UTILIZATION OF MATERNAL HEALTH SERVICES AMONG THE YOUTH IN KENYA

BY

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DECLARATION

This project is my original work and has not been presented for the award of a degree in this or any other university

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DEDICATION

To Mama and Papa I loved you so much. Your tender care, incredible encouragement, support and charity necessitated my growth into a sound and responsible person.

ACKNOWLEGEMENT

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LIST OF ACRONYMS

TBA   Traditional Birth Attendant

KDHS   Kenya Demographic and Health Survey

NCPD   National Council for Population and Development

CEB   Children Ever Born

ICPD   International Conference on population and Development

HIV   Human Immune Virus

MDGs   Millennium Development Goals

AIDS   Acquired Immune Deficiency Syndrome

UN   United Nations

ABSTRACT

Information on utilization of maternal health services is very vital to a government that is concerned about the welfare of its citizens. The main objective of this study was to examine utilization of maternal health services among the youth in Kenya. The study population consisted of 1232 and1401 women aged 15-24 years who had utilized antenatal and delivery care services respectively covered in the KDHS conducted in 2003. The study variables were level of education, wealth index, maternal age, marital status, place of residence, region of residence, parity, contraceptive use, religion, type of delivery assistance and timing for the first antenatal care visit/check.

The technique for data analysis employed was Logistic Regression model. From cross tabulation results, it was established that there were differentials in reporting of the type of delivery assistance sought and the timing for the first antenatal care visit/check across all characteristics of women. Factors found to be significant included; highest education levels, place of residence, religion, wealth index, marital status, parity and contraceptive use. Logistic regression model showed that education, religion, place of residence, region of residence, wealth index and marital status were important determinants of whether a person used skilled delivery assistance at birth and also for early timing for the first antenatal care visit/check.

The major conclusion derived from the study findings was that although maternal health care services are available their utilization by the youth was still very low and various socio-economic, demographic and exposure to modern

health service factors influenced the youth's utilization of maternal health services. There is thus the need to increase awareness and improve on access to the services such that both rural and urban youth are able to get the services. In terms of further research, there is a need to investigate the unexplained individual and community level factors influencing delivery care and timing for antenatal care. For instance, use of skilled delivery assistance is also determined by the presence of childbirth complications, which this study did not look into. A qualitative study would therefore be particularly important in helping to understand the unexplained socio-economic aspects of delivery care and timing for antenatal care. Further studies in these areas would be useful in the formulation of effective intervention programs for appropriate delivery and antenatal care services in Kenya.

CHAPTER ONE

INTRODUCTION/BACKGROUND INFORMATION

1.1 General Introduction

Due to high levels of early childbearing in developing countries, pregnancy and childbirth are the leading causes of death among women aged 15-24. In Kenya 20% of women aged 15-24 are either pregnant or have had a birth. Senderowitz J. (1995)

The youth are at a higher risk for complications and death during first pregnancies, especially those in developing countries. Most of these health problems can be avoided with proper health care, but youth are less likely to access or have access to the appropriate providers. Some studies suggest that the youth that are involved in empowerment and development programs are significantly more likely to access health services. However, if the youth do access health care, the services often do not address their needs (e.g. judgmental providers, mistrust that providers will not maintain their confidentiality). The services need to address social and cultural biases against youth in clinical settings, youth services should have community support and the services need to be tailored to both older and younger youth.

Determinants of poor maternal and infant outcomes among young people include poverty; cultural factors that restrict women's autonomy, promote early marriage or support harmful traditional practices; nutritional deficiencies; reproductive factors such as young age at first birth; distance to health services, and inadequate health care behavior or use of services. McCarthy J and Maine D (1992) Programs to delay first births to youths would mitigate risks to maternal

and infant health associated with maternal factors such as short height, low weight and inadequate nutrition, but it is not clear how delaying first births would affect the social advantages or disadvantages of early childbearing. For example, youths who become pregnant may cut their education short because they are forced to leave school. Yet early childbearing may improve a woman's social status because in some cultures it is an important step toward marriage Magadi et al. (2000)

The youth are persons between the age of 15 and 24. This definition is used by both the United Nations and the World Bank and is applied in many statistics and indicators (Wikipedia). This study will adopt this definition of the youth.

For all women, use of health care services is a key proximate determinant of maternal and infant outcomes, United Nations (1989), including maternal and infant mortality, Das Gupta M (1996). Moreover, the benefits of health care-seeking and positive health behaviours are relatively strong in settings and subgroups where socioeconomic and public health resources are constrained. Palloni A and Millman S (1986). Timely and appropriate care can provide an opportunity to prevent or manage the direct causes of maternal mortality - hemorrhage, obstructed labour, unsafe abortion, infection and hypertensive disorders - and to reduce fetal and neonatal deaths related to obstetric complications, (Committee on Improving Birth Outcomes 2003).

Despite the benefits of maternal health care, many women in developing countries do not receive pre-natal care at all, and the care that is received is often characterized by an insufficient number of visits timed late into the pregnancy. Furthermore, the delivery care utilized in most developing countries is

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dominated by home births. Hence, high risk pregnancies (in which most teenage pregnancies fall) are often not identified, obstetric histories are ignored, opportunities for transmitting family planning messages are missed and important information on child nutrition and health care is not disseminated to a large proportion of mothers. Previous literature has documented an urban-rural dichotomy in child health and survival and the utilization of maternal health care in developing countries (Madise and Diamond 1996, Matthews and Diamond 1997, Stephenson 1998).

There is a paucity of information regarding the variations in uptake, morbidity and mortality within urban areas although some authors have noted intra-urban disparities (Sen (1994), Harpham (1998) and Timaeus and Lush (1995)). Rates of infant mortality are much higher in poorer sectors of urban areas, and although a wide range of services often exist (including free Municipal services), for most developing countries, differential utilization of maternal heath care between urban socio-economic groups is suggested. Academic attention to social factors that affect health of poor urban dwellers is relatively new. Past research has tended to focus only on their physical environment. Diversity within rural areas is even less documented, although the potential for variation in rural service use is often constrained by a lack of infrastructure (Griffiths and Stephenson 1999).

1.2   Background Information of the Study
1.2.1   The Demographic Situation

Kenya has a population of approximately 36 million of which 36% comprise of youth between the ages of 15-24 years. Youth form the fastest growing segment of the population. They are our present and our future. The young people in

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Kenya today face challenges similar to those experienced by the young people in the past. What is unique for youth today is that they have less access to good information from concerned adults to carry them through this period from childhood to adulthood. They also marry at later ages than previously. Many youth are confronted with negative influences and lack of good role models which may leave them confused or helpless. As a result, they may be influenced to experiment with drugs, crime and irresponsible sexual behaviour. The reality in Kenya today, as in the rest of the world, is that irresponsible sexual behaviour among young people could lead to high rates of HIV infection, as well as unwanted pregnancies (www.nutrition.uio).

In the past, Kenyan youth received advice and counsel on sexual matters from older relatives. The youth of today, however, get information about sexuality from mass media, peers and newspapers, resulting in mixed and possibly confusing messages. Today's youth receives little useful information about reproductive health or how to make good decisions about growing up. As families begin to live more in urban areas, leaving aunts, uncles and grandparents in the countryside, many traditional family customs are no longer being continued; the traditional manners of teaching youth about issues related to sexuality is changing. The leaders – policy makers, researchers, opinion leaders, religious leaders, teachers, and parents – now have a larger role in helping our youth grow and develop (www.nutrition.uio).

1.2.2 Utilization of Maternal and Child Health Services

Maternal and child health outcomes are greatly influenced by the quality of care during pregnancy, delivery, and after delivery. This is especially important

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under conditions of repeated childbearing by women who are in poor overall health.

Recent Kenya estimates suggest that there are 414 maternal deaths per 100,000 live births, representing a 1 in 25 lifetime risk of dying from a maternal-related cause (KDHS 2003). Hospital based studies suggest that the majority of these deaths are due to obstetric complications, including haemorrhage, sepsis, eclampsia, obstructed labour, and unsafe abortion. Unsafe abortion practices alone are thought to cause at least a third of all maternal deaths. Kenyan women's use of maternal health services is higher than in other African countries. The KDHS 2003 found that 88 percent of women make at least one antenatal care visit, 31 percent make two or three visits, and more than 52 percent make four or more visits. However, the majority of these women seek antenatal care relatively late in pregnancy; the median gestation at first visit is 5.9 months. The 2003 KDHS also showed that 52 percent of mothers received two or more doses of tetanus toxoid vaccine during pregnancy, while 34 percent received one dose. The remaining 14 percent of mothers did not receive any tetanus immunization.

Delivery within a health facility or with a skilled attendant is much less common than antenatal care. Only 42 percent of women have a skilled attendant present at delivery, while 28 percent of women deliver with a traditional birth attendant (TBA); slightly over one-fifth deliver with a relative and nearly one tenth of women deliver entirely alone. The majority of the deliveries with a skilled attendant occur in health facilities. Overall, 26 percent of all deliveries occur in public health facilities, and three out of five births occur at home (KDHS 2003).

These aggregate figures conceal wide provincial disparities, however. Delivery at home, for example, is more than twice as common in rural as in urban areas, and the proportion of births with a skilled attendant ranges from only 29 percent in Western province to 79 percent in Nairobi (KDHS 2003).

1.3   Problem Statement

Since the International Conference on population and Development (ICPD) of 1994, reproductive health has taken centre stage in population programmes of many countries including Kenya. Many governments in sub-Saharan Africa view with concern the region's continued rapid population growth, high birth rates, and escalating rates of HIV infection especially among the youth.

Well-known barriers to care for most women are due to delays in seeking care, in reaching adequate health facilities and in receiving appropriate care at facilities and these factors may be especially pronounced for youth, who may have little knowledge and experience in seeking care. In some places like rural Bangladesh, for example, family members often expect the youth to give birth at home with traditional birth attendants, and young women have little or no influence on the decision. Youth have increased risk for poor maternal and infant outcomes, and it is widely assumed that they are less likely than older women to use services.

This study tried to determine the overall utilization of maternal health services among the youth and came up with recommendations on areas of improvements that would make more youth seek these services for the benefit of their own health and that of their babies. This way, both maternal and infant mortality will be reduced and this will help the country move towards achieving the

Millennium Development Goals (MDGs) of ensuring maternal health and reducing child mortality.

1.4   Key Research Questions

i.   To what extent do the pregnant youth utilize antenatal care services?

ii.   Do they seek skilled assistance during delivery?

iii. What are the differentials in utilization of maternal and child health services: (i) among the married and unmarried youth? (ii) across their various level of educational attainment? (iii) across their regions of residence? And (iv) by place of residence – in terms of urban and rural dichotomy?

1.5   Research Objectives
OVERALL OBJECTIVE

- The aim of this study was to examine utilization of maternal health services among the youth in Kenya more specifically antenatal and delivery services

SPECIFIC OBJECTIVES

i.   To establish the extent to which pregnant youth utilize antenatal care services

ii.   To establish if the youth seeking skilled assistance during delivery

iii. To establish the differentials among the youth in utilization of maternal and child health services according to socio-economic and demographic factors

1.6 Justification of the Study

The importance of maternal health services in reducing maternal and infant morbidity and mortality has received increasing recognition since the 1994 Cairo Conference on Population and Development (Mekonnen 2003). Previous studies have shown that the uptake of Maternal Health Care (MHC) in developing countries has significant consequences for both the safe transition of the mother through pregnancy and child birth, and the survival and health of the child during early infancy (Khan 1987). Although antenatal care alone cannot prevent all obstetric emergencies (Vilar 1997), the information provided by the antenatal service provider on danger signs, diet, and planning for delivery, along with testing for anaemia, malaria and high blood pressure are important for the successful management of pregnancies and the subsequent wellbeing of the child.

Studies demonstrating the high levels of maternal mortality and morbidity in developing countries and research identifying causes of maternal deaths have repeatedly emphasized the need for antenatal care and availability of trained personnel to attend women during labour and delivery. The importance of tetanus toxoid injections given prior to birth to reduce neonatal mortality has been documented as well. In spite of the clear importance of maternal care, poor access to and low utilization of such services continue to be important determinants of mortality and morbidity throughout the world (Mekonnen 2003). Due to the increased risk of poor maternal and neonatal outcomes among the youth, there is need to investigate their utilization patterns so that appropriate measures are taken to encourage more utilization incase of underutilization. This study will try to examine the utilization of maternal health services among the youth.

1.7 Scope and Limitations

This study focused on female youths age 15-24 in Kenya interviewed during the 2003 KDHS. These are youths for whom antenatal and other maternity care services are relevant. The data will be analyzed to establish levels and differentials in utilization and their association with socio-economic, demographic and exposure characteristics of the study population.

CHAPTER TWO

LITERATURE REVIEW AND THEORETICAL FRAMEWORK

2.1   Literature review

The importance of provision and utilization of maternal health care in enhancing child survival and reducing maternal morbidity and mortality has long been recognized. Many scholars consider health care services as being very important in determining the overall mortality levels in developing countries. This importance has been illustrated by case studies of China, Kerala State of India, Sri Lanka and Costa Rica. In the recent past a number of studies have investigated the relationship between use of maternal health care and child survival.

Nag (1985) indicated that greater access and utilization of health facilities in Kerala State in India was the most important factor that placed Kerala in a better mortality position in comparison with West Bengal in India. The 1985 United Nations comparative study of effects of socio-economic factors on child mortality in Nigeria and Peru (the only two countries that had appropriate data on health care) indicated that both access and utilization of health services were positively associated with child survival. Other studies show that the use of health services is positively associated with child survival. Ewbank and Gribble (1993) argued that the provision and utilization of health services was one of the factors closely associated with the decline in infant and child mortality in sub-Saharan Africa. A study carried out in Addis Ababa, Ethiopia, in 1981-83 indicate that maternal mortality for women who had received antenatal care was significantly lowered than that for women who had not received any antenatal care (Ikamari 2004).

Determinants of poor maternal and infant outcomes include poverty; cultural factors that restrict women's autonomy, promote early marriage or support harmful traditional practices; nutritional deficiencies; reproductive factors such as young age at first birth; distance to health services, and inadequate health care behavior or use of services. Pregnant youth are disproportionately affected by these factors. Programs to delay first births to adolescents would mitigate risks to maternal and infant health associated with maternal factors such as short height, low weight and inadequate nutrition, but it is not clear how delaying first births would affect the social advantages or disadvantages of early childbearing. For example, youth who become pregnant may cut their education short because they are forced to leave school. Yet early childbearing may improve a woman's social status because in some cultures it is an important step towards marriage (Magadi et al. 2000).

Antenatal care can improve certain outcomes through the detection and management of and referral for potential complications, although such care has not been shown to reduce rates of maternal mortality. Evidence from developed countries suggests that adequate antenatal care may improve birth weight. Antenatal care can also prevent, identify and treat iron deficiency and anaemia in young mothers; severe anaemia has been linked to maternal and child mortality. Furthermore, women who are pregnant for the first time-including most pregnant youth-are more susceptible than women with higher-order pregnancies to malarial parasitic infection, which is associated with anaemia, abortion, stillbirth, premature birth and low birth weight. Antenatal care is an appropriate venue for the primary prevention of malaria (through providers' counseling and the use of bed nets or chemoprophylaxis) or prompt diagnosis and treatment. Care during pregnancy can provide an entry into the health system, and for

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adolescents in particular, such care may be one of the first comprehensive health assessments they receive. The provision of antenatal care also presents an opportunity to teach adolescents how to recognize and respond to the signs of obstetric complications (Magadi et al. 2000).

Delivery services, especially emergency obstetric care, are also critical for pregnant women. Emergency care is important if the young people experience obstructed labour, pregnancy-induced hypertension, eclampsia or severe untreated anaemia. Obstructed or prolonged labour is one of the more serious complications that can cause maternal morbidity and death, and the youth appear to be at higher risk than are older women, because their pelvic bones and birth canals are not completely developed. Obstetric care can also prevent or treat complications that affect the neonate, such as birth asphyxia.

The postpartum period is a critical time for mother and newborn. However, few data are available to assess whether the youth use postpartum care. Data are also scarce on postpartum care use for the mother's health, but those that do exist suggest that coverage is low. Demographic and Health Survey (DHS) data document postpartum care for women who did not deliver in health facilities; for women who did, the surveys assume that both mothers and infants received some care. For the infant, immunizations are one of the most cost-effective interventions to reduce vaccine-preventable diseases.

Delays in seeking care, in reaching adequate health facilities and in receiving appropriate care at facilities are well-known barriers to care for all women, and these factors may be especially pronounced for youth, who may have little knowledge and experience in seeking care. In some places-rural Bangladesh, for

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example-family members often expect the youth to give birth at home with traditional birth attendants, and young women have little or no influence on the decision.

2.1.1 Socio-economic and Demographic factors associated with poor Maternal Health

Use of Family Planning Services

High rates of maternal mortality in the developing world reflect not only the poor health status of these women but also the large number of pregnancies. Thus, the number of women dying can be lowered both by reducing the risk associated with pregnancy and by reducing the number of unwanted pregnancies through the wider use of family planning. Deborah Maine of Columbia University's Centre for Population and Family Welfare analyzed data from the World Fertility survey to estimate that maternal deaths in many developing countries would be reduced by 25 to 40 percent if all women who explicitly say that they want no more children were using a contraceptive method. World Fertility Survey estimates that some 300 million couples around the world would like to postpone pregnancy or to avoid it altogether, but have no access to family planning services. (Starrs 1987)

Maternal Age

Some groups of women are more susceptible to death or disability from pregnancy and pregnancy related illness. Young people under the age of 15 are 5-7 times more likely to die in pregnancy and childbirth than women in the lowest risk age group of 20-24. Girls under age 15 have narrow pelvises to allow easy passage of an infant. They then suffer from obstructed labour and develop fistulae or die after 24, 48 or even 72 hours of agony.

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Women who have had 5 or more pregnancies and women over the age of 35 also face a substantially higher risk than those aged 20-24. Women who become pregnant less than 2 years after a previous birth often suffer adverse consequences as well, their children are also more likely to be ill and die than infants who are born more than 2 years apart. Health professionals therefore advice women to avoid pregnancies, "too early, too late, too many, too close together" (Starrs 1987).

Maternal Education

Studies have found that education give women self-esteem, making them better service-users, and enhancing their ability to communicate effectively with health workers (Checkley et al. 2004). Similarly, negotiating and problem-solving skills might are reinforced vicariously through cultural involvement, and cultural capital provide mothers with self-efficacy, making them better health service-users when their children are sick. Low-income women often held the perception that physicians did not always listen to them (Kilpelainen et al. 2001) and maternal cultural capital might have improved communication. Since communication between physician and patient is especially important in increasing compliance (Winnick et al. 2005), child health is enhanced both because physicians better understood the complaints presented by mothers and because mothers may follow instructions more closely.

Timing and frequency of antenatal care

It has been argued that some of the poor pregnancy outcomes and complications of high-risk women are as a result of lack of antenatal care. Llewellyn-Jones (1974) asserts that lack of antenatal care, rather than biological inefficiency may be responsible for complications such as pre-eclampsia, anaemia and low birth

weight among teenage and unmarried mothers. However, there is no doubt that pregnancies of very young or older mothers have increased risks for both the mother and the baby (Anandalakshmy *et al.*, 1993; Miller *et al.*, 1996).

Demographic factors have also been observed to play an important role in terms of antenatal care utilization. Mothers aged below 18 years were less likely to have routine antenatal check-up, while first order pregnancies were more likely to receive routine antenatal check-up (Bhatia and Cleland, 1995). The desirability of a pregnancy is another important determinant of the use of maternal health services. Pregnancies which are mistimed or not wanted are associated with irregular and later antenatal care visits than pregnancies which are conceived at the time that a woman wanted the pregnancy (Weller *et al.*, 1987; Joyce and Grossman, 1990).

Delivery care

Appropriate care during delivery is important for the health of the mother and the newborn, especially in cases where childbirth complications develop. Although the majority of deliveries have no complications, sometimes sudden and unpredictable complications may arise, requiring urgent medical attention. It is estimated that 40% of pregnancies world-wide develop complications, 15% as life-threatening emergencies (Graham and Murray, 1997). The birth outcomes under such circumstances are greatly improved if the complications occur in the presence of a qualified attendant and in a medical facility with necessary equipment and supplies to adequately manage the complications.

Frequency of Antenatal care visits

The frequency of antenatal care visits is also influenced by the accessibility of antenatal care services within a community. As expected, an increase in distance or time to the nearest health facility is associated with fewer antenatal visits. The results of a study done by Magadi et al. also suggest some correlation between frequent use of antenatal care and ever use of modern family planning methods. The demographic factors observed to be important include marital status, the length of the preceding birth interval, and the age of the mother at first birth. Single women, and those who started childbearing before 20 years of age attended fewer antenatal sessions than married mothers or those who started childbearing on or after 20 years of age. (Magadi et al. 2000)

Desirability of a Pregnancy

Another important variable is the desirability of a pregnancy. Compared to women whose pregnancies were wanted ('wanted then'), women who stated that their pregnancies were unwanted ('wanted no more') or were mistimed ('wanted later') had an average of 0.41 and 0.21 fewer antenatal visits during pregnancy, respectively. Also, women desiring a large family size had fewer antenatal visits on average: women whose ideal family size was 7 children or more had an average of 0.4 fewer antenatal health care visits than those whose ideal family size was three children or less.

Social stigma and Poor Treatment by Providers

If young people are embarrassed to be seen at clinic or worried about lack of privacy and confidentiality, they may not eek care. At time, young women may be afraid of medical procedure such a pelvic examination. (Barker 2000). Young people may also feel uncomfortable discussing their reproductive health need

with parent or provider, particularly if providers are unfriendly. Cultural and religious biases may make provider reluctant to give reproductive health information and contraception to young people, especially unmarried women. Case studies in Africa have shown that young people who approach clinic for care are often berated, denied information or given misinformation, or turned away because staff object to addressing young people's reproductive health concern (Abdool Karim et al. 1992). Many providers have had little training or experience in meeting young people's special reproductive health need and are ill equipped to save them.

Policy Barriers

Despite international consensus regarding young people's right to reproductive health service and information, they are often excluded from national health policies. Some countries have restrictive legal policies, while others have more positive ones that may not be well known by providers or educators. Policies concerning youth reproductive health need to be clarified and more widely disseminated to providers, managers, policymakers, and young people and further research I needed to determine what legal policies make a difference (Barnett and Katz 2000).

2.2   Theoretical Framework

2.2.1   Conceptual Framework explaining Utilization of Maternal Health Services

Kroeger (1983) identified two broad frameworks for analyzing health seeking behaviour. The pathway model that use qualitative methods of investigation is anthropological. The method identifies a sequence of steps from recognition of

complications to use of health facilities and social and cultural steps that affect the sequence. The model that is used by the study assumes that information leads to use of health services. The operational framework assumes that socio-economic, demographic and exposure factors have an effect on utilization of maternal health services.

A Conceptual Framework for Utilization of Maternal Health Services

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┌─────────────────────────┐
│ Socio-economic Factors  │─────────────┐
└─────────────────────────┘             │
                                        │      ┌──────────────────────────┐
┌─────────────────────────┐             │      │ Utilization of maternal  │
│ Demographic Factors     │─────────────┼─────▶│ Health Services          │
└─────────────────────────┘             │      └──────────────────────────┘
                                        │
┌─────────────────────────┐             │
│ Exposure to Modern      │─────────────┘
│ Health Services         │
└─────────────────────────┘
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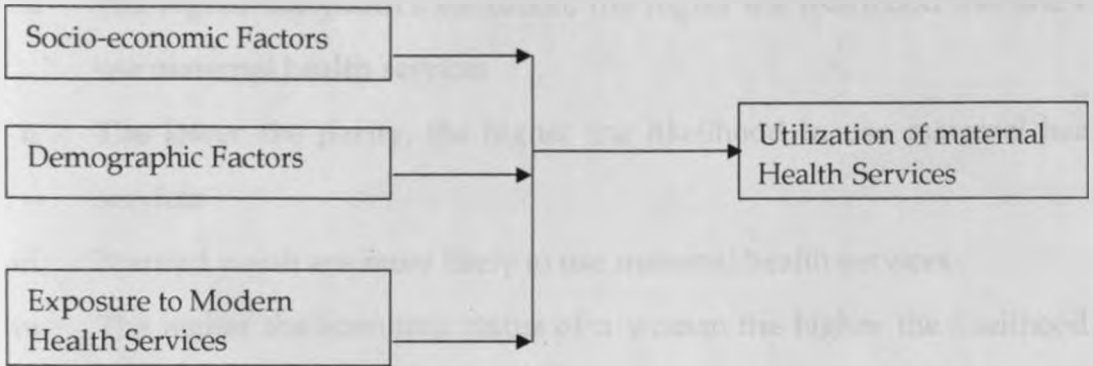
2.2.2 Conceptual Hypothesis

A range of socio-economic, demographic and exposure factors act with one another to influence the use of maternal health services among the youth

2.2.3 Operational Framework
An Operational Framework for Utilization of Maternal Health Services

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┌──────────────────────────────────┐
│ Socio-economic Factors           │──────────┐
│                                  │          │
│   • Maternal education           │          │
│   • Wealth Index                 │          │
│   • Place of Residence           │          │
│   • Region of Residence          │          │
└──────────────────────────────────┘          │     ┌──────────────────────────┐
                                               │     │ Utilization of maternal  │
                                               │     │ Health Services          │
┌──────────────────────────────────┐          │     │   • Timing for the first ANC
│ Demographic Factors              │          │     │     visit/check          │
│   • Maternal Age                 │──────────┼────▶│   • Assistance during    │
│   • Total Children Ever Born     │          │     │     delivery             │
│   • Marital Status               │          │     └──────────────────────────┘
└──────────────────────────────────┘          │
                                               │
┌──────────────────────────────────┐          │
│ Exposure to Modern               │          │
│ Health Services                  │          │
│   • Ever use of modern           │──────────┘
│     methods of family            │
│     planning                     │
└──────────────────────────────────┘
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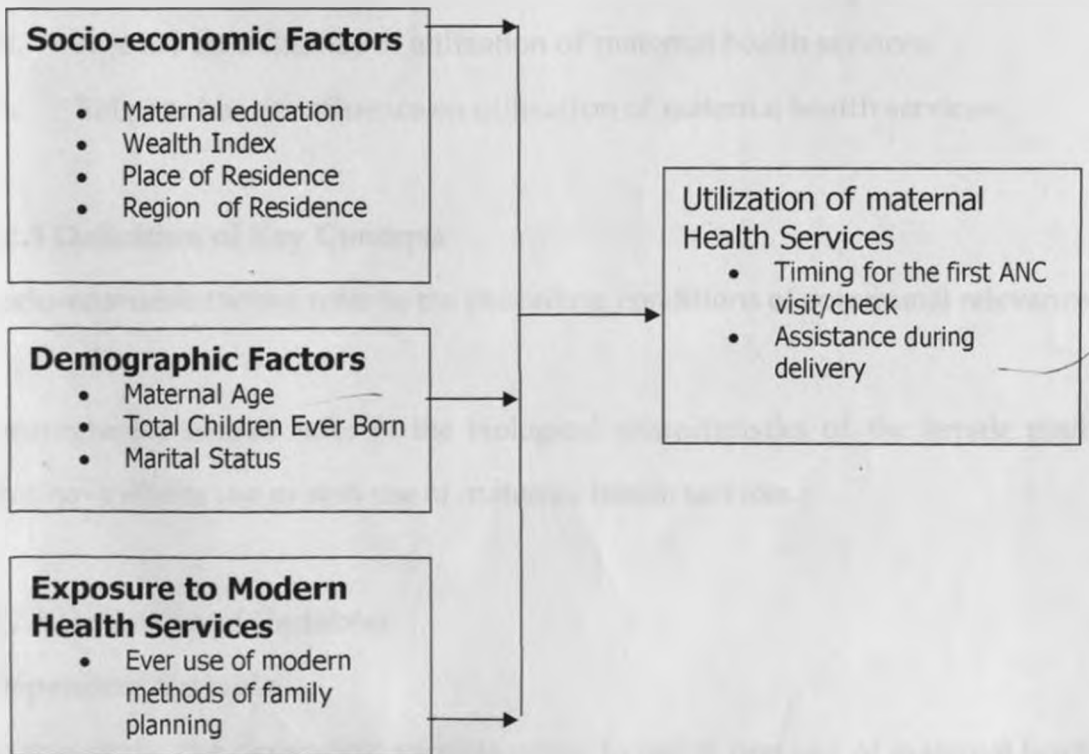
2.2.4 Operational Hypothesis

    i.   The higher the youth's education, the higher the likelihood that she will use maternal health services

    ii.   The lower the parity, the higher the likelihood to use maternal health services

    iii.   Married youth are more likely to use maternal health services

    iv.   The higher the economic status of a woman the higher the likelihood to use maternal health services

    v.   Women who have ever used modern methods of family planning are more likely to utilize maternal health services

    vi.   Type of place of residence has an influence on utilization of maternal health services

    vii.   The region of residence has an influence on utilization of maternal health services

    viii.   Age has an influence of utilization of maternal health services

    ix.   Religion has an influence on utilization of maternal health services

2.2.5 Definition of Key Concepts

Socio-economic factors refer to the prevailing conditions of communal relevance.

Demographic factors refer to the biological characteristics of the female youth that have effects use or non use of maternal health services.

2.2.6 Definition of Variables

Dependent Variable

In this study, the dependent variable refers to use or non use of maternal health services. Maternal health care utilization will be measured by; assistance during

delivery and timing of the first antenatal check for pregnancy. This variable will have two main categories; non-use and use accorded values 1 & 2 respectively.

Independent variables

Educational level represents the highest level of formal schooling attained by the respondent and the spouse. The categories will be; no education, primary education, secondary education and above.

Place of residence refers to the place where the respondent was at the time of the interview, categorized mainly as rural and urban.

Region of residence refers to the province where the respondent was at the time of the interview.

Religion refers to the religious group to which the respondent was affiliated to at the time of the survey.

Age refers to the number of completed years lived by the respondent and will be grouped into 15-19 and 20-24 years.

Marital status refers to the state of union that persons were involved in at the time of the interview. 3 categories will be included in this study; never married, married & other.

CHAPTER THREE

METHODOLOGY

3.1 Data Source

This study used data from the 2003 KDHS which was a nationally representative survey of 8195 women age 15-49 years and 3578 men aged 15-54 years. A sample of 3530 who are youth aged 15-24 was be used in the study.

3.2 Sampling Design

The 2003 KDHS covered the entire country including the 7 sparsely populated northern districts. A two stage stratified sampling approach was utilized and the first stage involved sampling of clusters and the second stage involved selecting of households within sampled points from a list compiled during a KDHS household listing exercise.

3.3 Questionnaire

The survey had three kinds of questionnaires; the household questionnaire, the women's questionnaire and the men's questionnaire. All women aged 15-49 were targeted for the interviews in the selected households. Information collected include, background characteristics, reproductive history, knowledge and use of family planning methods, antenatal and delivery care, breast feeding and weaning practices, vaccination and health of children under age 5, marriage fertility preferences, husbands background and respondents work status and awareness of HIV/AIDS. For the purpose of this study, data relating to utilization of maternal and child health services among the youth (15-24) years will be used.

3.4 Data Quality

Non-sampling errors and sampling errors are two types of errors that affect estimates from sample surveys. Non-sampling errors may result from

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shortcomings in data collection and data processing, such as data entry errors, failure to interview the right household or misinterpretation of the questions. Non-sampling errors are difficult to avoid and to evaluate statistically. Sampling errors are a measure of the variability between all possible samples. The degree of variability although not known, can be estimated from the survey results. A sampling error can be measured in terms of the standard error for a particular statistic, which is the square of the root of variance. The standard error can be used to calculate confidence intervals within which the true value of the population can reasonably be assumed to fall. Overall, the KDHS data is of relatively high quality for the analysis of utilization of maternal and child health services. The general standard errors for most estimates for the country as a whole are small except for the estimates of very small proportions (NCPD et al 1999).

3.5 Methods of Data Analysis
3.5.1 Logistic Regression Analysis

Standard logistic regression will be applied to assess the effect of factors said to be associated with utilization of maternal health services. Logistic regression analysis has been chosen because the dependent variable (utilization of maternal health services) is dichotomous. Furthermore the use of a dichotomous dependent variable in logistic regression analysis refocuses the analysis from examining in general the non-use versus use. The explanatory variables under study are also categorical, calling for the application of logistic regression model.

3.6 Variables and their Measurements

Past studies showed that these variables were important explanatory variables of utilization of maternal health services. They are as follows; marital status, place of residence, maternal age, level of education, region of residence, type of

prenatal care provider, type of delivery assistance, tetanus toxoid immunization, number of antenatal care visits, timing for first antenatal care visit and type of place of delivery.

Variable Name	Measurement	Type of Variable
Marital status	1=Never married	Independent
	2=Ever married	
Place of residence	1=Urban	
	2=Rural	Independent
Respondents age	1=15-19	
	2=20-24	Independent
Education	1=No education	
	2=Primary	
	3=Secondary	
	4=Higher +	Independent
Region residence	1=Nairobi	
	2=Central	Independent
	3=Coast	
	4=Eastern	
	5=Nyanza	
	6=Rift Valley	
	7=Western	
	8=North Eastern	
Type of delivery assistance	1=Else	Dependent
	2=Doctor/nurse	
Timing for first antenatal Care visits	1= (1st Trimester checks) Early	Dependent
	2= (2nd & 3rd Trimester checks) Late	
Exposure to modern health services	1=Never used	Independent
	2=Ever use	
Parity/total CEB	1=1	
	2=2-3	
	3=4+	
Wealth Index	1=Low status	Independent
	2=Middle status	
	3=Upper status	

CHAPTER FOUR

DESCRIPTION OF CHARACTERISTICS OF STUDY POPULATION

4.1   Introduction

This chapter presents descriptions of the characteristics of the study population. The analysis and interpretations was based on the sample of 1401 women aged 15-24 who had births in the period of the 2003 Kenya Demographic Health Survey. This section addresses the objectives of establishing the extent to which the pregnant youth utilize antenatal care; establish if youth seek skilled assistance during delivery and establish the differentials among the youth according to socio-economic, demographic and by exposure to modern health services. Utilization of maternal health services refers to a score derived from information on whether the respondent reported use of antenatal care and delivery services.

4.2   Background characteristics of the respondents

The number of youth (15-24) interviewed during the 2003 KDHS were 3530, however those who had utilized antenatal care were 1232 and it is only this number that were considered for analysis in determining their timing for the first antenatal care visit/check.

4.2.1 Timing for the first Antenatal Care Visit (ANC)

Table 4.1 Percentage distribution of respondents by background characteristics

Characteristic	Number (n)	Percentage
Timing for first ANC visit		
Early	162	13.1
Late	1070	86.9
Maternal age		
15-19	286	23.2
20-24	946	76.8
Marital status		
Ever married	1024	83.4
Never married	204	16.6
Education		
No education/pre-school	129	10.5
Primary	844	68.5
Secondary	259	21.0
Place of residence		
Urban	380	30.8
Rural	852	69.2
Contraceptive use		
Use	335	27.4
Non use	887	72.6
Religion		
Roman Catholic	305	24.8
Protestant/Other Christians	758	61.7
Muslim	126	10.3
No religion/other	40	3.3
Region of residence		
Nairobi	138	11.2
Central	176	14.3
Coast	143	11.6
Eastern	139	11.3
Nyanza	194	15.7
Rift Valley	234	19.0
Western	183	14.9
North Eastern	25	2.0
Wealth Index*		
Low	376	43.7
Medium	149	17.3
High	335	39.0
Missing		
Parity (CEB)		
1	688	55.8
2-3	502	40.7
4+	42	3.4
Total (n)	1232	100%

Again when interviewed concerning their timing for the first antenatal care visit, women of parity one formed the majority of the respondents with a 55.8% of the total number interviewed saying they went for early visits while those of between parity 2-3 were 40.7% and their numbers significantly declined with an increase in parity such that those of parity four and above were only 3.4%. When we look at the respondents by their levels of education, a majority of the respondents had primary education and they constituted 68.5% of the youth interviewed, followed by those with secondary education who were 19.4%, those with no education/pre-school were 10.5% while those with higher education were the least with a percentage of 1.6. When we looked at their marital status, respondents who were ever married constituted the majority with 83.4% while those who were never married were 16.6%.

The distribution of the respondents by wealth index revealed that most of them were in the low wealth index and they accounted for 43.7% of those interviewed, those in the medium and high wealth indexes were 17.3 and 39.0 percent respectively. The distribution of the respondents according to maternal age saw us come up with two age groups all classified as the youth, those aged 15-19 accounting for 23.2% while the majority who accounted for 76.8% were those aged 20-24. When classified by place of residence, majority of the youth were found to be in the rural areas and this group accounted for 69.2% of the study population, while those in urban areas were 30.8%.

Among the youth, the dominant religion was the protestant/other Christian and they accounted for 61.7%, Catholic came in second with a percentage of 24.8%, the Muslims were 10.3% while those who reported to be belonging to no religion were 3.0% while the rest were grouped as others and they accounted for 0.2% of

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the population. The distribution of the respondents by region of residence revealed that most of the respondents were from Rift Valley with 19.0%, followed by Nyanza with 15.7%, then Western with 14.9% and closely followed by Central which had 14.3%, then Coast with 11.5%, Eastern with a percentage of 11.3, then Nairobi with 11.2% and lastly North Eastern had the least with 2.0% of the respondents. When asked about use of contraceptives because the services are usually offered in the Maternal and Child health/Family Planning department and given that this can influence timing for antenatal care, 72.6% reported not to have use any method of family planning wile only 27.4% had used the services. Out of the 1232 youth who went for antenatal care services, only 13.1% sought the services early while a majority of them, who constituted 86.9% went for antenatal care services late, meaning in their second and third trimester (between 4-9 months).

4.2.2   Delivery assistance

The number of youth (15-24) interviewed during the 2003 KDHS were 3530, however the question of utilization of maternal health services was addressed to those who had given birth and they were 1401. There were 1401 births among the respondents aged 15-24 and this formed the basis of this analysis. Table 4.1 below gives the distributions of study population according to delivery assistance received, number of antenatal care visits, maternal age, marital status, place of residence, region of residence, religion, wealth index and parity. As shown in Table 4.1 below, when interviewed concerning seeking of delivery assistance at birth, women of parity one formed the majority of the respondents with a 54.6% of the total number interviewed while those of between parity 2-3 were 41.3% and their numbers significantly declined with an increase in parity such that those of parity four and above were only 4.1%.

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When we look at the respondents by their levels of education, a majority of the respondents had primary education and they constituted 66.3% of the youth interviewed, followed by those with secondary education who were 18.0%, those with no education/pre-school were 14.2% while those with higher education were the least with a percentage of 1.2. When we looked at their marital status, respondents who were ever married constituted the majority with 83.3% while those who were never married were 16.7%.

The distribution of the respondents by wealth index revealed that most of them were in the low wealth index and they accounted for 44.8% of those interviewed, those in the medium and high wealth indexes were 17.0 and 38.2 percent respectively. The distribution of the respondents according to maternal age saw us come up with two age groups all classified as the youth, those aged 15-19 accounting for 24.3% while the majority who accounted for 75.7% were those aged 20-24. When classified by place of residence, majority of the youth were found to be in the rural areas and this group accounted for 70.4% of the study population, while those in urban areas were 29.6%.

Table 4.2 Percentage distribution of respondents by background characteristics

Characteristic	Number (n)	Percentage
Delivery assistance		
Doctor/nurse	623	44.5
else	778	55.5
Maternal age		
15-19	341	24.3
20-24	1060	75.7
Marital status		
Ever married	1167	83.3
Never married	234	16.7
Education		
No education/pre-school	199	14.2
Primary	929	66.3
Secondary+	273	19.5
Place of residence		
Urban	415	29.6
Rural	986	70.4
Contraceptive use		
Use	356	25.6
Non use	1034	74.4
Religion		
Roman Catholic	331	23.7
Protestant/Other Christians	831	59.4
Muslim	191	13.7
No religion/other	45	3.2
Region of residence		
Nairobi	147	10.5
Central	189	13.5
Coast	159	11.3
Eastern	152	10.8
Nyanza	218	15.6
Rift Valley	263	18.8
Western	195	13.9
North Eastern	78	5.6
Wealth Index*		
Low	443	44.8
Medium	168	17.0
High	377	38.2
Missing	413	
Parity (CEB)		
1	765	54.6
2-3	578	41.3
4+	58	4.1
Total (n)	1401	100%

either in their second or third trimester. The bivariate results show that age is not associated with use of delivery services.

When education was looked at by timing for the first ANC visit/check, the results revealed that timing for the first ANC visit/check decreased with the level of education, particularly for those with secondary and primary education, while it was high among those with no education and higher education. For instance, 27.1% of those with no education went for early ANC checks/visits as opposed to only 10.5% who had secondary education. For those with higher education, 25.0% had gone for early ANC visits/checks while for those with primary education, only 11.5% went for early ANC checks/visits. Timing for the first ANC check/visit was lowest among those with secondary education and 89.5% of them had gone for late checks/visits, while for those with primary education, 88.5% had also gone for late checks/visits. Again those with no education and higher education each accounted for 72.9 and 75.0 percent respectively. The Chi-square results show that education is strongly associated with use of skilled assistance during delivery. The hypothesis that there exists an association between education and timing for the first antenatal care visit/check is thus confirmed.

There were wide regional variations in regard to timing for the first ANC check/visit, with North Eastern province having the highest number of those who went for early checks, with a 32.0% then followed by Coast with 20.3%, Rift Valley 15.0%, Nairobi 13.0%, Central 12.5%, Western with 11.5% and closely followed by Nyanza with 11.3% and the region that had

Table 4.3 Distribution of study variables by timing for first ANC visit

Characteristic	Early	Late	Number (n)
Maternal age			
15-19	37	249	286
20-24	125	821	946
X² = 0.15 df =1 Sig. =0.904			
Marital status			
Ever married	141	887	1028
Never married	21	183	204
X² = 1.745 df =1 Sig. =0.186			
Education			
No education/pre-school	35	94	129
Primary	97	747	844
Secondary+	30	229	259
X² = 24.668 df =2 Sig. =0.000			
Place of residence			
Urban	58	322	380
Rural	104	748	852
X² = 2.150 df =1 Sig. =0.143			
Contraceptive use			
Use	46	289	335
Non use	115	772	887
X² = 0.125 df =1 Sig. =0.724			
Religion			
Roman Catholic	36	269	305
Protestant/Other Christians	90	668	758
Muslim	29	97	126
No religion/Other	6	34	40
X² = 12.462 df =3 Sig. =0.006			
Region of residence			
Nairobi	18	120	138
Central	22	154	176
Coast	29	114	143
Eastern	7	132	139
Nyanza	22	172	194
Rift Valley	35	199	234
Western	21	162	183
North Eastern	8	17	25
X² = 23.898 df =7 Sig. =0.001			
Wealth Index			
Low	40	336	376
Medium	17	132	149
High	47	288	335
X² = 1.996 df =2 Sig. =0.369			
Parity (CEB)			
1	92	596	688
2-3	63	439	502
4+	7	35	42
X² = 0.643 df =2 Sig. =0.725			

the least percentage for timing for the first ANC care visit/check was Eastern with only 5.0%. The chi-square results show there is a significant association between region of residence and the type of delivery assistance sought. This confirms the hypothesis that there is an association between region of residence and the timing for the first ANC care visit/check.

In terms of religion and timing for the first antenatal care visit/check, the Muslims had the highest percentage of those who went for early visits/checks with 23.0%, the other religion were those who said they belonged to no religion/others with 15.0%, Protestants were 11.9% and the Roman Catholics had the least number going for early visits/checks with 11.8%. For those who went for late visits/checks, 88.2% were Roman Catholics, 88.1% were Protestants, 85.0% belonged to no religion/other while the Muslims had 77.0%. The chi-square test reveals a significant association between religion and the timing for the first ANC visit/check. This then confirms the hypothesis that religion is associated with timing for the first antenatal care visit/check.

Table 4.4 shows the distribution of various background variables by use of delivery assistance. The results reveal that the use of skilled delivery assistance is very low among the youth with only 44.0% of those aged 15-19 using the services of either a doctor or a nurse, while another 44.6% of those between the ages of 20-24 used the services of either a doctor or a nurse during delivery. A majority of the youth 56.0%, between the ages of 15-19 used either a Traditional Birth Attendant (TBA) or a relative to assist them during delivery.

Table 4.4 Distribution of study variables by delivery assistance

Characteristic	Doctor/nurse	Else	Number (n)
Maternal age			
15-19	150	191	341
20-24	473	587	1060
$X^2 = 0.042$ df =1 Sig. =0.838			
Marital status			
Ever married	490	677	1167
Never married	133	101	234
$X^2 = 17.406$ df =1 Sig. =0.000			
Education			
No education/pre-school	36	163	199
Primary	441	518	929
Secondary	160	92	252
$X^2 = 100.314$ df =2 Sig. =0.000			
Place of residence			
Urban	266	149	415
Rural	357	629	986
$X^2 = 91.998$ df =1 Sig. =0.000			
Contraceptive use			
Use	214	142	1034
Non use	403	631	356
$X^2 = 47.932$ df =1 Sig. =0.000			
Religion			
Roman Catholic	174	157	331
Protestant/Other Christians	381	450	831
Muslim	47	144	191
No religion/Other	19	26	45
$X^2 = 40.044$ df =3 Sig. =0.000			
Region of residence			
Nairobi	95	52	147
Central	134	55	189
Coast	53	106	159
Eastern	69	83	152
Nyanza	99	119	218
Rift Valley	104	159	263
Western	57	138	195
North Eastern	12	66	78
$X^2 = 133.408$ df =7 Sig. =0.000			
Wealth Index*			
Low	182	261	443
Medium	79	89	163
High	173	204	377
Missing	249		
$X^2 = 2.697$ df =2 Sig. =0.260			
Parity (CEB)			
1	428	337	765
2-3	188	390	578
4+	7	51	58
$X^2 = 98.861$ df =2 Sig. =0.000			

When education was looked at by use of skilled delivery assistance, the results revealed that the use of skilled delivery assistance increased with the level of education, particularly those with higher and those with no education. For instance, 76.2% of those with higher education received skilled assistance during delivery as opposed to only 18.1% who had no education. 81.9% of those with no education either received assistance from a relative or a TBA while only 23.8% of those with higher education utilized the services of either a TBA or a relative during delivery. Of those with primary education, 44.2% had used the services of either a doctor or a nurse while 55.8% used the services of either a TBA or a relative during delivery. When considering those with secondary education, 63.5% said they had used the services of either a doctor or a nurse while 36.5% had received the assistance of a TBA or a relative during delivery. The Chi-square results show that education is strongly associated with use of skilled assistance during delivery. The hypothesis that there exists an association between education and type of delivery assistance sought is thus confirmed.

In terms of place of residence, the results of the table above show that majority of the youth in urban areas sought skilled assistance at delivery compared to their counter parts in rural areas. For instance, 64.1% of the urban residence received skilled delivery assistance (from either a doctor or nurse) compared to only 36.2% of their counter parts in rural areas. However, a significant proportion of the youth, 63.8% in rural areas used unskilled assistance (TBA or relative) compared to only 35.9% in urban areas. The Chi-square tests show there is a relationship between the place of residence and the type of delivery assistance sought.. The hypothesis that there is an association between place of residence and the type of delivery assistance sought is therefore confirmed.

There were wide regional variations in regard to the type of assistance sought during delivery. The provinces which had the highest number of youth seeking skilled assistance during delivery were; Central 70.9%, Nairobi 64.6%, the rest with the least numbers seeking delivery assistance were; Nyanza and Eastern tying at 45.4%, Rift Valley at 39.5%, then Coast, Western and North Eastern with 33.3%, 29.2% and 15.4% respectively. Out of the regions of residence, North Eastern had the highest percentage, 84.6% of those who received unskilled delivery assistance (TBA or relative) followed by Western with 70.8%, Coast with 66.7%, Rift Valley 60.5%, Nyanza and Eastern both had 54.6%, then they were followed by Nairobi and Central with the least numbers of those seeking unskilled assistance during delivery, they had 35.4% and 29.1% respectively. The chi-square results show there is a significant association between region of residence and the type of delivery assistance sought. This confirms the hypothesis that there is an association between region of residence and the type of delivery assistance sought.

With regard to use of modern family planning method, 60.1% of the respondents who reported having used a modern family planning method sought skilled assistance during delivery while only 39.0% of those who had not used a modern family planning method had used skilled assistance at delivery. On the contrary only 39.9% of those who had used family planning used unskilled assistance during delivery while 61.0% of those who had not used any family planning method used unskilled assistance during delivery. The chi-square results show that there is a significant association between use of family planning and the type of assistance sought during delivery. The hypothesis that use of family planning has an association with the type of delivery assistance sought is thus confirmed.

With regard to marital status, 56.8% of those who were never married received skilled assistance during delivery while only 42.0% of those who were married received skilled assistance. On the contrary, 58.0% of those married received the services of either a TBA or a relative during delivery while only 43.2% of those never married received unskilled assistance. This can be explained by the fact that those who are married have relatives around them who can assist them during delivery and are more likely to be influenced by the husband's relatives on the type of delivery assistance to seek. The chi-square test reveals a significant association between marital status and the type of delivery assistance sought by the youth. The hypothesis that there exists an association between the marital status and the type of delivery assistance sought is thus confirmed.

When looked at in terms of parity of the respondents, 55.9% of those with parity one had sought skilled assistance during delivery and this decreased with the increase in parity with fewer of those with higher parities seeking less skilled assistance during delivery. 87.9% of those with parity 4 and above sought the assistance of unskilled assistance (TBA or relative) during delivery those who were between the parity two to three also had a bigger percentage seeking unskilled assistance during delivery, and they were 67.5%. The chi-square test reveals a significant association between one's parity and the type of delivery assistance sought. This then confirms the hypothesis that the lower the parity, the higher the likelihood to use maternal health services.

In terms of religion and delivery assistance, the Roman Catholics had the highest percentage of 52.6 of those who sought skilled delivery assistance, followed by the Protestants/other Christians, those belonging to no religion/others with 42.2% and lastly Muslims who had 24.6%. Again Muslims were the leading with those

who sought unskilled assistance during delivery at 75.4%, then those with no religion/others with 57.8%, the Protestants/other Christians with 54.2% and the Roman Catholics with 47.4%. The chi-square test reveals a significant association between religion and the type of delivery assistance sought. This then confirms the hypothesis that religion is associated with delivery assistance sought. Since most of the variables account for significant variations in utilization of maternal health services among the youth, this study will go further to establish the effect of each of the independent variables on utilization of maternal health services.

CHAPTER FIVE

UTILIZATION OF MATERNAL HEALTH SERVICES AMONG THE YOUTH

5.1   Introduction

In this chapter logistic regression analysis has been used to estimate the likelihood of use of a specific form of maternal health care service given a set of socio-economic, demographic and exposure to use of modern family planning services. This method is used since the dependent variables are dichotomous. The dependent variables were; the type of delivery assistance sought which was measured as either doctor/nurse and else (relative/TBA) and timing for the first antenatal care visit/check which was measure as either early (when the timing was within the first trimester of pregnancy) and late (services were sought during the second and third trimester of pregnancy).

5.2   Timing for the first Antenatal care check/visit

Antenatal care is most beneficial when it is sought early in pregnancy and is continued throughout a pregnancy. The first antenatal visit should take place before the third month of pregnancy. The advantage of early detection of pregnancy is that a woman's normal baseline health status can be assessed; knowledge of a woman's baseline health will make early diagnosis of any abnormalities easier.

5.2.1   Factors influencing timing for the first antenatal care

Timing for the first antenatal care visit/check was measured as either early, for those who sought it during their first trimester and late for those who sought the services during the second and third trimesters of pregnancy. Table 5.1 **Model I** (Socio-economic factors) show the results of timing for the first delivery assistance and socio-economic factors and the higher the educational attainment,

the more likely that a youth will have an early timing for the first antenatal check/visit. Youths with secondary plus education were 3.0 times more likely to go for early antenatal check/visit as compared to those with no education. Those youth with primary education were also 2.5 times more likely to go for early antenatal checks than those with no education.

Women of the medium and high wealth index were less likely to go for early antenatal checks/visits compared to their counterparts in the low wealth index. The results confirm that belonging to either the middle or high wealth index does not guarantee on a high chance of early timing for the first antenatal check/visit. This could be due to the fact that women in the middle and high wealth index are either very busy trying to work hard that they do not get time for early timing for the antenatal care services.

Table 5.1 Factors that determine the timing for the first antenatal care

Variable	Model I Exp(B)	Model II Exp(B)	Model III Exp(B)	Model IV Exp(B)
Constant	3.130	3.164	2.931	3.183
Socio-economic factors				
a). Maternal Education				
None (RC)	1.000	1.000	1.000	1.000
Primary	2.533**	2.499**	2.574**	2.514**
Secondary+	2.962**	2.938**	3.136**	3.061**
b). Religion				
Catholic (RC)	1.000	1.000	1.000	1.000
Protestant	1.102	1.107	1.121	1.129
Muslim	0.926	0.934	0.862	0.876
No religion/other	1.319	1.359	1.309	1.370
c). Residence				
Urban (RC)	1.000	1.000	1.000	1.000
Rural	1.062	1.046	1.052	1.034
d). Region				
Nairobi (RC)	1.000	1.000	1.000	1.000
Central	1.169	1.171	1.196	1.191
Coast	0.753	0.748	0.878	0.871
Eastern	4.196**	4.160**	4.369**	4.278**
Nyanza	1.335	1.306	1.367	1.327
R/Valley	0.973	0.965	1.009	0.995
Western	1.026	0.991	1.061	1.015
N/Eastern	0.739	0.721	0.838	0.812
e). Wealth index				
Low (RC)	1.000	1.000	1.000	1.000
Medium	0.905	0.893	0.967	0.954
High	0.643*	0.639*	0.644*	0.640*
Demographic factors				
a). Maternal age				
15-19 (RC)		1.000		1.000
20-24		1.053		1.061
b). Parity				
1 (RC)		1.000		1.000
2-3		1.190		1.255
4+		1.177		1.230
c). Marital status				
Never married (RC)		1.000		1.000
Ever married		0.898		0.811
Exposure to modern health services				
a). Con Use				
Never use (RC)			1.000	1.000
Ever use			0.981	0.995

RC- Reference Category   Significance: ***<0.000, **<0.050, *<0.100

Youths in Eastern were 4.2 times more likely to go for early antenatal care checks/visits as compared to their colleagues in Nairobi Province. Again those in Central Province were 1.2 times more likely to go for early checks/visits. Those in Coast and North Eastern Province were 0.8 and 0.7 times less likely to go for early checks/visits.

In **Model II** (Socio-economic and Demographic factors) education still had a significant effect in determining early timing for the first antenatal care visit/check. Although now in the presence of the other variables (demographic factors) the influence of education on timing for the first antenatal care visit/ check does not vary significantly because those with secondary education were 2.9 times more to go for early timing for the first antenatal care visit/check that those with no education.

Wealth index was still not significant in the presence of the other factors (demographic) in determining whether one went for early or late antenatal care visits/checks. Again the youth in the medium and high wealth index were less likely to go for early checks/visits than their colleagues in the low wealth index. This is again explained by the fact that those in either the middle of high wealth indexes have certain income generating activities that they could be engaging in therefore find no time to go for early checks/visits as compared to those in the low wealth index who have all the time to go for the checks/visits.

When a comparison is made by region of residence, women in Central were 1.2 times more likely to go for early checks/visits than those in Nairobi Province, while the youth in Eastern Province was 4.2 times more likely to go for early checks than their colleagues in Nairobi Province.

For **Model III** (Socio-economic and exposure to modern health service factors) education still remained significant in determining early timing for the first antenatal care visit/check, a youth with secondary was 3.1 times more likely to go for early timing than that with no education while those with primary level of education were 2.5 times more likely to go for early timing for antenatal care than those with no education. Those in the high wealth index were 0.6 times less likely to go for early timing for the first antenatal care visit/check as their colleagues in the low wealth index.

Although being in some regions gave the people a higher chance of early timing for the first antenatal care visit/check, the region that was least favourable in determining whether one went for an early timing was North Eastern which had a 0.8 times less likelihood than Nairobi Province. Being in Eastern Province gave the youth a 4.4 times more likelihood for early timing than those in Nairobi Province.

In **Model IV** (where all the variables are included) education still remains to have a significance influence on timing for the first antenatal care visit/check. A person with primary level education was 2.5 times more likely to go for early checks/visits than that with no education while that with secondary plus education was 3.1 times more likely to go for early checks compared to their counter parts with no education.

While living in other provinces may reduce the chances for early timing for the first antenatal care visit/check, the youth in Eastern Province were 4.3 times more likely to go for early checks/visits than those in Nairobi province. Those in the

high wealth index were 0.6 times less likely to go for early timing for the first antenatal care visit/check compared to their colleagues in the low wealth index.

5.3   Type of Delivery Assistance

Skilled attendance at delivery is one of the key indicators that reflect progress towards the Millennium Development Goal of improving maternal health. This study looked at the factors that influence the use of skilled delivery assistance among the youth. Type of delivery assistance sought was measured as either skilled, that is, if a doctor/nurse offered the services and else if a relative or a TBA offered the services.

5.3.1   Factors influencing seeking skilled delivery assistance

Table 5.2 **Model I** (Socio-economic factors) show the regression results of delivery assistance with socio-economic factors, from the results the higher the educational attainment, the more the likely that a youth will seek skilled assistance during delivery. Youths with secondary plus education were 6.1 times more likely to seek skilled delivery assistance as compared to those with no education. Those youth with primary education were 3.4 times more likely to seek skilled delivery assistance than those with no education.

These findings agree with the assertion that, education alters the traditional balance of power within the family, leading to changes in decision making and allocation of resources within the household (Caldwell 1979, Caldwell, Reddy and Caldwell 1983); that education modifies the women's beliefs about disease causation and the cure thus influences use of modern health services, that

schooling enhances the woman's knowledge of modern health care facilities, improves her ability to communicate with modern health care providers and, by increasing the value she places on good health, results in heightened demand for modern health care services (Caldwell 1979, Schultz 1984, Caldwell and Caldwell 1988); and that maternal schooling reflects a higher standard of living and access to financial and other resources, because better educated women are more likely to marry wealthier men or because of their own increased earnings (Schultz 1984, Ware 1984).

Women of the medium and high wealth index were more likely to seek skilled delivery assistance than their counterparts in the low wealth index. This is explained by the fact that those in either the middle or high wealth indices may have economic power to cover the costs that are associated with delivering with the assistance of skilled health personnel. Youths in rural areas were 0.25 times less likely to seek skilled delivery assistance as compared to their counterparts in the urban areas. This could be due to the fact that in most rural areas in Kenya, the distance to the health facilities coupled with poor road networks and transport system may be a hindrance to delivery in health facilities. A comparison by region of residence revealed that women in Central were 5.2 times more likely to use skilled delivery assistance than their colleagues in Nairobi province

Table 5.2: Factors that determine the type of delivery assistance

Variable	Model I Exp(B)	Model II Exp(B)	Model III Exp(B)	Model IV Exp(B)
Constant	0.451	0.745	0.418	0.744
Socio-economic factors				
a). Maternal Education				
None (RC)	1.000	1.000	1.000	1.000
Primary	3.443***	3.388***	3.290***	3.199***
Secondary+	6.082***	5.214***	6.079***	5.120***
b). Religion				
Catholic (RC)	1.000	1.000	1.000	1.000
Protestant	0.782	0.787	0.806	0.816
Muslim	0.972	0.974	0.980	0.987
No religion/other	1.841	1.727	1.888	1.793
c). Residence				
Urban (RC)	1.000	1.000	1.000	1.000
Rural	0.249***	0.253***	0.251***	0.256***
d). Region				
Nairobi (RC)	1.000	1.000	1.000	1.000
Central	5.170***	4.984***	4.794***	4.459***
Coast	0.713	0.727	0.739	0.742
Eastern	1.751	1.703	1.638	1.545
Nyanza	1.101	1.198	1.123	1.205
R/Valley	1.362	1.427	1.326	1.367
Western	0.552	0.623	0.531**	0.589
N/Eastern	0.558	0.625	0.590	0.658
e). Wealth index				
Low (RC)	1.000	1.000	1.000	1.000
Medium	1.542**	1.682**	1.598**	1.735**
High	1.383**	1.427**	1.421**	1.461**
Demographic factors				
a). Maternal age				
15-19 (RC)		1.000		1.000
20-24		1.008		1.009
b). Parity				
1 (RC)		1.000		1.000
2-3		0.426***		0.427***
4+		0.221***		0.222***
c). Marital status				
Never married (RC)		1.000		1.000
Ever married		0.828		0.767
Exposure to modern health services				
a). Con Use				
Never use (RC)			1.000	1.000
Ever use			1.431**	1.487**

RC- Reference Category   Significance: ***<0.000, **<0.050, *<0.100

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In **Model II** (Socio-economic and Demographic factors) education still had a significant effect in determining utilization of skilled delivery assistance as the higher one is education the more the likelihood to use skilled delivery assistance. Although now in the presence of the other variables (demographic factors) the influence of education on use of skilled delivery assistance slightly reduces and those with secondary plus education were 5.2 times more likely to use skilled delivery assistance as compared to their colleagues with no education.

Wealth index remained a significant factor in determining use of skilled delivery assistance, if anything its effect increased in the presence of the demographic factors. Again the youth in the medium and high wealth index were 1.7 and 1.4 times respectively more likely to seek skilled delivery assistance than their colleagues in the low wealth index. This is again explained by the fact that those in either the middle of high wealth indices have the economic power to cover the costs that are associated with delivering with the assistance of skilled professionals.

When a comparison is made by region of residence, women in Central were still 5.0 times more likely to use skilled delivery assistance than their colleagues in Nairobi province although their likelihood of use decreases in the presence of the demographic factors. A comparison by place of residence also reveals that women in rural areas were 0.3 times less likely to use skilled delivery assistance compared to their colleagues in the urban areas although the likelihood to use among the rural women slightly increases here.

When the youth of different parities were compared, it was evident that the higher the parity the less the likelihood to use skilled delivery assistance. Women

of parity 2-3 were 0.4 times less likely to use skilled delivery assistance, while those of parity four and above were 0.2 times less likely to use the services. A study by Magadi et al. (2000) found out that there is a general tendency for home deliveries to increase with increasing birth order. The average odds of home deliveries for births of order 8 and above are about four times the odds for first-order births.

For **Model III** (Socio-economic and exposure to modern health service factors) education still remained significant in determining use of skilled delivery assistance with a youth with secondary plus education were 6.0 times more likely to use skilled delivery assistance than their counterparts with no education. Those youth in the medium wealth index were 1.6 times more likely to use skilled delivery assistance as compared to their counterparts in the low wealth index. Those in the high wealth index were 1.4 times more likely to use skilled delivery assistance that their fellows in the low wealth index.

Although being in some regions gave the people a higher chance of using skilled delivery assistance, the region that was least favourable in determining whether to use skilled delivery assistance or not was Western, Province. A youth in Western province was 0.5 times less likely to use skilled delivery assistance as compared to their colleagues in Nairobi Province. Being in Central gave the youth 4.8 times more likelihood to use skilled delivery assistance as compared to those in Nairobi Province. The fact that Central province is associated with the highest probabilities of health facility deliveries is possibly due to better quality of services, this region being relatively more developed socio-economically compared to the rest of the country. Youth in the rural areas were o.3 times less likely to use skilled delivery assistance that their colleagues in the urban areas.

Ever use of a contraceptive method gave the respondent a 1.4 times likelihood to use skilled delivery assistance. A study by Magadi et al. (2000) found out that women who have ever used modern family planning methods have about 60 percent lower odds of home deliveries than those who have never used any family planning method. Home deliveries are observed to decline consistently with increasing number of antenatal visits. The average odds of home deliveries for pregnancies that did not receive any antenatal care or those that received only one or two antenatal care visits were more than for pregnancies that benefited from at least seven antenatal care visits by a factor of 9.2 and 4.5, respectively.

In **Model IV** (where all the variables are included) education still remains to have a significance influence of use of skilled delivery assistance. A person with primary level education was 3.1 times more likely to use skilled delivery assistance than that with no education while that with secondary plus education was 5.1 times more likely to use skilled delivery assistance compared to their counterparts with no education.

While living in other provinces may reduce the chances of using skilled delivery assistance, the respondents in Central province were 4.5 times more likely to use skilled delivery assistance. For those who decide to use family planning services, their decision increases their chances of using skilled delivery assistance by 1.5 times than those who do not use the services. Those in the medium and high wealth index have a 1.7 and 1.5 times respectively higher chances of using skilled delivery assistance than those who belong to the low wealth index. Again the use of skilled delivery assistance decreases with increase in parity. Those in parity 2-3 and 4 plus were 0.4 and 0.2 times respectively less likely to use skilled delivery assistance.

CHAPTER SIX

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

6.1   Introduction

This study examined the extent to which socio-economic, demographic and exposure to use of modern family planning services influence the use of maternal health care services among the youth. Although maternal heath care comprise many components, this study only looked at timing for the first antenatal care visits/checks and the type delivery assistance sought by the youth.

Patterns of utilization among the youth are useful given they are the next generation so ensuring they are health is important not only for the health of the mother but also that of the foetus/baby. Again such information is useful to especially for policy makers in order to design appropriate and adequate interventions to help where there is need for the same. This is because the services are not only useful to the mother, but also to the other life she is carrying.

This study set out to achieve the following objectives;

   i. To establish the extent to which pregnant youth utilize antenatal care services
   ii. To establish if the youth seeking skilled assistance during delivery
   iii. To establish the differentials among the youth in utilization of maternal and child health services according to socio-economic and demographic factors

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The hypotheses to guide the study were;

  i.   The higher the youth's education, the higher the likelihood that she will use maternal health services

  ii. The lower the parity, the higher the likelihood to use maternal health services

  iii. Married youth are more likely to use maternal health services

  iv. The higher the economic status of a woman the higher the likelihood to use maternal health services

  v.   Women who have ever used modern methods of family planning are more likely to utilize maternal health services

  vi. Type of place of residence has an influence on utilization of maternal health services

  vii. Type of place of residence has an influence on utilization of maternal health services

To achieve the study objectives, data from the 2003 Kenya Demographic and Health Survey was used. The methodology included cross tabulations and chi-square tests to measure associations between the dependent variables and the independent variables. Logistic regression was used to assess the effect of the independent variables on utilization of maternal health services. The dependent variables were timing for the first antenatal care visits/checks and type of assistance received during delivery. The independent variables were maternal age, education level, religion, region of residence, place of residence, marital status, contraceptive use, parity and the wealth index.

6.2   Summary of the findings

To meet the objectives of the study, frequency distributions of the dependent variables and the independent variables was carried out. The findings of this study indicate that most deliveries among the youth are attended to by unskilled personnel while most antenatal care visits begin late.

Again cross tabulations and chi-square tests were performed, the factors that were found to be significant in determining whether to use skilled delivery assistance were marital status, region of residence, place of residence, parity, contraceptive use, religion and education. For timing for the first antenatal care visit, the factors that were found to be significant were; education, religion and region of residence. These findings have implications for policy intervention in that awareness and access to the services should be increased to ensure an increase in utilization of the services.

Mother's education was significant in determining utilization of both skilled delivery assistance and in timing for the first antenatal care visit/check. The higher the mother's education the higher were the chances of using skilled assistance during delivery, those with no education mostly delivered with the assistance of either relatives or Traditional Birth Attendants (TBAs). In determining the timing for the first antenatal care visit/check, education still remained significant with those whose education was high going for early checks/visits compared to their colleagues who had lower education levels and consequently went for late checks/visits.

Type of place of residence served both as a socio-economic measure and a proxy measure for accessibility of the maternal health care services since urban

residents are usually more accessible to the services than their rural counterparts. From the study, place of delivery had on type of delivery assistance sought in that most urban residents received delivery assistance from skilled attendants while most of those in rural areas either used a relative or a TBA. This could be due to the fact that most such services are offered in hospitals and health centers which could be so far away from their homes such that they resort to use unskilled professionals to assist them during delivery than walk long distances in very difficult terrain to go and look for the services. The results of this study have policy implications given that education and accessibility came out as very significant in determining use of maternal health services. There is need to increase awareness and accessibility of the services to ensure that more youth get to use the services to ensure their health and that of their children.

Ever use of family planning was a significant factor in determining use of delivery services and timing for the first antenatal care visit/check. Youths who had ever used family planning were more likely to use skilled delivery assistance compared to those who never used. While when it came to timing for the first antenatal care visit/check, those who had never used any family planning method were more likely to go for early checks than those who had ever used. It is then important that coverage of family planning services be increased especially in rural areas so that the likelihood of those who ever use increase in terms of skilled delivery assistance.

6.3   Conclusion

The major conclusion derived from the study findings was that although maternal health care services are available their utilization by the youth was still

very low and various socio-economic, demographic and exposure to modern health service factors influenced the youth's utilization of maternal health services. There is thus the need to increase awareness and improve on access to the services such that both rural and urban youth are able to get the services.

The results suggest that the utilization of maternal health services among the youth is still very low with only 13.1% of the youth going for early antenatal care checks while only 44.5% went for skilled delivery assistance. This therefore calls for further concerted efforts by all stakeholders so as to realize an increase in utilization of maternal health services by the youth. This will translate to social economic growth as envisaged in the national policy for sustainable development. More attention should be focused on the relevant policy measures aimed at changing the social structures that discourage utilization of the services by the youth. It is on the basis of this background that policy makers should create and strengthen conditions that encourage the youth to utilize maternal health services.

6.4   Policy Implications

- The findings of this study showed that the urban youth were more likely to use maternal health care services and this could be due to the differentials in access to the services. Long distances and the difficult terrain could discourage others from using the services, there is thus need to increase access especially in the rural areas

- Education was also found to be very significant in determining use of maternal health care services so there is need to improve the education level of most youth as it changes the ideas and attitudes of the youth towards utilization of maternal health services

- Region of residence was very significant in determining use of maternal health services and there is need to improve the quality of services offered by the different facilities across the regions so that those regions that are not socio-economically developed can benefit from such programmes so that there are no wide differences in terms of regions. Again there is need to have specific programmes targeting regions that are more disadvantaged in terms of facilities

- Most youth who deliver with skilled attendants had ever used family planning this may be due to the fact that during the time they go for the family planning services, such youth also get exposed to modern medical services and this is common as in most health facilities, family planning services are offered in the same department where other maternal health services are also offered.

- In terms of further research, there is a need to investigate the unexplained individual and community level factors influencing delivery care. For instance, use of skilled delivery assistance is also determined by the presence of childbirth complications, which this study did not look into.

- A qualitative study would therefore be particularly important in helping to understand the unexplained socio-economic aspects of delivery care and timing for antenatal care. Further studies in these areas would be useful in the formulation of effective intervention programs for appropriate delivery and antenatal care services in Kenya.

REFERENCES

African Journal of Health Sciences (2004) Volume 11, Number 1-2, January – June

Bledsoe C. and Cohen B. (1993) *Social Dynamics of Adolescent Fertility in Sub-Saharan Africa*, Washington, DC: National Academy Press

Caldwell, J. (1979) Education as a factor in mortality decline: an examination of Nigerian data. *Population Studies* 33:395–413

Caldwell, J. (1990) Cultural and social factors influencing mortality in developing countries. *The Annals of the American Academy of Political and Social Science* 510:44–59.

Caldwell, J. and P. Caldwell (1988) Women's position and child mortality and morbidity in LDCs. Paper presented to IUSSP Conference on Women's Position and Demographic Change in the Course of Development, Oslo.

Caldwell, J., P.H. Reddy and P. Caldwell (1983) The social component of mortality decline: an investigation in south India employing alternative methodologies. *Population Studies* 37:185–205

Committee on Improving Birth Outcomes (2003) Board on Global Health, *Improving Birth Outcomes: Meeting the Challenge in the Developing World*, Washington, DC: National Academies Press.

Das Gupta M, (1996) Death clustering, mothers' education and the determinants of child mortality in rural Punjab, India, Population Studies, 1990, 44(3):489–505; Kobinsky M, Conroy C and Kureshy N, Issues in Programming for Safe Motherhood, Arlington, VA, USA: Mothercare/John Snow, 2000; and Maine D et al., Why did maternal mortality decline in Matlab? Studies in Family Planning.

Fauveau, V., Koenig, M., Chakraborty, T., & Choudhury, A. (1988). Causes of maternal mortality in rural Bangladesh: 1978-1985. *Bulletin of the World Health Organisation 66(5)*, 643-651.

Griffiths, P. and Stephenson, R (1999). Prenatal Care and Child Delivery in Maharashtra: A Qualitative Approach. Working Paper number 1999-01, Department of Social Statistics, University of Southampton, UK.

Gupta M. D, (2001) Overcoming Gender-based Constraints to Utilization of Maternal and Child Health Services in Pakistan: The Role of the Doorstep Delivery System

Harpham, T. (1998) Urbanisation and Mental Health in Developing Countries: A Research Role for Social Scientists, Public Health Professionals and Social Psychiatrists. *Social Science and Medicine*, 39(2): 233-245.

Khan, M. E. (1987). Infant Mortality in Uttar Pradesh. in *Social Change*, 17, (3), 52-64.

Leete, R. (1998) Issues in Measuring and Monitoring Maternal Mortality: Implications or Programmes. Technical and Policy paper No. 1. UNFPA

Madise, N and Diamond, I (1995). Determinants of infant mortality in Malawi: An analysis to control for death clustering within families. *Journal of Biosocial Science*, 27(1): 95-106.

Magadi M, Diamond I, Nascimento (2000). The determinants of delivery care in Kenya, A Journal Social Biology, Fall 2000

Magadi, M. A., N. J. Madise and R. N. Rodrigues. (2000). "Frequency and Timing of Antenatal Care in Kenya: Explaining the Variations between Women of Different Communities" *Social Science and Medicine* 51:551-561.

Magadi, M. A, I. Diamond, N. Madise and P. Smith . 2004. "Pathways of the Determinants of Unfavourable Outcomes in Kenya" *Journal of Biosocial Science* 36:153-176.

Matthews, Z and Diamond, I (1997). Child immunization in Ghana: The effects of family location and social disparity. *Journal of Biosocial Science*, Vol 29, 3, 327-343.

McCarthy J and Maine D (1992) A framework for analyzing the determinants of maternal mortality, *Studies in Family Planning*

Mekonnen Y, (2003) Patterns of Maternal Care Service Utilization in Southern Ethiopia: Evidence from a Community and family survey

Obermeyer, C.M. (1993). Maternal health care and women's status: a comparison of Morocco and Tunisia. *Studies in Family Planning 24(6),* 354-365.

Palloni A and Millman S. (1986). Effects of inter-birth intervals and breastfeeding on infant and early childhood mortality, *Population Studies*

Ramachandran, L. (1989). The effect of antenatal and natal services on pregnancy outcome, and health of the mother and child. *Journal of Family Welfare 35(5),* 34-46.

Rutstein S, Sommerfelt A and Schoemaker J (1990) Who uses maternal and child health services? evidence from the Demographic and Health Surveys, in: *Child Survival Programs: Issues for the 1990s,* Baltimore, MD, USA: Institute for International Programs, School of Hygiene and Public Health, Johns Hopkins University, pp. 37–84

Schultz, T.P. (1984). Studying the impact of household economic and community variables on child mortality. *Population and Development Review* Suppl. 10:215–235

Sen, A. (1994). Population: Delusion and Reality. *New York Review,* September 22nd.

Senderowitz J, (1995). *Adolescent Health: Reassessing the Passage to Adulthood,* Washington, DC: World Bank

Starrs, N. (1987). Preventing the Tragedy of Maternal deaths: A Report on the International Safe Motherhood Conference. Kenya

Stephenson, R (1998). The Impact of Rural-Urban Migration on Child Survival in India. Unpublished thesis submitted for Mphil candidature to the Department of Social Statistics, University of Southampton, UK.

Stewart, K., & Sommerfelt, E. (1991). Utilization of maternal care Services: A comparative study using DHS data, *Proceeding of the demographic and Health Surveys, World Conference,* Washington.

Timaeus, I and Lush, L (1995). Intra-Urban Differentials in Child Health. *Health transition Review*, Volume 5, Pages 163-190.

United Nations, (2001). Can skilled attendance at delivery reduce maternal mortality in developing countries? in: De Brouwere V and Van Leberghe W, eds., *Safe Motherhood Strategies: A Review of the Evidence*, Antwerp, Belgium: ITG Press, 2001, pp. 97–129.

Vilar, J and Bergsjo (1997). Scientific Basis for the Content of Routine Antenatal Care. *Acta Obstetrica et Gynecologica Scandanavica*, 76, 1-14

Ware, Helen. (1984). Effects of maternal education, women's roles, and child care on child mortality. *Population and Development Review* Suppl. 10:191–214.

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