependent) variable is the 'hazard'. The hazard is the probability of giving birth (or experiencing the event in question) given that women have survived up to a given point in time.

The model was to determine how education level influences the risk of a first birth together with other covariates which in case of this study are control variables. It handles censored case correctly and provides estimate co-efficient for each of the covariates allowing one to assess the impact of multiple covariates in the same model.

CHAPTER FOUR

EFFECT OF EDUCATION ON AGE AT FIRST BIRTH IN KENYA

4.1 Introduction

This Chapter presents the distribution of the study population by various background characteristics. It also presents differentials of median age at first birth by education levels and other socio- economic, socio- cultural and demographic variables. In addition it presents the multivariate results of the risk of giving birth by education levels and by other covariates among women aged 15-49 years in Kenya.

4.2 Background Characteristics of the Study Variables

Table 4.1 presents results of the background characteristics. There were 8195 women in the study population. The results show that at the time of the survey about 72 percent of the women had at least given birth to their first child at the time of the survey while over 28 percent had not experienced a first birth. Distribution by education levels shows that about 16 percent of the women had no education, while more than half of the women at 53 percent had primary education and 31 percent of the women in the study had at least secondary education and above.

The findings further indicate that two thirds of the women in the study were living in the rural area at the time of the survey and while a third were residents of urban areas. Ethnic groups were fairly distributed and the Kikuyu were 24 percent followed by the Luhya with 15 percent. The Kalenjin\Masai\Turkana were 11 percent while Kamba and the Luo contributed 10 percent each. Embu\Meru group were 5.9 percent of the study population while the Coastal Bantus were 8.6 percent. Kisii\Kuria were 6 percent and the Somali and Other ethnic groups were about 9 percent. The study shows that distribution by religion was skewed towards Protestant and other Christians who were 62 percent of the study population followed by Roman Catholic with 23 percent and Muslims with 12.5 percent of the study population while other religions were only 2.5 percent of the study population.

The study population was fairly distributed within regions, with Rift Valley and Central province each having 16 percent of the women in the study population and Nairobi contributed 14 percent. Eastern, Nyanza and Western contributed about 37 percent while the rest were in Coast, 11 percent and North Eastern slightly more than 5 percent. Furthermore distribution by age at first marriage show that women who had never been married were 30 percent while among those who had at least a first marriage by age 20 years were about 44 percent. Women who had their first marriage at between 20 and 24 years were about 21 percent while those who got who experienced marriage after 25 years were about 6 percent. Moreover about 64.6 percent of the women in the study population had had their fist sexual experience before they attained the age of 20 years. At age 20 to 24 years were 12.1 percent of the women had already had their first sexual intercourse. The women who had not had sex and those whose sexual status were unknown were 21.5 percent of the sample.

Table 4.1: Characteristics of the Study Population

Variables	Frequency	Percent
<i>Age at first birth</i>		
A birth has occurred	5865	71.6
No birth has occurred	2330	28.4
Independent variables		
<i>Socio-economic Variables</i>		
<i>Education Levels</i>		
No education	1291	15.8
Primary	4348	53.1
Secondary+	2556	31.2
<i>Type of Place of Residence</i>		
Urban	2751	33.6
Rural	5444	66.4
<i>Socio-Cultural Variables</i>		
<i>Ethnicity</i>		
Kikuyu	1977	24.1
Kamba	786	9.6
Luhya	1229	15.0
Luo	853	10.4
Embu/Meru	487	5.9
Kalenjin/Masai/Turkana	926	11.3
Kisii/Kuria	501	6.1
Coastal Bantus	701	8.6
Somali	602	7.3
Others	133	1.6
<i>Religion</i>		
Roman Catholic	1919	23.4
Protestant and Other Christians	5045	61.6
Muslims	1025	12.5
Others	206	2.5
<i>Region</i>		
Nairobi	1169	14.3
Central	1314	16.0
Coast	938	11.4
Eastern	993	12.1
Nyanza	1025	12.5
Rift Valley	1328	16.2
Western	991	12.1
North Eastern	437	5.3
Proximate Variables		
<i>Age at first marriage</i>		
Below 20 years	3572	43.6
20-24 years	1697	20.7
25 years and above	460	5.6
Unmarried	2466	30.1
<i>Age at first sexual intercourse</i>		
Below 20 years	5292	64.6
20-24 years	991	12.1
25 years and above	146	1.8
Had not had sex and sexual status unknown	1417	21.5
Total	8195	100.0

Source: Analysis of KDHS, 2003.

4.3 Differentials in Median Age at first Birth in Kenya

This section presents the differentials of the median age at first birth in Kenya as shown on table 4.2. The median age at first birth of women with no education is 19.11 years as shown in table 4.2 while the women with primary education had a median age at first birth of about 20.1 years. Those with at least secondary and above education have a median age at first birth of 24.2 years. The results imply that higher levels of education is associated with delay of initiating childbearing and confirms the findings of other scholars (Gyimah, 2003; Gaisie, 1984; and Gupta et al., 2003) who found that women with higher level of education also have higher median age at first birth. This may be due to the fact that education increases age at first birth as schooling brings in competing interests in women like pursuing a career. In most cases very few women go back to school after giving birth to their first child as motherhood takes priority (Ferre, 2009) despite the return to school policy for girls who give birth.

Moreover there are age differences between women living in urban areas and those living in the rural areas when it comes to the median age at first birth. The median age at first birth of women living in urban area is about 22.7 years while those in the rural area have a median age at first birth of 20.4 years. This finding is similar to the results of Ikamari (2008) who found that younger women living in rural areas are more likely to initiate childbearing early compared with those living in urban areas.

Differentials in age at first birth by ethnic affiliation were also found with the Others having median age of 21.06 years, Embu/Meru 20.54 years and Kikuyu 20.02 years. The other ethnic groups had a median age of 20 years. The Kamba had a median age at first birth of 19.53 years while the Luhya had 19.13 years, Kisii/Kuria 19.05 years and the Coastal Bantus a median age of 19 years. Kalenjin/Masai/Turkana and Somalis had median age at first birth of 18.90 and 18.95 years respectively. The Luo had the lowest median age of 18.06 years. This ethnic differential in median age at first birth is an indication of social and cultural diversity among ethnic communities in Kenya. This is consistent with other findings from other studies for example by Gyimah (2003) that showed ethnic affiliation to have an influence in age at first birth.

The results imply that women of Muslim faith and other religions had children earlier than either the Roman Catholics or the Protestants and other Christians. Women belonging to the Roman Catholics had a median age at the birth of the first child of 21.2 years while that of Protestants and Others Christians was 21.14 years. Muslims and other religion were found to have a median age at the birth of the first child of 20.3 years and 19.6 respectively. This agrees studies by some scholars (Gyimah, 2003) who found that the median age at first birth higher among the Catholics girls compared with girls belonging to other religions.

In this study women in Nairobi province were found to have the highest median age at first birth of 24.4 years followed closely by women from Central and Eastern provinces at 21.4 and 21.2 years respectively. In the other provinces, Coast, Rift valley and Western, women had a median age at the birth of the first child of 20.7, 20.0, and 20.7 years respectively. However women in North Eastern province were found to have the lowest median age at first birth of about 20 years. The results of the median age at first birth reflect what is expected of the province considering the level of development in this province. The constituency poverty level report showed that poverty incidence increased in North Eastern province from 64.2 percent in 1999 to 74.0 percent in 2005 (KNBS, 2008) This confirms a study by Ferre (2009) that the areas that are have more development tend to have a higher median age at first birth.

The results imply that the age at which a woman marries for the first time determines the age that she will start childbearing. Women who married for the first time below 20 years of age had a median age at first birth of 18.3 years and those who married at 20-24 years had a median age at first birth of 22.1 years. Similarly as expected women who married after 25 years had a median age of 25.6 years at the birth of their first birth. Nahar et al. (2008) found that those who married an early age were more likely to give birth early.

The study has shown that a woman's exposure to sex determines the age at first birth. Women who had their first sexual intercourse below the age of 20 years had a median age at first birth of 18.02 years while those who had sex for the first time at 20 to 24 years had a median age at first

birth of 21.28 years. Moreover women who delayed first sexual intercourse had a median age at first birth of 28.13 years.

Table 4.2: Differentials of Median age at first birth by different covariates

Variable	Median age
Highest Education Levels	
No education	19.11
Primary	20.07
Secondary+	24.21
Type of place of residence	
Urban	22.73
Rural	20.41
Ethnicity	
Kamba	19.63
Kikuyu	20.02
Luhya	19.13
Luo	18.06
Meru/Embu	20.54
Masai/Turkana/Kalenjin	18.90
Coastal Bantus	18.99
Kisii/Kuria	19.05
Somali	18.95
Others	21.06
Religion	
Roman Catholic	21.20
Protestant and Other Christians	21.14
Muslims	20.31
Others	19.57
Region	
Nairobi	24.45
Central	21.45
Coast	20.75
Eastern	21.22
Nyanza	19.94
Rift Valley	20.03
Western	20.72
North Eastern	19.99
Age at first marriage	
Below 20 years	18.33
20-24 years	22.07
25 years and above	25.57
Age at sex first sex	
Below 20 years	18.02
20-24 years	21.48
25 years and above	28.17

Source: Analysis of 2003 KDHS

4.3. 1 Effect of Education on the Risk of a First Birth in Kenya

Three models were used for analysis of the risk of giving birth to the first child. Three models were used to estimate the influence of education on the risk of first birth and the other two models were introduced to see if education still remained a significant factor on the risk of a first birth in the presence of other factors. The first model measured the gross effect of education on the risk of first birth. The second model measured the net effect of education in the presence of the background characteristics that include type of place of residence, ethnicity, religion and region of residence. The third model measured effect of education on the risk of giving a first birth in the presence of the proximate determinants to if education still remained a significant factor.

4.3.2 Education and Age at First Birth

The result of analysing the effect of education on age at first birth in the first model presented in table 4.3 shows that education level has a significant effect on the risk of a first birth in Kenya. The reference category is always equal to a unit or in other words a hundred percent. When the Exp (B) is greater than a unit shows that women are at a higher risk of experiencing a first birth compared to the reference category and when Exp (B) is less than a unit it shows that women are at a lower risk of experiencing a first birth compared to the women in the reference category. The percentage is calculated by how much the Exp (B) is greater or less than the unit. The risk of having a first birth for a woman with primary level of education was 31 percent lower compared to a woman with no education. Similarly a woman with secondary education and above had a 54 percent lower risk of having a first birth compared to a woman with no education. This finding confirms the results of a study carried out by Gyimah (2003) who argues that long years of formal education invariably delays a woman's entrance into marriage which indirectly raises the age at first birth. Studies by Gaisie (2003) and Ikamari (2008) also found that education delays age at first birth among women. Gaisie (2003) for instance found that the median age at first birth for women with secondary or tertiary education was 25 years compared to 19 years for the middle and primary school leavers hence showing that education contributes to delaying the onset of childbearing. Similar studies in Kenya for example Konogolo (1985) confirmed that

post-primary schooling (especially of 9 or more years) has a strong effect in postponing the onset of childbearing often by 3 to 4 years.

4.3.3 Effect of Socio-Economic and Social-Cultural Factors on Age at First Birth

The effect of Socio- economic and socio-cultural factors were examined in the second model to explore if education was still a factor in the risk of having a first birth. The results in model 2 show that education is still a significant determinant of age at first birth. The risk of a woman with primary education having a first birth is 40 percent lower in model 2 compared to the risk of 31 percent in model 1. Women with secondary and above education were also at a lower risk in model 2 than in model 1. Women with secondary and above education were at 58 percent lower risk of an first birth compared to women with no education in model 2. The results imply that education level of a woman becomes a strong factor in determining the age at which she starts childbearing. It also implies that when a woman starts childbearing her chances of continuing with education are reduced despite the return to school policy as childrearing competes with schooling. The result confirms the findings of other scholars (Gyimah, 2003; Gaisie 2003 and Ikamari 2008) who argue that education has a strong influence on age at first birth even when other factors are taken into consideration.

The other results examined in model 2 show that the effect of other variables are as expected. In this model ethnicity was found to have an influence on age at first birth among women in Kenya. Women belonging to the Luo ethnic group were 35 percent more likely to have a first birth compared to the Kikuyu women. Similarly women belonging to the Luhya ethnic community had 19 percent higher risk of a first birth compared to the Kikuyu. The result was statistically significant at 1 percent level. In addition, women belonging to the Somali ethnic community had 30 percent lower risk of a first birth compared with those from the Kikuyu ethnic community. This finding is contrary to what was expected considering the Kikuyu have a higher median age at first birth than the Somali. This calls for further investigation using qualitative data. This confirms the results of studies carried out in Ghana by Gyimah (2003) which he found ethnic background of the women to influence first births. The results were not statistically

significant for the women belonging to Kamba, Kisii/Kuria Kalenjin/Masai/Turkana and Coastal Bantus ethnic communities.

The results show women's religious affiliation was a significant factor in influencing age at first birth; that is the religion a woman professes determines her risk of experiencing a first birth. Women belonging to Protestant/Other Christians, Muslims and those of other religion were found to be more likely to experience a first birth (hazard ratios 1.08, 1.18 and 1.29 respectively) compared with women professing the catholic faith. This calls for further investigation to explain this finding. However, this finding is contrary to the findings of other scholars (Gyimah, 2003) who found higher risk of first birth among the Catholics girls compared with girls belonging to other religions in Ghana.

The region of residence of the women was found to have an influence on age at first birth among women in Kenya. Compared with women living in Nairobi province, women living in Central were at 36 percent higher risk of a first birth, similarly women living in Eastern 20 percent higher risk of a first birth at 2 percent level. Women living in Nyanza and Rift Valley provinces had 25 percent and 32 percent higher risk respectively of a first birth compared to women from Nairobi. The results were not significant for women from Coast, Western and North Eastern provinces.

In model 3(full model) age at first marriage and age at first sexual intercourse variables were examined to explore if education was still a significant factor on the risk of having a first birth. The introduction of these two variables altered the effect of education on age at first birth however education still remained a significant factor on age at first birth. The results show that women with secondary and above level of education are at 11 per cent less likely to have a first birth compared with women with no education at 3 percent level of significance. In addition women with primary level of education were found to be not statistically significant with women with no education. The findings imply that higher level of education lowers the risk of a woman experiencing a first birth even in the presence of other factors like the socio-economic, socio-

cultural and proximate determinants. The findings show by having more women transit to secondary school will lower the risk of a first birth among women in Kenya.

This finding is consistent with the result of other studies for example Ikamari (2008) who found that the effect of education on age at first birth diminished in the presence of the controls for age at first marriage. Similarly the introduction of age at first sexual intercourse reduced the effect of education on age at first birth.

The other results in this model show that the effects of other variables are as expected. The risk of a first birth among women living in the rural areas compared with those in the urban areas was 11 percent more likely at 1 percent level. This finding is consistent with the finding of other scholars (Ikamari, 2008) who argued that early age at first birth among women living in rural areas may be explained by the fact that these women tend to initiate early child bearing compared with those in the urban areas. Moreover, the 2003 Kenya Demographic and Health Survey indicate that women in the rural start sexual activity about one year earlier than their urban counterparts (CBS et al, 2004).

The effect of ethnicity and religion on age at first birth was not statistically significant after the introduction of age at first marriage and age at first sexual intercourse in Model 3. The introduction of age at first marriage and age at first sexual intercourse variables in the model reduced the effect of region of residence on age at first birth in Model 3. The result show that only women living in central province were statistically significant compared to women living in Nairobi at 24 percent more likely to experience a first birth. The result also indicate that women living in Coast, Eastern, Nyanza, Rift Valley, Western and North Eastern were not statistically at risk compared to women living in Nairobi.

As expected women who married for the first time at age 20-24, and 25 and above years together with had a lower risk of experiencing a first birth (hazard ratios 0.56 and 0.51 respectively) compared to women who married for the first time at below 20 years. This finding is consistent with the finding of Gyimah (2003) who argues that since age at first marriage is a normative

proxy for exposure to the risk of conception, women who marry early are expected to have an early first birth and vice-versa. Moreover, Ikamari (2005) argues that marriage predisposes women to childbearing.

The result of this study shows that, compared with women who had sexual debut at age below 20 years, women who started sexual intercourse at later ages 20-24, 25 and above years had a lower risk of experiencing a first birth (hazard ratios 0.69 and 0.56 respectively). Age at first sex in absence of any contraceptive use predisposes a woman to pregnancy hence increasing the chances of experiencing a birth. Moreover, age at first sexual intercourse is one of the key proximate determinants of fertility (Nahar et al. 2008).

Table 4.3: A Hazard Model of the Risk of Birth in Kenya

Variables in the Equation	Model 1	Model 2	Model 3
Education			
No education (RC)	1.00	1.00	1.00
Primary	0.69***	0.60***	1.02
Secondary+	0.46***	0.42***	0.89*
Type of Place of residence			
Urban (RC)		1.00	1.00
Rural		1.06	1.11**
Ethnicity			
Kikuyu (RC)		1.00	1.00
Kamba		1.11	1.01
Luhya		1.19**	1.04
Luo		1.35***	1.09
Embu/Meru		0.88	0.90
Kalejin/Masai/Turkana		1.04	1.10
Kisii/Kuria		1.14	1.08
Coastal Bantus		1.02	0.85
Somali		0.70**	0.92
Others		0.95	0.86
Religion			
Roman Catholics (RC)		1.00	1.00
Protestants and Other Christians		1.08*	1.02
Muslims		1.18*	1.03
Other religion		1.29**	0.92
Region			
Nairobi (RC)		1.00	1.00
Central		1.36***	1.24**
Coast		1.45	1.15
Eastern		1.20*	1.12
Nyanza		1.24**	1.05
Rift Valley		1.32***	1.13
Western		1.11	1.14
North Eastern		1.20	1.13
Age at first Marriage			
Below 20 years (RC)			1.00
20-24 years			0.56***
25 years and above			0.51***
Age at first sexual Intercourse			
Below 20 years			1.00
20-24 years			0.69***
25 and above			0.56***

2log likelihood

100012.9

99847.5

87721.7

Notes: Significance ***p<0.000, **p<0.01, *p<0.05

Source: Primary analysis of 2003

KDHS

CHAPTER FIVE

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

5.1 Introduction

The section summarizes findings, provides conclusions and finally makes recommendations for policy and further research.

5.2 Summary of the findings

The main objective of the study was to investigate influence of education on timing of first birth among women of child bearing age in Kenya. The study used 2003 Kenya Demographic and Health Survey which was a nationally representative survey. The study employed the lifetable approach for the bivariate analysis and Cox regression for the multivariate analysis.

The results of the bivariate life table analysis indicated that the median age at first birth was lower (19.1 years) among women with no education compared to those with primary education (20.1 years) and those with secondary and above education (24.2 years). The result implies that a higher level of education is associated with delay of initiating childbearing among women. On the other hand, results of the multivariate analysis using the Cox Proportional Hazard model showed that the risk of having a first birth for a woman with primary level of education was 31 percent lower compared to a woman with no education. Similarly a woman with secondary education and above had a 54 percent lower risk of having a first birth compared to a woman with no education. The finding shows that long years of formal education invariably delay a woman's entrance into marriage which indirectly increases the age at first birth.

The introduction of other factors into the Cox Proportional Hazard model showed that education still had a significant influence on age at first birth among women in Kenya. In the second model, type of place of residence, region, ethnicity and religion were introduced. The results showed that the risk of a woman with primary education having a first birth increased from 31 percent from model one with education alone to 40 percent when other factors such as type of place of residence, region, ethnicity and religion were introduced in the second model. In addition, women with secondary and above education were also at a lower risk in model two

than in model one. Women with secondary and above education were at 58 percent less likely to experience a first birth compared to women with no education in model two. The results showed that education is incompatible with childbearing.

Finally, the introductions of age at first marriage and age at first sexual intercourse variables into third model reduced further the effect of education on age at first birth among women in Kenya. The result shows that women with secondary and above level of education were at 11 per cent less likely to have a first birth compared with women with no education. The result was statistically significant at 0.05 confidence level; the other levels of education were not statistically significant. This shows that the effect of education on age at first birth is very strong at higher levels of education among women in Kenya.

5.3 Conclusions

Education among women has been found to have a strong influence in delaying the onset of childbearing. Women with higher levels of education were less likely to experience early childbirth. The median age at first birth of women with secondary education was 24.21 years compared with those with no education with a median age of 19.11 years.

The effect of education on age at first birth remains strong even after introduction of other factors in the analysis which are known to influence age at first birth such as type of place of residence (urban or rural), age at first marriage and age at first sex among others. Women with no education therefore have been found to have a low median age at first birth in this study compared to those with primary and secondary education. The risk of experiencing a first birth for women with primary and secondary education was lower than that of women with no education. This shows that education of a woman contributes to her timing of her entry to motherhood and therefore universal access to education by women is likely to result into delay in the onset of childbearing in Kenya. Education gives woman autonomy to make decisions and it is also unlikely for a woman to get married and continue schooling hence school life reduces the chance of a woman being exposed to childbearing.

Since Kenya's independence in 1963, a lot of effort has gone to education reforms and especially women education and there has been a great improvement in increasing age at first birth. Some of these reforms include lower entry points for women in secondary, tertiary and university education and have contributed greatly in delaying the onset of childbearing. The government also enacted the Children Act of 2001 which sets the age of sexual consent at 18 years. This has played a role in women delaying onset of child bearing as more women access high levels of education though the number is still low (Republic of Kenya , 2006).

5.4 Recommendations

5.4.1 Policy and Program Recommendations

The result of this study shows that education among women has a strong influence on the onset of childbearing. Secondary and above level of education had a positive impact in delaying onset of childbearing. Policies and programmes aimed at reducing the onset of childbearing and reduction of fertility therefore need to consider the promotion of interventions that encourage more women accessing secondary education. This will need the government to build more secondary schools so that women can transit from primary level to secondary level of education and above.

Women who experience early sexual debut were at a higher risk of having a first birth. Reproductive health programmes with information on adolescent sexual reproductive health should be made readily available to all the young people in and out of school in a way they can easily understand to delay onset of sexual intercourse.

5.4.2 Recommendations for Further Research

The study used quantitative data to examine the influence of education on age at first birth among women while controlling for socio-economic and proximate determinants of age at first birth such as age at first marriage and age at first sexual intercourse. The results of the study show that education has a strong influence on age at first birth even when other factors are introduced into the analysis. However, no qualitative data was used in this study to collaborate the results of the quantitative analysis and as quantitative analysis does not provide the answers why people behave the way they do given their levels of education there is need for qualitative

research. The qualitative data will explain how education influences age at first birth. Such a study is useful for it would provide the much needed information to policy makers and programme implementers which could help increase the age at which start child bearing in the country and hence facilitate the reduction of fertility in Kenya.

The data available was up to provincial level yet there may be disparities within the counties. There is also a need to carry out a study to explore the differentials in education and age at first birth among women that exist within the specific counties in Kenya.

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Appendices

Appendix 1: A Hazard Model of the Risk of Birth in Kenya

Model 1

Variables in the equation	B	SE	Wald	df	Sig.	Exp(B)
Education						
No education			418.054	2	0.00	
Primary	-0.371	0.035	112.211	1	0.00	0.69
Secondary+	-0.785	0.039	404.648	1	0.00	0.46

Source: Primary Analysis 2003 KDHS

Appendix 2: A Hazard Model of the Risk of Birth in Kenya

Model 2

Variables in the equation	B	SE	Wald	df	Sig.	Exp(B)
Education						
No education			316.792	2	0.00	
Primary	-0.507	0.044	130.027	1	0.00	0.60
Secondary+	-0.877	0.050	304.958	1	0.00	0.42
Type of Place of residence						
Urban						
Rural	0.054	0.037	2.098	1	0.15	1.06
Ethnicity						
Kikuyu			49.892	9	0.00	
kamba	0.102	0.074	1.894	1	0.17	1.11
Luhya	0.177	0.066	7.067	1	0.01	1.19
Luo	0.303	0.073	17.337	1	0.00	1.35
Embu/Meru	-0.132	0.087	2.287	1	0.13	0.88
Kalejin/Masai/Turkana	0.034	0.066	0.276	1	0.60	1.04
Kisii/Kuria	0.128	0.088	2.095	1	0.15	1.14
Coastal Bantus	0.018	0.100	0.033	1	0.86	1.02
Somali	-0.351	0.125	7.886	1	0.00	0.70
Others	-0.056	0.118	0.227	1	0.63	0.95
Religion						
Roman Catholics			12.814	3	0.01	
Protestants and Other Christians	0.076	0.032	5.427	1	0.02	1.08
Muslims	0.167	0.074	5.012	1	0.03	1.18
Other religion	0.255	0.084	9.181	1	0.00	1.29
Region						
Nairobi			28.925	7	0.00	
Central	0.304	0.067	20.714	1	0.00	1.36
Coast	0.139	0.083	2.809	1	0.09	1.15
Eastern	0.185	0.080	5.426	1	0.02	1.20
Nyanza	0.226	0.078	8.457	1	0.00	1.25
Rift Valley	0.278	0.066	17.556	1	0.00	1.32
Western	0.100	0.074	1.833	1	0.18	1.11
North Eastern	0.181	0.112	2.613	1	0.11	1.20

Source: Primary Analysis 2003 KDHS

Appendix 3: A Hazard Model of the Risk of Birth in Kenya

Model 3

Variables in the equation	B	SE	Wald	df	Sig.	Exp(B)
Education						
No education			15.731	2	0.00	
Primary	0.020	0.047	0.186	1	0.67	1.02
Secondary+	-0.119	0.054	4.838	1	0.03	0.89
Type of Place of residence						
Urban						
Rural	0.101	0.038	6.939	1	0.01	1.11
Ethnicity						
Kikuyu			12.159	9	0.20	
Kamba	0.010	0.076	0.017	1	0.90	1.01
Luhya	0.041	0.068	0.358	1	0.55	1.04
Luo	0.089	0.073	1.469	1	0.23	1.09
Embu/Meru	-0.111	0.089	1.531	1	0.22	0.90
Kalejin/Masai/Turkana	0.091	0.067	1.854	1	0.17	1.10
Kisii/Kuria	0.076	0.087	0.747	1	0.39	1.08
Coastal Bantus	-0.159	0.105	2.284	1	0.13	0.85
Somali	-0.084	0.130	0.416	1	0.52	0.92
Others	-0.156	0.124	1.597	1	0.21	0.86
Religion						
Roman Catholics			1.644	3	0.65	
Protestants and Other Christians	0.018	0.033	0.286	1	0.59	1.02
Muslims	0.026	0.080	0.102	1	0.75	1.03
Other religion	-0.082	0.090	0.843	1	0.36	0.92
Region						
Nairobi			11.730	7	0.11	
Central	0.212	0.068	9.815	1	0.00	1.24
Coast	0.143	0.086	2.791	1	0.09	1.15
Eastern	0.112	0.082	1.862	1	0.17	1.12
Nyanza	0.048	0.078	0.370	1	0.54	1.05
Rift Valley	0.121	0.069	3.063	1	0.08	1.13
Western	0.133	0.076	3.093	1	0.08	1.14
North Eastern	0.126	0.115	1.196	1	0.27	1.13
Age at first Marriage						
Below 20 years			1,099.732	3	0.00	
20-24 years	-0.582	0.037	241.107	1	0.00	0.56
25 years and above	-0.675	0.064	112.818	1	0.00	0.51
Unmarried	-1.730	0.053	1,051.318	1	0.00	0.18
Age at first sexual Intercourse						
Below 20 years			89.648	2	0.00	
20-24 years	-0.379	0.045	72.532	1	0.00	0.68
25 and above	-0.576	0.106	29.572	1	0.00	0.56

Source: Primary Analysis 2003 KDHS