THE DETERMINANTS OF ADOLESCENT FERTILITY IN KENYA: EVIDENCE FROM K.D.H.S 1993

BY

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DECLARATION

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

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DEDICATION

TO MY SONS, GLENN AND ALVIN

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ABSTRACT

The problem of adolescent fertility continues to persist and raise concern in Kenya. This study examined the determinants of adolescent fertility in the country using data from the Kenya Demographic and Health Survey data, 1993, a survey conducted by National Council for Population and Development (NCPD) and the Central Bureau of Statistics (CBS).

The survey used stratified multistage probability sampling to select 526 clusters nationally. A total of 1788 women aged 15-19 (in this study considered as adolescents) was interviewed in the survey. This study investigated different factors largely grouped under socio-economic, socio-cultural and demographic factors that affect fertility. The social-cultural variables considered are; ethnicity, religion and place of residence while the social-economic variables considered are occupation, knowledge of any method and education level. The demographic variables considered are age, age at first intercourse and marital status. The study adopted the proximate determinant model to guide the analysis. The intermediate variable used in this study was ever use of contraception.

Data was analyzed using frequencies, cross tabulation with chi-square as well as logistic regression analysis. The bivariate results found that adolescent fertility is influenced by an interaction of different factors, which can be grouped as socio-economic, socio-cultural, and demographic factors. The chi-square test confirmed all the variables to be significantly associated with adolescent fertility except the variable type of place of residence. The multivariate analysis found age, current marital status, education level, ethnicity, occupation, and knowledge of any method of contraception, age at first intercourse (15-19 yrs), ever use of contraceptives and religion to be significantly associated with adolescent fertility in Kenya.

In terms of policy, the study recommends the development of programs that delay and discourage early marriage including the setting up of a minimum age at marriage. It also recommends the development of relevant programs to encourage girl child education with higher enrolment and retention levels especially up to at least secondary school level.

In this study there were some unexpected findings such as adolescents with no education having lower fertility levels than those with primary school education. Similarly, the positive association between knowledge of contraception; ever use of contraception and adolescent fertility were unexpected. This study recommends similar qualitative studies at both national and sub-national levels to provide qualitative explanations and increase the understanding of adolescent fertility.

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CHAPTER ONE: GENERAL INTRODUCTION

1.0 INTRODUCTION

Adolescence is a period of transition from childhood to adulthood. This period of transition is often accompanied by biological, physical and psychosocial developments and changes. Some of these changes are manifested in different ways such as the entry into the labour-force that entails a transition from economic dependence, to independence, educational and vocational training, and the growth of physical attributes that manifest maturity. Other developments include progress from the initial appearance of secondary sexual characteristics to reproductive maturity, attainment of full adult size, beginning of sexual interest and activities, the replacement of a dependent childhood attachment to parents with a mature adult relationship to them and others, and the formulation of personal standards and tastes (McGrath, 1979:47).

Suffice it is to say that these changes take place over a long period. McGrath (1979:46) puts it to between ages 10 to 20 years generally in all societies. He, however, observes that the changes may indeed be accomplished in a simple initiation ceremony. The period of socialization into adulthood often takes a longer time.

Today, more than half of the human population is below 25 years of age and about a third of these people are aged between 10-24 years: of whom 80% are living in the developing countries (UNFPA, 1995:39). The youth in the age group 15-19 years account for a large and growing proportion of the population in developing countries in contrast to developed countries, where this age group is small. UN estimates show

that there were 46 million 15-19 year olds in sub Saharan Africa in 1985 and the numbers are projected to more than double to 106 million by the year 2010 setting an annual growth rate of 3.3%, the fastest in the world (UN, 1991, Caroline and Cohen, 1993).

The picture is not any different in Kenya, although, recently fertility has been declining. The country's population has been increasing tremendously over the years with an annual growth rate of 3.8% (Population Studies and Research Institute, 1994:53). According to the 1969 population census, Kenya's population was 10 million and increased to 15 million in 1979 and 21 million in 1989. The increase in population size accelerated between 1969 and 1979 due to rising fertility and a declining mortality in the 1960s and 1970s. The increase in population slackened down between 1979 and 1989 partly due to falling fertility in the1980s.

The 1989 census shows that the average inter-censal growth rate declined slightly from 3.37% to 3.36 percent per annum during the periods 1969-79 and 1979-89 respectively. Regional disparities are noted among the provinces. In Nairobi the growth rate declined from 4.86 to 4.70, Central province from 3.36 to 2.8, Coast from 3.52 to 3.07, and Eastern from 3.55 to 3.26. It, however, increased in Rift Valley from 3.83 to 4.17, Nyanza from 2.70 to 2.83 and Western from 3.22 to 3.58. In the three censuses (1969,1979,1989), a large majority of the Kenyan population (over 58%) comprise the young under the age 20 (CBS, 1996). All the provinces exhibited the same youthful age structure except for Nairobi and Central provinces.

While it is apparent that child bearing is common and widespread in Sub-Saharan Africa, there exist wide variations within the region. Each year no less than 18% of Africa's female population aged 15-19 years give birth compared to 5% in North America, 3% in Asia, and 3% in Europe (Yeboah, 1993). This implies that on average, 900 births occur to each group of 1000 African women who reach the age of 20, compared to 400 births to every 1000 in Latin America, 250 in North America and 150 in Asia and Europe (Yeboah, 1993:1).

Among adolescents, child bearing cannot be understood easily by merely looking at the biological aspects of early physical maturity, sexual activity and fecundity. Focus should also be laid on the social, cultural and economic issues since they exert influence on behaviour and decisions on reproduction.

Adolescent fertility can be attributed to different factors. These can be grouped under social, cultural, economic, and demographic factors. Although most adolescent child bearing still takes place in marriage, most sexual intercourse is generally initiated before marriage. The age at menarche appears to be declining all over the world. Early initiation into sexual activities lengthens the reproductive span for women (Yeboah, 1993:1). Consequently, this increases the length of time women are exposed to pregnancy risk. For the adolescent women, this increase lengthens the period of sexual capability and the general postponement of the time in which sexual capability would have in a marriage state (Bouge, 1976).

Kenya's economic growth has not been impressive over the past decade. According to the Central Bureau of Statistics (CBS), the annual growth rate of the economy declined from 4.6% in 1996 to 2.3% in 1997 with key sectors of the economy - agriculture from 4.4% in 1996 to 1.2% in 1997, and manufacturing from 3.3% to 1.9% in the same period (CBS, 1998:2). The population growth rate is higher than the economic growth rate leading to increased unemployment among the youth. In the modern sector for instance, wage employment dropped from 4.0% in 1996 to 1.8% in 1997 and this is attributed to the harsh economic environment, aggravated by the *el nino* rains, public sector reform that has reduced employment in the sector, and retrenchment in the private sector due to relaxation of redundancy procedures as part of the liberalisation of the labour market (CBS, 1998:54). This has increased hardships to parents and youth in Kenya. Lack of employment opportunities denies them an income to be able to afford the necessary social and health amenities.

Further, the introduction of Structural Adjustment Programs (SAPS) has even more aggravated the situation. SAPS have led to cutbacks in government spending, including the provision of social services such as education, health care and even social welfare. Despite the recent developments in the introduction of free primary school education, the costs of education even at the secondary level still remains a burden to many parents. Young people whose parents who cannot afford to pay for schooling eventually dropout. In some cases parents favour boys in education at the expense of girls due to perceived old age security from the boys.

Due to increased health costs in terms of cost-sharing many Kenyans, particularly in the rural areas, cannot afford family planning and other health care services. In a state of poverty, the only means to escape the harsh economic reality for most of the youth in Kenya are alcohol, drugs, and sex (Carael, 1992). With HIV/AIDS on the scene, the youth are being devastated by this epidemic. Already, a decline in the age profile of HIV and AIDS victims has been observed in Kenya and other African countries such as Zimbabwe, Ghana, and Zambia (Carael, 1992). Some of the youth submit themselves to sugar daddies and commercial sex for economic survival thereby curtailing their career advancement.

Despite the recent policy and legislative developments in adolescent reproductive health, a lot still needs to be done to increase the level of information on the risks of early pregnancy and childbearing among the youth. Pregnancy among unmarried schoolgirls always creates dissatisfaction among the parents and the public. Caroline and Cohen (1993), show that disapproval surfaces visibly in policies that stipulate the expulsion of pregnant girls from schools or screen them for pregnancy as a prerequisite for admission to advanced education.

Disapproval of pre-marital pregnancy does not only manifest itself in educational institutions. In the public health sector, adolescents fear to visit health facilities due to the fear of condemnation. Consequently, many of them shun pre-natal care while others attempt, and at times secure illegal abortions. Condemnation of pregnancy arises because pregnancy curtails other opportunities-education and better jobs.

Diversification and improvement of efficient transport and communication has increased information transfer and contact among people, particularly the youth, unlike in the past. Urban areas have become areas of cultural and ethnic diversity and the mingling of people from different backgrounds, thus, increasing the level of socialization. Interaction at work places, streets, parks, hotels, film theatres, discos, parties, and educational institutions has created arenas where traditional roles, norms, and taboos as well as elderly authority are disregarded.

Economic and social frustrations psychologically affect adolescents and would easily lead to suicide, especially among the rejected pregnant girls. According to McGrath (1979:48), adolescents believe that their values are different from, and superior to those of the older generations. Adolescent values vary with age, gender, ethnicity and rural or urban place of residence. In Kenya today, the youth have been exposed by their education and mass media to foreign values. The declining influence of the extended family pattern, changing inheritance patterns, migration, and urbanization, industrialization, social, and labour mobility has further provided room for expression of western values.

To most young people, their sexual and reproductive health needs remain largely remain uncattered for due to poor access in terms of affordability, acceptability in health facilities and the quality of services offered to them. The few youth friendly clinics have been designed by adults based on the experience of adult program with minimal youth involvement. There are no adequate and trained health providers to

handle young people. Consequently, the levels of teenage risk of HIV/AIDS infection, early age of sexual activity, high rates of induced abortion and high rates of school dropouts due to pregnancy still persist.

The lack of definite political support for the family planning programs has been a major obstacle to its complete success. Ocholla Ayayo (1991:30-31), notes that the "persuasive policy " adopted by the government of extending freedom of choice does not work in the case of population control. Fertility, marriage, and family life are surrounded by normative beliefs, values, and rules of conduct such that the tools of persuasive and free choice cannot prove effective. The failure of the persuasive policy can be attributed to different reasons. Ocholla Ayayo (1991:83), postulates that the social and cultural codes of procreation are organized into rules of conduct, which are supposed to control relationships and sexual behaviour of members of the society even though they are often violated. These include traditional norms, beliefs, and values with a deep religious inclination, which govern heterosexual relationships in and outside marriage. They also define which types of actions are morally disapproved of, and constitute taboos, that ought to be observed.

Adolescent fertility, if unchecked, would pose serious challenges to the society. Unwanted premarital pregnancy results in school drop out, curtailing career advancement. Apart from adding on the depended sector of the population, adolescent pregnancies are associated with diverse health risks both for the mother and the child. Poor physiological development for the mother results into maternal

complications at birth and other pregnancy disorders like anaemia, injuries, and sepsis. In developing countries in general, complications during delivery directly cause about three quarters of all maternal death (Caroline & Cohen, 1993). For the infants, low birth weight is the most common problem associated with adolescent fertility that contributes directly to infant deaths.

Unwanted pregnancies among adolescents are likely to end up in illegal abortions. This has serious public health implications since they raise the level of maternal morbidity and mortality. Abortion cases among adolescents in hospitals account for 28-64% of all abortion cases in Kenya (Ojwang, 1993). Early and unprotected sexual activity among adolescents also exposes them to sexually transmitted diseases that could lead to miscarriages, infertility, and blindness in newborns.

The issues of adolescent fertility are, therefore, engraved in social, economic, cultural, and demographic factors. This study examines the major determinants of adolescent fertility in Kenya.

1.1 PROBLEM STATEMENT

Over 50% of Kenya's population is less than 16 years of age with one third of the entire population being between 13 –19 years old (NCPD/CBS, 1999). The early age at sexual initiation, and the reducing age at menarche lengthen the time adolescent women engage in premarital sex while increasing the incidence of unintended pregnancies. It is estimated that about 11,700 teenage girls in Kenya get pregnant

monthly and 40% of the pregnancies are terminated through abortion (Oloo, 1998)

Many unwanted pregnancies occur during adolescence when young women and their partners become sexually active before they are fully aware of the need for contraception or have had access to appropriate services. In Kenya, if unwanted births were eliminated, the fertility rate would be 3.4 births per woman or two children fewer than the actual fertility rate of 5.4 births (NCPD/CBS, 1994). Rapid population growth frustrates nations in terms of providing education, health services and employment for the population.

Unwanted pregnancies have psychosocial and health consequences for the adolescent mothers and their newborn babies. This is more severe where there is no firm support from the young partners, family, health systems and society in general. Adolescent women are suffering the bulk of unsafe abortion cases sexually transmitted infections including HIV/AIDS (Caroline & Cohen 1993:6). Besides, early childbearing often leads to school dropout reducing the economic, employment options and career choices in life.

Modernization has weakened parental and elderly authority, traditional norms and codes of conduct in the society. Secularisation and the development of personal ethics among the youth has led to the abandonment of beliefs In taboos that acted in that past as ethical self restraint on sexual behaviour. About 77% of the parents in Kenya find it difficult to talk to their teenage children about sexuality (Oloo, 1998).

The family, the school, or the society at large does not easily accept the idea of adolescent sexuality and fertility. Consequently, adolescents are often denied access to education on sexuality and if or when it is offered, it is inadequate and fails to take into account the real needs of young people. Seldom do adolescent have proper access to reproductive health care and contraception.

Most studies on adolescent fertility in Kenya have been by and large at the sub-national level [Juma 1992, Mugwe 1989, Ochieng 1991, Omari 1994, Nyaga 1989, Ruthiru 1992], while others have focused largely on special groups within the adolescent women, for example, pregnant schoolgirls [Khasiani 1985]. Others have focused on a few selected factors that influence adolescent fertility [Omondi Ahawo 1981]. Most studies at the micro-level have recommended similar studies at the macro-level on the determinants of adolescent fertility. A comprehensive study at the national level on the determinants of adolescent fertility has not been done. This study examines selected demographic, socio-cultural, and socio-economic factors that influence adolescent fertility in Kenya.

1.2 OBJECTIVES OF THE STUDY

General Objective

To investigate the socio-cultural, socio-economic and demographic factors that influence adolescent fertility in Kenya.

Specific Objectives

(1) To examine the effect of adolescents' level of education, occupation, and knowledge of contraceptive methods on the number of children ever born.

(2) To examine the influence of adolescents' religion, place of residence and ethnicity on the number of children ever born.

(3) To examine the impact of adolescents' age, and current marital status on the number of children ever born.

1.3 JUSTIFICATION OF THE STUDY

The issues of adolescent fertility continue to draw a lot of attention in Kenya. Concern about the adolescent fertility has been due to the health, social, economic and demographic consequences of adolescent pregnancy and child bearing. This study contributes to the understanding of the factors that influence adolescent pregnancy and childbearing at the national level. It provides additional knowledge useful to academicians, policy makers, and non-governmental organizations interested in adolescent welfare to be able to identify appropriate mechanisms through which interventions can be channelled.

The proportion of births to adolescents is rising fast compared to other age groups, yet the reproductive health needs of the youth remain largely unmet. At the same time, Kenya is experiencing a decline in fertility. The country's total fertility stood at 5.4 births per woman in 1993 and if adolescent fertility could be reduced, the total fertility would be 2 children less (NCPD/CBS, 1994). Identifying the determinants of

adolescent fertility would bring out areas for programme interventions to reduce adolescent fertility.

The trend all over the world is to empower women through education and labour force participation. The consequences of adolescent pregnancies such as school dropout frustrate efforts to empower women. Adolescent child bearing curtails the girls' education and career advancement. Understanding the factors that contribute to adolescent fertility will be a positive step towards identifying appropriate intervention channels to reduce adolescent pregnancy and childbearing while enhancing their empowerment.

1.4 SCOPE AND LIMITATIONS

This study uses secondary data from the Kenya Demographic Health Survey conducted in 1993 to examine the socio-economic, socio-cultural, and demographic determinants of adolescent fertility in Kenya. It focuses on teenage fertility among the 15-19 years old women in the KDHS1993 irrespective of their backgrounds.

There is no universal definition of adolescent as regards age limit. Generally adolescence defines young people in the stage of life between childhood and adulthood. However, their own societies define those terms for males and females (Caroline & Cohen 1993:179). Different studies define their own categories of adolescents. Some cover 15-24 year olds; others cover 10-24 or 10-20 year olds. This study confines itself to the 15-19 year old women as covered in the KDHS1993.

The study confines itself to the areas and clusters covered in the KDHS1993 sample. The KDHS1993 sample design, though national in scope, excluded all districts in the North Eastern province and four districts (Isiolo, Marsabit, Samburu and Turkana in the Rift Valley Province. The seven districts account for 4% of the Kenyan population. Because the survey was based on household samples, it is likely that eligible adolescents who were in boarding schools at the time of the survey were omitted. Other limitations of data are discussed under methodology in chapter three. The study analyses only the selected socio-cultural, socio-economic and demographic factors that were covered in the KDHS1993 survey.

CHAPTER TWO: LITERATURE REVIEW AND THEORETICAL FRAMEWORK

2.0 INTRODUCTION

This chapter presents the review of previous studies and works in the field of fertility in general and specifically adolescent fertility, in the world, Africa, particularly sub-Sahara Africa and specifically in Kenya. Also presented in this chapter are the theoretical and operational frameworks that guide the study, as well as, the definition of concepts and variables used in the study.

2.1 LITERATURE REVIEW

There has been an enormous increase in attention to adolescent issues in the recent past in both developed and developing countries. Various studies have been undertaken focusing on adolescent pregnancy and childbearing, adolescent sexuality, and contraceptive use, determinants and consequences of adolescent sexuality and fertility.

Westoff *et al* (1983) examined the trends and variations in teenage fertility in 31 developed countries with a view of comparing adolescent fertility among subgroups in the countries. Using bivariate regression equations, the study found that blacks in the U.S.A. and Arabs in Israel had twice as many children on average as their white and Jewish counterparts respectively by the end of their teenage years. For instance in 1979, blacks and white teenage age specific fertility rates were estimated to be 715 and 274 per 1000 women respectively.

Studies in the U.S.A. by the National Centre for Health Statistics show that as the birth rate declined in the last decade, births to teenagers became a larger proportion of all the births among women in the reproductive age group. For example in 1968, of over 600,000 infants, 57% of all in that year were born to women aged under 20 while more than 200,000 of the mothers were 17 years or younger. Thus in 1968, 17% of all the births were to teenagers as compared to 14% in 1961, suggesting an increase in teen fertility

In Europe, Deschamps and Valentine (1978), studied adolescent fertility in various countries. Their findings indicate that fertility rates of teenage women in Bulgaria varied from 73% for younger teenagers aged 10-14, to 72.4% for older teenagers aged 15-19. In Switzerland, the rates varied from 0.2% to 17.4% for younger and older teenagers respectively. Finland and France were noted for their low teenage fertility.

Many girls in most parts of the world have traditionally married young and started child bearing at an early age. Today 18% of the girls in Asia, 16% in Africa and 8% in Latin America are married by age 15 years (UNFPA, 1995:39). Overall, the age at first marriage for both men and women has been rising in many parts of the world according to the UNFPA, (1997:38). It has been most rapid in Asia and North Africa. In Sub-Saharan Africa where the prevalence of teen marriage remains high, the decline has been from 73% to 59%. The proportion married by age 20 years has remained comparatively stable in Latin America and the Caribbean, changing from 50% to 42% while in some countries (Costa Rica, Trinidad & Tobago, Guatemala, and Jamaica)

the proportion marrying young has increased. Western Europe and Northern America have also seen a steady rise in age at marriage, increasing from the early to mid 20s. Eastern and Southern Europe have shown more stability, Eastern Europe at a relatively low age (on average between 21 years & 22 years), Southern Europe at a higher level (on average between 24 years & 25 years).

The report also shows that in all regions, less educated women are more likely to marry younger. This is because education keeps women away in school where they have access to reproductive and family life education. In school, these girls have an opportunity to develop their careers as opposed to those who drop out of school early and who have fewer options than marriage and childbearing. Among 20 to 24 year old women married before age 20 years in Zambia, 44% had completed primary school compared to 83% of those married. Corresponding figures for other countries are: Uganda; 20% and 43%, Cameroon; 27% and 77%, Kenya; 54% and 84%, Indonesia; 18% and 58%, the Philippines; 61% and 84%; Columbia; 39% and 66%, Mexico; 32% and 72%, Peru; 53% and 88%, Egypt; 25% and 60%, Morocco; 9% and 31% (UNFPA, 1997:39).

In a study in the U.S.A, Kahn *et al* (1990:323), examined the determinants of contraceptive method choices among adolescent women. The study used data from 1982 National Survey of Family growth to examine the factors that differentiate users of various methods early in their sexual careers as teenage women. It was found that patterns of method choice, not only vary by race and region, but also change over the

teenager's life course. In addition, among the teenagers who did not use a method at first sex, the likelihood of adopting a method soon thereafter was low for both whites and blacks and was unaffected by social and structural characteristics.

Different studies (Baldwin, 1977, UNFPA, 1995) have found teenage child bearing to be associated with risks to the health of the mother and the baby. These studies also associate complications of pregnancy among adolescents to physical immaturity. The UNFPA findings show that mothers aged 15-19 years are 2 or 3 times more likely to die in childbirth than those aged 20-24 years; those under 15 years are 5 times more likely. Further, teenagers are also more likely to suffer complications, such as fistulas - an abnormal opening between the vagina and the rectum or urinary tract which often leads to lifelong disability (UNFPA, 1995:40). Health risks to the teenage mother and the baby during pregnancy can be attributed to immature physical development of the mother.

UNFPA, (1995:39), documents that young women first experience sexual intercourse on the average at age 15 years, in Niger, 19 years, in Indonesia, 16 years, in U.S.A. and 17 years, in Italy. In a study examining the sexual behaviour of and contraceptive use among young adults in Chile, Herold *et al*, (1992:128), found that 35% of females and 65% of males had premarital sex. The median age at first sexual experience was 18.4 years for the women and 16.4 years for the men. Further, only 20% of the females, and 19% of the males used contraception at their first premarital intercourse. The fertility data also revealed that 70% of the first births were premarital and more

than a third of these occurred prior to joining a union. The high rates of premarital and unintended pregnancy among young women together with low contraceptive prevalence demands for greater emphasis on sex education and provision of family planning services to adolescents.

In most of Asia, including the Arab states, marriage and childbearing starts early. Although premarital sexual activity is uncommon, as is pregnancy and childbirth out of wedlock, adolescent fertility rates are high. Sub-Saharan Africa resembles the Asian pattern; only that premarital sexual experience is more common (UNFPA, 1997:36). This is a contrast in the developed countries, where sexual activity starts in the middle of late teens and age at marriage is relatively late.

In developing countries, few demographic differences have been as clear and persistent as the fertility differentials between the rural and urban areas (Fennely, 1993:107). Urbanisation reduces the demand for children by increasing the cost of food and childcare, among other costs. Women in urban areas, due to their increased access to fertility regulation services and information, have smaller families too. Urbanization is an underlying cause of modernization, which affects value changes around the demand for children

On the world scene, Africa stands out as a region of high fertility. The crude birth rate for adolescents aged 15-19 years ranges from 52 per 1000 in Burundi, to 230 per 1000 in Liberia. The Demographic Health Surveys' in Africa show that in 10 of the 11

countries, (Botswana, Burundi, Kenya, Ghana, Liberia, Mali, Nigeria, Senegal, Togo, Uganda, and Zimbabwe) at least one out of every five teenagers had one or more children, or was currently pregnant at the time of the DHS interviews. This is an indication of high-level child bearing among teenage women (IDHS, 1993:3).

In sub-Saharan Africa, different unions co-exist and a significant number of births occur outside marriage. Kirk and Pillet, (1998:15) indicate that in Rwanda and Burundi, the strong influence of the Catholic Church has altered traditional union formation. Age at first marriage and age at first birth are much higher than elsewhere in sub-Sahara Africa where the incidence of premarital birth and polygyny are lower. In Botswana and Namibia, a high prevalence exists of sexual unions that do not imply regular cohabitation exists. Formal marriages occur relatively late in life but childbearing starts at an early age in conformity with the sub-Sahara Africa pattern. In countries such as Kenya and Zimbabwe where age at marriage is higher, premarital births are more frequent (Kirk and Pillet 1998:15).

Elsewhere, Meekers, (1994:61) shows that the percentage of women who have a child before marriage is increasing in Sub-Saharan Africa. The increase in premarital sex is now reflected in an increase in premarital child bearing to mothers who tend to be illiterate, poor, and often in poor health. Similarly, the influence of the extended family system that used to cater for the needs of these children has sharply declined.

In sub-Saharan Africa, 15-20% of all births occur to teenagers (IDHS, 1993:9). More than half of the teenage women in Africa have had sexual intercourse at least once irrespective of their marital status (IDHS, 1993:11). In Botswana, China, Kenya, Liberia and Togo more than half of the teenagers with sexual experience are not married. Although knowledge of contraception is high, its use is low. In Kenya, knowledge of family planning methods is 76% but use is low, 4% (CBS/NCPD, 1994:17). This kind of scenario does not augur well for the demographic picture of the country. The information below shows the trends in adolescent fertility in the country.

Table 2.1 Adolescent age specific fertility rates from various surveys and censuses in Kenya

AGE GROUP	1962 CENSUS	1969 CENSUS	1977/78 KFS	1979 CENSUS	1984 KCPS	1989 KDHS	1989 CENSUS	1993 KDHS	1994 WMSII
15-19	141	132	168	179	143	152	158	110	115

Source: CBS, 1989 table 4.13, table 6.15 from 1979 census and CBS, (1998:36).

In Burkina Faso, a study on the situation of pregnant students and their motherhood, social environment and the situation of their children, found that lack of contraceptive knowledge, ambiguous feelings about pregnancy, and contraception, conflicting messages concerning the reproductive role of young women, and the girl's low esteem in their interaction with older experienced male partners influence student pregnancies (Gorgen *et al*, 1993:283). The study revealed that family planning programs fail to address the needs of the sexually active school age population.

Henry and Piotrow (1978) have noted from their analysis of age, marriage, and fertility in Africa that in eleven countries, with contraceptive prevalence surveys (CPS) or world fertility survey data, two thirds or more of all women aged 20-24 married before age 20. In Islamic countries of the Sahel, (Mali, Chad, Mauritania and Niger), young women have traditionally married shortly after menarche. Early marriage increases the risk of pregnancy for fecund women.

McCarthy (1982), in a study of differentials in age at first marriage, shows that in most African countries, rural women marry 1.5 to 2 years earlier than urban women. Urban women were more likely to go to school and work outside homes accounting for their late marriage. Differences, however, do arise with respect to adolescent fertility when analyzed by age, marriage type, education, and urban/rural residents (Gyepi Gabrah, 1985:29).

In Harare, Zimbabwe, a study among young adults aged 15-24 found that most adolescent child bearing takes place within marriage. This was despite the fact that sexual intercourse is generally initiated before marriage. This is the case in most of Africa and the developing world. Knowledge of family planning was found to be high although contraceptive use lags behind knowledge in Harare. The study found that fewer than half of the young women who were unmarried at the time of first intercourse used contraceptives compared to 18% of young unmarried men. Current use of contraceptives among the sexually active and married youth was low, 36% among women and 29% among men (Boohene et al, 1991). The study also found that

the consequence of low contraceptive use was a high incidence of unwanted pre-marital pregnancies (29% of the women in the Harare survey had been pregnant). Those not married at the time they got pregnant generally got married soon after. Among the girls who got pregnant, 90% dropped out from school. The study also found increased risks of transmission of sexually transmitted diseases and AIDS among the youth in Harare due to low contraceptive use.

In a study on adolescents in Liberia, Nichols *et al* (1987:169), found that although 57-93% of the respondents claimed to have information on reproductive health, only 2-21% could identify the monthly fertile period. Thirty to forty nine percent of females aged 14-17 years had several sexual relations with their partners at least once a month while over 80% of female non-students aged 18-21 years were sexually active. Among the sexually active female non-students respondents, 79% had never used contraception. They also found that half of the females aged 14-21 years who were currently attending school had been pregnant, as compared to 67% of those who were out of school. According to the study, three factors explain the large number of pregnancies among unmarried adolescents: early sexual maturity and its relation to age at marriage and widespread urban migration, which weakened social control that traditionally discouraged premarital sexual activity among adolescents.

Friedman and Edstrom (1985:7) have identified factors in developing societies that contribute to a change in reproduction-related health risks for adolescents. They include an apparent trend towards lowering of the age at menarche, an increase in

age at marriage, changes in values due to urbanization, a decline in the influence of the extended family, exposure to foreign values through the mass media, and tourism. These factors in turn increase the chances of unwanted adolescent pregnancies, abortion, and childbirth in different respects. Due to a generally intense cultural emphasis on fertility in Africa, pregnancies to unmarried teenagers are the ones deemed wrong. In many European countries, teenage pregnancy is deemed as a health risk (Kulin, 1986).

Other factors have been identified and suggested as responsible for high levels of adolescent fertility in Africa. In the past, young African women moved directly from childhood to adulthood. However, the once brief interlude between childhood and adulthood has lengthened due to early and declined age at menarche. Labour migration and schooling are delaying marriage and that partners in reproduction are not necessarily partners in marriage (Caroline and Cohen, 1993:8).

Caroline and Cohen (1993:83), indicate that employment possibilities for young men allow greater sexual freedom. Work opportunities typically draw young men away from parental authority as short term wage workers, and self-employed activities for instance in the *juakali* sector in Kenya. This weakens the impact of traditional guidance from parents. A new career opportunity for young women outside the home makes them less eager to rush into marriage and childbearing. Thus, an increase in adolescent fertility outside marriage is one of the emerging patterns among women in sub-Saharan Africa (Caroline & Cohen 1993:83).

In Kenya, various studies have been carried out on adolescent fertility. According to the International Demographic Health Survey (1993:6), teen fertility in Kenya stands at 153 per 1000 as opposed to 213 per thousand 12-15 years back. Despite the decline, adolescent fertility is still quite high in Kenya contributing up to 20% of the country's total fertility rate.

Barker and Rich (1990), report that early pregnancy in Kenyan urban areas and rural areas is characterized by out of wedlock birth, forced school expulsion and a high rate of unsafe abortion. The study identifies the causes of early child bearing in Kenya as strong sexual desire among adolescents, lack of proper education, and attending of discos. This increases interaction among the youth further raising opportunities for sexual expression. Adolescents relied heavily on peers as the main source of information regarding sexuality. The study also found abortion to be the only option for dealing with out-of-wedlock births among the youth.

The report of the first inter-African conference on adolescent health in sub-Saharan Africa held in Nairobi reveals that adolescent entry into active sexuality is increasingly very early, although, albeit unfortunately, this entry is not reflected in place intervention nor in program development for young people. Premarital sexual activities of schoolgirls result in early pregnancies and the accompanying consequences.

2.1.1 DEMOGRAPHIC FACTORS

The age at which women begin to have children has a very close relationship to the overall growth of a population. This is because most births take place within marriage. Early age at marriage tends to lead to higher fertility and population growth for two reasons: the earlier childbearing begins, the longer the reproductive period and the greater the likelihood of higher total fertility, and short span between generations accelerates growth rates (Gyepi-Gabra, 1985:37).

Omondi Ahawo (1981) used the Kenya Fertility survey data, (1977/8), to study the association between the events of age at first birth and first marriage among adolescent women in Kenya. Using chi-square, percentages, and means in statistical analysis, the study found that adolescent fertility was on the increase in Kenya. The mean age at menarche for urban adolescents was found to be 14.72 years and 15.19 years for their rural counterparts. He also found age at menarche to be associated with early age at birth and first marriage, with the average age at first birth at 16.6 years. All the variations were based on ethnic, educational and religious grounds.

Njau and Lema (1988) in their review of research conducted on adolescent fertility found the mean age at first intercourse to be 13 years for boys and 14 for girls. These provide evidence that adolescents engage in sexual activities at tender ages.

In a study of adolescent fertility in Chogoria location of Meru district, Nyaga (1989), using graphs and cross tabulation found that most adolescents had parity one with

most infants being more than 2 years old. The study found that 95% of the respondents reported accidental conception, as they had no information about contraceptives before. Focusing on the social consequences of adolescent fertility in Kenya, Mong'oka (1987), found illegal abortion to be on the increase among the adolescents.

Age at first marriage, age at first intercourse, and first birth are important demographic factors in fertility studies. Ochola (1992) used means, median, and mode derived by cross tabulation, multiple regression, and the Coal-Trussel P/F technique to study ages at first marriage, first sexual intercourse, and first birth using the Kenya Demographic Health Survey 1989. The regression results showed that the three demographic factors have a significant effect on fertility index (Total Children Ever Born). The study established that ages at first marriage, first birth, and first sexual intercourse were inversely related to fertility. Age at first marriage was found to have the highest association with fertility while the age at first intercourse was found to have a low association with fertility. In Meru district, Ruthiru (1992), using graphs and tables established that the level of education and frequency of intercourse among adolescents are inversely related- the higher the education level the less the frequency of intercourse, hence, a lower fertility.

Khasiani (1985:1) demonstrates that the problem of adolescent fertility is serious. This observation was based on the findings that more adolescents are having sexual intercourse at tender ages, yet few of them use contraceptives despite knowing about

them. As a result premarital adolescent pregnancy and childbearing remains a family problem particularly in the absence of social support facilities at community and national level. The study also found that, although the adolescent expectant and nursing mothers would like to re-integrate back into the main stream of society through education, training, or employment, numerous cultural structural constraints relegate them into situations of marginality, apathy, and subsequent poverty.

Ajayi *et al* (1991:21), in study on adolescent sexuality and fertility in Kenya found that the age at first intercourse ranged from 11 to 15 years with a mean age of 13 years for male and close to 14 years for females. According to the study, almost 50% of older male students had sexual relations and among the male non-students, the percentage was over 90%. For females, roughly 80% of the non-students have had sexual relations. Although the attitudes towards use of contraceptives by unmarried youth were found to be favourable, in practice only eleven percent of sexually active respondents reported ever having used contraceptives. The reasons cited for non-use were lack of information, difficulty in obtaining contraceptives and safety concerns.

The KDHS (1989) indicates that although young women are marrying later, many are still having birth at tender ages. More than 20% of teenage girls have at least one child and 7% were pregnant at the time of the survey. For the births occurring in the 12 months before the survey, over half were either mistimed or unwanted. A fifth of all the births occurred less than 24 months after previous births.

Kiragu (1991:iii), in a study of adolescents in Nakuru found the mean age at first sexual contact to be 12 years among sexually active males and 14 for females. Nearly half of the sexually active males reported multiple sex partners. She found contraceptive use to be low. Over half of the sexually active respondents had never used birth control, and nearly 70% were unprotected at their last sexual intercourse.

In western Kenya - Kisumu district, Juma (1992), used the Coal-Trussel P/F technique, cross tabulation with chi-square in examining the determinants of adolescent fertility. The study found age at first intercourse, frequency of intercourse, knowledge of contraceptives, use of contraceptives as the demographic variables that determine adolescent fertility. She recommended similar studies at the national level.

Mugwe (1989), using data from Kirinyaga district found pregnancy in schools to be closely related to adolescent's age at first intercourse, frequency of intercourse, parental status, and occupation. She used both qualitative and quantitative statistical techniques in data analysis and recommended studies at the national level on the determinants of adolescent fertility.

Omari (1994) studied the determinants of adolescent fertility in Kisii district using cross tabulation with chi-square, correlation, and multiple regressions. The study found age at first marriage, age at first sexual intercourse, use of contraceptives, and currently married to positively affect adolescent fertility while age at menarche negatively affected adolescent fertility.

According to Ojwang *et al* (1991:76), adolescent girls contribute up to 30% of the total pregnancies in Kenya, which is 11.5% of all births. By the year 2000, incidences of pregnancies to adolescent girls are projected to be at 44.2%.

2.1.2 SOCIO-ECONOMIC FACTORS

Various studies have indicated that social-economic factors are influence adolescent fertility. Graham (1990), in a study of adolescents in Iowa, (USA) on the influences of sexual activity and use or non-use of contraceptives among adolescents found that, adolescents who were involved in frequent sexual activities had poor non-existent relationships with their mothers and a very unstable family environment. The results indicated that adolescents found engaging in sexual relations were older and had poor or non-existent relationships with their mothers. These adolescents also did not engage in extracurricular activities. They watched television and felt that their parents and friends would be upset if they had sexual.

Similar findings have been revealed in Kenya. Juma (1992:123) found that, adolescents living with both parents are less likely to initiate sexual activities at an earlier age and that adolescent fertility varied by different socio-economic factors. Higher fertility was recorded for the non-schooling than for schooling adolescents. Mugwe (1989) has also obtained similar findings. She found education and frequency of sexual intercourse to be inversely related. She also found that most adolescent pregnancies occur to girls from families of low social-economic status.

Economic benefits of children in terms of labour, supplementary income and security in old age promote high fertility (PSRI 1994). Although children are perceived to be posing economic costs, particularly as far as food, clothing, and schooling are concerned, they are besides their positive contribution to the family, also an economic burden (PSRI, 1994).

Early pregnancy and child bearing restricts the future opportunities for social and economic advancement. According to Gyepi-Gabra (1985:35), students who become pregnant in Kenya are faced with two difficult choices: either abort their pregnancies before they are detected in order to continue their education, or drop out voluntarily in order to have the child. Moreover, hastily arranged marriages help reduce the social stigma and psychological problems arising from the ridicule that the young unwed mother may encounter.

This is despite the fact that this type of marriage may not be able to effectively contain the socio-economic problems associated with the failure to see schooling through to its conclusion (Gyepi-gabra, 1985:38). Many studies acknowledge the importance of education in determining adolescent fertility (Gyepi Gabrah, 1985:40, Caroline & Cohen, 1993:99). Most of the studies conclude that fertility declines significantly as education increases.

Other studies such as AMREF's (1994), emphasize the already noted factors that influence adolescent sexuality and fertility such as religion, ethnicity, contraceptives

use, type of school, class, place of residence, future career aspirations, parental marital status, menarche, and age at first intercourse to significantly influence entrance into sexual unions.

2.1.3 SOCIAL AND CULTURAL FACTORS

In Kenya studies (Gabrah, 1985, Gachuhi, 1974, Rogo et al, 1994, Ocholla Ayayo, 1991) have indicated that social-cultural change is a contributing factor to adolescent fertility. They argue that with increased modernization, the role of grandparents, aunts, and uncles in educating and modelling the adolescent in matters related to sex has shifted to the school, peers, films, and magazines. These are the common sources of information on sexuality fro the youth.

According to Juma (1992), adolescent's type of family greatly affects adolescent fertility. The study found that adolescents from polygamous families had higher fertility than those from monogamous families. Further, religious affiliation was strongly related to adolescent fertility. Fertility was high among African independent churches and Catholics, and low on others. Those who had married parents exhibited low fertility as compared to those with widowed or separated parents indicating that fertility is influenced by parental marital status. Opinion on premarital sex and contraceptive use by adolescents was found to influence adolescent fertility. Those in favour of premarital sex had high adolescent fertility and so were those against contraceptives.

The mushrooming of many non-traditional shelters in the form of lodges, hotels, guest houses, and youth hostels throughout the country have created more opportunities for inter-sexual unions (Ocholla-Ayayo & Otieno, 1988:260). This has increased the intensity of coitus frequency that is now higher than at any time before these shelters came into being. The consequence is increased cases of unwanted pregnancy among teenagers, and increased exposure to HIV/AIDS and sexually transmitted diseases.

They further observe that traditionally, young people and especially unmarried boys and girls were never accepted at beer places. However, today, they form the majority in such places, which are also housing private rooms for sexual contacts. Alcohol drinking is used as stimulant to promote sexual desires by both sexes and as a result, many pregnancies of single mothers are believed to be a result of encounters in such shelters (Ochola Ayayo & Otieno, 1988). The social norms, taboos, and restrictions that hitherto used to govern sexual behaviour have been diluted by modernization. The influence of foreign culture and the loosening family ties, weakening of parental authority contribute largely to increased adolescent sexual activity and fertility.

Studies have shown that there is a significant difference in fertility between Catholics and Muslims, and that the rest of the religious groups fall in between (Ocholla-Ayayo and Osiemo, 1989). These findings are similar to Henin's (1979), that low fertility in Muslims in Tanzania was due to high proportion of childlessness. Muslims were found to be associated with less secular education and a high level of polygyny. Fertility among Christians could be high due to disregard of most traditional norms, beliefs,

and practices that used to regulate fertility, and the use of modern contraceptives (Ocholla-Ayayo and Muganzi, 1986).

Anker and Knowles (1982), argue that any analysis of fertility differentials in Kenya would be incomplete if ethnicity is not considered. This is because in Africa, children belong to the lineage or patterns of marriage that affect fertility. Ocholla-Ayayo and Osiemo, (1989) indicate that the Kikuyu women married much later than the Luo but there was no difference in the fertility levels of the two groups as would have been expected. The Luo marry early and stopped giving birth early whereas the Kikuyu marry late and stopped giving birth late (Ochola Ayayo &O. Makoteku, 1988).

In a study on premarital teenage pregnancy and child bearing among the kikuyu of Kiambu and the Maasai of Narok district Wangui Njau (1992), found teenage individual characteristics and levels of sexual intercourse to be similar in both communities and could not, therefore, on their own account for differences in levels of premarital pregnancies. She concludes that premarital pregnancies are explained by interplay of individual and social-cultural factors within the context of the communities in which the teenagers live. The extent to which the community directly intervenes in the regulation, and management of sexual and reproductive behaviour of teenagers in particular was found to be a crucial factor in determining whether or not the pregnancies occur.

2.1.4 Summary of literature

From the preceding literature review, it is clear that adolescent fertility is associated with a number of factors that can be largely grouped as social, cultural, demographic, political, economic, and environmental factors. Studies such as: Mugwe, 1989, Juma, 1992, Omari, 1994 used these concepts to study adolescent fertility. This study adopted selected socio-cultural, socio-economic and demographic factors in its conceptual and operational models to guide it.

It is also clear that most studies done in Kenya have largely focused on the sub national level (Juma, 1992, Mugwe, 1989, Ochieng, 1991, Omari, 1994, Nyaga, 1989, PSRI, 1992, Ruthiru, 1992), and most have recommended further research at the national level. Other studies have focused on special groups within the adolescents like in school adolescents such as Khasiani (1985) while others have focused on a few selected factors such as demographic factors of age at first birth, age at first marriage, and age at first intercourse that influence adolescent fertility like Omondi A. (1981).

2.2 THEORETICAL FRAMEWORK

Various theories have been advanced to explain the determinants, pattern and levels of fertility as reviewed in the literature above. The demographic transition theory is one of these theories. The demographic theory can be viewed as a generalisation of the historical process that many industrialised nations of the west moved through from a traditional regime of high mortality and fertility to the present day regime characterized by low mortality and fertility. The overall framework of the theory is commonly used in the analysis of demographic patterns, levels and trends in the contemporary developing countries which are sometimes seen to follow the same historical pattern through which the present day western societies passed.

Theoretical models of individual fertility making decisions were proposed by economists (Becker, 1960). In these economic models the underlying assumption is that some degree of rationality. Couples are seen as making decisions concerning family size based on considerations of perceived advantages and disadvantages associated with children.

The rationale underlying this theory is that families choose a fertility level that maximises their well being considering their household constraints. This theory applies consumer behaviour to child bearing in that consumers choose their commodities that maximise their satisfaction based on their tastes, prices and income. Becker (1960) argued that children could also be looked at this way. The number of children an

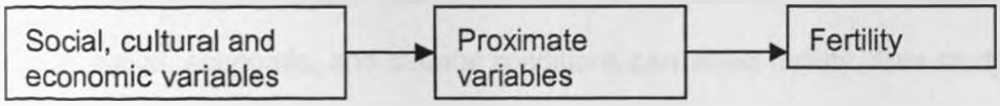
individual would have will, thus, be based on the idea of them being a commodity, which satisfies them given other considerations. Children are seen to constitute 'utility' and, had a 'price', therefore, fertility decisions were like consumer behaviour. In order to adopt this argument for fertility analysis, Becker (1960) proposed that children be seen as a special kind of commodity that gives satisfaction as much as it is an investment and this view gave forth to the "new home economics models". Fertility control here is seen in relation to the demand and supply of children. Social, cultural and economic factors are seen to influence fertility through the demand and supply on the motivation to accept and use fertility regulation mechanisms.

Easterlin's (1975), work can be viewed as an extension of the new home economics theory. He argues that a simple economic approach provides insufficient basis for understanding fertility behaviour especially in the developing countries and, therefore, suggests that an integration of economic and sociological approaches are superior to those that can be gained through the exclusive use of either model. He thus suggests that the supply side that includes the biological and cultural mechanisms that affect a couple's fertility should be considered in the framework. The assumption is that these supply conditions are beyond the control of the family. These conditions are seen as constraints in the environment of the family rather than decision variables.

Davis and Blake (1956:214), in the intermediate variable framework assert that any analysis of institutional factors in fertility must first explain the well-known fact that underdeveloped societies in general have a higher rate of reproduction than the

industrial societies. They attribute this to the high mortality rates in these societies and hence the growth of institutional organization which give them sufficient reproduction to survive. They further identified eleven "intermediate" variables through which any social factor can influence fertility. Each of the eleven intermediate variables may have a positive or negative effect on fertility because of their different manifestations in different societies. The actual birth rate depends on the net balance of the values of the variables. It was difficult to operationalize this framework and this weakness led Bongaart (1978,1982), to improve on the framework, resulting into the proximate determinants model and the socio-economic model of fertility in figure 1.

FIG 1. Proximate determinants model



Source: Farooq and DeGraff (1991:14).

The proximate variables in figure 1 above can be seen as providing the link between social, cultural and economic factors on the one hand and the physiological process which ultimately determines fertility on the other hand. Bongaarts (1978,1982), identified a set of seven intermediate variables that affect fertility:

(a) Proportion married among females

(b) Contraceptive use and effectiveness

(c) Prevalence of induced abortion

(d) Post partum infecundability duration

(e) Coital frequency

(f) Spontaneous intrauterine mortality (foetal wastages)

(g) Prevalence of permanent sterility.

The importance of each of the proximate variables in explaining differences in fertility levels across countries, or populations depends on both the extent to which the particular variable differs across population and the extent to which fertility in a given population responds to variations in the variable. He argued that variations in fertility result from changes in one or more of the above factors. The degree of influence these factors have on fertility varies from one society to another.

The intermediate variables are assumed to determine the degree of risk of exposure throughout the different stages of biological reproductive cycle of intercourse, conception and gestation. The intermediate variables are the only factors through which social, economic, and cultural conditions can affect fertility. This study adopted the Bongaarts proximate determinants of fertility framework because of its suitability.

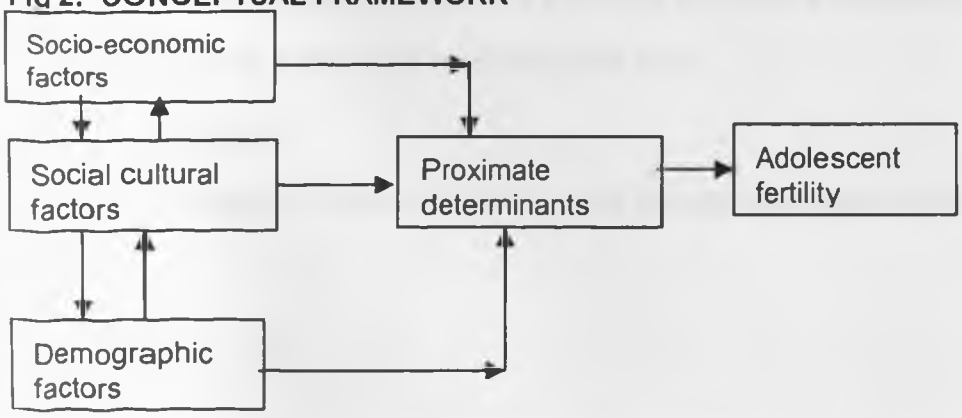
2.3 Summary of the conceptual analysis

In the proximate determinants models, emphasis is laid on the fact that social, cultural and economic factors affect fertility through the proximate factors. This study borrows heavily from the proximate determinants models in its conceptual and operational model. The conceptual framework for this study is based on the fact that decisions to regulate fertility are complex and are influenced by diverse factors be they social-economic, social-cultural, environmental, political or demographic factors. The modified conceptual model for this study which, draws from Bongaarts (1978) model is illustrated in figure 2(see next page in the text).

The socio-economic, social-cultural, and demographic factors affect fertility indirectly through the proximate determinants as shown in figure 2. For example a woman's occupation is perceived to influence fertility indirectly. The income she earns enables her to afford family planning methods to lower her fertility.

Social-cultural factors such as religion (figure 2) affect fertility indirectly through the proximate determinants. For instance, most religions such as the Catholics oppose the use of modern contraceptives. Women who belong to such religious groups and uphold such beliefs are exposed to a higher risk of pregnancy and consequently higher fertility if they are sexually active. According to the conceptual framework, the demographic factors like current marital status are seen to affect fertility through the proximate determinants. The proximate variables affect fertility directly as shown in figure 2. The Demographic variables considered in this study are: age, and marital status. The social and cultural factors considered are religion, ethnicity and place of residence, while the socio-economic factors considered are education, knowledge of any method and occupation.

Fig 2: CONCEPTUAL FRAMEWORK



Source: modified Bongaarts Model of fertility determinants, 1978.

2.4 DEFINITION OF KEY CONCEPTS

Socio-economic factors

These factors are the indices of socio-economic status. The socio-economic variables selected for investigation in this study from the KDHS (1993) were occupation, education level, and knowledge of any method of contraception.

Social cultural factors

These are factors that regulate behaviour and the way of life in a community. In this study religion, ethnicities, place of residence were the only socio-cultural variables selected from the KDHS (1993), for investigation.

Demographic factors

These are factors that are inherent, or that characterise a population. The only demographic variables considered in this study are the adolescent's: age and current marital status.

Proximate determinants

These are the factors through which the socio-economic, social cultural and demographic factors are perceived to act through to influence adolescent fertility. The proximate variable in this study is contraceptive use.

Adolescent fertility

This is the dependent variable in this study and its index is children ever born.

2.5 CONCEPTUAL HYPOTHESIS

1. Socio-economic factors affect adolescent fertility through the proximate determinants.
2. Social cultural factors affect adolescent fertility through the proximate determinants.
3. Demographic factors affect adolescent fertility through the proximate determinants.

Fig 3: OPERATIONAL MODEL

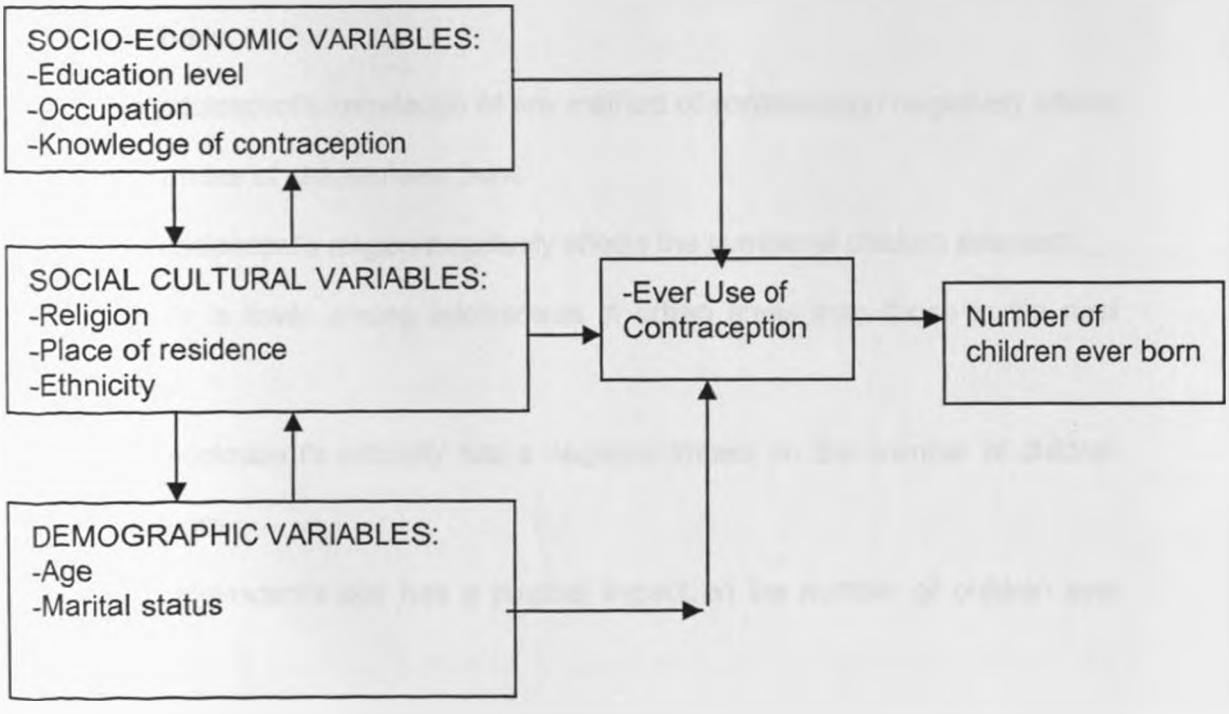


Figure 3 above is the operational framework of the conceptual model in figure 2.This model contains variables to be measured. The independent variables included in the operational model are age, current marital status, education, occupation, and knowledge of contraception, religion, ethnicity, and place of residence. The proximate

variable is contraceptive use and the dependent variable is the number of children ever born.

2.6 OPERATIONAL HYPOTHESES

The following are the hypotheses to be tested in this study.

1. Higher level of education has a negative effect on the number of children ever born.
2. The adolescent's type of occupation negatively affects the number of children ever born.
3. The adolescent's knowledge of any method of contraception negatively affects the number of children ever born.
4. The adolescent's religion negatively affects the number of children ever born.
5. Fertility is lower among adolescents in urban areas than those in the rural areas.
6. The adolescent's ethnicity has a negative impact on the number of children ever born.
7. The adolescent's age has a positive impact on the number of children ever born.
8. The adolescent's marital status has a positive effect on the number of children ever born.
9. The adolescents who have ever used any method of contraceptives have a fewer children born than those who have never used any method.

2.7 OPERATIONAL DEFINITION OF VARIABLES

In this study, adolescent fertility whose index is the total number of children ever is taken as the dependent variable while the demographic, socio-economic, and social cultural characteristics are the independent variables.

Adolescent: This study considers the adolescents as those women aged 15-19 years old.

Level of Education: It is defined as formal education attained by the adolescents. It is categorized as no education, primary education or secondary-or post secondary education.

Age: It refers to the completed years the adolescent has lived since her birth. In this study the age bracket considered is 15-19.

Occupation: It refers to any gainful employment that ensures the adolescent of an income. It is categorised as not working, white collar and blue collar in this study.

Religion: It is the spiritual group or affiliation that the adolescents belong to. It is categorised as no religion, Christians, Islam, and Other religious groups.

Place of residence: It refers to either the urban or rural place of residence of the adolescent.

Marital status: Marriage is a union between persons of the opposite sexes. In this study it refers to the status of the adolescent as far as marriage is concerned i.e. not married, married, or other marital unions.

Knowledge of contraception: It refers to the adolescent's ability to identify any method of contraception. It is categorised as: knows any method and does not know any method.

Ethnicity: The major ethnic groups considered in this study are; Kalenjin, Kamba, Luo, Kikuyu, Kisii, Meru/Embu, Taita/Taveta, Mijikenda/Swahili, and other.

Adolescent fertility performance: It refers to the number of children the adolescent has given birth to. It is considered as the dependent variable and categorised as 'at least one child born' and 'Never had a child'.

Ever use of contraception: It refers to the use of any form of method used to prevent pregnancy among adolescents. It is categorised as ever used and never used, of any method of contraception.

CHAPTER THREE: DATA SOURCES AND METHODOLOGY

3.0 INTRODUCTION

This chapter presents a description of the data and methodology used in the analysis of this study. The first section presents the design of the survey and the nature of data that was collected. The later section presents the methodology of data analysis that include frequencies, cross tabulation with chi-square, and logistic regression analysis.

3.1 SOURCES OF DATA

A total of 8,805 households were selected for survey in the KDHS 1993 of which 7,950 were successfully interviewed. Among the 8,185 households that were found, 97% were interviewed. Within the households, 7,952 women were identified as eligible for an individual interview and 7,540 or 95% were interviewed. In one half of the households that were selected for inclusion in the male survey, 2,762 eligible men were identified of whom 2,336, or 85% were interviewed.

The objective of the KDHS was mainly to serve as a source of population and health data for policy makers and the research community. It also assessed the overall demographic picture in Kenya. More specifically, the survey aimed at providing data on family planning and fertility behaviour of the Kenyan population, measuring changes in fertility and contraceptive prevalence while studying factors which affect these changes like socio-economic factors (NCPD/CBS 1994:4). This data is suited to achieving the objectives of this study

Despite the emphasis on obtaining district level data for planning purposes, it was decided that reliable estimates could not be produced from the survey of all 48 districts unless the samples were expanded to unmanageable size. Reliable estimates were therefore obtained in 15 rural districts. These districts were targeted because of their large sizes in their provinces and that most were targeted in the previous survey (1989). Six of these districts were sub-divided shortly before the sample design was completed. The survey utilised the previous boundaries in order to maintain comparability with the 1989 survey. As a result of this over sampling the Kenya Demographic Health Survey sample is not self-weighing at the national level. Sample weights were used to compensate for the unequal probability of selection between strata.

The survey utilized four types of questionnaires that included the following, the household questionnaire, the woman's questionnaire (for women 15-49), the man's questionnaire (for men aged 20-54) and the service availability Questionnaire. The households covered in the survey were selected from a national master sample, the third National sample survey and Evaluation Program (NASSEP-3), an improved version of NASSEP-2 used in 1989. The master sample followed a two-stage design stratified by urban-rural residents and within the rural stratum by individual districts. The entire master sample consisted of 1,048 rural and urban sample points (clusters). A total of 536 clusters (92 urban and 444 rural) were selected for coverage in the KDHS 1993 and 520 of these were successfully covered while 16 clusters were inaccessible for various reasons. Finally for each respondent, her background socio-

economic, social cultural, and demographic characteristics were obtained.

3.2 LIMITATIONS OF THE DATA

Although the survey was national in scope its sample design excluded three districts in the northern province and four other northern districts. The excluded districts account for less than 4% of the Kenyan population. Besides, the survey selected a total of 536 clusters but a majority of these clusters were rural while only 92 clusters were urban, 520 of the total clusters were covered while 16 were inaccessible for various reasons. Thus, the majority of women interviewed in the survey were from the rural areas. At the district level, the sample size was small. This could have had an effect of not being representative of the subgroups at that level hence the study risks overgeneralization from a small sample (NCPD/CBS 1994).

Like any other survey, the KDHS suffered from two types of errors, sampling and non-sampling errors. Non-sampling errors result from mistakes made in implementing data collection and data entry and processing like failure to locate and interview the correct respondents, omissions etc. Although a lot of effort was made during enumeration to minimise these errors, non-sampling errors are impossible to avoid and difficult to evaluate statistically. Sampling errors can be evaluated statistically and these errors were calculated for the various selected variables. In general the relative standard error for most estimates for the country as a whole is small (NCPD/CBS 1994).

Sampling errors occur in a survey due to the fact that the sample selected is just one

among the many possible ones that could have been selected using the sample design and sample size. The sampling errors in this survey were estimated from the survey results. Sampling errors were calculated for the selected variables considered to be of primary interest. Generally, the relative standard error for most of the estimates for the country as a whole is small, except for estimates of very small proportions.

3.3 METHODOLOGY OF DATA ANALYSIS

The fertility index used in measuring adolescent fertility in this study is children ever born categorised as at least one child born and child never born. This is considered as the dependent variable in this study. The main methods of data analysis used in this study are frequency distributions, cross tabulation with chi-square test, and logistic regression analysis.

Frequency distributions in data analysis enable the results obtained to be easily comprehensible and interpreted. They present the distribution of variables in categories as they fall within their individual classes with their respective characteristics.

In order to study the association and distribution between two variables the dependent variable and independent variable, cross-tabulation is a suitable technique to use. The method is able to give an indication of the nature of association between the two variables. In this study, cross-tabulation was used to measure the strength of

association between the independent variables such as marital status of adolescent, occupation of adolescent, educational level of adolescent, religion, place of residence, ethnicity, and the dependent variable is the number of children ever born.

Together with cross-tabulation, the chi-square test is used to test the significance of association between variables. The chi-square test demands in its application, first the formulation of two types of hypotheses, the null hypotheses (H_o) and the alternative hypothesis (H_1). The H_o is formulated in a way to invalidate the outcome of the two variables (dependent and independent), for instance, if we have a hypothesis; education level has a negative effect on adolescent fertility as Ho, then H1 will be; level of education has no influence on adolescent fertility and this is the hypothesis that is tested. If the H_o is tested statistically and found to be true, it is rejected and consequently the alternative hypothesis is accepted.

To calculate the test statistic (χ^2) formula is used:

$$\chi^2 = \sum_i \sum_j \frac{(O_{ij} - E_{ij})^2}{E_{ij}}$$

Where
χ^2 - chi-square
Σ - Summation
O_{ij} - observed frequency (values)
E_{ij} - expected frequencies (Gupta 1981)

The expected values for each cell in the cross tabulation for instance between age and the number of children ever born are computed using row and column totals. *ni* denotes the row totals while column totals are denoted by n_j and the grand total denoted by N. Thus the expected values are computed as follows:

$$E_{ij} = (n_i * n_j)/N$$

The calculated chi-square value the cross-tabulation for instance between age and the number of children ever born is then compared with the table chi-square value in order to determine the statistical significance of the chi-square obtained through the guidance of the confidence level (0.05) and the degrees of freedom (R-1)*(C-1). If the calculated chi-square value is greater than the table value at the specific confidence level and degrees of freedom the null hypothesis is rejected and the alternative accepted (Gupta, 1981).

3.4 Logistic Regression Analysis

Logistic regression analysis is a mathematical modelling approach that can be used to analyze the relationship of several explanatory variables to a dichotomous dependent variable. In this study regression analysis is used to enable us to establish an equation, which gives the relationship between the independent variables and the dependent variable. The equations can be used to predict the dependent variable, children ever born, as well as, the strength and direction of association between the dependent and independent variables like age and education level.

Logistic regression analysis allows one to examine the effect of the independent variables on determining the probability of occurrence of the dependent variable. For example the dependent dichotomous variable in this study is at least one child born, denoted as '1' and '0' as otherwise. The dichotomous nature of the dependent variable in logistic regression refocuses the analysis from examining the determinants of adolescent fertility in general to the examination of the determinants of at least one

child born or not born. Kleinbaun (1994) indicates that logistic analysis expresses the dichotomous dependent variable as a linear function of the explanatory variables. The model assumes that the conditional expectation of the independent variables can be interpreted as the conditional probability that an event of interest will or will not occur given the variables in the models. The logistic function f (z) can be given as follows:

$$f(z) = \frac{1}{1+e^{-z}}$$

This functions range between 0 and 1 and it is therefore set to ensure that whatever estimate we get, it will always lie between 0 and 1. The logistic regression model is defined as follows:

$z = \alpha + \beta_1 X_1 + \beta_2 X_2 + \cdots \beta_k X_k$
Where; X^s are independent variables of interest
α And ßs are constant terms representing unknown parameters
z is the index that combines the X^s thus the model can be written as:

$$P(x) = \frac{e^{\beta o + \beta(x)}}{1+e^{\beta o+\beta(x)}}$$

Where P(x) = Probability of event occurring
e = base of natural log.
ß = coefficient estimates
X^s = independent variables

Hence $P(x) = 1/\{1+Exp^{-(\beta o+\beta 1X1 + \cdots \beta p(x)p}\}$ (Kleinbaun 1994)

This means that the probability Px of the occurrence of the dependent variable depends on the independent variables (of age, education, ethnicity and others) $X_1, X_2, \cdots X_p$. Therefore, the probability of a woman with characteristics age 16, who has secondary or higher education, is catholic etc $X_1, X_2, X_3, \cdots Xp$ having at least one child is given by the above equation.

The logistic regression model is, therefore, presented in terms of logits or log odds. The logit here is the odds whose variations are to be explained. An odds is the ratio of the probability that some event- at least one child born- will occur over the probability that the same event will not occur (Kleinbaum, 1994:18). The formula for odds is given as follows:

$\frac{P}{1-P}$ where P (at least one child born) is the probability of event of interest

For example the odds of a fifth means that the probability of at least one child being born is a fifth the probability of a birth not occurring. In logit analysis, the odds ratio is used to measure the effect of the independent variable on the dependent variable. The model transforms the dependent variable of adolescent fertility performance to range from $-\infty$ to $+\infty$ thus eliminating the problem that $\alpha+\beta x$ will be outside the unit range (Hall, 1980).

Interpretation of the coefficients of the logistic regression model

The logistic regression coefficients are the ßs. The interpretation of the estimated coefficients for the independent variables involves determining the functional relationship between the dependent variable - children ever born and independent variable - age, ethnicity, education and others, and appropriately defining the unit of change for the independent variable. This is because the estimated coefficients for the independent variable represent the slope or rate of change of a function of the dependent variable per unit of change in the dependent variable. This involves establishing what function of the dependent variable yields a linear function of the independent variable and this is called the link function (Mc Cullagh and Needler,

1983). In the logistic regression the link function is the logit transformation.

$$g_{(x)} = \ln(JJ_{(x)}/(1-JJ_{(x)}\} = ß_o+ß_x$$

In the logistic regression model $ß = q_{(x)} + 1 - q_{(x)}$ i.e. the slope co-efficient represents the change in the logit for a change of one unit in the independent variable. The $ß^s$ are thus interpreted in this manner. Expressed in terms of logits, a unit change in the independent variable, age - X_1 changes the logit of the dependent variable, total number of children ever born, by the amount of $ß_1$. The logit model is a linear function of the independent variable for example age, education, religion $X_1 X_2$,---X_p indicating that the effect of education - X_2 does not depend on the values of the other variables (Mc Cullagh and Needler, 1983).

The magnitude of estimates of regression coefficients does not tell which variable is more important than the other in explaining the dependent variable. Consider $ß_1$ = 0.1216 for age - X^1 and ß = 0.0070 for education - X^2. This does not mean that age - X_1 is more important than education - X_2 in explaining the dependent variable- children ever born on the basis of the magnitude of the coefficients. It is interpreted as $ß_1$ indicates that a one unit increase in age - X_1 is associated with an increase of 0.1216 in the logit of risk or equivalently the odds of the total number of children ever born, dependent variable increased (1.13 times) by 13% (exp.0.1216 = 1.13). Although this interpretation suits continuous variables it can also be adapted for categorical variables. Moreover the parameters in the logit model can be interpreted as ordinary regression coefficients (Mc Cullagh and Needler, 1983).

Positive values indicate that the independent variables or their interaction raises the odds of the dependent variable while the negative Betas show lower log odds. For example if the logit coefficient of ever use of any contraceptive methods is -0.425, then, this means that women who have ever used any method of contraception are about 2/3 (antilog -0.425 = 0.65) likely to have a child born than those who have never used any contraception (McCullough and Needler, 1983). In terms of odds, the logistic functions can be written in terms of

$$\frac{\text{Prob event}}{\text{Prob (no event)}} = e^{xp\ ßo+ß1X1\ —ßkXk}$$

Exponential (exp) raised to the power $ß_1$ is the factor by which the odds change when the i^{th} independent variable increases by one unit. If ß is positive, this factor will be greater than one meaning that the odds are increased and if ß is negative, the factor will be less than one meaning the odds are decreased when ß= O the factor equals to one which leaves the odds unchanged (Mc Cullagh and Needler, 1983).

Dummy variables

In logistic regression analysis undertaken in this study, the independent variables Xs are represented as categorical variables. In specifying dummy variables, one of the categories is taken as the reference category. A dummy variable is simply a binary variable that has the value of one if the observation comes from the population with the qualitative factor being considered and is zero for all other observations [Hanushek 1977:102]. Thus, a categorical variable having K categories is represented by K-1 dummy variables provided the model contains a constant term.

The partial regression coefficients for dummy variables represent the difference in the predicted means between the categories. For instance, if the variable education is represented as a set of three categories (X0 = None, X1 = Primary and X2 = Secondary plus), then this relationship would be expressed with education as a set of dummy variables as: E (Y)= B0 + B1X1 + B2X2, where B1 expresses the difference between the expected value of y for those with no education and those with primary education. Similarly, B2 can be interpreted as expressing the difference in the dependent variable between those with secondary and above level of education and those with none, while B0 represents the mean for those with no education.

In this study the independent variables are expressed in terms of categories and each category is treated as a separate dummy variable. In specifying the dummy variables one of the categories is taken as a reference category in which other categories are compared. The regression coefficients are interpreted bearing in mind the existing dummy variables. For example, the variable place of residence, indicated as variable X_2, coded as O-urban and 1-rural, the coefficients $ß_2$ in terms of $ß_2X_2$ may be interpreted as the change in the logit of the dependent variable X_2 from urban to rural.

Thus, for urban $ß_2X_2 = 0$ where as for rural $ß_2X_2 = ß$ so that exp $ß_2$ represents the relative odds of a child ever born for rural women as compared to urban women (assuming no interaction between X_2 and any other variable). In general, if a discrete variable has k category there will be k-1 dummy variables to be used. The coefficient $ß_n$ for the dummy variable X_n then represents the change in the logit of the

independent variable for this category relative to the reference category. Equivalently the exp.$ß_n$ represents the relative odds of child ever born for the individual of the category R_i as compared with individuals of the reference category (Hanushek, 1977).

For a discrete variable X_4 with four categories three dummy variables will be used because the first category is taken to be a reference category. For each of the other categories one introduces a variable K_i, which is coded 1(present) and 0(absent). The variable X4 is, thus, replaced by three indicator variables K_1 K_2 and K_3 and the data input for regression recorded to reflect this. It follows that if our model was:

$$\ln P_{(x)}/q_{(x)} = ß_o + ß_1X_1 + ß_2(X)_2 + ß_3X_3 + ß_4 - - -$$

The model is then fitted as:

$$\ln P_{(x)}/q_{(x)} = ß_0 + ß_1X_1 + ß_2X_2 + ß_3x_3 + ß_4K_1 + ß_5K_2 + ß_6K_6 ---$$

The dummy variables used in the analysis are:

AGE

AG1= Age 15-16 (reference category)

AG2= AGE 17-19

Place of residence

PLR1= Place residence is urban (reference category)

PLR2= Place residence is rural

Higher Education level

EDUC1= No education (reference category)

EDUC2= primary education

EDUC3= Secondary and post secondary education

Religion

REL1= Christians

REL2= Muslims

REL3= other (reference category)

Ethnicity

Eth1= Luo/Luyha/Kisii (reference category)

Eth2= Kamba/Kikuyu/Meru/Embu.

Eth3= Mijikenda/swahili/taita/taveta.

Eth4= Other

Total number of children ever born

CHB1= Child never born (reference category)

CHB2= At least one child born

Knowledge of method

KNM1= Knows no method (reference category)

KNM2= Knows method

Ever use of any method

EUM1= Never used (reference category)

EUM2= Ever used method

Marital status

CMs1= Never married (reference category).

CMs2= Married

CMs3= Others

Occupation

OCC1= White collar (Reference category).

OCC2= Blue collar

0CC3 = Not working

The significance of the model is assessed via the likelihood ratio chi-square test. Thus, at any step in the procedure, the most important variable, in statistical terms will produce the greatest change in the log-likelihood relative to the model that does not contain the variable, that is, the one that would result in the largest likelihood ratio statistic (Hosmer and Lemeshow, 1989) The test is done at 0.05 level of significance.

The adequacy of a given logistic model is assessed by fitting a saturated model that contains additional parameters representing particular types of departure (deviance) from the initial model. The likelihood ratio test can then be applied to determine whether the additional regression associated with the more saturated model is equal to zero (Schlesselman, 1982). When the variance is discrete, the test is equivalent to the Pearsons chi-square test.

In assessing the goodness of fit of the models the chi-square is used. A large Chi-square value is a clear show that there is a substantial problem with the model. The smaller the value, the better goodness of fit. However, large sample sizes imply a corresponding large value of the chi-square statistic even if the model substantially fits the observed cases. If the p-value for the whole equation is less than 0.05, then, the model can be considered adequate.

The standard error estimate (S.E) is used to measure the reliability of the estimating equation. It also measures the scatter of the observed values of the dependent variables around the regression line (Schlesselman, 1982). The larger the S.E estimate the greater is the dispersion of observation around the regression line. But if the S.E is zero, then the estimating equation is a 'perfect estimator' of the dependent variable.

Problems of logistic regression

Like multiple regression, logistic regression has one basic problem, multi-collinearity. This arises when the independent variables are strongly inter-related hence their influence overlap. This problem makes the interpretation of the parameters difficult, as it is not possible to estimate the unique effects of the contribution of individual independent variables.

Some degree of multi-collinearity, however, is inherently present among social, economic, cultural and demographic variables. Where there is a high degree of multi-collinearity in a multivariate regression model, at least one of the explanatory variables can be expressed as a linear function of one or more of the remaining variables.

CHAPTER FOUR: DESCRIPTION OF VARIABLES, CROSS-TABULATION & CHI-SQUARE RESULTS AND THE DETERMINANTS OF ADOLESCENT FERTILITY

4.0 INTRODUCTION

This chapter presents the results emanating from the various analyses that were carried out: Cross tabulation with Chi-square and logistic regression analysis to ascertain the impact of the selected demographic, socio-economic and social cultural factors on adolescent fertility.

4.1 DESCRIPTION OF VARIABLES

The KDHS 1993 consisted of a sample of 1788 respondents aged between 15 and 19 years old. Table 4.2.1 shows the distribution of various background factors, the proximate and dependent variables used in the study.

Table 4.1.1 Distribution of respondents by background, proximate and dependent variables

BACKGROUND FACTORS	FREQUENCY	PERCENTAGE
SOCIO – CULTURAL FACTORS		
RELIGION		
CHRISTIANS	1657	92.7%
MUSLIMS	84	4.7%
OTHER	47	2.6%
TOTAL	1788	100%
PLACE OF RESIDENCE		
URBAN	246	13.8%
RURAL	1542	86.2%
TOTAL	1788	100%
ETHNICITY		
LUO/LUYHA/KISII	678	37.9%
KAMBA/KIKUYU/MERU/EMBU	566	31.7%
MIJIKENDA/SWAHILI/TAITA/TAVETA	215	12.0%
OTHER	329	18.4%
TOTAL	1788	100%
SOCIO-ECONOMIC FACTORS		
KNOWLEDGE OF METHOD		
KNOWS NO METHOD	155	8.7%
KNOWS METHOD	1633	91.3%
HIGHEST EDUCATION LEVEL		
NO EDUCATION	60	3.4%
PRIMARY EDUCATION	1350	75.5%
SECONDARY+	378	21.1%
TOTAL	1788	100%
OCCUPATION		
WHITE COLLAR	96	5.4%
BLUE COLLAR	315	17.6%
NOT WORKING	1377	77.0%
TOTAL	1788	100%
DEMOGRAPHIC FACTORS		
AGE GROUP		
15-16	694	38.8%
17-19	1094	61.2%
TOTAL	1788	100%
MARITAL STATUS		
NEVER MARRIED	1506	84.2%
MARRIED	261	14.6%
OTHERS	21	1.2%
TOTAL	1788	100%
PROXIMATE FACTORS		
EVER USE OF CONTRACEPTIVE METHOD		
NEVER USED	1520	85.0%
EVER USED	268	15.0%
TOTAL	1788	100%
DEPENDENT VARIABLE (CHILDREN EVER BORN)		
CHILD NEVER BORN	1492	83.4%
AT LEAST ONE CHILD BORN	296	16.6%
TOTAL	1788	100%

In this study the dependent variable is the adolescent fertility performance categorised as at least one child born and no child born. The above table also shows the distribution of respondents by their various socio-cultural factors. It shows that 86.2%

of the respondents reside in the rural areas while 13.8% reside in the urban areas. This is the same nationally where the majority of the Kenyan population resides in the rural areas. The table shows that most of the respondents are Christians (92.7%) while 4.7% are Muslims, and adolescents in other religious groups formed 2.6% of the respondents. The Luo/Luhya/Kisii ethnic groups are the majority forming 37.5% of the respondents. The rest are as follows: Kamba /Kikuyu /Meru /Embu 31.7%, Mijikenda /Swahili /Taita-Taveta 12% while other ethnic groups comprised of 18.4% of the total population.

The table also shows distribution of respondents by the various socio-economic factors. The majority of respondents, over 96% had attended at least primary school education. Precisely, 75% had attended primary schooling while 21.1% had secondary or higher level education. Only 3.4% had no formal education. Although most of the respondents were not working, 17.6% were blue-collar jobs while 5.4% in white-collar jobs. The majority of adolescents in the survey (91.3%) were aware of any contraceptive methods while 8.7% did not have any knowledge of the method.

The distribution of respondents by their demographic factors indicates that 61.2% were aged 17-19 while 38.8% were aged between 15-16 years. Most of the respondents were not married. For those married, 14.3% did so while aged between15-19 while 1.5% were aged between 8-14 years. The table shows that the majority of respondents (83%) had never used any contraceptive method, while 15.0% had ever used a method.

4.2 BIVARIATE RESULTS

Cross tabulation is a necessary step for considering the strength of a relationship between two variables. The chi-square test is applied together with cross tabulation to enable us know whether there exists a significant relationship between two variables. This section presents the cross tabulation with chi-square results of the various selected independent factors (demographic, socio-economic, and socio-cultural) by adolescent fertility.

Table 4.2.1 below contains information on the cross tabulation between adolescent fertility performance by their current age-grouped. The table shows that the number of children ever born increases with age.

Table 4.2.1 Total children ever born by current age of respondent – grouped

TOTAL CHILDREN EVER BORN	CURRENT AGE OF RESPONDENT-GROUPED		ROW TOTALS
	15-16	17-19	
NO CHILD BORN	669 (96.4%)	823 (75.2%)	1492 (83.4%)
AT LEAST 1 CHILD BORN	25 (3.6%)	271 (24.8%)	296 (16.6%)
COLUMN TOTAL	694 (100%)	1094 (100%)	1788 (100%)

Chi-square value 137.75002 DF 1 Significance 0.0000

The cross tabulation of adolescent's fertility performance by age group showed an observed significance at 0.000. At 0.05 level of significance, adolescent fertility was found to be dependent on age.

Place of residence exerts some influence on fertility. This is mainly due to the differences in environmental factors in both rural and urban areas. Urban areas

usually have lower fertility due to among other factors constraints of urban life, particularly, in regard to provision of food, shelter, education, and health costs that make large families cumbersome to maintain as opposed to rural areas. Lower urban fertility is also associated with closer accessibility to health facilities. Other contributing factors to lower fertility rates include a notable concentration of better educated women, formal participation in the labour force, steady, and higher incomes that make family planning services affordable, and the desire for better standards of living hence emphasis on smaller family sizes.

Table 4.2.2 below contains the cross-classification of children ever born by type of place of residence. According to the table, the majority of respondents reside in the rural areas and recorded higher fertility. However, the majority of the respondents had not given birth with 16.6% of the respondents having at least one child. The cross-tabulation of adolescent fertility performance by type of place of residence of the adolescents was not significant at 0.10704. At 0.05 level of significance place of residence has no significant effect on adolescent fertility.

Table 4.2.2 Total children ever born by type of place residence

TOTAL CHILDREN EVER BORN	TYPE OF PLACE OF RESIDENCE		
	URBAN	RURAL	ROW TOTALS
NO CHILD BORN	214 [87%]	1278 [82.9%]	1492 (83.4%)
AT LEAST 1 CHILD BORN	32 [13%]	264 [17.1%]	296 [16.6%]
COLUMN TOTALS	246 (100%)	1542 (100%)	1788 (100%)

Chi-square value 2.59739 DF 1 Significance 0.10704

Table 4.2.3. Show the cross-tabulation results of adolescents' fertility performance in view of their highest level of education. It shows that respondents with primary level

education had more children born than the other categories. These results are unique given that lower levels of fertility are associated with educational attainment. However, other studies have also found similar results that low levels of education as opposed to no education may actually be associated with relatively higher fertility (Karen A.F *et al* 1993 cited in Ocholla-Ayayo 1991). It is argued that primary education makes women more conscious of the importance of hygiene and other basic health requirements, which help in the survival of the children preventing foetal wastages (Ocholla-Ayayo 1991:78).

Table 4.2.3. Total children ever born by highest education level

TOTAL CHILDREN EVER BORN	HIGHEST EDUCATION LEVEL			
	NO EDUCATION	PRIMARY	SECONDARY+	ROW TOTALS
NO CHILD BORN	45 [75%]	1104 [81.8%]	343 [90.7%]	1492 [83.4%]
AT LEAST 1 CHILD BORN	15 [25%]	246 [18.2%]	35 [9.3%]	296 [16.6%]
COLUMN TOTAL	60 (100%)	1350 (100%)	378 (100%)	1788 (100%)

Chi-square value 20.37883 DF 2 Significance 0.00004

The cross-tabulation of the respondents' fertility performance by highest education level of the adolescents was significant at 0.00004. At 0.05 level of significance, therefore, adolescents' educational level was found to have a statistically significant influence on their fertility.

Table 4.2.4 below contains the cross-tabulation results of the total number of children ever born by religion. It shows that Christians had more children born than the other religious groups. The cross-tabulation was significant at 0.01350. This suggests that at

0.5 level of significance religion has a statistically significant influence on adolescent fertility.

Table 4.2.4 Total children ever born by religion

TOTAL CHILDREN EVER BORN	RELIGION			
	CHRISTIANS	MUSLIMS	OTHER	ROW
NO CHILD BORN	1387 (83.7%)	73 (86.9%)	30 (66.7%)	1490 (83.4%)
AT LEAST ONE CHILD BORN	270 (16.3%)	11 (13.1%)	15 (33.3%)	296 (16.6%)
COLUMN TOTAL	1657 (100%)	84 (100%)	45(100%)	1786 (100%)

Chi-square value 10.69344 DF 3 Significance 0.01350

Table 4.2.5 below shows the cross-tabulation of total children ever born by ethnicity.

Table 4.2.5 Total children ever born by ethnicity

TOTAL CHILDREN EVER BORN	ETHNICITY				
	LUO/LUYHA/ KISII	KAMBA/ KIKUYU/MERU	MIJIKENDA/SWAHILI/ TAITA/TAVETA	OTHERS	ROW TOTALS
NO CHILD BORN	537 [80.1%]	482 [85.2%]	188 [87.4%]	278 [84.5%]	1485 [83.4%]
AT LEAST ONE CHILD BORN	133 [19.9%]	84 [14.8%]	27 [12.6%]	51 (15.5%)	295 [16.6%]
COLUMN TOTAL	670 (100%)	566 (100%)	215 (100%)	329 (100%)	1780 [100%]

Chi-square value 9.21389 DF 3 Significance 0.02658

The cross-tabulation of respondent's fertility performance by ethnicity was significant at 0.02658. At 0.05 level of significance adolescent fertility was found to be dependent on the adolescent's ethnicity. The association between ethnicity and fertility could be explained by the effect of cultural practices of specific ethnic groups that range from marriage patterns, birth intervals, breast feeding behaviour, sex regulation mechanisms, and the value of children.

Table 4.2.6 shows the cross-tabulation of total children ever born by knowledge of any method of contraception. It shows that despite the fact that a majority of the respondents knew about contraception, they had a higher fertility, suggesting a low acceptance and user rates. This could be attributed to inadequate access to effective family planning methods.

Table 4.2.6 Total children ever born by Knowledge of any method

TOTAL CHILDREN EVER BORN	KNOWLEDGE OF ANY METHOD OF CONTRACEPTION		ROW TOTALS
	DON'T KNOW ANY METHOD	KNOWS METHOD	
NO CHILD BORN	150 (96.8%)	1342 (82.2%)	1492 (83.4%)
AT LEAST 1 CHILD BORN	5 (3.2%)	291 (17.8%)	296 (16.6%)
COLUMN TOTALS	155 (100%)	1633 (100%)	1788 (100%)

Chi-square value 21.82644 DF 1 Significance 0.00000

The cross-tabulation of adolescent fertility performance by knowledge of contraception showed an observed significance at 0.0000. At 0.05 level of significance, knowledge of contraception has a statistically significant influence on adolescent fertility. Table 4.2.7 indicates the results of cross-tabulation of children ever born by ever use of any contraceptive method.

Table 4.2.7 Total children ever born by ever use of method

TOTAL CHILDREN EVER BORN	EVER USED OF ANY METHOD OF CONTRACEPTION		ROW TOTALS
	NEVER USED	EVER USED	
NO CHILD BORN	1332 (87.6%)	160 (59.7%)	1492 (83.4%)
AT LEAST 1 CHILD BORN	188 (12.4%)	108 (40.3%)	296 (16.6%)
COLUMN TOTAL	1520 (100%)	268 (100%)	1788 (100%)

Chi-square value 128.65595 DF 1 significance 0.00000

The cross-tabulation of adolescent's fertility performance by ever use of contraception showed an observed significance at 0.00000. At 0.05 level of significance, adolescent

fertility was found to be dependent on ever use of any method of contraception. Table 4.2.8 below illustrates the cross-tabulation children ever born by marital status.

Table 4.2.8 Total children ever born by marital status

TOTAL CHILDREN EVER BORN	CURRENT MARITAL STATUS			
	NOT MARRIED	MARRIED	OTHER	ROW TOTALS
NO CHILD BORN	1379 (91.6%)	105 (40.2%)	8 (38.1%)	1492 (83.4%)
AT LEAST 1 CHILD BORN	127 (8.4%)	156 (59.8%)	13 (61.9%)	296 (16.6%)
COLUMN TOTALS	1506 (100%)	261 (100%)	21 (100%)	1788 (100%)

Chi-square value 456.02801 DF 2 significance 0.00000

The table shows that 8.4% of those who were not married had at least one child. Although the above table shows that the majority of respondents were not married, they had many births among them. This suggest premarital child bearing. The table further shows that those married had a higher fertility an indication that most childbearing takes place in stable unions of marriage. The cross-tabulation of adolescent's fertility performance by marital status was significant at 0.00000. At 5% level of significance, adolescent fertility was found to be dependent on marital status.

Table 4.2.9 contains the cross-tabulation children ever born by occupation. The results show that most of the respondents who were not working had at least one child. The relationship between occupation and fertility can be viewed in terms of income earnings. The income that an individual gets dictates the ability to afford health services, especially, effective family planning services. Those in better paying

occupations have a higher chance of affording and using family planning services and hence, fewer number of children.

Table 4.2.9 Total children ever born by occupation

TOTAL CHILDREN EVER BORN	OCCUPATION			
	NOT WORKING	WHITE COLLAR	BLUE COLLAR	ROW TOTALS
NO CHILD BORN	1203 (87.4%)	60 [62.5%]	229 [72.7%]	1492 (83.4%)
AT LEAST 1 CHILD BORN	174 (12.6%)	36 [37.5%]	86 [27.3%]	296 (16.6%)
COLUMN TOTALS	1377 (100%)	96 (100%)	315 (100%)	1788 [100%]

Chi-square value 72.129 DF 2 Significance 0.000

The cross-tabulation of adolescent's fertility performance by occupation was significant at 0.000. At 0.05 level of significance, adolescent fertility is therefore, dependent on occupation.

4.3 CONCLUSION

From the bivariate analysis results above, we infer that the selected demographic, socio-cultural and socio-economic variables are associated with adolescent fertility. The chi-square test results confirmed all the variables to be statistically significant influence on adolescent fertility at 0.05 level of significance except place of residence.

4.4.0: DETERMINANTS OF ADOLESCENT FERTILITY

Logistic regression analysis in this study is used in the examination of the determinants of adolescent fertility. Logistic regression gives the strength and magnitude of the association between the dependent and independent variables.

Estimation of the values of the dependent variable is made possible from the knowledge of the values of the independent variables. This process is enhanced through the adopted models used in estimation. Estimation of the determinants of adolescent fertility in this study is done using five different models: proximate variables with the dependent variable, socio-economic variable with the dependent variable, socio-cultural variables with the dependent variable, demographic variables with the dependent variable, and the independent variables through the proximate variables with the dependent variable.

4.4.1 LOGISTIC REGRESSION ANALYSIS OF THE DEPENDENT VARIABLE WITH PROXIMATE FACTOR

Table 4.4.1 Parameters for Logistic Regression for Proximate Variable

Variable	B	S.E	Sig.	ODDS RATIO
Ever use of method	1.565	0.147	0.000	4.782
Constant	-1.958	0.078	0.000	

-2log likelihood 1498.947
Model Chi-square 105.806 DF 1 Sig. 0.000

This model is significant at 0.000 indicating that it is appropriate. Ever use of any method was found to be statistically significant at 0.000 when alpha = 0.05. The significance of this proximate variable is a measure of its suitability and the direct impact it has on adolescent fertility. The Odds ratio of 4.782 shows that adolescents who have ever used any contraceptive method are 4.782 times more likely to have at least one child born than those who have never used any method of contraception.

4.4.2 LOGISTIC REGRESSION ANALYSIS OF THE DEPENDENT VARIABLE WITH SOCIO- ECONOMIC FACTORS

The table below shows the results of the logistic regression analysis for the dependent variable with the socio-economic variables.

Table 4.4.2: Parameters for logistic regression for social-economic variables

DUMMY VARIABLE	B	S.E	SIG	ODDS RATIO
PRIMARY EDUCATION	0.363	0.331	0.273	0.696
SECONDARY EDUCATION	1.102	0.371	0.003	0.332
KNOWS ANY METHOD	1.948	0.463	0.000	2.012
BLUE COLLAR OCCUPATION	0.408	0.250	0.103	0.665
NOT WORKING	1.266	0.230	0.000	0.282
CONSTANT	2.014	0.571	0.000	0.134

-2log likelihood 1469.206
Model chi-square 108.55 DF 5 significance 0.000

The above model of the logistic regression analysis examined the direct impact of the social-economic factors on the probability of having at least one child born to adolescent women. The dummy variable - Primary level education was not statistically significant at alpha = 0.05, while secondary or higher level of education was significant at 0.003. Secondary or higher education showed an expected negative association with the probability of having at least one child born. The direct impact on the probability of having at least one child born can be explained by the fact that most women stay in school longer, hence, postponing marriage, an institution where most child bearing takes place. The odds ratio of 0.332 means that women with secondary or higher education level were 0.332 times less likely to have at least one child born compared to those with no education in the reference category.

Knowledge of any method of contraception was found to be statistically significant at 0.000. Adolescent women who know any contraceptive method exhibited a positive association with the dependent variable although this association was not expected. The positive association may be due to low user rates or ineffective use of the methods. Thus, adolescent women who know any method of contraceptive are 2.012 times more likely than those of the reference category who do not know of any method to have at least one child born.

The occupation dummy variable found to be statistically significant in the model was for those who were not working at 0.000 when alpha= 0.05. Adolescent women who were not working are 0.282 times less likely to have at least one child born than those in the white-collar occupation. Occupation showed a negative association with the dependent variable.

4.4.3: LOGISTIC REGRESSION ANALYSIS OF THE DEPENDENT VARIABLE WITH SOCIAL-CULTURAL FACTORS

The table below shows the results of the logistic regression analysis for the dependent variable with the social-cultural variables.

Table 4.4.3: Parameters for logistic regression for social-cultural variables

DUMMY VARIABLES	B	S.E	SIG.	ODDS RATIO
CHRISTIANS	1.056	0.330	0.001	0.348
MUSLIMS	0.896	0.461	0.050	0.408
KAMBA/KIKUYU/MERU	0.347	0.153	0.023	0.706
MIJIKENDA/ SWAHILI/TAITA	0.647	0.246	0.008	0.523
OTHERS	0.358	0.182	0.049	0.698
RURAL	0.365	0.210	0.083	1.440
CONSTANT	0.6847	0.373	0.046	0.504

Model 20.706 DF 6 sig.0.002 -2log-likelihood 1584.047

The above regression analysis examined the effect of social-cultural factors on the fertility performance of adolescent women. The social-cultural factors considered in the model included: religion, ethnicity, and type of place of residence.

In the analysis, Christian adolescents showed significance at 0.001, while Muslim adolescents were significant at 0.050. The odds ratio for Christians was at 0.348, showing them to be 0.348 times more likely than other religious groups to have at least one child born. Christians showed a positive association with the adolescent fertility. On the other hand, Muslim women were found to be 0.408 times more likely to have at least one child born compared to other religious groups. The variable showed a positive association with adolescent fertility.

All the ethnicity variables showed a positive association with adolescent fertility as much as they were all found to be statistically significant at alpha = 0.05. The

Kamba/Kikuyu/Meru/Embu adolescents, with an odds ratio of 0.706 were 0.706 times more likely as Luo/Luyha/Kisii counterparts to have at least one child born. The adolescent women in the ethnic groups of Mijikenda/Swahili/Taita/ Taveta, were 0.523 times more likely than their Luo/ Luyha/Kisii counterparts to have at least one child born while adolescent women in the `other' ethnic groups were 0.698 times more likely than those in the among Luo/Luhya/Kisii counterparts to have at least one child born. Rural place of residence was not different statistically from the reference category of urban place of residence in terms of their impact on adolescent fertility. The chi-square test for the model coefficients was statistically significant at 0.0021.

4.4.4 LOGISTIC REGRESSION ANALYSIS OF THE DEPENDENT VARIABLE WITH DEMOGRAPHIC FACTORS

The table below shows the results of the logistic regression analysis for the dependent variable with the demographic variables.

Table 4.4.4 Parameters for logistic regression for demographic variables

VARIABLE	B	S.E	SIG.	EXP.B
Age 17-19yrs	1.725	0.226	0.000	5.612
Married	2.491	0.162	0.000	6.078
Other	2.552	0.473	0.000	6.828
CONSTANT	-3.625	0.214	0.000	0.027

-2log-likelihood = 1172.877
Model Chi-square 431.876 DF 3 Sig. 0.000

In the above logistic regression analysis, the direct impact of the demographic factors on the probability of having at least one child born was examined. When alpha = 0.05, model chi-square was found to be statistically significant at 0.000. Adolescent women aged 17-19 years showed a significant impact on adolescent fertility at 0.000 when

alpha is 0.05. Adolescents aged 17-19 years are 5.612 times more likely to have at least one child than those aged 15-16 years in the reference category. Age, thus, showed an expected positive association with adolescent fertility.

Adolescent women currently married showed a positive and statistically significant effect on adolescent fertility at 0.000. Similarly, those in the "other" group (separated, divorced, widowed) showed a positive association with adolescent fertility and were significant at 0.000. Currently, married women were 6.078 times more likely to have at least one child born than those in the reference group who were not married. The "others" – (separated, divorced, widowed), were 6.828 times the odds of the reference category of adolescent women who were not married more likely to have a child.

4.4.5 LOGISTIC REGRESSION ANALYSIS OF THE DEPENDENT VARIABLE WITH INDEPENDENT AND PROXIMATE FACTORS

The table below shows the results of the logistic regression analysis for the dependent variable with all the independent variables

Table 4.4.5 Parameters for logistic regression for independent and proximate factors

VARIABLE	B	S.E	SIGN	ODDS RATIO
Age 17-19yrs	1.774	0.238	0.000	5.897
Currently Married	2.248	0.176	0.000	9.468
Other	2.392	0.333	0.000	9.940
Primary Education	0.549	0.320	0.050	1.732
Secondary-plus Education	-0.405	0.466	0.385	0.667
Knows Method	0.596	0.492	0.043	2.708
Blue Collar	-0.582	0.307	0.050	0.559
Not Working	-0.773	0.275	0.005	0.462
Christian	-0.471	0.421	0.175	0.565
Muslim	-0.676	0.264	0.231	0.509
Kamba/Kikuyu/Meru	0.092	0.194	0.635	0.912
Mijikenda/Swahili/ Taita	0.632	0.300	0.035	0.532
Other	0.140	0.225	0.533	1.151
Rural	0.299	0.258	0.245	1.349
Ever use of method	0.141	0.186	0.000	3.130
Constant	-4.128	0.495	0.000	0.016

Model chi-square 519.117 DF 15 Sig. 0.000 -2log-likelihood 1085.636

The above model examined the combined effect of the independent social cultural, social-economic, and demographic factors through the proximate factors on dependent adolescent fertility.

The aim of the model was to assess the impact of the independent variables through the proximate factors on the dependent variable. The goodness of fit of the overall model was examined using the model chi-square. At alpha = 0.05, the model was found to be significant at 0.000. The multivariate results above indicate that religion, secondary or higher level of education, rural place of residence, the Kamba, Kikuyu, Meru, and Other ethnic groups did not show a statistically significant effect on adolescent fertility.

Age (17-19), showed a positive association with adolescent fertility. Adolescent women 17-19 years old were found to be 5.897 times more likely to have a child born than those in the reference category aged 15-16 years old. Age was found to be significant at 0.000 when alpha is 0.05.

Adolescent women currently married showed a statistically significant positive association with adolescent fertility at 0.000 when alpha = 0.05. Currently married adolescents were found to be 9.468 times more likely to have at least one child than those who were not married. Adolescent women in the "Other marital status" category (separated, divorced, widowed), showed a statistically positive impact on adolescent

fertility at 0.000. Women in this category were 9.940 times more likely to have at least one child. Primary education level showed a positive association with adolescent fertility. The variable showed significance at 0.050 when alpha is 0.05. Adolescent women with primary level education were 1.732 times more likely to have a child than those in the reference category who did not have any education.

Ever use of any method of contraception had a statistically significant effect on adolescent fertility at 0.000. This variable had an odds ratio of 3.130. This means that women who have ever used any method of contraception are 3.130 times likely to have at least one child born than those who have never used any method. This is unexpected considering that ever use of contraception is supposed to reduce fertility. However, this could be the case due to lower user rates of contraceptive methods as well as, ineffective or temporary use of these methods.

The multivariate results also indicate that knowledge of any method has a statistically significant effect on adolescent fertility. This variable was significant at 0.043 when alpha is 0.05. Knowledge of any method showed a positive association with adolescent fertility. This, although unexpected, could be due to lower user rates or lack of access despite the knowledge of various methods. Adolescent women who knew of any method were found to be2.708 times more likely to have at least one child compared to those who did not know of any method.

Occupation, too, showed a negative and significant effect on adolescent fertility. Adolescent women in the blue-collar occupation were 0.559 times less likely to have a child than those in the white-collar occupation. Similarly those who were not working were 0.462 times less likely to have a child than those in the white-collar occupation. Mijikenda, Swahili, and Taita adolescents were 0.532 times the odds of their Luyha, Luo, and Kisii counterparts less likely to have at least one child born.

CHAPTER FIVE: SUMMARY OF THE FINDINGS, CONCLUSION AND RECOMMENDATIONS

5.0 INTRODUCTION

This chapter presents a summary of the main findings of this study on the determinants of adolescent fertility in Kenya. It also presents the conclusion, drawn from the findings and the research and policy recommendations.

5.1 SUMMARY OF THE FINDINGS

From the bivariate analysis of the independent variables – socio-economic, socio-cultural, and demographic variables - by the dependent variable of adolescent fertility performance, it is apparent that there is a statistically significant association between the independent and the dependent factor. The cross tabulation with chi-square results show that religion, ethnicity, knowledge of contraceptive methods, education level attained, occupation, current marital status, and ever use of contraceptives have a statistically significant association with adolescent fertility at 5% level of confidence. The only variable found to lack statistical significance is place of residence.

The multivariate analysis results confirmed most of the variables to have a statistically significant effect on adolescent fertility. These variables include ever use of any method of contraception, education level, knowledge of any method, ethnicity, current marital status, and not working. The variables that did not have a statistically significant effect on adolescent fertility at alpha = 0.05 were blue-collar occupation and rural place of residence. Both variables were found to have no difference in effect on

adolescent fertility as compared with their respective reference categories. The bivariate and multivariate logistic regression results indicate that age, current marital status, secondary or higher education level, ethnicity, occupation, knowledge of any method of contraception, ever use of contraceptives, and religion have a statistically significant influence on adolescent fertility.

The first objective of this study was to examine the effect of socio-economic factors of education level, knowledge of any method of contraception, and occupation on adolescent fertility performance. Consequently, three hypothesis were used to examine the effect of these factors on adolescent fertility, and these were the following:

1. Higher level of education has a negative effect on number of children ever born.
2. The adolescent's type of occupation has a negative effect on number of children ever born.
2. The adolescent's knowledge of any method of contraception has a negative effect on number of children ever born.

The bi-variate results of the adolescent fertility performance by the various socio-economic factors of education level, occupation and knowledge of any method found an association between them. The chi-square test results confirmed that adolescent fertility is dependent on the socio-economic factors of education level and knowledge of any method of contraception and occupation.

The cross tabulation with chi-square results of children ever born by education showed an inconsistent association with adolescent fertility. Women who had no education at all had fewer children ever born among them than those with primary education level although both had more children born to them individually than women who had secondary and higher level education. These results are not unique considering that other studies have found the same (Ocholla-Ayayo, 1991).

The multivariate regression analysis that considered the direct impact of the socio-economic factors found secondary and higher level of education to have an indirect negative impact on the probability of having at least one child born. Primary level education did not show a direct impact on adolescent fertility although when considered with other independent, and proximate variables this variable had a statistically significant impact at 0.050. The direct negative impact of secondary and higher level education could be explained by the longer period that women stay in school, hence, postponing marriage where most child bearing takes place. Given the foregoing logistic regression results on primary level and secondary education, we confirm that the hypothesised relationship between education and adolescent fertility.

The cross-tabulation results of adolescent fertility by occupation showed an observed association between them, and the chi-square test confirmed the association to be statistically significant. When the occupation variables were considered in the logistic regression analysis, they were found to have a significant effect on adolescent fertility.

In the bivariate analysis, occupation showed a direct negative association with adolescent fertility. In conclusion, therefore, we can state that occupation has a direct and statistically significant impact on the number of children ever born. In this regard, therefore, the hypothesised relationship is confirmed.

The other socio-economic factor considered in this study was knowledge of any method of contraception. The cross tabulation results of adolescent fertility performance by knowledge of any method of contraception showed an observed association between them. The chi-square results confirmed that adolescent fertility is dependent on knowledge of any method of contraception. The logistic regression results showed that knowledge of any method has a positive and statistically significant effect on adolescent and, therefore, confirm the hypothesised relationship.

The second objective was to examine the influence of the selected social cultural factors of religion, ethnicity, and place of residence on adolescent fertility. The study had three hypothesis related to this objective and these included the following:

1. Adolescent's religion has a negative effect on number of children ever born.
2. Fertility is lower among adolescents in the urban areas than in the rural areas.
3. The adolescent's ethnicity has a negative effect on number of children ever born.

The cross tabulation results showed that all the social-cultural variables were associated with adolescent fertility. The cross tabulation results showed that all the

social-cultural variables type of place of residence, ethnicity, and religion had an observed association with adolescent fertility. The Chi-square test confirmed that adolescent fertility is dependent on the ethnicity and religion variables. Type of place of residence did not have a statistically significant effect on adolescent fertility. The multivariate results confirmed that the type of place of residence had no statistically significant effect on adolescent fertility; thus, the hypothesised relationship between place of residence and adolescent fertility is rejected.

The multivariate analysis found that ethnicity had a negative effect on adolescent fertility. Thus, we can conclude that ethnicity has an effect on adolescent fertility, and therefore, the hypothesised relationship is confirmed.

The religion dummy variable of Christians and Muslims had a statistically significant impact on adolescent fertility in the multivariate analysis. It, therefore, confirms the hypothesised relationship that religion has a negative effect on adolescent fertility.

The third objective was to examine the impact of demographic variables of age and marital status and on whether the adolescent respondents had given birth to children. The following hypothesis were related to this objective:

1 The adolescent's age has a positive effect on the number of children ever born.

2 The adolescent's marital status has a positive effect on the number of

children ever born.

The cross tabulation results of adolescent fertility by demographic factors showed an observed association between them. The chi-square test results showed that adolescent fertility was dependent on age and current marital status. The multivariate analysis results found age to have a statistically significant effect on adolescent fertility. It exhibited a positive effect on adolescent fertility. We can, thus, conclude that age has a statistically significant effect on adolescent fertility confirming the hypothesised relationship that age has a positive effect on adolescent fertility.

Current marital status was statistically significant in the multivariate analysis. It exhibited a positive association with adolescent fertility. Current marital status, therefore, has a significant influence on adolescent fertility and hence, the hypothesised relationship with adolescent fertility is confirmed and, therefore, accepted.

The cross tabulation results of the proximate variable showed an association with the dependent variable. The chi-square test results confirmed adolescent fertility is dependent upon ever use of any contraceptive method. The logistic regression results found the dummy variable of ever use of contraception to affect adolescent fertility. Ever use of any method showed a positive relationship with adolescent fertility. However, the positive association for the ever use of contraceptives was unexpected because contraceptive use reduces the risk of conception and, thus, one would expect

a negative association. Nonetheless, this could be due to ineffective or discontinued use of contraceptives.

5.2 CONCLUSION

From the cross tabulation results above, it is clear that the selected demographic, socio-economic, and socio-cultural variables indeed have a role to play in determining adolescent fertility in Kenya because of their recorded association with adolescent fertility. The cross-tabulation with chi-square test results confirmed all the variables to be statistically significant at 0.05 level of significance, except the variable type of place of residence, which was not statistically significant.

The multivariate results confirmed the following variables to have a statistically significant effect on adolescent fertility: age, current marital status, education level, ethnicity, occupation, knowledge of any method of contraception, ever use of contraceptives, and religion.

It is, thus, concluded that adolescent fertility is determined by a complex interplay of socio-cultural, socio-economic, and demographic factors. The following are, therefore, the determinants of adolescent fertility: age, current marital status, education level, ethnicity, occupation, knowledge of any method of contraception, ever use of contraceptives, and religion.

5.3 Policy Recommendations

This study set out to examine the determinants of adolescent fertility in Kenya based on the KDHS data of 1993. The following are some suggested policy recommendations based on the findings of the study:

1. The study results showed that adolescent fertility is higher among girls who enter marital unions at an early age. To reduce adolescent fertility, this study recommends that programs that delay and discourage early marriage should be developed and enforced at the community and national levels. This could set a minimum age at marriage.
2. The study results show that adolescent girls with at least secondary school educations have lower fertility levels compared to those with less or no education at all. This study recommends the development of relevant programs to encourage girl child education with higher enrolment and retention levels especially up to at least secondary school level.

5.4 Research Recommendation

1. In this study there were some unexpected findings such as adolescents with no education having lower fertility levels than those with primary school education. Similarly, the positive association between knowledge of contraception; ever use of contraception and adolescent fertility. To get concrete explanations for these findings, similar qualitative studies at both national and sub-national levels would increase the understanding of adolescent fertility and provide policy and programmatic directions in this respect.

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