FACTORS INFLUENCING UTILISATION OF MATERNAL HEALTH CARE SERVICES IN NYANZA PROVINCE, KENYA

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DECLARATION

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

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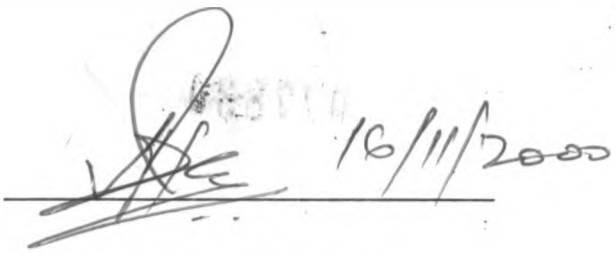
This thesis has been submitted for examination with our approval as University supervisors.



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This work is dedicated to my baby Jean, and my mama - for being there for me through it all.

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ABSTRACT

The study is based on data drawn from the 1993 Kenya Demographic and Health Survey (KDHS). An analytical model was adapted from Kroeger (1983) to act as a guideline to the study. Cross tabulations were used to establish differentials in use of maternal health care services. Logistic regression analysis was used to analyse the effects of the independent variables on use of different maternal health care services.

The results obtained show that for the births in the study, there is a general low level of utilisation of maternal health care services in Nyanza province. In addition, there are significant differentials in the use of maternal health care services by the study population. Factors that had significant influence on the uptake of tetanus toxoid vaccinations were paternal education and ever use of family planning. The uptake of tetanus vaccination was positively and significantly associated with paternal education. Women who had ever used modern methods were also most likely to get the vaccine. Timing of the first antenatal check was associated with whether a woman earned cash for work or not. There was a significant association between choice of prenatal care provider and the each of the following: maternal education, paternal education, household economic status and the number of children ever born. The type of place of delivery and assistance during delivery were significantly associated with maternal and paternal education, household economic status, earning cash, maternal age and total children ever born. Other factors that were associated with the type of place and assistance during delivery were number of antenatal visits, scale of antenatal care, timing of antenatal visits and type of place of residence.

Household economic status and paternal education was each significantly associated with the choice of a prenatal care provider. Higher status households and having at least secondary education led to greater likelihood of seeking professional antenatal care. Timing of the first antenatal visit was determined by earning cash for work, whereby mothers who earned had greater chances of seeking early prenatal care. The other factor was maternal education, so that the higher the level of education, the greater the chances of early onset of antenatal care.

The choice of place of delivery and assistance received during delivery were each determined by household economic status, type of place of residence, ever use of family planning, paternal education, the timing of antenatal visits and the number of clinic visits made.

Overall, the study found that differences in utilisation of maternal health care services in Nyanza province were mainly as a result of socio-economic factors rather than demographic factors.

Arising from the results of the study, several recommendations have been made. The study found that majority of births, their mothers got adequate antenatal care. However over 60 per cent of the births were delivered at home. The study therefore strongly recommends that coverage of health facilities offering delivery services should be increased. Studies should also be conducted to establish the reasons for the discrepancy. Secondly, community education on the importance of using maternity health care services is necessary. Moreover, barriers to access in rural areas should be eliminated. Lastly, the study recommends that qualitative research should be done to explain some of the patterns of utilisation observed, since the study was only able to give a

quantitative approach. Specifically, it would be useful to know why women in Nyanza begin antenatal clinics late, go for only a few clinic checks and why they prefer to deliver at home.

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LIST OF ACRONYMS

ANC	Antenatal care
CBS	Central Bureau of Statistics
ICPD	International Conference on Population and Development
KDHS	Kenya Demographic and Health Survey
MCH/FP	Maternal and Child Health/Family Planning
MHCS	Maternal Health Care Services
MI	Macro International
MOH	Ministry of Health (Kenya)
MPND	Ministry of Planning and National Development (Kenya)
NCPD	National Council for Population and Development
PROF	Professional MHCS provider
TBA	Traditional birth attendant
TT/TTI	Tetanus toxoid injections
UN	United Nations
UNICEF	United Nations Fund For Children
WHO	World Health Organization

1.0 Introduction

Pregnancy related complications are a leading cause of death among women in the reproductive ages (15-49) in developing countries. In Kenya, the incidence is estimated to be 590 deaths per 100,000 live births (NCPD and MI 1999). Some Sub-Saharan African countries record extremely high maternal mortality rates, for example, Mali, 1750; Somalia, 1100; and Ghana, 1000 deaths per 100,000 live births. These are in contrast to low rates in developed countries, for example, 5 in Sweden; and 3 in Denmark, Norway and Israel (Population Action International, 1995).

Studies indicate that greater numbers of maternal deaths could be avoided with widespread accessibility and utilisation of maternal health care services. Inadequate medical facilities, treatment of complications and inadequate medical personnel contribute between 10% and 45% of all maternal deaths. Complications arising from maternal obstetric conditions need not lead to death; they occur mainly because of severe socio-economic deprivations that are prevalent in developing countries. However, the socio-economic factors do not work in isolation, but in conjunction with access to health services and ease of transportation (MOH, 1997; Obermeyer and Potter, 1991).

Although the primary health care strategies that have been implemented in Kenya since independence have positively impacted on child health, similar trends in maternal health have not been noted (MOH, 1997). This realisation led to the establishment of the Maternal Health

and Safe Motherhood Programme in 1987. The objectives of this programme are to ensure that women are healthy through pregnancy and childbirth. It is now over 10 years since the 1987 Safe Motherhood Conference in Nairobi, yet maternal death rates in Africa show no sign of decreasing and may even be on the increase in some countries (Rosen and Conly, 1998).

It has been suggested that the most effective way of reducing the risk of death among pregnant women is by first, increasing accessibility and use of essential obstetric services. Secondly, by increasing awareness of the signs and symptoms of birth related complications among women, their families and traditional birth attendants. Thirdly, is by improving the availability and quality of services at health referrals. Increased use of essential services when complications arise would significantly reduce the number of maternal deaths (MOH, 1997; McCarthy and Maine, 1992).

It is the maternity services which often make the difference between life and death (MOH, 1997). These need to be accessible and affordable to women on a 24-hour basis since many pregnancy complications occur without any warning. Although the services may be accessible and available, they may not always be used due to lack of information or other constraints.

However, the single most important proximate determinant of maternal health and survival is the extent to which women have access to and utilise high quality maternal health care services (UN, 1998). The Programme of Action of the ICPD 1994 recognised the above fact and states that; "all countries must expand the provision of maternal health services.... All births should be assisted by trained persons, preferably nurses and midwives, but at least by trained birth attendants" (UN, 1995, chapter 1, Resolution 1). Therefore, interventions to improve

reproductive health outcomes need to include ways of making maternal health services available while taking into account women's various socio-economic and cultural backgrounds.

1.1 BACKGROUND INFORMATION

Maternity care essentially involves the care given to a woman in her expectant state, at delivery and during the postpartum period. In Kenya, it may entail both modern and traditional care. Modern maternity care comprises antenatal pregnancy check ups, tetanus toxoid vaccinations, and professional assistance at delivery, advice on diet and hygiene, and care after delivery (NCPD et al, 1994; UNICEF, 1998).

Antenatal care (ANC) is a very important component of ensuring safe motherhood. Ideally, women ought to have 12 to 13 visits to the antenatal clinic. Visits should be monthly until 28 weeks of pregnancy then fortnightly until 36 weeks of pregnancy and then weekly until delivery (NCPD et al, 1994; UNICEF 1998)[1].

Prevention and prompt treatment of maternal infections antenatally is an important strategy in ensuring good outcomes during pregnancy both for the mother and baby. The purpose of antenatal care (ANC) is to ensure good health for expectant mothers, to enable her have a normal delivery and healthy baby. Through periodic pregnancy check up, abnormal conditions can be detected and managed where possible (Ebrahim, 1972).

Another purpose of ANC is to provide proper guidance on nutrition for the mother. In many

[1] Obstetricians generally recommend that antenatal visits be made monthly to the 28th week, fortnightly to the 36th week and then weekly until the 40th week (until birth). This optimum schedule translates to a total of at least 12-13 visits during the pregnancy.

communities in the developing countries, women go through repeated pregnancies and prolonged lactation. At the same time, some beliefs forbid pregnant women to eat certain foods. For example, eggs, in many African communities were taboo for pregnant women. In others, there are beliefs that the pregnant woman should eat less in order to have a smaller baby, and consequently, less trouble with delivery (Ebrahim, 1972). During the clinic visits mothers are advised on the best diet during pregnancy and lactation, and essentially dispel fears caused by some such superstitions.

Especially where malnutrition is widespread, a pregnant woman may become acutely anaemic when a pregnancy depletes already low reserves of vital nutrients. Anaemia during pregnancy is a serious problem that contributes to maternal deaths from causes such as haemorrhage. These can be treated easily with oral iron supplements, if detected during antenatal checks (Population Action International, 1995). Other benefits of prenatal care include counselling on hygiene, breastfeeding, family planning and food supplementation, where necessary.

Tetanus Toxoid (TT) Vaccinations are injections given to an expectant mother to prevent neonatal tetanus. Neonatal tetanus is a fatal disease caused by poor hygiene during childbirth. Two doses of the toxoid are recommended for an expectant mother. The 1993 KDHS results show that TT coverage is widespread in Kenya, with at least 90% of women having received one injection during pregnancy (NCPD et al, 1994).

Place of delivery may either be home, or a health institution. The latter include public and private hospitals, health centres, maternity hospitals, clinics and mission hospitals. Sometimes, a qualified midwife through private arrangement attends to home deliveries. Delivery in health

facilities where proper medical attention and hygiene are observed is necessary for mothers. Their conditions reduce the risks of complications that may cause death and serious illness to the mother (Ebrahim, 1972; NCPD et al, 1994).

The type of assistance a woman receives during delivery of the child has implications for both the child's and her health. Assistance during delivery may be from a doctor, trained nurse or midwife, trained birth attendant, a traditional birth attendant (TBA), relative or friend. Other women receive no assistance at all in delivering their babies.

Global estimates by World Health Organisation (WHO) show that in the developing countries, approximately 65 per cent of pregnant women receive at least some care during pregnancy. The same source also indicates that 40 per cent of deliveries take place in health facilities and that just over half of all deliveries are assisted by skilled personnel. This contrasts sharply with developed countries where practically every woman receives regular care during pregnancy, delivery and the postpartum period (WHO, 1997a).

This study focuses on factors that affect the use of the above outlined maternal health care services in Nyanza Province. The province also records one of the highest home delivery, and lowest antenatal clinic attendance rates in the country (MOH, 1997).

A woman's background reflects the milieu within which she makes decisions regarding health care and the situations that are bound to influence these decisions. Even when decisions to use health care are made, the social, economic, demographic and cultural set up may act to either boost or hinder the implementation of the decision.

1.1.0 Demographic Profile

Kenya is a country that has been experiencing a high fertility rate (over 7 in 1980s) until very recently when the total fertility rate (TFR) dropped to 4.3 per woman (NCPD and MI, 1999). The high fertility has been explained in terms of the near universal pattern of marriage, early age at marriage, shortening of the breastfeeding periods with increasing modernisation and the relatively low use of contraceptives (NCPD et al, 1994). TFR for Nyanza province by 1993 was 7 births per woman (NCPD et al, 1994).

Contraceptive use though currently observed to be on the increase, is only about 33 per cent (NCPD et al, 1994). This level is low compared to the developed countries where contraceptive use is as high as 80 per cent (Population Action International, 1995). However, Kenya is rated better than several Sub-Saharan African countries that still have very low levels of use. For example, contraceptive prevalence rate is 5 per cent for Uganda, 2 per cent for Angola and 4 per cent for Ethiopia.

Birth spacing patterns have far reaching impacts on child and maternal mortality levels. In many regions of Kenya, there are relatively short birth intervals of about two years. These vary according to the local people's practice of lactation and post partum abstinence. For instance, among the Kamba community of Machakos, birth intervals were as long as five to 10 years (Dissevelt, 1978). Among those around Lake Victoria the period is shorter; around two to three years (Chaiken, 1986; NCPD et al, 1994). The KDHS data of 1993 shows that for 25 per cent of the births, spacing is less than two years.

Life expectancy has increased steadily in Kenya over the past three decades. This is primarily because of improved survival of infants and children, better health care and improved socio-economic condition. Currently, HIV/AIDs and hard economic conditions threaten the situation. Nyanza province is one of the provinces where life expectancy at birth is still rather low at 53 years (MOH, 1997).

Despite crude death rates having fallen consistently over the last 20 years, there is uncertainty due to the impact of AIDS and the rate of fertility decline. One can only conservatively estimate the future population. Maternal mortality ratios for the country are estimated at 365 deaths per 100,000 live births (MOH, 1997). However, there are regional variations and some areas such as Nyanza province, Coast and Western provinces have higher incidence of over 700 maternal deaths per 100,000 live births.

Maternal mortality continues to pose a major threat to women of reproductive age. In Kenya, the maternal mortality ratio is currently 365 maternal deaths per 100,000 live births. Lack of population based data does not allow a description of time trends, although it is suspected that the incidence may be on the increase in some regions. Regional variations exist with Nyanza Province having the highest rates accounting for 23.6 per cent of all the recorded maternal deaths, followed by Western and Eastern at 23 and 21 per cent respectively (MOH, 1997). A longitudinal study in Central Kenya in 1979 indicated that maternal mortality rate was about 90 per 100,000 live births (Boerma and Mati, 1987). A more recent national study reveals that there exist significant regional differentials with Coast, Western and Nyanza provinces having over 1000 maternal deaths per 100,000 live births, to a low of under 100 in Central parts of Kenya (PSRI/UNICEF, 1994). According to the report, the main factors responsible for the

high maternal mortality relate to inadequate obstetric care and complications associated with unsafe abortion.

Table 1.1 shows some estimates of the incidence of maternal mortality around the world comparing the developed and less developed countries.

From the table, it is observable that women in Africa have the greatest risk of dying due to maternal causes. Again, Kenya's situation with a ratio of 365, vis-à-vis the rest of the continent's 870, is fairly remarkable. However, in comparison to the developed world, a disparity is noted.

Table 1.1 Estimates of Maternal Mortality by Regions of the World

	Maternal Mortality Ratio	Number of Maternal deaths (`000)	Lifetime Risk: 1 in: -
World	430	585	60
More developed	27	4	1800
Less developed	480	582	48
Africa	870	235	16
Asia	390	323	65
Latin America/ The Caribbean's	190	23	130
Northern America	11	0.5	3700

Source: United Nations (1998).

1.1.1 Socio-economic Situation

School enrolment rates for women have steadily increased over the last two decades. However, there are striking differences in the literacy of women by age group (MPND, 1996; NCPD et al, 1994). These may illustrate the changes in educational opportunities over the last two decades.

Whereas 78 per cent of women aged 40 and over are illiterate, only 11 per cent of those below 30 years cannot read and write (MPND, 1996). Nonetheless, there are still some differences between boys and girls in terms of primary school enrolment and continuation rates. Educational achievement affects fertility levels, contraceptive use, child survival and therefore, use of maternal health care facilities.

Agriculture is the mainstay of the Kenyan economy and a majority of rural women are engaged in agricultural production. It is estimated that 75 per cent of those living in rural areas are employed in the agricultural sector (MPND, 1996). Yet health services are often inadequate for the rural needy women.

Kinship remains a fundamental element of social organisation in both rural and urban areas. Reproductive and health behaviour appears to be strongly affected by family structure and household composition (Chaiken, 1986; Mburu, 1983). Even though changes are taking place, traditional culture and social structures marked by patriarchy still influence a lot of day to day attitudes and behaviour.

Currently in Kenya, women (NCPD et al, 1994) head an estimated 30 per cent of households. Many women in Nyanza Province endure a lifetime of poor health and nutritional status. The 1998 KDHS indicates that 11.3% of women in Nyanza have below the recommended mean BMI of 18.5 kilograms per meter squared. A body mass index below 18.5 is considered underweight (NCPD and MI, 1999). In Nairobi and Central provinces, 4.7 and 5.8 percent respectively, have less than 18.5 BMI.[2]

[2] The lowest BMI is observed in Rift Valley and Eastern, where over 15% of women have

1.1.2 Provision of Maternity Health Care Services

The provision of affordable and accessible care can affect maternal health through level of usage of antenatal care; safe delivery; and essential obstetric care. The provision of care by the public sector has been reviewed regularly to make the services more relevant. The most recent of them was in 1996, specifically focusing on health personnel. A lot of emphasis is also laid on safe motherhood (MOH, 1997). For instance, one of the long-term objectives of the health sector as stipulated in the Alma Ata Declaration of the 1994-1996 National Development Plan was to increase coverage and accessibility of health services with active community participation (MPND, 1996). Previously, the 1989-1993 national development plan had the overall objective of promoting the health of mothers and children. During the period, a number of activities were undertaken to meet the set objectives. Among them was the training of traditional birth attendants (TBAs) and strengthening of district health management teams (MOH, 1996). However, it appeared that although significant gains were made in improving child health, the case was not so for maternal health.

Currently, nurses and midwives provide most of the MHCS especially in the rural areas where there are very few doctors. Moreover, 60 per cent of the doctors are in the private sector and are based in the urban areas. TBAs also provide health services in most of the rural country, although their actual numbers are not known. They mostly practice traditional medicine. Often superstitions and taboo in the locality influence their practice.

Regarding regional distribution of services, 84 per cent of doctors and 56 per cent of health

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below average BMI.

personnel are urban based. Almost 25 per cent of health personnel are found in Nairobi. There are seven clinical officers for 100,000 residents of Nyanza province while there are 15 for North Eastern Province. This shows the skewed nature of health service provision in the country (MOH, 1997). Generally, almost 40 per cent of the population in Kenya live within 4 kilometres of a health facility while 75 per cent are within 8 kilometres. The KDHS of 1993 revealed that 50% of the population was within 5 kilometres of health facility that offered antenatal care. Only 33% of married women were within 5 kilometres of a health facility offering laboratory and delivery services. In rural areas, these can be up to 20 to 25 kilometres away[3].

In Kenya nearly all-pregnant women access ANC, with just over 50 per cent of them starting clinic before 6 months of pregnancy. One third begin at 7 to 8 months (NCPD et al, 1994). More than two thirds of the women have more than four antenatal visits and about one quarter have 2 to 3 visits. Only four per cent of pregnant women do not attend antenatal clinic (NCPD et al, 1994). Most women sought antenatal care from nurses or midwives. Doctors offered 23 per cent and TBAs 0.7 per cent of antenatal care (NCPD et al, 1994).

The government is the main provider of MCH services in Kenya, and these are provided through the Maternal and Child Health / Family Planning (MCH/FP) facilities (MOH, 1996). In the public sector, antenatal care and immunisation are provided free of charge.

[3] These disparities may contribute to the significant role played by unqualified traditional health

1.2 PROBLEM STATEMENT

Demographers are interested in maternal health because of its influence on maternal mortality, as an indicator of the success of maternal health programmes and as an explanation for sex differentials in mortality. Research has shown that adequate use of antenatal and delivery services can reduce maternal deaths by between 10 to 45 per cent, especially in the developing countries where maternal mortality is highest (WHO (A), 1997).

The study seeks to identify factors that influence the use of various maternal health care services in Nyanza province. Currently, there is inadequate information regarding the level of utilisation of MCH services in the province. Similarly, the factors that affect the utilisation of the services have not been identified and are poorly understood.

It is reported that large proportions of pregnant women in Kenya seek antenatal care from health facilities. For 95 per cent of births occurring during the five years preceding the 1993 KDHS survey, the expectant mother sought some antenatal care. However, over half of births in Kenya occur at home; 60 per cent for rural births (NCPD et al, 1994). The same source indicates that the mother, without any assistance delivers one in ten births in Kenya. Furthermore, these patterns have been observed not to have changed significantly between 1989 and 1993. The rural women are more likely to deliver with no assistance. High proportions of such births are recorded to occur in Western, Coast and Nyanza province. Therefore, such women are more at risk of deaths which can be prevented or treated with effective use of modern medical facilities (NCPD et al, 1994).

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practitioners and birth attendants in health care delivery.

Nyanza Province records one of the highest levels of maternal mortality in the country, of over 1000 deaths per 100,000 live births in some areas (MOH, 1997). A problem arises in that attendance of antenatal and delivery services is also very low in the region. The average number of visits by 1993 was only 4.7 as opposed to the recommended 12 visits (that is averaging once a month during the earlier months of pregnancy).

Although availability of health care is very important, its effectiveness can only be achieved through utilisation of existing services (Nginya, 1980). In Kenya maternal health care services are available but their use is low (NCPD et al, 1994). The motivating factors for health service utilisation behaviour are not properly known. Currently, it is not known why most women do not use maternal health care services. Even in urban areas where physical accessibility is less of a constraint, still almost quarter of all deliveries occur away from health facilities. This finding is disturbing as it indicates that a significant proportion of women fail to seek delivery by trained health workers. The risk of complication and/or death are highly increased under such situations (MOH, 1997).

In a nutshell, this study seeks to identify factors that either enhance or constraint the utilisation of maternal health care services in Nyanza Province.

Consequently, an outcome of the research will be to answer the following research questions: How many women use maternal health care services? Do the socio-economic and demographic characteristics have any role in the utilisation patterns?

1.3 STUDY OBJECTIVES

General objective

The broad objective of this study is to investigate the level of coverage of maternal health care and identify some of the factors influencing use of these services.

Specifically the study objectives are to:

1. Determine the overall level of utilisation of the selected maternal health care services.
2. Investigate differentials in the utilisation of the various maternal health care services among the study population according to different socio-economic and demographic characteristics.
3. To find out the determinants of utilisation of maternal health care services.

1.4 JUSTIFICATION AND RATIONALE OF THE STUDY

The increasing attention on women's reproductive health and primary health care is a pointer to the need for better information and data than is currently available. Lack of adequate data hampers the development of appropriate health interventions and responsive strategies especially in countries like Kenya where maternal mortality is high. The study will generate some useful information regarding utilisation of maternal health care and their determinants.

For a long time in Kenya, maternal and child health were lumped together at hospitals and service delivery points. This was with the hope that no time would be wasted in locating the two services at their respective points. The effect was that the maternal component ended up being given little or no attention. More emphasis was placed on childcare at the expense of maternal health (MOH 1996). In fact, even in the Demographic and Health Surveys more emphasis seems to be laid on child health. While deviating from this trend that may have contributed to the high incidence of maternal mortality, this study hopes to contribute to an area

that is less researched on.

To planners and health providers, there is always need for information on the socio-economic and demographic background of the people they serve in order to give better services. The present study aims to create an understanding of the relationship between socio-economic and demographic characteristics of women and maternity care use or non-use.

The study is useful for Nyanza Province because if the factors influencing maternal health care service use are established, appropriate strategies can be devised to enhance the use of maternal care services in the province. That way, maternal morbidity and mortality could be reduced. The concern with prevention of early death, hence prolongation of a long healthy life for women is part of the International Safe Motherhood Initiative of 1987, which Kenya endorsed. One of its objectives was to "flag the major information gaps on maternal mortality and morbidity in Kenya " (MOH, 1997). Furthermore, the Cairo International Conference on Population and Development (ICPD) of 1994 placed a lot of emphasis on reproductive health, of which safe motherhood is a component. Kenya adopted the Plan of Action on reproductive health. The government recognises the right of access to appropriate health care services that will enable women to go safely through pregnancy and childbirth and provide couples with the best chance of having a healthy infant. The present study has come at a most appropriate time, when attention is being given to reproductive health in all its totality. The study aims to contribute to the same by investigating one of the determinants of maternal morbidity and mortality: the utilisation of maternity services by women.

The health of the woman is an important asset for herself, her family, the community and the nation in general. Since family health is greatly dependent on the health of women throughout their life, research is needed to generate data on maternal mortality and morbidity outside medical institutions. Moreover, the economic contribution of women to the family in particular and to societal development in general is often curtailed due to pregnancy related deaths.

This is also an important research area because it is reported that deaths of women due to pregnancy related causes account for the majority of deaths that occur to adult female population. Rural areas record the highest incidence of maternal mortality in Kenya (over 1000 deaths per 100,000 live births against a national estimate of 365 (MOH, 1997). There is need to understand factors that are responsible for the maintenance of this phenomenon. This research anticipates to shed light on the same through the study of the determinant factors of utilisation of maternity care, since these are identified as determinants of maternal deaths (MOH 1997; McCarthy and Maine, 1992).

1.5 SCOPE AND LIMITATIONS OF THE STUDY

This study focuses primarily on the female adult population of Nyanza province who were interviewed during the 1993 KDHS. The data used represents women aged 15 to 49 years who had a live birth in the five years preceding the survey. This population comprises the active reproductive ages and therefore, those at risk of maternal death. Moreover, these are the women for whom antenatal and other maternity care services are relevant. The data have been analysed to establish levels and differentials in health care services utilisation and their associations with socio-economic, demographic and exposure characteristics of the study population.

The use of secondary data such as the 1993 KDHS, has some limitations. First, the survey was not specifically tailored for the needs of this research. It covers a broad range of topics and therefore does not include detailed information on a particular topic. Moreover, the area of maternal health is given very little coverage as compared to infant and child health (with which they are in a similar category) and contraceptive use. Therefore, the study is limited only to aspects of the available data.

Secondly, it is difficult to control the quality of secondary data. The survey may have been prone to both sampling and non-sampling error. In the case of the 1993 KDHS data, efforts were made during implementation of the survey to minimise non-sampling error. Overall, sampling error for the whole country was small except for very small proportions (NCPD et al, 1994). For the purpose of this study no modifications were necessary, as the data is fairly representative of the study area.

In the analysis, there was insufficient data for urban women since there were only 36 cases. This affected the standard error of logistic regression as it was seen to be rather high in respect to the variable type of place of residence. The same problem was experienced with cross tabulations and Chi-square tests.

CHAPTER TWO

LITERATURE REVIEW

2.0 Introduction

This chapter presents a review of studies that have been undertaken on utilisation of maternal health care and derives a conceptual framework for identifying factors that explain utilisation of maternal health care services. In many African societies, attitudes towards modern health care have yet to be studied. However, most studies have established that reproductive health behaviour is influenced by both attitudes and factors external to the person (Mburu, 1983).

Literature on maternal health is relatively limited compared to family planning and child health. In fact, the area has lately come to be referred to as the forgotten tragedy (MOH, 1997). Studies have also experienced data related problems. National statistics on women's health are often of poor quality or limited especially in developing countries where vital registration systems are not established. Most studies have been based on health service statistics or hospital data.

Several inquiries have been carried out on aspects of maternal health and mortality especially using health service statistics. Most of the researches have examined the determinants of maternal mortality. Few of the studies were done at health service precincts. However, using DHS-like surveys it has been possible to study aspects of maternal health out of hospital.

It is accepted in the medical field that between 60 to 80 percent of all direct maternal deaths can be prevented with proper and early medical diagnosis, proper health facilities, and adequate use of the facilities (McCarthy and Maine, 1992). However, social and economic factors may

hinder access to modern medical care and hence the proper utilisation. Some of these will be outlined in this review of literature.

2.1 Attitudes towards Pregnancy and Use of Modern Health Services

Bhatia (1993) departed from the more common hospital based studies of maternal mortality and used community based statistics from a survey. In his studies of maternal health and mortality in India, he estimated that there were 798 deaths per 100,000 live births. Over half occurred at home or on the way to hospital. Analysis revealed that many of the deaths were preventable. Most of the deaths occurred to women aged 29 years or younger.

From the study, respondents from the deceased women's families indicated they did not realise the seriousness of the woman's condition. A large number of them called the health worker or doctor, or took the woman to the hospital. Results of the study showed that a higher proportion of women of higher socio-economic status survived childbirth. Knowledge of, attitudes about and use of health facilities were found to be significantly higher among families of survivors. Surviving women registered and sought antenatal care in greater proportions than women who died. The study also established that although primary health centres had existed for more than 40 years, many rural people were not aware of them. They were not much used by the communities they were intended to serve.

While utilisation of maternal health care services is increasingly being seen as a major proximate determinant of maternal mortality, it is also the case that the mere provision of services does not lead to their better utilisation. For example, (Basu, 1990), in a study established that informal networks played a crucial role among city women in delivery; with

relatives, friends and neighbours always coming to the rescue, in India. Modern health services were found not to be persuasive enough as compared to the former. Even for hospital deliveries, registration at the maternity centre or hospital and subsequent antenatal checks began at a late stage of pregnancy. Women went for registration only because prior registration is required to receive admittance at labour. The explanation given for reluctance to have hospital delivery is fear. From the researcher's sample of rural North Indian women, their limited exposure to the outside world made them distrust medical professionals.

Okafor and Rizutto (1994) assert that maternal mortality continues to be high largely because maternal services especially in the rural areas of Nigeria are often deficient and inappropriate to women's situations. Using focus group discussions and interviews, they determined that hostility between traditional birth attendants and midwives was a serious constraint to good maternal care in the area. The women's perceptions and attitudes were also constraints to effective health care uptake. Women did not seek assistance from health workers unless they felt serious discomfort.

Mburu (1983) carried out a study in Mbiuni and Matungulu locations in Machakos district to examine health behaviour towards maternal and child health. The results of the investigation revealed that demographic factors, 'cosmopoliteness' or level of exposure to urban cultures and awareness of modern preventive health care were important determinant factors in whether a woman sought medical care or not. Consciousness of disease was related to the use of maternal and child healthcare. The study established that large numbers of the rural people do not always utilise existing health care services. Some were suspicious of modern medicine because it did not incorporate local beliefs and behaviour related to health matters. This partly explains why

over half of the rural population sought health care in traditional medicine.

Khayundi (1998) studied an area prone to malaria and high maternal and child mortality, to find out how the local people react to malaria and other diseases during pregnancy. It was found that 65 per cent of the respondents from Siaya district did not know the existence of MCH facilities in the area. For the majority of the respondents, the average distance from the facilities was 8 to 11 kilometres. Over half of the respondents did not attend antenatal clinics, although they stated that distance was not an obstacle for them. It was the time taken to travel and waiting that negatively influenced the use of MCH. Interestingly, many women did not like the frequency with which they were required to attend antenatal clinics. Those between 0 to 28 weeks of pregnancy were required to visit a clinic every four weeks, and those 29 to 35 weeks fortnightly, while 36 to 40 weeks were to visit weekly. They felt no need to attend clinics frequently since they only needed to know the "position in which the baby was lying in the womb". The study also found that women preferred to consult traditional birth attendants with certain kinds of complications in pregnancy. For instance, this was observed when there was a belief that one was bewitched or was haunted by some spirit or if the baby was not positioned normally in the womb.

Dissevelt (1978) in his study of use the of maternal and child health services in Masii, Machakos district observed that since pregnancy and child birth are perceived as natural events, it was difficult to convince women on the importance of prenatal care. Many women thought it was unnecessary to seek prenatal care unless they had complications.

Sargent and Rawlings (1991) carried out a research to analyse prevailing patterns of prenatal care among low-income women in Kingston, Jamaica. They particularly focussed on client's understanding of the need for prenatal care. The research was carried out at a maternity hospital. The study confirmed that low-income Kingston women were reluctant to seek early prenatal care. Only 16 per cent had begun prenatal care during the first trimester. The women recognised the need for care but did not view pregnancy as a pathological condition. Therefore, they could consult health professionals but not attend clinics regularly.

Chaiken (1986) carried out a study on factors that contribute to the high rate of maternal and child mortality in Mbita Division of South Nyanza province. She found that in Mbita, as in most communities in the developing world, there are traditional health practitioners. A traditional birth attendant (TBA) or *nyamrerwa* usually provided paediatric and obstetric care. The services of a *nyamrerwa* are commonly used and over half of the children in the sample were born at home with *nyamrerwa* in attendance. More than half of the women interviewed reported that someone in the family had consulted a nyamrerwa in the last six months. She suggests that traditional healers be incorporated into the overall health care system by training them with techniques of disease prevention and treatment, since they are culturally acceptable to the people. She also notes that solutions to the problems of child and maternal health need not be technological but should come from improvements in health service delivery, public education and awareness and participation in prevention of disease and complications, using the existing optimal resources.

Stewart (1996) based her study on a Philippine safe motherhood survey. The 1993 Philippines Safer Motherhood Survey was designed to collect data about maternal health, nutrition and

service use. Use was found to be particularly low among pregnant women. Information was lacking on the informal referral system, quality of obstetric care and the impact of these on pregnancy outcomes. Women were not aware of the existence of the project in their neighbourhood. Even among those that were aware, care was only sought in the case of complication.

A similar study in Jordan by Obermeyer and Potter (1991) indicated that the Jordanian population received some maternal health care services but a large part of the population was not adequately covered. The study used data from the Jordan Fertility and Family Health Survey of 1983. The objectives of the study were to address: the overall coverage of prenatal care and proportions of deliveries attended by trained personnel; variations in coverage among diverse sectors of the population and according to different socio-economic gradients; interrelations between public and private services and the factors determining utilisation of maternal and child health services.

Findings of this study showed that just over 58 per cent of the total sample of women had some prenatal care. Among them, 57 per cent received care from the private sector. Government hospitals only cared for 15 per cent of the people. In addition, it was found that 42 per cent of births took place at home, almost invariably attended by midwives (*dayas*). Women evaded hospitals for fear of an episiotomy or caesarean section. The *dayas* provided maternal care to the poorer population. Their services were perceived to be more convenient than public hospitals. They often stayed at home with the woman after delivery to avoid disruption in the home. The study concluded that utilisation patterns were influenced by the people's hierarchy of needs which gave preventive services a lower priority than other activities, and not because of

culture.

Goodburn et al (1995) carried out a research on delivery and postpartum practises in Bangladesh. Findings of the study show that knowledge of illnesses was common. However, knowledge of treatment of infection was rare. There was therefore an unmet need for basic postpartum health care in the villages. Local women under-used health services. Discussions revealed that the concepts of antenatal care for a normal pregnancy were alien to women. Participants considered it unnecessary to consult health personnel when they were feeling well. This is a reflection of a lack of health education on pregnancy services. They recommended that health workers and educators take cultural constraints on women into account.

Poland et al. (1990), carried out a study of low income women who delivered at a hospital in Detroit, two to five days postpartum, to gather information on experiences of pregnancy and prenatal care. The study identified three predictors of quality of care, viz.; health insurance, perceived importance of prenatal care and attitudes towards health professionals. Attitudes towards the importance of prenatal care were significant determinants of the quality of care a woman received. Women who received little or no care or attended walk-in clinics described early and continuous care as less important. Furthermore, even women who felt prenatal care was necessary often described it as boring and many were confused about the purpose or importance of medical procedures. The authors suggest that to solve this problem, vigorous, culturally appropriate health education programmes might be helpful.

Silberschmidt (1991), in a survey of Kisii district, found that 89 per cent of pregnant women were using antenatal services, even though their use was not regular. The majority of women

attended clinics for preventive purposes, i.e., check ups and tetanus toxoid injections. The women were aware of the preventive aspect, being the major reason for them to attend clinics. A large proportion also attended clinics because they felt unwell. Another factor that was observed to play a crucial role in relation to pregnancy problems is women's workload. For the 353 cases, 256 confirmed that their workload did not change during pregnancy, hence they were exposed to very tough physical strain which may lead to haemorrhage and back pains.

As in other studies conducted in Kenya, more women attended antenatal clinics than delivered in hospitals or health centres. In the Kisii case, 32 per cent had delivered with the help of medical personnel, while 46 per cent delivered at home. Women who delivered alone were mostly high parity mothers and had experienced births with no major problems. A reason given for self-delivery was bad relations with mother or sister-in-law or when there were no relations or friends to turn to.

Several reasons were advanced for non-use of antenatal services. Women said that they had to give priority to domestic chores and could not afford to lose a day at the clinic. In addition, who to leave the children with at home was a problem, and often women had to carry them along to hospital. Women who had experienced previous normal pregnancies saw no need for regular check ups. Non-users tended to come from female headed households and were poor. The women feared going to clinics for fear of exposing their pregnancy thereby risking bewitching from jealous people. Apparently, in this community, women who got pregnant soon after marriage were the envy of others who may not have had a child or had delayed in doing so.

2.2 Age and Parity

Bulut (1995), carried out a study among low-income women in Istanbul to establish determinants of maternal health care use. They found that 88 per cent had received some type of antenatal care for their most recent pregnancy. It was found too that women with some education, work outside the home, and of parity one, were more likely to have made use of antenatal care services

From the same study, home deliveries were observed to occur among older and multiparous women. The main reason for home delivery was inability to pay for hospital fees. Majority of women received attention from a trained midwife from the local health centre. The Istanbul health system provides a minimal role in providing vital information about maternal health. No information is provided women about antenatal and delivery care. Therefore, older women who could not read were largely ignorant.

In Kazakstan, differences in antenatal care between age groups of women were found to be negligible (Kazakstan DHS, 1995). However, birth orders played a big role. Mothers were more likely to seek care for first births than births of order four and above.

Dissevelt (1978), carried out a research on MCH in Masii in Machakos district between 1972 and 1974. 45% of the women attending antenatal clinics were found to be younger than 25 years of age. Unmarried women were also likely to attend more than married ones. A significant decrease in the proportion of women with parity 5 and more was observed over the period, especially for antenatal care. Women who used antenatal care were also more likely to use child health services.

Nginya (1980), in her study of Biberioni in Kiambu district, reports that perceived severity of illness is important in decisions to seek health care. The study also found that younger females tended to seek medical attention more than older age groups.

Miles-Doan and Brewster (1998), in a study of urban Cebu Philippines, observed that age had a non-linear association with the likelihood of seeking timely prenatal care. Women aged 25 to 34 years sought prenatal care more than older women did.

Obermeyer and Potter (1991), found among Jordanian women, that high parity and rural residence are negatively associated with adequacy of prenatal care. The age of the respondent, age at marriage and sector of employment proved not to predict use of prenatal care. However, younger mothers were less likely than those over age 35 to make use of care were.

Sargent and Rawlings (1991), contrary to expectations, observed that multiparous women attended prenatal clinics more than primiparous women and attached more value to hospital delivery. This was from a study of low-income Jamaican women and there is a possibility that other factors than age, played a greater role in use of services.

2.3 Education

Stuebing (1997), from a study of the language and literacy skills of schooled mothers in Ndola township, Zambia, suggested that one of the pathways through which maternal education may lead to less maternal mortality is by a socialisation effect resulting in greater cleanliness and greater use of health services. The schooled women are better able to use health information to

the benefit of themselves and their children.

Miles-Doan and Brewster (1998), in a study of urban Cebu, Philippines, observed that education of the woman was found to influence attendance of prenatal clinics. However, women with two or more years of schooling were more likely to seek care by the fifth month of pregnancy than those with no education or incomplete primary education.

The husband's level of education was found to have a statistically significant association with the likelihood of seeking care. In fact, the husband's education had a stronger influence than the woman's own education.

Donabedian and Rosenfield(1983), in a study of some factors influencing prenatal care in the United States, revealed that use varied with social class. Lower class mothers tended to utilise prenatal care less than mothers from upper class. The former wait longer before seeking care than the former. The difference, according to the study, is due to variations in the level of education rather than income. The authors found that less educated mothers did not feel the need for prenatal care within the first three months of pregnancy.

The 1992 Moroccan DHS / Macro International 1994, documented a decline in fertility but little progress in utilisation of important maternal health services. In the same period, there were an estimated 332 maternal deaths per 100,000 live births. Although there was improvement in maternal health indicators, especially the tetanus toxoid vaccination, use of antenatal and delivery care remained low. More than two thirds of Moroccan mothers were not receiving antenatal care. The majority of those using services were those who had attained more than

primary education. Therefore, education was seen as having an impact on the decision to use services.

Kars (1974), studied the use of modern and traditional forms of maternity care among the Akamba in Kenya, and observed that the attitude towards demand for modern medical care during the first pregnancy was positively correlated to the level of a woman's education. Women who had at least primary education tended to seek medical care over those with no education.

The National Population Council (Egypt) and Macro International (1996) in a report of the 1995 Egyptian DHS, showed that few women receive adequate antenatal or delivery care. In the five years before the survey, only 30 per cent of births received antenatal care and deliveries less than half from a medical professional. Level of education was found to be most strongly associated with use of both prenatal and delivery services.

In a 1981 Mexican study, the poorest, least educated women, who lived in poor housing were only 25 per cent likely to have prenatal care as women with more education and better homes (Lettenmaier and Liskin, 1988).

2.4 Accessibility and Utilisation

Accessibility of health care is one of the determinants of use of modern health care. Access can be in terms of financial outlay, geographical distance and position of a health institution within the general network of health services. A study in Tanzania found that distance between medical facilities and the population was a major factor impeding utilisation (Etten, 1978). The people

who consult public clinics vary with their relative access, availability and affordability. In Kenya, the introduction of clinic fees led to a reduction in the attendance rates (Moses et al., 1992; cited in Ward et al., 1997). The availability of competing sources of care and problems of access may lead to considerable delays in seeking maternal care.

The Population Action International (1995) in a world-wide assessment of maternal health highlights the need for sound policies to address not only the unmet need for family planning but also other critical women's health needs namely prenatal and maternity care services. They observed that in Sub-Saharan Africa maternal services lack in over 70 per cent of the region due to inadequate access to safe, effective and affordable pregnancy and delivery care, which have the potential of saving large numbers of additional lives should appropriate interventions be taken.

In some settings, the most obvious impediment to use of maternal health care services is distance. In some rural areas where women have little resources to pay for transportation and where roads are likely to be poor and vehicles rare, the physical barriers involved render use of routine prenatal care services complicated and utilisation of emergency services difficult (UN, 1998).

King (1966) had made a similar observation in Uganda and Kenya and concluded that distance is a critical determinant in health care utilisation and only those close to a health institution can derive the full benefit from its services. Areas located within 0 to 5-kilometre circumference of a health centre contributed four times as many people as those located 5 to over 10 kilometres away. Use is attributed to availability of and access to the institutions. The study reported that

for three-quarters of patients, the severity of the disease was not a major determinant in the utilisation of hospital services. The main reason leading to use was that it was the nearest medical unit to their homes. Again, the study found that the kind of complication a woman had played a role in that specific diseases were brought to a hospital even if the distance covered was far.

In Cebu, Philippines, researchers found that rural women made more prenatal visits when clinics were within walking distance (Lettenmaier and Liskin, 1988). Women were more likely to use prenatal care services when they were within a 3-kilometre radius. In rural areas, however, often there were no services nearby. Women tended to keep away from non-female health care providers, especially so because prenatal clinics did not offer adequate privacy when examining women.

The proportion of women using transport for travelling to the health centre was gradually observed to increase over the study period, especially for those using antenatal services. Most people were prepared to walk not more than 10 kilometres to get to a hospital. This shows that accessibility and money costs are a determining factor of use of MCH services.

Nginya (1980), also found that short distance to health institutions was an encouragement to use the same. Other than that, free medication was also an attractive force. However, where the government charged some fee, people preferred to attend private hospitals, for their perceived better services. The use of traditional healers was found to be significantly low, probably due to the majority Christian following. There was also found to be a lot of dissatisfaction with maternity care. The care was considered to be inadequate and the distance and expenses at the

Nazareth Maternity Hospital expensive. Women who had to pay for transportation felt discouraged to attend frequently.

Toppozada (1991), carried out a specific study on perinatal mortality and morbidity in Egypt. Egypt is one of the underprivileged countries where over half of pregnant women receive neither trained antenatal supervision nor skilled help in labour. Most of the care given to expectant mothers is concentrated in large cities and teaching hospitals. Large proportions of the rural population have little maternity or neonatal assistance and are attended by unlicensed midwives (*dayas).* The study found that the main problems for the rural areas are distance from health services, untrained *dayas* for delivery, time taken to hospital and lack of transport.

Findings of a survey on the maternity care Program in Matlab Bangladesh indicated that the decline in deaths was probably due to the combined efforts of community housewives and physicians at the Matlab maternity clinic (Maine, 1996). The study used data sets from the Demographic Surveillance System, midwives cards, the Matlab Maternity Clinic record book and government hospital records. The data were used to determine why maternal mortality declined in the area. To determine which interventions contributed to a decline in maternal deaths, an examination of changes in the number of deaths due to specific causes and interventions was done. The data indicated that the decline depended upon the functioning of the government hospital in Chandpur, where caesarean sections and blood transfusions were available. Midwives might also have made a special contribution by providing early termination of pregnancy, which is legal in Bangladesh. Midwives provided first aid and treatment. They also provided and facilitated transport by road. These are possible causes of reduced deaths in areas served by midwives.

The ability of Matlab clinic staff to identify serious cases, channel them to the main hospital was another explanation for averted deaths. The project's transport may have also contributed to decline in maternal deaths by raising the number of women who were able to reach the hospital and by reducing the time taken to get there. The researcher concludes that the presence of the Chandpur Hospital as a referral endpoint (from midwives and Matlab clinic) was a prime factor in the decline in maternal deaths.

The data from the research indicate that posting of midwives to the rural areas resulted in greater use of Matlab Clinic. The data suggests that intervention at the community level alone is unlikely to result in substantial reduction in maternal mortality. The reduction depends on the functioning of higher levels of the health system and access to them.

Basu (1990), identified the cost factor which when quite high, can deter women from using services. Her research sampled women from a rural setting in India where incomes were low. There are the expenses of transport, food and necessities for the new mother and the time involved in registering for a hospital delivery. These disadvantages discourage women from using hospital-based care unless there was an emergency.

Kars (1974), in a study of the Akamba of Kenya noted that although there was a general switch from traditional to modern antenatal care, the choice between them depended on extent of pain or discomfort felt. However, the proximity of health services significantly influenced the decision to attend modern antenatal care. Those living closest to the health facilities were most likely to attend clinics.

2.5 Provider-Client Relations

Mburu (1983), observed that among other factors influencing use of maternity care include the youthfulness of hospital staff who are assumed to lack cultural knowledge about childbirth; the unfriendly treatment and atmosphere at the hospital. Women who felt that they were not given proper treatment by clinic staff were discouraged from returning to the place.

Unkind treatment by hospital staff to clients who commence prenatal care late is another important factor in determining whether women will seek care or not. For instance, women who did not book early for delivery tended to be given less attention should they go to a health facility for the same service (Sargent and Rawlings 1991).

Poland et al., (1990) noted in their study that negative attitudes toward health professionals was a recurring problem affecting access to prenatal care. Most women in the study complained that physicians, nurses, social workers and clerks were rude, uncommunicative and frightening. Discontinuity of care in large public health or hospital based clinics was a disincentive to keeping appointments. The hurried, often-rude atmosphere of prenatal clinics communicates a lack of interest. The authors suggest that if poor women are to receive quality prenatal care, its importance must be communicated to them by the manner in which the care is provided.

2.6 Type of place of residence

The National Institute of Nutrition and Macro International (1996), during the 1995 Kazakstani DHS, found differences in the source of antenatal care classified by rural/urban residence. Urban mothers received more care than in the rural areas. In the urban areas a doctor in the city of Almaty than in the rural areas attended relatively more deliveries.

Rural women are less likely to seek prenatal care than the urban women are. This is because the rural women with less income find that it costs too much time and money to get maternity health care. Some cannot afford to pay for transportation or the services needed. For instance, in Mexico, when clinics began charging deposits for prenatal care, attendance at government clinics dropped (Lettenmaier and Liskin, 1988).

Summary of Literature Review

From the literature review, a number of factors have been consistently observed to the influence use of maternity care services. They seem to define inequalities in access to and quality of maternal care. Specifically, factors that were found to affect maternal health care are type of place of residence, age, parity, education, and household level variables.

The effect of education on the use of maternal health care services has been observed to be profound in almost all the works reviewed. It not only makes one aware of the available services, but also of the need to go for medical checks. Education provides an avenue for economic advancement, in that educated women are more likely to get paid employment. Economically empowered women have greater access to health care. White-collar job workers, for example, are more likely to obtain care than those who do not work, even when the services are free (Miles-Doan and Brewster, 1998). Therefore, empowering women financially may improve their access to health services and better their health related decisions in the developing countries.

Access has a very strong influence on the use of maternal health care. In a lot of cases, the distance and time taken to get to a health institution appears to determine the use of the facility. Distances of over 5 kilometres from a health facility are associated with a decline in attendance.

Another aspect of access is finance. Women with little finances are less likely to use medical care especially when there are no alternatives to private medical care. The costs of transportation from home to the clinic can serve as a deterrent to the use of the same. Coupled with the most immediate needs such as food and clothing for the family, a woman is likely to avoid the travelling expense and meet the family needs.

Urban women tend to have access to services due to infrastructure and transport. The availability of health care services is in most cases greater than in rural areas, and women have options from which to select. In rural areas, women have to cover long distances to get to health care providers, a fact that can discourage use.

Women are likely to shy away from health care providers who treat them impartially or in a way they consider rude. This aspect particularly leads women to seek the care of TBAs with whom they are more conversant and can visit them at their homes. Winikoff (1987), in a study of the role of family planning in reducing maternal mortality, argue that the combined strategies of fertility reduction, abortion services and family planning for the high risk groups usually of older and younger women might address about half of all maternal mortality in the developing world. Pregnancy and delivery care have the potential for saving large numbers of lives with appropriate interventions. On the basis of these studies, they conclude that improving women's reproductive health requires attention both to family planning and to improved services for

pregnant women. They also note that pregnancy and delivery care have the potential for saving large numbers of additional lives, if appropriate interventions are taken. These may not necessarily be complicated technologies but may be appropriately cast as primary maternity care.

2.7 CONCEPTUAL AND OPERATIONAL FRAMEWORK

2.7.1 Conceptual Framework

Maternal health care depends primarily on the socio-economic and cultural milieu in which a woman lives. The World Health Organisation Expert Committee on Maternal and Child Health (MCH) stated that if MCH care programmes were to be effective, they must concern themselves not only with immediate causes of morbidity and mortality, but with the types of social organisations and values that characterise the populations (WHO, 1997a). This is because pregnancy and childbirth in Africa are surrounded by beliefs and customs that affect health and health care sought.

The resources available both to the family and community determine the access which women have to maternal health care services. The cultural set up too, influences the health care behaviour and use of health services. The modern maternal health care services may be available but if culture prohibits some practises, then women may not make use of them.

It is important to examine utilisation of maternal health care services in developing countries within their own context. Not always will complications lead people to seeking attention from medical staff and not always do people seek scientific medicine as the most appropriate. Who is consulted once complications are recognised depends on pre-existing beliefs about their meaning, the efficacy of different approaches (be they traditional, spiritual or modern medicine), and the availability and access of the sources of help. Where there is an assumption that a spirit for instance is intervening, then one is likely to seek the help of a traditional healer (Ward et al., 1997).

The theoretical framework by Kasl and Cobb (1966), states that health seeking behaviour is a function of the perception of threat and the attractiveness of value of the behaviour. The act of seeking health care is a function of:

1. The unpleasantness of cost "taking action compared to taking no action and suffering the consequences".
2. The perceived probability that the action will lead to the desired prevention of threat.

The model however has been criticised for the difficulty in specifying its limits. Individuals who desire to prevent a disease may not be inclined to treat an illness (Nginya, 1980).

There are a wide range of factors that shape health-seeking behaviour. McKinlay (1972, cited in Ward et al., 1997), identified six approaches. These are first, the economic relating to financial barriers to seeking help. Second, the socio-demographic which relate to the significance of characteristics such as age, parity, gender and education for utilisation; the geographic (proximity of health services and use); the social-psychological (individual motivation. perception and learning and use behaviour). The socio-cultural (association between norms, values beliefs lifestyles and use of services); and the organisational (the effect of health care organisation on use of services).

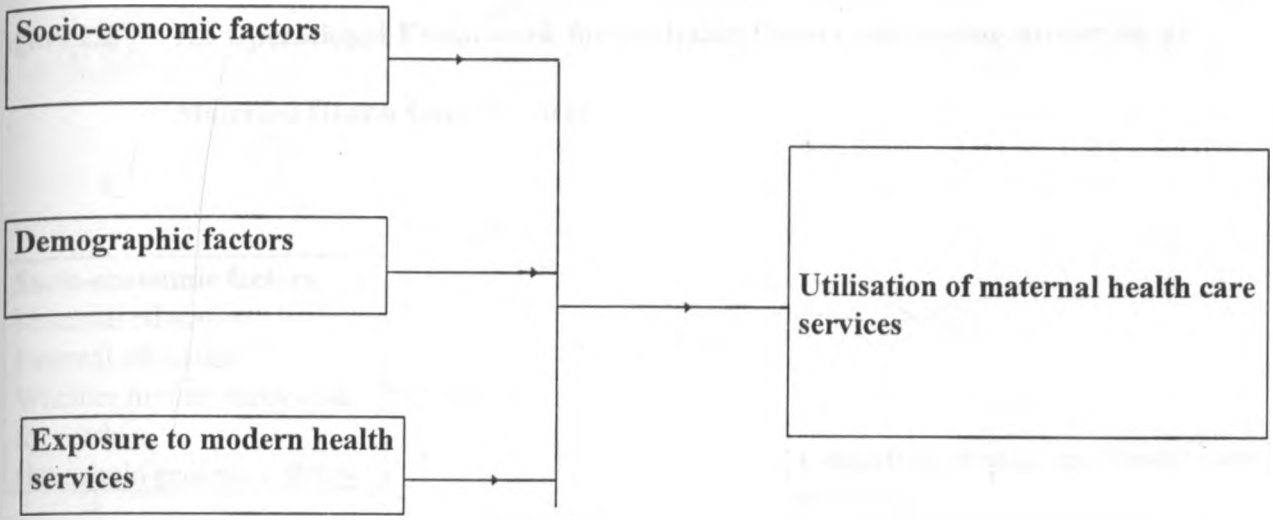
Kroeger (1983), identified two broad frameworks for analysing health-seeking behaviour. The pathway model that uses qualitative methods of investigation is anthropological. The method identifies a sequence of steps from recognition of complications to use of health facilities and the social and cultural 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 utilisation of maternity care. This framework is shown in figure 2.1.

Education is expected to affect the use of maternal care. Educated people are more likely to use maternity care. Rural women are usually less educated and therefore less exposed to knowledge and importance of maternity care. Living in the rural areas restricts the social networks of a woman, since a woman operates within some rather predetermined circle of friends and relatives. Therefore, information acquired through social learning and formal education, usually influences only few women.

The socio-economic conditions of women affect their attitudes and values. For the poor especially in the rural areas, poverty leads to lack of education that leads to ignorance of health services. Those socialised within low socio-economic class tend to be ignorant or apathetic to the health services around and available to them, even if they were free. Moreover, social interventions across socio-economic groups are less in the rural environment. Such interactions are hypothesised to enable exchange of information on reproductive health matters. The information acquired influences attitudes and perceptions, which together with access factors, determine one's use of maternity care services. However, in the rural areas, women tend to remain unaffected by social interventions and health awareness campaigns.

Figure 2.1 A conceptual Framework for Factors influencing the Utilisation of Maternal Health Care



Source: Kroeger (1983)

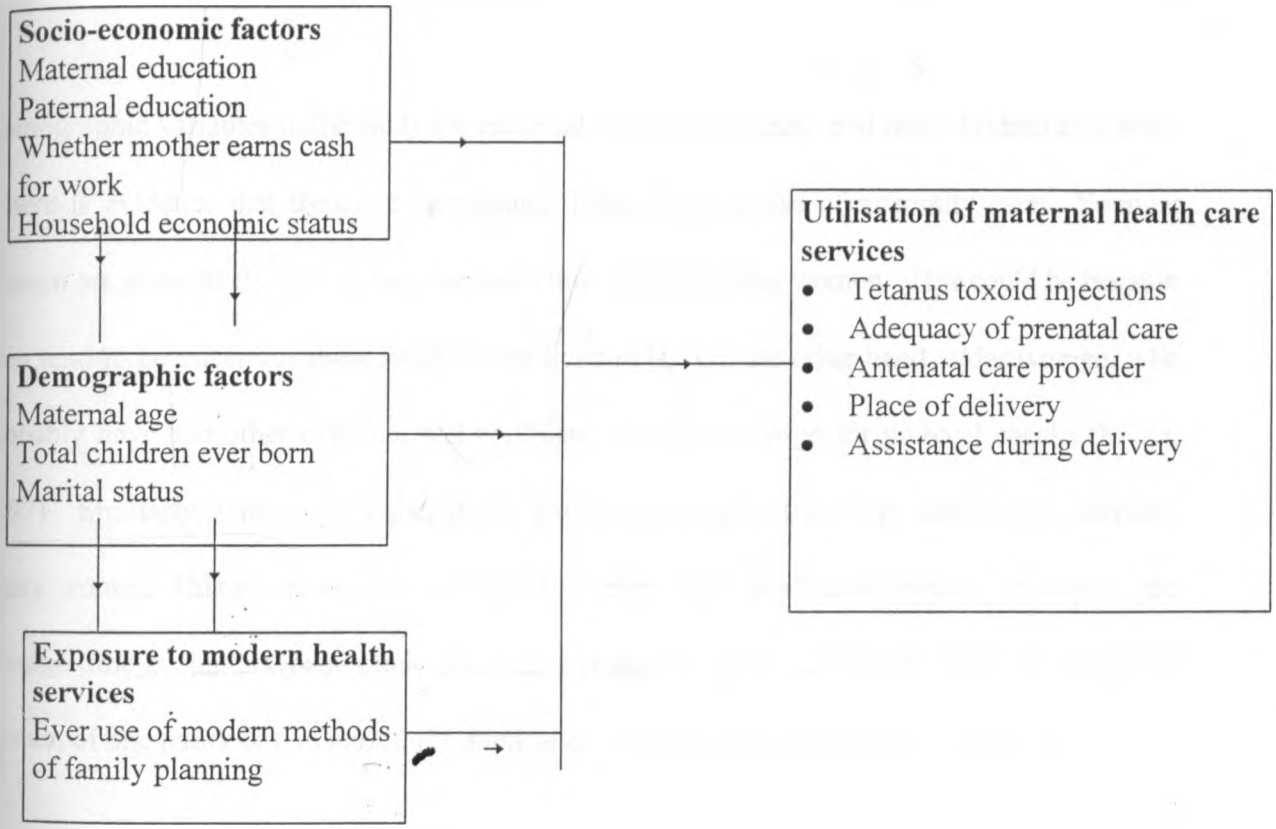
Conceptual Hypothesis.

The conceptual hypothesis derived from the model is that a range of socio-economic, demographic and exposure factors act with one another to influence use of maternal health care services in Nyanza province.

2.7.2 Operational Framework

The conceptual framework above illustrates how socio-economic, demographic and exposure factors influence maternal health care use. These factors are operationalised by the variables given in the framework below.

Figure 2.2 An Operational Framework for analysing factors influencing utilisation of Maternal Health Care Services



Source: Adopted from Kroeger (1983)

The socio-economic variables considered in the operational model include mother's education, whether mother earns cash for work or not, household economic status. type of place of residence and husband's education. A woman's education is expected to influence her occupation or income therefore determines the overall family income. hence access (in terms of

occupation or income therefore determines the overall family income, hence access (in terms of cost) and use of maternal health care services. Educated women also tend to be better informed about symptoms of complications and could therefore be more likely to seek timely medical care when such complications arise. Such women are likely to be in urban areas and thus are closer to health care facilities, or have better access to the transportation needed to reach the health facility. Educated women are likely to be employed and are better able to pay for the care given.

Demographic variables in the study are maternal age, marital status and total children ever born. There is evidence that there are age-related differentials in use of maternity care. Younger women are more likely to visit the antenatal clinic than are older women. This could be because they tend to be uncertain about what a complication is. On the other hand, older women, who probably have had other children, feel confident enough not to go for prenatal checks (MOH, 1997). Similarly, women of higher parity attend antenatal and delivery clinics less than low parity women. This too is the case with the first attendance at a health facility. In Kenya, the average time at first antenatal clinic attendance is six months (NCPD et al, 1994), although for women of one parity or two parity, the attendance begins at the third month on average.

Factors of exposure to modern medical services considered are ever use of family planning. It is expected that women who have ever used modern methods are more knowledgeable on the need to seek maternity care from hospital. They are also more likely to be at ease relating to medical personnel due to their exposure.

2.7.3 Operational Hypotheses

From the operational framework, the following operational hypotheses were formulated and tested:

1. The higher a woman's education, the higher the likelihood to use maternity health care services.

2. Women who have ever used modern methods of family planning are more likely to utilise maternal health care services.

3. The higher the level of education of the husband, the higher the chances of attendance of maternal health services by the woman.

4. The older a woman is, the lower will be her chances of using modern maternal health care services.

5. The lower the parity of a woman, the higher the likelihood of utilisation of maternal health care.

6 The type of place of residence has a strong influence on use of maternal health care services.

7. Marital status of a woman has a significant influence on utilisation of maternity care facilities.

8 Women who earn cash for work are more likely to use maternity care services.

9 The higher the household economic status of a woman, the greater the likelihood of her using maternal health care services.

2.7.3 Nature of variables

A. Dependent Variables

The dependent variables in this study are dichotomous i.e. either a woman used some form of maternity care or not. Maternal health care utilisation is measured by place of delivery, assistance during delivery, number of antenatal checks, timing of first antenatal check for pregnancy, tetanus injections before birth and the professionals seen for each of the services mentioned. The dependent variables are operationalised as discussed below.

Receipt of tetanus injections: Refers to whether a woman received tetanus toxoid injections during pregnancy or not. The variable is measured by the categories; no injection, and at least one or more injections.

Timing of antenatal checks for pregnancy: Refers to the stage of pregnancy at which antenatal checks commence. It is categorised twice, such that clinics beginning in the first trimester are considered early, and those beginning in the second and third trimester are considered late.

Number of antenatal checks: Refers to the total number of antenatal clinic visits a woman went for during pregnancy. The variable is measured by two categories; four visits or less, and five or more visits.

Scale of antenatal care: This variable was constructed using the number and timing of antenatal visits in an attempt to grade the quality of care during pregnancy. The scale of care is categorised as 'some' and 'adequate'. If a woman went for antenatal clinics early and had five and above visits in total during pregnancy, she was considered to have had adequate antenatal care. On the other hand, if a woman begun clinics late in pregnancy and went for four or less visits, then she is considered to have had 'some' care.

Prenatal care providers: This refers to the health care providers seen during pregnancy. It is measured by two categories; 'professional' and 'other care'. Professional care entails care provided by doctors, nurses and trained midwives. Other care is where the women were attended by untrained birth attendants and traditional birth attendants.

Place of delivery: Refers to where the delivery took place. It is represented by the categories 'Home', and 'Health institution'.

Assistance during delivery: The variable refers to the most qualified person who attended the mother during delivery and consists of three categories; 'professional', 'auxiliary' and 'other'. The professional category includes doctors, nurses and trained midwives. Auxiliary includes trained birth attendants, and 'other' includes traditional birth attendants and where there was self-delivery.

B. Independent Variables

Demographic Variables

Maternal Age: Refers to the age of the respondent as at the time of the birth of her child. This

variable is measured in three categories namely; 15-24, 25-34, and 35+. These categorisation was based on the fact that the three groups would adequately represent births to mothers of the young , middle and older age groups.

Total children ever born/Parity: Refers to the number of children ever born alive to a woman. A woman with one child is said to be of one parity and by extension for the rest. It is measured in terms of the categories 1-3, 4-6 and 7+ children. It is hoped that the grouping represents women of low, medium and high.

Marital Status: Is measured in terms of the categories; 'married and living together', 'single', and 'other' (which includes widowed, divorced and separated).

Socio-economic Variables

Maternal education: Refers to the highest level of education attained by the mother. It is measured in terms of the categories; 'None', 'Primary', and 'Secondary+'

Paternal Education: Refers to the highest level of education attained by the father. This is measured in terms of 'None', 'Primary' and 'Secondary+'.

Earns cash for work: This variable refers to whether a woman earns cash or not for the work she does. The variable is measured by the two categories; 'Earns cash' and 'does not earn'.

Type of place of residence: Refers to the mother's place of residence as at the time of interview. Is categorised as either rural or urban.

Household socio-economic status (HSES): It has often been observed that income influences

utilisation of maternal care services. The KDHS did not gather information on household income. Nonetheless, three types of data were used to capture variations in household income. These data were used to construct an index as a proxy for household disposable wealth or income (Bicego and Boerma, 1991). The possession of a radio earns one point and television two points. Secondly, the type of material used on the floor is considered so that two points are awarded for non-earth floor and zero otherwise. The third type of data relates to ownership of motorised means of transportation. There was no data on motorised means of transport for Nyanza province. Therefore the index constructed used only the former two data sets. This ranking results in an index ranging from a minimum of zero and a maximum of 3. The variable is coded as 1 if low status, 2 if middle and takes the value 3 if upper middle.

Exposure to modern health services

Ever use of family planning: Refers to whether a woman had ever used any form of family planning. The variable is categorised into three; 'never used', 'traditional or folk', and 'modern'.

CHAPTER THREE

METHODOLOGY

This chapter gives a discussion of the source and quality of data used in the study. It also discusses the methods employed in analysis of the variables in order to test the hypotheses and meet the objectives of the study.

3.1 Data source

The secondary data were obtained from the 1993 Kenya Demographic and Health Survey. This was a survey that covered the entire country with the exception of seven districts in the North Eastern section of the country. The sample clusters were selected from the Central Bureau of Statistics national master sample, of the third National Sample Survey and Evaluation Programme (NASSEP-3). The NASSEP master plan had a two-stage design, stratified by rural-urban residence and within the rural stratum by individual districts (NCPD et al, 1994).

The KDHS was conducted to collect data regarding fertility, family planning and maternal and child health. The data were collected through interviews using a structured questionnaire containing a number of questions on social, cultural, economic and demographic variables. Four types of questionnaires - Household, Woman's, Man's and Services Availability Questionnaire, were used to collect the data (NCPD et al, 1994). For this study, the woman's questionnaire is useful. It was used to collect information from women aged 15 to 49 years. Specifically, data on the background characteristics, reproductive history and antenatal and delivery care of the women was extracted and used to achieve the study objectives. Data so extracted from the KDHS were analysed in order to establish differentials in use of maternal health care. Secondly, they were used to investigate the effects, if any, of the selected

background variables on the use of the maternal health care services. The unit of analysis is the individual child that was born in the five years preceding the survey. The child is used as the unit of analysis because the data relating to utilisation of maternal health services were collected in connection to each birth.

3.2 Quality of the 1993 KDHS Data

The sample for the 1993 KDHS was national in scope. Three districts in parts of Eastern and the whole of North Eastern Provinces were excluded. Some selected districts were oversampled in the survey in order to produce more reliable estimates for certain variables at district level. Due to the oversampling, the KDHS sample is not self-weighting at the national level. Sample weights were used to compensate for the unequal probability of selection between strata (NCPD et al, 1994). Therefore. where necessary, weighted figures are to be used in this study.

To obtain data on the use of maternal health care services, women were asked retrospective questions on birth histories. This may render the data susceptible to errors of omission caused by memory lapse. Other possible errors could include misreporting of events, especially for age and parity.

A common problem of demography in Africa is that of defective data. Due to the absence of vital registration systems, obtaining reliable estimates of birth histories is difficult (Kpedekpo, 1982; UN, 1989). Recall of certain events such as antenatal checks may render the data suspect. Memory lapses where recall period is vast can be a source of bias. This is not expected to be a major problem as the recall period is five years preceding the survey.

Efforts were made during the implementation of the survey to minimise sampling and non-sampling error. Non-sampling error result from mistakes made in implementing data collection, such as failure to interview the correct household, misunderstanding of questions by either interviewer or respondent. and processing for example, incorrect entry of data.

Sampling error on the other hand, is a measure of variability between all possible results of the actual sample selected. It is measured in terms of the standard error. The standard error for the 1993 KDHS were calculated for selected variables considered being of primary interest. Generally, the relative standard error for most estimates for the country as a whole is small, except for very small proportions, such as geographical areas.

3.3 Methods of Data analysis

The data drawn from the 1993 KDHS were analysed using both descriptive and inferential statistics. Descriptive statistics entailed frequency distributions of births according to their mothers' by selected explanatory variables. All preparations and analyses of data in this study were done using the Statistical Package for Social Sciences (SPSS).

3.3.1 Cross tabulation and Chi-square test

The study uses the chi-square technique to test whether there is association between use of maternal health care services and the socio-economic, demographic and exposure factors.

The test employs two types of hypotheses:

1. The null hypothesis (H_o) - which states that there is no significant difference between the

observed and expected frequencies.

2. The alternative (H_1) - which states that there is a difference.

Computation of Chi-square is done by the formula:

$$X^2 = \Sigma(O-E)^2/E$$

Where

O are the observed frequencies.

E are expected frequencies.

SPSS is used to calculate the significance level of the test. For this study, if the level is less than 0.05, then the null hypothesis is rejected. The value of Chi-square depends on the number of rows and columns in the contingency table under consideration; therefore degrees of freedom have to be calculated. Degrees of freedom are the number of observations that can vary after one observation is removed from each cell. The degrees of freedom are calculated by SPSS.

One disadvantage of the chi-square test, however, is that the test statistic is insensitive to the direction of relationship since it involves the squares of deviations and cannot therefore be negative.

3. 3. 2 Logistic Regression Analysis

Logistic regression analysis was used to estimate the likelihood of use of a specific form of maternity health care service, given a set of socio-economic, demographic, and exposure factors. Logistic regression analysis was used to test the validity of the operational hypotheses since the dependent variables are dichotomous.

Logistic regression is a statistical technique that is used to estimate the effect of independent variables on the dependent variables. The analysis is an extension of linear regression models, which express the dichotomous dependent variable as function of the explanatory variables. The method is efficient when the dependent variable is dichotomous and the explanatory variables categorical. as is the case in this study.

Logistic regression analysis is applied in situations where an event has occurred or not occurred. It assumes that the dependent variable has binomial distribution. Logistic analysis is a probability regression model. which expresses the dichotomous variable Y_i as a non-linear function of the explanatory variable X_i.

The parameters in the logit model may be interpreted as ordinary regression coefficients where positive values indicate that the independent variable or their interactions raise the log odds of the independent variable while negative coefficients show lower log odds. An odd is the ratio of the frequency of being in one category to not being in that category. It is interpreted, as the chance that an individual randomly selected will be observed to fall into the category of interest. The odds ratio is used in logit analysis to measure the effect of independent variables on the dependent variables.

In logistic regression one directly estimates the probability of an event occurring for one independent variable such that:

Probability of event = $e^{\beta o + \beta 1 x} / 1 + e^{\beta o + \beta 1 x}$

Where β_o and β_1 are coefficients estimated from the data, x is the independent variable

and e is the base of the natural logarithms (approximately 2.718).

For more than one independent variable, the model can be written as:

Prob (event) = $e^z / (1 + e^z)$

OR

Prob (event) = $1 / (1 + e^{-z})$

Where

$$z = \beta_0 + \beta_{1x1} + \beta_{2x2} + \ldots + \beta_{pxp}.$$

And the probability estimates always range between 0 and 1. The dependent variable takes the value one if a woman used some form of maternal health care service and zero if she did not use. For each explanatory variable, there was assigned a reference category, which has an odds ratio of 1.00. If the odds ratio of a given category is less than 1.00, it indicates lower chance of using maternal health care services. If it is more than one, it indicates a higher chance of utilisation of the services compared to the reference category.

Suitability of Logistic Analysis for the study

Logistic analysis is found fitting for this study because; first, it is a multivariate method of estimating relative risk. The logistic coefficients are the natural logarithms of the relative odds by which determinants of use of maternal health care services are found. The use of dichotomous dependent variables refocuses the analysis from examining determinants of use of services in general but also to examining the determinants of non-use. The model is flexible and easily used.

CHAPTER FOUR

LEVELS AND DIFFERENTIALS IN THE USE OF MATERNAL HEALTH CARE SERVICES

4.1 Introduction

This chapter addresses two objectives of the study, namely; to determine the overall level of utilisation of maternal health care services. Secondly, is to investigate differentials in use of maternal health care services according to socio-economic and demographic characteristics. It was hypothesised that there is differential utilisation according to socio-economic and demographic backgrounds of the women. On the basis of these objectives and hypotheses, results of cross tabulations and chi-square tests are presented in this chapter. Frequency descriptions and cross tabulations have been used because they are useful in giving an overall picture of the relationships between the study and independent variables.

This chapter, therefore, presents and discusses the basic characteristics of the respondents, and levels and differentials in the use of maternal health care services. The data are drawn from a sub-sample of women who were interviewed during the 1993 KDHS. There was a total 1112 births that occurred among these women during the period. This study is based on them because: these are the births for which information relevant and pertinent for this study was obtained.

4.2 CHARACTERISTICS OF THE STUDY POPULATION

The basic characteristics of the study population are presented below in Table 4.1. From the table, it is clear that a majority of the children were born to women with lower educational attainment. About 66 per cent of them, were born to mothers with primary education, while only 18 percent had mothers with at least secondary education. In studies of utilisation of maternity health care services, there is often a significant association between level of education and use of services. More educated women are expected to use the services more than those with lower educational attainment. The low educational attainment among the sampled women is a predictor of low utilisation of maternity care services. Similar to the mothers, most of their partners had attained a maximum primary education, the category having 59 per cent; those with secondary education and higher constituting only 32 per cent. For 17 per cent of the births, their mothers did not have any formal education while only 8 per cent of their spouses did so.

Distribution of births by maternal age reveals that births to younger women aged less than 35 years constituted the majority of the group. Those children whose mothers were aged 15 to 24 years constituted 35 per cent of the sample. 49 per cent of the births were to women aged between 25 and 34 years. This is typical of the province since it has been experiencing a consistently high fertility regime and it is expected that subsequent birth cohorts are larger than previous ones. Births to older women (35+) are fewer in the sample, since generally they may have had their desired family size or stopped childbearing. Therefore, they are likely to have fewer children aged five and below than their relatively younger counterparts in the province.

The majority of children were born to women who had six children or less, accounting for 77 per cent. It has already been stated that most of the births occurred to younger women. The

observation may be explained by a probable high value for many children and low use of contraception by younger women as they enter their reproductive life. Only 23 per cent of the births occurred to women who had given birth to at least seven children.

Table 4.1 **Percentage distribution of births that occurred between 1988 and 1993 in Nyanza Province according to maternal background characteristics.**

	Percentage	Number of births (N)
Maternal Age		
15-24	35.1	390
25-34	49.1	549
35+	15.6	173
Maternal Education		
No education	16.5	184
Primary	65.9	733
Secondary +	17.5	195
Whether Mother earns cash for work		
No	25.2	208
Yes	74.8	618
CEB of mother		
1-3 children	39.4	438
4-6	37.3	415
7+	23.3	259
Ever use of FP		
Never	52.4	583
*Trad / Folk	15.6	174
Modern	31.9	355
Maternal Marital Status		
Single	6.0	67
Married. living together	84.7	942
Other	9.3	103
Paternal Educational level		
No education	8.3	85
Primary	59.6	612
Secondary +	32.1	330
Type of place of residence		
Rural	96.8	1076
Urban	3.2	36
Household economic Status		
Low	48.6	458
Middle	43.3	408
Upper middle	8.1	76
Total	**100**	**1112**

Source: Analysis of 1993 KDHS data.

*Note: FP=Family planning and Trad/folk refers to traditional and folkloric methods of family planning. Not all row totals add up to 1112 due to missing cases.

Over 84 per cent of the births occurred to currently married women, 6 per cent were to single women and 9 per cent were to either divorced, widowed or mothers not living together with

their husbands. This observation conforms with expectations in a society where marriage is almost universal, and nearly all women are expected to marry upon entering adulthood.

A majority of the children were born to women who earned cash for the work they do, and this accounted for 75 per cent. This observation indicates that the mothers were economically engaged and exposed to influences other than those in the home. These two factors have been found to influence the use of maternal health care services in other studies. It would therefore be expected that women who earn cash would be more accessible to the services.

The 1993 KDHS did not gather information on household income per se. However it has been observed that income influences utilisation of maternal health care services. An attempt was made to construct an index as a proxy for household disposable wealth and income. It is observed that over 48 per cent of the births in Nyanza province were to low income households. Moreover, 97 per cent of the births were born to rural residents.

Ever use of family planning has been used as a proxy measure of exposure to maternity health care services, since in Kenya maternal and family planning services are usually provided under one clinic roof. It is interesting to note that a majority 52 per cent of the births was to women who had never used any form of family planning. Only 32 per cent had used modern family planning methods while 16 per cent had used traditional and folkloric methods.

4.3 Levels of Utilisation of Maternal Health care Services

The first objective of this study was to establish the levels of utilisation of maternal health care services in Nyanza province. To achieve this goal, frequency distributions were used; and the findings are presented in this section and Table 4.2.

Antenatal care is most effective if the clinic visits are started early in the pregnancy and continue regularly until delivery. However, for most of the births in the province, antenatal clinics began in the second trimester of their mother's pregnancy. For over 69 per cent of the births. the women visited the antenatal clinic for the first time during the second trimester of pregnancy. Only 17 percent of these births' mothers began their antenatal clinics in the first trimester. Health personnel recommend that women should go for screening during the first month so that they can be checked for any diseases; hence given treatment before they can cause complications for both the mother and the growing baby. Very late onset of antenatal checks, that is. in the third trimester, was observed among 15 per cent of the mothers. Such mothers are particularly at risk because when and if they develop any complications, the situation may have already caused damage to either the mother or the baby at the foetal stage..

Despite the recommendation that a woman should attend at least 12 antenatal checks for the pregnancy, for 64 per cent of the births, mothers had 4 or less visits during the entire pregnancy. In fact, it is for only 36 per cent of the births that their mothers had 5 or more checks. The largest proportion of the births was to mothers who had 4 or less antenatal clinic checks for the entire pregnancy. This in essence means that their pregnancies were not regularly monitored in case of any abnormal developments.

The percentage of births to women not receiving antenatal care is almost similar to the national estimate. Whereas just below 4 per cent of women at the national level did not get any antenatal care (NCPD et al 1994); 4.3 per cent is true for Nyanza Province.

There appears to be a general high uptake of tetanus toxoid injections. Evidence for this is the fact that 93 per cent of the mothers had at least one tetanus injection before birth. It is recommended that a woman should have two of such injections, but for second and consecutive births, one dose of a booster is adequate in preventing tetanus infection. More critically though, it appears that just about half of the births' mothers had two or more tetanus injections. The rest had either one or no vaccination at all. But, since the majority of the mothers captured in this study had more than one child, it can be stated that there was near adequate receipt of tetanus toxoid injections. In fact, non-receipt of tetanus toxoid is lowest in Nyanza province as compared to other provinces in the country (NCPD et al, 1994). Only 7 per cent of mothers in Nyanza province did not benefit from any vaccination compared to 10 per cent at the national level.

Nurses and/or midwives invariably, were the most preferred to provide antenatal care. For an overwhelming 88 per cent of the births, mothers reported having seen a nurse or midwife for their prenatal care. This is to be expected as in most rural health facilities nurses provide most of the antenatal care. In any case, nurses run most of the rural health facilities. Doctors attended only 6 per cent for prenatal care. Trained birth attendants and untrained traditional birth attendants attended only a negligible number of the cases.

A remarkable shift in the choice of health care provider is noted with regard to assistance

during delivery. Whereas most of the births mothers sought prenatal care from nurses and midwives during delivery, there is a clear distribution among all the various health care providers. Nonetheless, nurses and midwives still delivered most of the births, accounting for 33 per cent of all the births. Trained and untrained birth attendants assisted in over 16 per cent of the deliveries. A more noteworthy observation is the fact that relatives, friends or the mother herself without any assistance attended about 44 per cent of the deliveries. Such occurrences pose great risks for both the mother and baby; as there is a high level of unskilled handling of the delivery process.

From the literature review, it was established that the kind of care a woman receives when delivering her baby is crucial in determining their health and survival status. In Nyanza Province. 18 per cent of the births were delivered by the mother herself without any assistance. This is quite a high level of unattended delivery. In other parts of the country, however, there are even greater proportions of unattended delivery. For example, the proportion of children delivered by the mother is rather high in Turkana district, accounting for 52 per cent and Kwale 39 per cent of the cases. Self-delivery in Western Kenya is also high and accounts for 23 per cent of the cases (CBS, 1996). In this study, one may therefore postulate that the preference for unskilled personnel during delivery may be a possible factor in determining the high maternal mortality levels in Nyanza Province.

The kind of assistance a mother receives during the birth of a child is dependent on the place of delivery. Most of the deliveries at home are likely to be aided by TBAs or close relatives while births at a health facility are likely to be assisted by trained medical personnel. Although for the majority of births in Nyanza Province the mothers had attended prenatal care from medical

personnel, only 39 per cent of births were delivered at a health facility. The remaining 61 per cent were delivered at home, (CBS 1996). These findings are consistent with other studies where it was found that higher proportions of mothers received adequate prenatal care than those that were attended at delivery and delivered at a health institution.

An attempt has been made to grade the quality of prenatal care a woman received during pregnancy. Based on the number of visits and the timing of the first antenatal check up, care was classified into two categories- some or adequate. Women who had four or less visits from the second trimester onwards were considered to have got "some" care. Those that went for five and more visits and began clinics in the first trimester were considered to have got "adequate" care. It is observed that only 41 per cent of the births had their mothers receiving adequate care. The rest received just some care. Obviously then, a majority of women in Nyanza Province do not receive adequate antenatal care. This is a particularly useful observation for health care intervention, since more than half of the population does not benefit adequately from medical attention during their pregnancy.

TABLE 4.2 The Percentage distribution of births by Mother's Utilisation of Maternity Care Services, Nyanza Province; 1993 KDHS.

Form of Maternity cares		Percentage	Number of cases
1. Timing of first ANC check			
a.	1st trimester	16.7	178
	2nd trimester	69.1	735
	3rd trimester	14.2	151
b.	Late	83.3	886
	Early	16.7	178
2. ANC visits for pregnancy			
a.	No visits	4.4	48
	At least one visit	95.6	1063
b.	4 visits and less	63.8	709
	5 and more visits	36.2	402
3. TT for pregnancy			
a.	No injection	7.2	80
	At least one injection	92.8	1032
b.	Two and above	49.4	549
	One and less	50.6	563
4. Prenatal care provider			
	Doctor	5.7	63
	Nurse/midwife	88.2	981
	Trained birth attendant	1.4	16
	TBA	0.4	4
	No one	4.3	48
5. Assistance during delivery			
	Doctor	4.9	54
	Nurse/midwife	33.6	374
	Trained BA	8.9	99
	TBA	7.8	87
	Self	18.1	203
	Relative	26.6	295
6. Place of delivery			
	Home	61.3	682
	Health institution	38.7	430
7. Scale of prenatal Care			
	Adequate	38.6	429
	Some	61.4	683
	Total	**100**	**1112**

Source: Computed from 1993 KDHS data.
Note: Some row totals do not add up to 1112 due to missing cases.

4.4 DIFFERENTIALS IN THE USE OF MATERNITY HEALTH CARE SERVICES

The second objective of the study was to investigate the differentials in the use of maternal health care services according to demographic and socio-economic characteristics. To achieve the objective, cross tabulations and chi-square tests were carried out. The findings are discussed in this section.

The subsection examines differentials in utilisation of given forms of maternity care services and whether or not there exist relationships between them and the selected independent variables. The maternal health care services stated include tetanus toxoid injections, prenatal care provider, number of antenatal visits, place of delivery and assistance during delivery.

For each case considered, the hypotheses tested shall take the form;

H_o There is no association between the socio-economic and demographic factors and use of maternal health care services.

H_1 There is an association between the dependent and independent variables.

Results of chi-square tests indicate that some factors are associated with the use of given forms of maternal health care, while others do not have a significant relationship at all, as will be discussed in the following section.

4.4.1 Receipt of Tetanus Toxoid Vaccinations before Birth

As already stated, it is recommended that an expectant mother have at least two tetanus toxoid injections before delivery. For second and higher order births, only one booster is needed.

The number of tetanus toxoid injections a birth's mother received in Nyanza province before birth is observed to be associated to ever use of family planning methods, and the partner's education level (Table 4.3). However, there is a very high level of receipt of tetanus injections by all educational categories, and for over 90 per cent of the births, the mothers got at least one injection. Births to women whose partners had at least primary education were most likely to receive tetanus injection.

The number of tetanus toxoid injections a child's mother received is also associated to ever use of family planning methods. Births to mothers who had never used any method were most likely to have no injections. Those who had used traditional methods showed greater likelihood of getting tetanus injections.

Table 4.3 Percent Distribution of Births by Tetanus toxoid vaccinations and selected background characteristics; Nyanza Province, 1993 KDHS

	Tetanus Vaccination before birth		
	No injection	At least one	No.of cases
1. Maternal Education			
No education	9.2	90.8	184
Primary	7.6	92.4	733
Secondary+	3.6	96.4	195
Total	80	1032	1112
X^2: 5.16475	**DF: 2**	**Sig.: 0.07559**	
2. Marital status			
Single	3.0	97.0	67
Married	7.0	93.0	942
Other	11.7	88.3	103
Total	80	1032	1112
X^2: 4.89118	**DF: 2**	**Sig: 0.08668**	
3. Paternal education			
No education	9.4	90.6	85
Primary	9.5	90.5	612
Secondary+	3.3	96.7	330
Total	77	950	1027
X^2: 12.15807	**DF: 2**	**Sig: 0.00229**	

4. Household economic status			
Low	7.4	92.6	458
Middle	7.1	92.9	408
Upper middle	3.9	96.1	76
Total	**66**	**876**	**942**
X^2: 1.22031	**DF: 2**	**Sig: 0.54327**	
7. Mother earns cash for work			
Yes	7.1	92.9	618
No	8.7	91.3	208
Total	62	764	826
X^2: 0.52754	**DF: 1**	**Sig: 0.46764**	
6. Maternal Age			
15-24	6.4	93.6	390
25-34	7.1	92.9	549
35+	9.2	90.8	173
Total	80	1032	1112
X^2: 1.45924	**DF: 2**	**Sig: 0.48209**	
7. Total CEB			
1-3	6.2	93.8	438
4-6	6.7	93.3	415
7+	9.7	90.3	257
Total	80	1032	1112
X^2: 3.16433	**DF: 2**	**Sig: 0.220553**	
8. Ever use family planning			
Never	8.4	91.6	583
Trad/folk	2.3	97.7	174
Modern	7.6	92.4	355
Total	**80**	**1032**	**1112**
X^2: 7.61506	**DF: 2**	**Sig: 0.02220**	
9. Type of place of residence			
Urban	0.0	100	36
Rural	7.4	92.6	1076
Total	**80**	**1032**	**1112**
X^2: 2.88407	**DF: 1**	**Sig: 0.08946**	

Source: Computed from 1993 KDHS

Note: significance level set at 0.05. Note: Some row totals do not add up to 1112 due to missing cases.

4.4.2 Timing of antenatal clinic checks/visits

The onset of antenatal clinic visits during the pregnancy is very important for the health of the mother and the foetus Table 4.4. It was earlier observed that most women in Nyanza province begin their first clinic checks during the second trimester of the pregnancy. In this section an investigation is made into the factors that are associated with the timing of the first antenatal

check.

Remarkably, at 0.05 significance level, only one variable had a significant relationship with timing of antenatal checks, namely, whether a child's mother earns cash for work or not. Mothers who earned cash were most likely to go for antenatal checks in the second and third trimester. Mothers who did not earn cash had greater chances of going for the first antenatal check during the first trimester.

Table 4.4 Percent Distribution of Births by Mothers' Timing of First Antenatal check and selected background characteristics; Nyanza Province, 1993 KDHS

	Timing of ANC checks			
	1st trimester	2nd Trimester	3rd trimester	No. of cases
1. Maternal Education				
No education	16.3	15.0	21.9	172
Primary	62.9	66.9	63.6	700
Secondary+	20.8	18.1	14.6	192
Total	172	735	151	1064
X^2: 8.49440	**DF: 4**	**Sig: 0.07506**		
2. Mother's marital status				
Single	6.2	5.6	8.2	65
Married	82.0	85.3	86.8	904
Other	11.8	9.1	4.6	95
Total	178	735	151	1064
X^2: 6.92055	**DF: 4**	**Sig: 0.14015**		
3. Partner's education				
No education	8.5	8.8	5.2	81
Primary	54.3	58.3	64.4	574
Secondary+	37.2	32.9	30.4	327
Total	164	683	135	982
X^2: 4.23602	**DF: 4**	**Sig: 0.37501**		
4. Household economic status				
Low	15.8	70.9	13.3	430
Middle	15.8	68.3	16.0	400
Upper middle	20.3	66.2	13.5	74
Total	**146**	**627**	**131**	**904**
X^2: 2.30697	**DF: 4**	**Sig: 0.67950**		
5. Mother earns cash for work				
Yes	65.4	77.6	71.0	592
No	33.6	22.4	29.0	200
Total	136	563	93	792
X^2: 9.40494	**DF: 2**	**Sig: 0.00907**		

6. Maternal age				
15-24	16.6	70.6	12.8	374
25-34	16.5	67.7	15.7	527
35+	17.8	69.9	12.3	163
Total	178	735	163	1064
X^2: 2.21855	**DF: 4**	**Sig: 0.61563**		
7. Children Ever Born				
1-3	42.7	39.6	35.8	421
4-6	37.6	37.6	40.4	404
7+	19.7	22.9	23.8	239
Total	178	735	151	1064
X^2: 2.06656	**DF: 4**	**Sig: 0.72352**		
8. Ever use FP				
Never	57.3	51.3	47.7	551
Trad/folk	10.7	17.1	17.2	171
Modern	32.0	31.6	35.1	342
Total	**178**	**735**	**151**	**1064**
X^2: 5.93487	**DF: 4**	**Sig: 0.20406**		
9. Type of place of residence				
Urban	17.1	77.1	5.7	35
Rural	16.7	68.8	14.5	1029
Total	**178**	**735**	**151**	**1064**
X^2: 2.17706	**DF: 2**	**Sig: 0.33671**		

Source: Computed from 1993 KDHS.
Note: significance level set at 0.05. Not all rows add up to 1112 due to missing cases.

Generally, the stage of pregnancy at the time of first antenatal visit seems to vary a little between Nyanza province and the national level. In Nyanza province, for 69 per cent of births, women began visits in the second trimester, while in Kenya the proportion is 56 per cent. Those attending clinics for the first time during the third trimester accounted for 4.1 per cent at the national level and about 15 per cent in Nyanza province (NCPD et al; the present study).

4.4.3 Choice of Prenatal Care Provider

The prenatal care services being investigated in this study are tetanus toxoid injections, periodic checks during pregnancy and advice on nutrition. For the purposes of this analysis, prenatal care providers are classified as either 'professional' or 'other'. The professional category includes doctors, midwives and nurses. 'Other' includes trained birth attendants and untrained traditional birth attendants.

Table 4.5 Percent distribution of births by mothers' choice of Prenatal care provider by selected background characteristics; Nyanza Province, 1993 KDHS

	Prenatal care provider		
	Professional	Other	N
1. Maternal education			
No education	91.5	8.5	184
Primary	94.8	5.2	733
Secondary+	97.49	2.6	195
Total	1044	68	1112
X^2: 6.82843	**DF: 2**	**Sig: 0.03290**	
2. Mother's marital status			
Single	97.0	3.0	67
Married	94.1	5.9	942
Other	90.3	9.7	103
Total	1044	68	1112
X^2: 3.50781	**DF: 2**	**Sig: 0.17310**	
3. Paternal education			
No education	92.9	9.2	85
Primary	92.3	7.7	612
Secondary+	96.4	3.6	330
Total	962	65	1027
X^2: 5.99551	**DF: 2**	**Sig: 0.04990**	
4. Household economic status			
Low	91.9	8.1	458
Middle	91.9	3.2	408
Upper middle	92.1	7.9	76
Total	876	66	942
X^2: 9.79892	**DF: 2**	**Sig: 0.00745**	
5. Mother earns cash for work			
Yes	94.7	5.3	618
No	96.2	3.8	208
Total	785	41	826
X^2: 0.73600	**DF: 1**	**Sig: 0.39095**	
6. Maternal Age			
15-24	93.6	6.4	390
25-34	94.2	5.8	549
35+	93.6	6.4	173
Total	1044	68	1112
X^2: 0.15541	**DF: 2**	**Sig: 0.92524**	
7. Children Ever Born			
1-3	93.2	6.8	438
4-6	96.6	3.4	415
7+	90.7	9.3	259
Total	1044	68	1112
X^2: 10.32454	**DF: 2**	**Sig: 0.00573**	
8. Ever use FP			
Never	93.1	6.9	583
Trad/folk	95.4	4.6	174
Modern	94.4	5.6	355
Total	**1044**	**68**	**1112**
X^2: 1.40614	**DF: 2**	**Sig: 0.49506**	

Table 4.5 continued

9. Type of place of residence			
Urban	97.2	2.8	36
Rural	93.8	6.2	1076
Total	**1044**	**68**	**1112**
X^2: 0.72176	**DF: 1**	**Sig: 0.3557**	

Source: Computed from 1993 KDHS

Note: significance level set at 0.05. Not all rows add up to 1112 due to missing cases.

From Table 4.5 above, it is clear that for over 90% of the births, the mothers sought prenatal care from professional health personnel. Despite the fact that receipt of prenatal care services from professional health personnel was generally high for the province, more educated mothers had greater chances of seeking the care of professionals than the less educated mothers. At least primary education increased the chances of getting prenatal care from a professional. It is also noted that marital status, partner's education and parity all had a significant association with seeking antenatal care. Paternal education also had a significant influence on choice of prenatal care provider, and the relationship is very similar to that exhibited by maternal education. Secondary and above education of the father increased the chances of the mother seeking prenatal care from a professional.

Also notable is the very strong significant relationship between children ever born and choice of prenatal care provider. Births to women with six and less children were more likely to seek prenatal care. Lower parity women were less likely to seek prenatal care from professional health personnel. This observation is odd considering results of other previous studies.

4.4.4 Number of antenatal clinic checks during pregnancy

The frequency of antenatal clinic checks a woman has during the entire pregnancy reduces the risk of complications during pregnancy and childbirth. The recommended number of checks for a pregnancy is 12 (or once a month for the first seven months, bi-weekly in the eighth month and weekly for the last month of pregnancy). When a complication is detected early enough, it can be dealt with before it advances beyond control. However, for mothers who do not attend clinics frequently, such complications cannot be detected early, and may lead to ill health for both her and the child. Table 4.6 shows the differentials in the number of antenatal checks.

First. a majority of the mothers had 4 or less visits for the entire pregnancy. These accounted for over 63 per cent of the births. There is an association between number of antenatal checks and maternal education and marital status (Table 4.6). The higher the level of education, the more the antenatal checks a child's mother had. Secondary plus education increased the chances of having 5 or more clinic checks. Children of women with no education had the least number of checks, as 91 per cent of them had only six or less checks.

Regarding ever use of any method of family planning, it emerges that women who had ever used traditional or folk methods had greater likelihood of going for fewer checks. Overall, ever use of any method of family planning had a significant association to the number of antenatal checks a woman went for.

There are mixed results as regards maternal age. Whereas births to mothers aged over 35 had the greatest chances of getting the fewest checks, those aged 15 to 24 were most likely to go for 4 or less checks. Births to mothers aged over 35 had the greatest chances of going for 5 and

over antenatal checks. This observation is rather unexpected because previous studies established that older, higher parity women were less likely to go for antenatal checks during pregnancy (Bulut 1995; Dissevelt 1978; Nginya 1980; Obemeyer 1991). In Nyanza province, over 55 per cent of the women went for 2-4 antenatal checks. Nationally, 64 per cent of the women went for equal visits.

Table 4.6 Percentage Distribution of births by mothers' Attendance of Antenatal clinics for pregnancy according to selected independent variables, Nyanza Province, KDHS 1993

	Number of ANC visits for pregnancy		
	4 & less	5+ visits	No. of cases
1. Maternal Education			
No education	60.9	39.1	184
Primary	66.9	33.2	733
Secondary+	55.2	48.8	194
Total	709	402	1111
X^2: 9.91384	**DF: 2**	**Sig: 0.00703**	
2. Marital status			
Single	71.6	28.4	67
Married	63.2	36.8	941
Other	64.1	35.9	103
Total	709	402	1111
X^2: 1.91970	**DF: 2**	**Sig: 0.38295**	
3. Paternal education			
No education	56.5	43.5	85
Primary	66.7	33.3	612
Secondary+	58.4	41.6	329
Total	648	329	1026
X^2: 8.12833	**DF: 2**	**Sig: 0.01718**	
4. Household economic status			
Low	64.0	36.0	458
Middle	63.7	36.3	408
Upper middle	56.6	43.4	76
Total	596	346	942
X^2: 1.59818	**DF: 2**	**Sig: 0.44974**	
5. Mother earns cash for work			
Yes	76.4	72.1	617
No	23.6	27.9	208
Total	513	312	825
X^2: 1.90057	**DF: 1**	**Sig: 0.16801**	

Table 4.6 continued

6. Maternal age			
15-24	67.7	32.3	390
25-34	63.1	36.9	548
35+	57.2	42.8	173
Total	709	402	1111
X^2: 5.90089	**DF: 2**	**Sig: 0.05232**	
7. Total CEB			
1-3	65.8	34.2	438
4-6	62.1	37.9	414
7+	63.3	36.7	259
Total	709	409	1111
X^2: 1.28155	**DF: 2**	**Sig: 0.52688**	
8. Ever use FP			
Never	61.3	38.7	582
Trad/folk	72.4	27.6	174
Modern	63.4	36.3	355
Total	709	402	1111
X^2: 7.11888	**DF: 2**	**Sig: 0.02845**	
9. Type of place of residence			
Urban	55.6	44.4	36
Rural	64.1	35.9	1075
Total	**709**	**402**	**1111**
X^2: 1.09954	**DF: 1**	**Sig: 0.29437**	

Source: 1993 KDHS data

Note: significance level set at 0.05. Not all rows add up to 1112 due to missing cases.

4.4.5 Scale of Antenatal care received

Previously, it was observed that for over 60 per cent of the births, their mothers received less than adequate prenatal care. In this subsection an investigation is made into differentials and factors significantly related to the quality of prenatal care.

Table 4.7 The percentage distribution of births by Scale of Prenatal Care received according to selected background characteristics; Nyanza Province, 1993 KDHS

	Scale of Prenatal care		
	Adequate	Some	No. of cases
1. Maternal education			
No education	41.8	58.2	184
Primary	35.6	64.4	733
Secondary+	46.7	53.3	195
Total	**429**	**683**	**1112**
X^2: 8.94473	**DF: 2**	**Sig: 0.01142**	
2. Paternal education			
No education	45.9	54.1	85
Primary	35.3	64.7	612
Secondary+	44.2	55.7	330
Total	**401**	**626**	**1027**
X^2: 9.03291	**DF:2**	**Sig: 0.01093**	
3. Marital status			
Single	34.3	65.7	67
Married/living together	39.3	61.4	942
Other	45.7	59.2	103
Total	**429**	**683**	**1112**
X^2: 0.72236	**DF: 2**	**Sig: 0.69685**	
4. Maternal age			
15-24-	34.4	65.6	390
25-34	39.3	60.7	549
35+	45.7	54.3	173
Total	**429**	**683**	**1112**
X^2: 6.73238	**DF: 2**	**Sig: 0.03452**	
5. Mother earns cash for work			
Yes	38.5	61.5	618
No	44.7	55.3	208
Total	**331**	**495**	**826**
X^2 :2.49122	**DF: 1**	**Sig: 0.11440**	
6. Household economic status			
Low	62.4	37.6	458
Middle	62.3	37.7	408
Upper middle	50.0	50.0	76
Total	**364**	**578**	**942**
X^2: 4.50198	DF: 2	Sig: 1.5029	

Table 4.7 continued

7. Total children ever born			
1-3	37.2	62.8	438
4-6	39.8	60.2	416
7+	39.0	61.0	259
Total	**429**	**683**	
X^2: 0.60699	**DF: 2**	**Sig: 0.73823**	
8. Ever use FP			
Never	41.0	59.0	583
Trad/folk	31.0	69.0	174
Modern	38.3	61.9	355
Total	**429**	**683**	**1112**
X^2: 5.62650	**DF: 2**	**Sig: 0.06001**	
9. Type of place of residence			
Urban	44.4	55.6	36
Rural	38.4	61.6	1076
Total	**429**	**683**	**1112**
X^2: 0.54014	**DF: 1**	**Sig: 0.46237**	

Source: Computed from KDHS 1993 data.
Note: significance level set at 0.05. Not all rows add up to 1112 due to missing cases.

From Table 4.7, receipt of adequate or otherwise antenatal care is seen to be significantly related to maternal age, education and paternal education. Births to mothers aged 25 to 34 had better chances of receiving adequate care, while those aged 35 and above were the worst placed in terms of getting adequate care.

Secondly, at least primary education improved the likelihood of receiving adequate care. No education reduced chances of the same. The effect of paternal education is similar to that of maternal education, whereby births to those with no education had the least chance of getting adequate care.

4.4.6 Place of delivery

Generally, it is necessary that mothers deliver their babies at health facilities, where proper medical attention is given and hygienic conditions observed to reduce the risk of complication and infections that may cause death or illness to the mother or baby.

The place from where a birth was delivered is related to a number of factors as can be seen in Table 4.8. Factors that were significantly associated with place of delivery were; total children ever born, maternal age, maternal and paternal education, household economic status, place of residence, ever use of family planning, number and timing of antenatal checks and scale of antenatal care received.

With regard to total children ever born, the higher the parity, the greater were the chances of a mother delivering at home. 71 per cent of births to mothers of parity seven and above were born at home, compared to 54 per cent for parity 1-3. Conversely, health facility deliveries were greatest among births to lower parity women.

Most births to mothers with primary or no education were the most likely to be delivered at home in Nyanza province, while mothers with secondary education had greater chances of delivering their babies in a health institution. The relationship between partners education and place of delivery is similar to that of the mothers.

Regarding mothers' earning status, those who earned cash had greater likelihood of delivering at a health institution. On the other hand, those who did not earn cash were more likely to deliver at home. The most plausible explanation for this is that the former were better able to pay for delivery in a health institution.

The household economic status too, is observed to be significantly related to place of delivery. A greater proportion of those who delivered at home was from the low economic status households. On the other hand, over 75 per cent of births in medium and upper status

households took place in health institutions.

At another level, rural residence is associated with higher likelihood of home deliveries, where 63 per cent of births occur at home. Urban residence increases the chances of a health institution delivery, whereby 78 per cent of births were delivered in a health facility.

Maternal age also had a statistically significant relationship with place of delivery. The chances of delivering at home were greatest among older mothers aged 35 years and above. The youngest age group, of mothers aged 15 to 24 had the most chances of delivering at a health institution. Moreover, a greater percentage of mothers who delivered at health institutions were lower parity women with 1 to 3 children. Over 70 per cent of mothers of parity 7 and above delivered at home, compared to about 54 per cent of those of parity 1 to 3.

The above relationships of age and parity are in agreement with previous studies where it was found that younger women tended to deliver at a health facility for fear of complications during childbirth. Older women, however, were observed to deliver at home due to confidence and experience with previous births (Bulut, 1995; Dissevelt, 1978; Nginya, 1980; Obemeyer and Potter, 1991; Winikoff,1987; and Sargent and Rawlings, 1991).

With reference to timing and number of antenatal checks during pregnancy, there appears to be a very strong significant association. Mothers who had their first antenatal check in the third trimester were most likely to deliver their babies at home. On the other hand, mothers who went for their first check in the first trimester had greater chances of delivering in a health

institution. Moreover, it is also clear that mothers who had four or less antenatal visits had greater chances of delivering at home. Conversely, mothers who had over five antenatal checks showed greater likelihood of delivering at a health institution.

The quality of antenatal care received by a woman is also noted to have a significant relationship to place of delivery. Births to women who had received adequate prenatal care had greater proportions delivered at a health facility, while those to mothers who had just some care were likely to be born at home.

Further, it is observed that births to women who had never used any family planning methods had greater chances of being delivered at a home. Births to women who had used modern methods of family planning exhibited greater likelihood of being delivered at a health institution. One may hypothesise at this juncture that such women are exposed to the MCH/FP structure and are therefore more aware and comfortable to seek their services.

It is noted here that in Nyanza province 62 per cent of births were delivered at home during the period 1988 to 1993. The national estimate on the other hand, is that 55 per cent of births occur at home during the same period.

Table 4.8 Percentage Distribution of Births according to Type of Place of delivery by selected independent variables; Nyanza province, KDHS 1993

	Place of delivery At home	Health Inst.	No. of cases
1. Maternal Education			
No education	75.0	25.0	184
Primary	63.4	36.6	733
Secondary+	40.5	59.5	195
Total	682	430	1112
X^2: 51.50301	**DF:2**	**Sig: 0.00000**	
2. Marital status			
Single	52.2	47.8	67
Married	60.4	38.6	942
Other	68.2	33.0	103
Total	682	430	1112
X^2: 3.72672	**DF:2**	**Sig: 0.15515**	
3. Paternal education			
No education	71.8	28.2	85
Primary	69.1	30.9	612
Secondary+	45.5	54.4	330
Total	634	393	1027
X^2: 54.76548	**DF:2**	**Sig: 0.00000**	
4. Household economic status			
Low	70.1	29.9	458
Middle	57.8	42.2	408
Upper middle	27.6	72.4	76
Total	578	364	942
X^2: 53.30653	**DF: 2**	**Sig: 0.00000**	
5. Mother earns cash for work			
Yes	60.0	40.0	618
No	68.8	31.3	208
Total	514	312	826
X^2: 5.03167	**DF:1**	**Sig: 0.02489**	
6. Maternal age			
15-24	56.7	43.3	390
25-34	61.9	38.1	549
35+	69.9	30.1	173
Total	682	430	1112
X^2: 9.07011	**DF:2**	**Sig: 0.01073**	
7. Total CEB			
1-3	54.3	45.7	438
4-6	62.7	37.3	415
7+	71..0	29.0	259
Total	682	430	1112
X^2: 19.63618	**DF:2**	**Sig: 0.00005**	

Table 4.8 continued

8. Timing of ANC visits			
1st trimester	48.3	51.7	178
2nd trimester	61.4	38.6	735
3rd trimester	66.9	33.1	151
Total	638	426	1064
X^2: 13.67388	**DF:2**	**Sig: 0.00107**	
9. Number of ANC visits			
4 and less	66.0	34.0	709
5+	53.2	46.8	402
Total	682	429	1111
X^2: 17.66206	**DF: 1**	**Sig: 0.00003**	
10. Ever use of FP			
Never	66.2	33.8	583
Trad/folk	62.6	37.4	174
Modern	52.7	47.3	355
Total	**682**	**430**	**1112**
X^2: 17.18921	**DF: 2**	**Sig: 0.00019**	
12 Scale of antenatal care			
Adequate	66.3	33.7	683
Some	53.4	46.6	429
Total	**682**	**430**	**1112**
X^2: 18.61828	**DF: 1**	**Sig: 0.00002**	
13 Type of place of residence			
Urban	22.2	77.8	36
Rural	62.6	37.4	1076
Total	**682**	**430**	**1112**
X^2: 23.99379	**DF: 1**	**Sig: 0.00000**	

Source: Computed from 1993KDHS .
Notes: ANC refers to antenatal clinic visits, trad/folk refers to traditional and folk methods of family planning. Not all row totals add up to 1112 due to missing cases.

4.4.7 Choice of attendant during delivery

The type of assistance a woman receives during the birth of her child has health implications for both the mother and baby. Home deliveries are more likely to occur without assistance from medically trained personnel. On the converse, births delivered at health facilities are more likely to be delivered by professional health personnel (NCPD et al, 1994).

As shown in Table 4.9, maternal education, age, marital status, paternal education, earning cash for work, total children ever born, timing of antenatal check, ever use of family planning and scale of prenatal care all have significant association with assistance received during delivery.

Mothers who had secondary education were more likely to seek delivery assistance from professionals than those with primary or no education. The case also follows for paternal education, and this may reflect the effect of husband's income and knowledge of the importance of seeking professional services for their wives.

There is a significant relationship between children ever born and assistance at delivery, whereby 47 per cent of births to women with three or less children were assisted by a professional compared to 36 and 27 per cent of those with 4-6 and 7+ children respectively. The lower the parity of the mother, the higher the chances of seeking professional assistance during delivery. A professional delivered 47 per cent of births to women of parity three and below, whereas only 36 and 27 per cent of parity 4-6 and 7+ respectively received the same care. Whereas relative, friend or self delivered 56 per cent of births to women of parity 7+, only 36 per cent of those with parity 3 and less did the same. Therefore, what emerges is that births to lower parity mothers were more likely to be delivered by professional health personnel.

With regard to marital status, married women were most likely to be attended by a relative, friend or self (48 per cent), unlike children of single mothers 28 per cent and others, 46 per cent. Among births to single mothers, there is a greater chance of seeking professional care during delivery than among the married women and the other categories.

Urban residence has also been noted as related to the choice of attendant during delivery. 78 per cent of urban births were attended by professionals, compared to 37 per cent of rural births. Furthermore, rural births were more likely to be delivered by trained or untrained birth attendants, relatives or self. Thus, urban women have an edge over their rural counterparts in

terms of receiving professional maternity care.

A further significant association was noted between assistance sought during delivery and household economic status. The upper middle status household births were more attended by professionals than the low economic status households, where TBAs, relatives and self-deliveries were more prevalent.

The choice of an attendant during delivery among the women in Nyanza province is again related to the scale of antenatal checks and timing of the first of these checks. Mothers who began their antenatal clinics early in the first trimester were likely to be attended by a professional during delivery. Secondly, mothers who began their visits in the second trimester had greater likelihood of being attended at delivery by trained or untrained TBAs. Mothers who had their first antenatal check in the last trimester of pregnancy showed the highest likelihood of being assisted by relatives, friends or self during delivery. Mothers who attended nine or more antenatal clinics had better chances of being assisted during delivery by professional health care staff. These women were also the least likely to be attended by trained or untrained birth attendants during delivery. Mothers who had none or at least four clinic checks had the greatest chances of being assisted by relatives, friends or self.

The scale of prenatal care received and ever use of family planning are another set of factors that are significantly related to attendance during delivery. Births to women who received adequate prenatal care were also more likely to be delivered by professionals. Conversely, births to women who received some care were more likely to be delivered by TBAs, relatives or self.

Regarding ever use of family planning, births to women who used modern methods showed better chances of delivery by professionals. Those births to women who had never used any method or had used traditional and folk methods were likely to be assisted by TBAs, relatives and self.

There is an association between household economic status and assistance during delivery such that births to lower status households were more likely to be delivered by TBAs, relatives or self. Upper middle status households had better chances of being attended by professionals. This observation may be explained by the fact that there exist differentials due to costs at health facilities and ability to pay for the same. Medium status households would be advantaged and therefore, better able to pay for the services of professional health providers.

Lastly, the higher the number of antenatal checks a child's mother went for the more likely she was to be assisted at delivery by a professional health care provider. About 49 per cent of births to mothers who had four or less visits were most likely to be assisted by TBAs, relatives or self.

Table 4.9 Percentage Distribution of Births according to Attendance during delivery by selected independent variables; Nyanza Province, 1993 KDHS

	Assistance during delivery			
	Professional	Auxiliary	Other	No. of cases
1. Maternal Education				
No education	23.9	16.8	111	181
Primary	37.4	17.6	330	733
Secondary+	56.9	13.3	58	195
Total	429	186	499	1112
X^2: 47.69667	**DF: 4**	**Sig: 0.00000**		
2. Marital status				
Single	52.2	19.4	28.4	67
Married	38.0	16.0	46.0	942
Other	35.0	21.4	43.7	103
Total	429	186	497	1112
X^2: 9.91914	**DF: 4**	**Sig: 0.04181**		
3. Paternal education				
No education	28.2	16.5	55.3	85
Primary	30.2	19.8	50.0	612
Secondary+	53.9	11.2	34.8	330
Total	387	172	468	1027
X^2: 56.28702	**DF: 4**	**Sig: 0.00000**		
4. Household economic status				
Low	30.1	17.9	52.0	458
Middle	41.2	13.7	45.1	408
Upper middle	68.4	17.1	14.5	76
Total	358	151	433	942
X^2: 49.51269	**DF: 4**	**Sig: 0.00000**		
5. Mother earns cash for work				
Yes	39.2	17.8	43.0	618
No	31.3	24.0	44.7	208
Total	307	160	359	826
X^2: 5.84599	**DF: 2**	**Sig: 0.05377**		
6. Maternal Age				
15-24	45.1	14.6	40.3	390
25-34	37.0	17.9	45.2	549
35+	28.9	17.9	53.2	173
Total	429	186	497	1112
X^2: 15.03545	**DF: 4**	**Sig: 0.00463**		
7. Total CEB				
1-3	47.3	16.0	36.8	438
4-6	36.4	17.3	46.3	415
7+	27.6	17.0	55.6	259
Total	429	186	499	1112
X^2: 30.98795	**DF: 4**	**Sig: 0.00000**		

Table 4.9 continued

8. Timing of 1st ANC check				
1st trimester	52.2	15.7	32.0	178
2nd trimester	38.0	17.6	44.5	735
3rd trimester	34.4	13.2	52.3	151
Total	424	177	463	1064
X^2: 18.38831	**DF: 4**	**Sig: 0.00104**		
9. Number of ANC visits				
4 or less	4.4	8.1	10.4	86
5 +	52.3	56.5	58.9	623
Total	428	186	499	1112
X^2: 111.34124 **DF: 9**		**Sig: 0.00000**		
10. Scale of antenatal care				
Adequate	46.4	16.6	37.1	429
Some	33.7	16.8	49.5	683
Total	**429**	**186**	**497**	**1112**
X^2: 20.15089	**DF: 2**	**Sig: 0.00004**		
11 No. of antenatal checks				
4 or less	34.3	16.9	48.8	709
5+	46.0	16.4	37.6	402
Total	**428**	**186**	**497**	**1111**
X^2: 16.47141	**DF: 2**	**Sig: 0.00027**		
12. Type of place of residence				
Urban	77.8	8.3	13.9	36
Rural	37.3	17.0	45.7	1076
Total	**429**	**186**	**497**	**1112**
X^2: 24.28420	**DF: 2**	**Sig: 0.00001**		

Source: Computed from KDHS 1993 data.
Note: ANC refers to antenatal clinics during pregnancy. CEB refers to children ever born, Significance level set at 0.05. Not all rows add up to 1112 due to missing cases.

In summary, it is apparent that there is selective alternation of care between different health care providers by the mothers in this study. Whereas for over 90 per cent of births their mothers sought prenatal care from a professional, only 38.2 per cent did so during delivery. Moreover, the high percentage of home deliveries attests to this fact. Overall, however, there is a general pattern of high proportions of women getting tetanus injections and receiving professional antenatal care.

It would be useful to further consider the results obtained in this chapter by controlling for the socio-economic, demographic and exposure characteristics of the children's mothers; and assess their impacts on the patterns of utilisation of maternal health care services. This will be done in the subsequent chapter.

CHAPTER FIVE

MULTIVARIATE ANALYSIS

5.0 Introduction

In the previous chapter, it was established that there are differentials in utilisation of maternal health care services in the study area. However, it is not clear what factors determine these differentials. Moreover, one of the objectives of the study was to investigate factors that might predict utilisation of maternal health care services in Nyanza province. It was hypothesised that higher levels of education of both parents, household economic status, earning cash for work, urban residence and ever use of modern methods of family planning, all increased chances of use of maternal health care services. This chapter, is concerned an investigation into and discussion of the factors that might predict utilisation of the services.

In order to quantify the simultaneous effect of the background variables on the chances of receiving a given form of maternal health care, the logistic regression techniques was used in the analysis of data to address the stated objectives and test the hypotheses. The logistic regression model aims to find the best fitting model to describe the relationship between an outcome variable and a set of independent variables. Stepwise regression method was used. In using this method, independent variables to be included in the equation are entered at different stages in order of their significance in affecting the dependent variable.

Previously, receipt of tetanus toxoid and provision of antenatal care by professional health personnel were found to be almost universal, and when each of the two dependent variables were included in regression analysis, there was very little variability in the use of these services among the study population. Independent variables included in the respective models were

found to have statistically insignificant effects in explaining the uptake of these two maternal health care services. Thus, we can conclude that the background factors in this study do not offer sufficient explanation for differences in utilisation of the two services. The other dependent variables considered were; place of delivery, assistance during delivery, timing of antenatal checks, number of antenatal checks and scale or adequacy of prenatal care.

In data-case selection, only births to married women were selected for analysis. This was done to ensure reduced incidences of missing cases that may have been introduced by including variables with husband's characteristics.

5.1 Results of logistic regression analysis

Stepwise regression analysis was carried out to establish the relationship between the dependent variable and the independent variables. In such a model, independent variables included in the equation are entered at different stages in order of their significance in affecting the dependent variable. The reason for carrying out the regression analysis was to determine factors that may predict utilisation of maternal health care services. The effects of each independent variable on the dependent variables are shown in the tables and discussions in the next section.

5.1.1 Receipt of tetanus toxoid vaccinations

It can be observed in Table 5.1 that paternal education was a significant predictor of receipt of tetanus injections. Receipt of tetanus toxoid increased with the level of education of the father. For children whose fathers were educated, their mothers were more likely than those whose fathers had no education to have tetanus toxoid vaccinations were. Similarly, for children whose fathers were more educated, their mothers were more likely than those children whose

fathers were less educated to have tetanus toxoid vaccination.

The other factor that had a significant effect on receipt of the toxoid was ever-use of family planning methods. Births to mothers who never used any method were more likely to receive tetanus vaccinations than those who used traditional and folk methods. Ever users of traditional methods were also less likely than ever users of modern methods to receive tetanus vaccinations. Therefore, traditional method users were the least likely to receive tetanus injections. All the rest of the factors included in the model were found to have an insignificant effect on the receipt of tetanus vaccination and were therefore automatically excluded from the final model. Possibly, this would be due to the fact that there is almost universal receipt of the toxoid, accompanied by little variation across respondents' characteristics.

Table 5.1 Odds ratios indicating the effects of background variables having a significant net effect on receipt of Tetanus Toxoid vaccination; Nyanza Province, 1993 KDHS

Explanatory Variable	Log odds	S.E	DF	P	LRχ^2	Odds ratios
Paternal education			2	p<0.05	8.839	
None	-.6230**	.7035				0.5363
Primary(R)	0.0000					1.000
Secondary+	.4292**	.3991				1.5361
Ever use of family planning			2	p<0.10	7.556	
Never	1.6110*	.7365				5.0080
Trad/folk(R)	0.0000					1.0000
Modern	0.2191	.7634				1.2450

Constant =2.6380
S.E for the model =0.5994

Source: computed from KDHS 1993 data
Notes: Reference categories are in parentheses. ** Significant at p<0.05, the rest p <0.10.

OR refers to odds ratios, S.E stands for standard error, Secondary+ refers to secondary education and above, trad/folk refers to traditional and folk methods of family planning.

5.1.2 Choice of prenatal care provider

From Table 5.2, receipt of prenatal care from professionals was associated with two factors namely, household economic status and paternal education. Births to low income households were less likely to receive professional antenatal care than middle income households were.

The likelihood of receipt of professional antenatal care increased with the level of paternal education. Births whose fathers had secondary and above education were the most likely to receive professional care, compared to the other categories.

Table 5.2 Odds ratios indicating the effects of background variables having significant net effects on choice of prenatal care provider during pregnancy, Nyanza Province, 1993 KDHS

Explanatory Variable	Log odds	S.E	DF	P	LRχ^2	Odds ratios
Household economic status			2	p<0.10	12.891	
Low	-1.2908*	37.08				0.2751
Middle(R)	0.0000					1.0000
Upper Middle	-1.9225*	1.195				0.1462
Paternal education			2	p<0.10	6.155	
None	-0.5747*	.2514			0.5629	
Primary(R)	0.0000					1.0000
Secondary+	0.5440*	.3236				1.7229

Constant = -1.8596 S.E for the model = 0.3769

Notes: Reference categories are in parentheses. * Significant at p<0.05, the rest p <0.10.
OR refers to odds ratios, S.E stands for standard error, Secondary+ refers to secondary education and above, trad/folk refers to traditional and folk methods of family planning
Source: Computed from analysis of 1993 KDHS data

5.1.4 Number of antenatal clinic visits during pregnancy

The most significant factor predicting the number of antenatal visits a woman had was ever use of family planning (see Table 5.2). Births to mothers who used traditional methods were most likely to go for five or more visits, while those who had never used any method were least likely to.

The likelihood of having five and above visits increased with the level of education of the mother. Secondary educated mothers were most likely to go for five or more visits while those with no education had the least likelihood.

Table 5.3 Odds ratios indicating the effects of background variables having significant net effects on 5 or more antenatal visits during pregnancy, Nyanza Province, 1993 KDHS

Explanatory Variable	Log odds	S.E	DF	P	LRχ^2	Odds ratios
Ever use family planning			2	p<0.10	9.337	
Never	-.7367*	.2470				0.4787
Trad/folk(R)	0.0000					1.0000
Modern	-.1633*	.1844				0.8494
Maternal education			2	p<0.10	6.932	
None	-.2749*	.2211				0.7596
Primary(R)	.0000					1.0000
Secondary+	.2709	.2776				1.3111
Constant = -.1142	S.E for the model = .2083					

Notes: Reference categories are in parentheses. * Significant at p <0.10.
OR refers to odds ratios, S.E stands for standard error, Secondary+ refers to secondary education and above, trad/folk refers to traditional and folk methods of family planning
Source: Computed from analysis 1993 of KDHS data

5.1.6 Timing of the first antenatal visit

From table 5.4, it is observed that earning cash had the most significant effect on early timing of the first antenatal check. The likelihood of early onset of antenatal care increased when the mother earned cash for work. Compared with mothers who did not earn cash, those who did were more likely to begin antenatal clinics early. A suggested explanation to this observation could be that mothers who earn cash are in a better position to pay for antenatal services especially if provided by private medical clinics. Moreover, they are better placed to meet costs of transport to the clinic. In the literature review, it was noted that women identified having to offset transportation costs as one of the reasons barring them from seeking maternity care.

The next most significant factor impacting on early timing of antenatal care was maternal education. Secondary education had the highest likelihood of early onset of prenatal care. Births whose mothers had no education had the least likelihood of beginning antenatal visits early. Mothers with secondary education were 1.4 times more likely to go for early prenatal care, compared to those with primary education.

Table 5.4 Odds ratios indicating the effects of background variables having significant net effects on early timing of antenatal checks during pregnancy, Nyanza Province, 1993 KDHS

Explanatory Variable	Log odds	S.E	DF	P	LRχ^2 Odds ratios
Earns cash for work			1	p<0.05	6.991
No(R)	0.0000				1.0000
Yes	0.6082**	.2269			1.8371
Maternal education			2	p<0.10	5.370
None	-0.2620*	.3628			0.7695
Primary(R)	0.0000				1.000
Secondary+	0.3406*	.3773			1.4058
Constant = -1.7514					
S.E for the model = 0.2740					

Notes: Reference categories are in parentheses. ** Significant at p<0.05, * p <0.10.
OR refers to odds ratios, S.E stands for standard error, Secondary+ refers to secondary education and above

Source: Computed from analysis of 1993 KDHS data.

5.1.7 Adequacy of prenatal care

The scale of prenatal care received was associated with maternal education and ever use of family planning, as seen in Table 5.5. Compared to those with primary education, mothers with secondary and above education were more likely to receive adequate antenatal care. Mothers with no education had the least likelihood of receiving adequate prenatal care.

Ever use of contraception was the second most significant determinant of adequacy of prenatal care. Mothers who used traditional methods were most likely to receive adequate prenatal care than never users and modern method users. This observation is rather unexpected because women who have ever used modern methods should be thought to be more aware of the need

for regular and adequate prenatal care than those who use traditional methods. Perhaps it has got to do with the experiences such women have had when in contact with the health care system that discouraged them from going back to seek services.

Table 5.5 Odds ratios indicating the effects of background variables having significant net effects on scale of antenatal care, Nyanza Province, 1993 KDHS

Explanatory Variables	Log odds	S.E	DF	P	LRχ^2	Odds Ratios
Maternal education			2	p<0.05	9.210	
None	- .3359**	.2752				.7147
Primary(R)	0.0000					1.000
Secondary+	0.2701**	.2120				1.3101
Ever use of family planning			2	p<0.05	7.200	
Never	0.6295**	.2405				0.5329
Trad/folk(R)	0.0000					1.0000
Modern	-0.1339**	.2571				0.8747

Constant = -0.1044
S.E for the model = 0.2027

Note: Reference categories are in parentheses. **Significant at p<0.05, OR refers to odds ratios, trad/folk stands for traditional and folk methods of family planning, secondary+ refers to secondary and above education, S.E=standard error.

Source: From analysis of 1993 KDHS data.

5.1.8 Place of delivery

Table 5.6 presents relationships between place of delivery and significant factors that affect it. Household economic status was the most significant factor in predicting place of delivery. Births to women in upper middle status households were more likely to be delivered in hospital than births in middle status households, while births to women in low status households were least likely to be delivered in hospital.

Ever use of family planning was also significantly associated with place of delivery. Relative to births to mothers who had used traditional methods, those who used modern methods had greater odds of hospital delivery. Births to mothers who never used any method had the least likelihood of hospital delivery.

Type of place of residence was another factor significant in determining place of delivery. Births to urban women were 5.4 times more likely to be born in a health facility than rural births. This particular observation may demonstrate the skewed nature of provision of delivery services towards urban areas. Again, it may point out the differential accessibility of the services between rural and urban areas.

The likelihood of a hospital delivery increased with the level of paternal education. Secondary and above education increased the odds of hospital delivery over primary education. Births whose fathers had no education were least likely to be delivered in a health facility.

Timing and number of antenatal visits were significantly associated with place of delivery. Those who began antenatal clinic visits late were more likely to deliver at a health institution. The same is true of women who had four or less visits. This is an unexpected observation in that a woman who begins antenatal clinics early and attends regularly throughout the pregnancy would be expected to deliver in hospital. Probably, women who commence antenatal clinics late only do so when they notice complications that eventually force them to deliver in hospital to avoid gross effects. Women who may have regularly attended clinics, on the other hand, might feel confident enough to deliver at home especially if they were diagnosed as fine during

their clinic examinations.

Table 5.6 **Odds ratios indicating the effects of background variables having significant net effects on Type of Place of delivery, Nyanza Province, 1993 KDHS**

Explanatory Variable	Log odds	S.E	DF	P	LRχ^2	Odds Ratios
Household economic status			2	p<0.05	19.479	
Low	-0.2591**	.2525				0.7718
Middle(R)	0.0000					1.0000
Upper middle	1.1980**	.3244				3.3036
Place of residence			1	p<0.05	9.253	
Rural(R)	0.0000					1.000
Urban	1.6855**	.6456				5.3952
Ever use of family planning			2	p<0.05	8.602	
Never	-0.1523**	.2482				0.8587
Trad/folk(R)	0.0000					1.9471
Modern	0.51290	.1937				1.6701
Paternal education			2	p<0.05	8.419	
None	-0.3022**	.3323				0.7392
Primary(R)	0.0000					1.0000
Secondary+	0.2300	.3570				1.2586
Timing of antenatal checks			1	p<0.10	4.115	
Early	- .4973 *	.2441				0.6082
Late(R)	0.0000					1.000
Number of antenatal checks			1	p<0.10	4.174	
<4	- .3381*	.1888				0.6778
5+(R)	0.0000					1.000
Constant = 0.1003						
S.E of the model = 0.3830						

Note: Reference categories are in parentheses. *Significant at p< 0.10, ** Significant at p< .05.

Secondary+ stands for secondary and above education, trad/folk refers to traditional and folk methods of family planning.

Source: Analysed from 1993 KDHS data

5.1.9 Assistance during delivery

Household economic status was significantly associated with assistance received during delivery. Relative to the middle status households, upper middle status households were more likely to be assisted by professionals.

The second most significant factor predicting assistance during delivery was paternal education. The odds of professional assistance were almost the same for primary and secondary educated fathers. However, the likelihood was lower for none educated fathers. Regarding place of residence, it is noted that urban residents were more likely to be assisted by professionals than their rural counterparts. This disparity is too wide and just like was seen with place of delivery, may be attributed to the fact that rural areas are less endowed with health services, especially for delivery.

Maternal education was a significant determinant of assistance received during delivery. Births whose mothers had secondary and above education were more likely to be delivered by a professional compared to those with primary education. It is interesting to note that mothers with no education were more likely to be assisted by a professional, than those with primary education.

The scale and timing of prenatal care received during pregnancy were predictors of the kind of assistance a mother received during delivery. Receipt of adequate care was negatively related to professional assistance during delivery. Relative to those who got inadequate care, mothers who got adequate care were less likely to be assisted by a professional. This observation is contrary to expectations because mothers who received adequate care are thought to be more

knowledgeable about the usefulness of a hospital delivery. After all, they have been more in contact with the health care system than their counterparts, and are expected to utilize their services more.

Table 5.7 Odds ratios indicating the effects of background variables having significant net effects on assistance during delivery, Nyanza Province, 1993 KDHS

Explanatory Variable	Log odds	S.E	DF	P	LRχ^2	Odds ratios
Household economic status			2	p<0.05	13.338	
Low	-0.2036**	7.6661				0.8158
Middle(R)	0.0000					1.0000
Upper middle	0.9735**	1.9556				2.6473
Paternal education			2	p<0.05	6.442	
None	-0.4505**	.3271				0.6373
Primary(R)	0.0000					1.0000
Secondary+	0.0059**	.3519				0.9941
Type of place of residence			1	p<0.05	6.281	
Rural(R)	0.0000					1.000
Urban	1.3549**	.6030				3.8763
Maternal education			2	p<0.05	5.075	
None	0.3061**	.2514				1.3581
Primary(R)	0.0000					1.0000
Secondary+	0.7124	.3236				2.0388
Scale of antenatal care			1	p<0.10	3.762	
Some(R)	0.0000					1.0000
Adequate	- 0.382*	.1674				0.6825
Timing of 1st antenatal visit			1	p<0.10	3.419	
Late(R)	0.000					1.0000
Early	0.4712*	.2458				0.6242
Constant =0.0052						
S.E for the model= 0.4055						

Notes: Reference categories are in parentheses. **Significant at p<0.05 *Significant at p <0.10.

Trad/folk refers to traditional and folk methods of family planning, secondary+ refers to secondary and above education, S.E =standard error.

Source: Analysed from 1993 KDHS data.

5.7 Comments on results

This chapter is an investigation into the effects of socioeconomic and demographic factors on utilization of different forms of maternal health care services. Multivariate logistic regression models were used towards this end. Certain aspects of the findings of the analysis deserve some comment and discussion.

Receipt of tetanus toxoid injections was found to be significantly related to paternal education and ever use of family planning methods. Births to women who ever used traditional methods were least likely to receive any dose of the toxoid.

Provision of prenatal care by professionals (doctors, nurses and midwives) was found to be significantly affected by household economic status and paternal education. Births to secondary educated fathers and to middle status households were most likely to seek professional antenatal care than any other category.

Early onset of antenatal visits was found to be predicted by maternal education and earning cash for work. Not earning cash for work significantly reduced the likelihood of early antenatal care, while maternal education increased the odds.

Maternal education and ever use of family planning were found to influence receipt of adequate prenatal care, so that secondary and higher education had the greatest effect on receipt of

adequate prenatal care.

Delivery in a health institution was found to be positively related to urban residence, secondary and higher education of the father and ever use of modern family planning methods. In addition, it was observed that the same factors increased the odds of assistance by a professional during delivery, with the inclusion of maternal education.

From the above observations and from results obtained in chapter 4, there appears to be very little variance in receipt of tetanus toxoid injections and choice of prenatal care provider. In fact, for over 90 per cent of the births, their mothers received at least one dose of the toxoid or were attended by a professional during the prenatal period. Thus, the factors outlined may not have been sufficient in explaining the little variation that existed in the use of the two forms of maternal health care services.

Ever use of family planning has been noted to play a very significant role in predicting use of a number of maternal health care services in Nyanza province. Most notable is the fact that ever use of traditional or folk methods increased the likelihood of receipt of adequate prenatal care and five or more antenatal visits. Yet, it would be expected that women who had ever used modern methods of contraception are more familiar with the health care system than those who used traditional or folk methods, and would be expected to use the same services more. One may therefore, be led to ask such questions as; "Is there some aspect of the maternal health care system that discourages ever-users to discontinue or fall out at some stage? Why would a woman who is aware of the need to use modern contraception (assumed to be obtained from modern health facilities) opt to go for fewer clinic visits and eventually receive inadequate

prenatal care?"

Generally, the results indicate that some of the study factors have implications for utilization of maternal health care services, but in varying dimensions. The study set out to assess the role of socioeconomic and demographic factors on use of the services in Nyanza province. The results have shown that only some of the factors were significant, either positively or negatively. In the literature review, it was observed that utilization of the same services was influenced by a complex of social, economic, cultural and demographic conditions such as educational attainment of both mother and father, type of place of residence, parity, age of mother and factors of accessibility.

Part of the findings of this study concurs with those of previous ones of similar nature. Notwithstanding, the results confirm the theoretical and conceptual models and the study hypotheses. In the theoretical framework, it was stated that socio-economic and demographic factors might affect use of maternal health care services. This statement is partly confirmed by the study results. The study has found that demographic factors of maternal age, marital status and total children ever born have no significant influence on use of maternal health services in Nyanza province. These findings concur with Obemeyer and Potter's (1991) findings of a similar study in Jordan. Other household and individual factors of the mother may have overshadowed these factors.

Socioeconomic factors played a more crucial role in influencing the use of services. It is apparent from the regression results that most socioeconomic variables are associated with utilization of the services. A possible explanation is that these factors define inequalities in

access to, and the quality of, maternal care received.

CHAPTER SIX

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

6.0 Introduction

This study examined the extent to which socioeconomic, demographic and exposure factors influence the use of maternal health care services in Nyanza province. Few studies in the past focused on the problem of maternal health and use of maternal health services in Kenya, and especially in Nyanza province. Maternal health services essentially comprise of prenatal examinations, administration of tetanus toxoid vaccinations, delivery in a health facility and professional assistance.

Establishing the patterns of utilisation of these services is useful especially for policy makers in order to design appropriate and adequate intervention measures. Such action is possible only when real factors affecting use are identified. Moreover, use of maternal health services has implications for not only the mother's health, but also for child health and survival.

The present study set out to achieve the following objectives:

- To determine the overall level of utilisation of maternal health services.
- To investigate variations in utilisation according to different socio-economic, demographic and exposure characteristics.
- To investigate factors determining and that may predict use of the services.

To guide the study, several hypotheses were formulated and tested. The study hypotheses were:-

1. The higher a woman's education, the greater the likelihood to use maternal health care

services.

2. Women who have ever used modern methods of family planning are more likely to use maternal health care services.
3. The higher the level of education of the husband, the higher the chances of using maternal health care services.
4. The older a woman is, the lower the likelihood of her using modern maternal health care services.
5. The lower the parity of a woman, the higher the chances of using maternal health care services.
6. The type of place of residence has a strong influence on the use of maternal health care services.
7. Marital status of a woman has a significant influence on use of maternal health care services.
8. Women who earn cash for work are more likely to use maternal health care services.
9. The higher the household economic status of a woman, the greater the likelihood of using maternal health care services.

In order to achieve the study objectives, data from the Kenya Demographic and Health Survey of 1993 were used. Methodology used included cross tabulations and chi-square test to measure association between dependent and independent variables. Logistic regression analysis was used to assess the effects of the independent variables on the utilisation of maternal health care services. The dependent variables included uptake of tetanus toxoid injections, choice of prenatal care provider, timing of the first antenatal check, place of delivery and assistance during delivery. Independent variables were maternal and paternal education, maternal age,

total children ever born, household economic status, earning cash for work, type of place of residence, marital status and ever use of family planning methods. The analysis of utilisation of maternal health care services was based on the 1112 births that occurred between 1988 and mid 1993 in Nyanza Province.

6.1 Summary of findings

To meet the first objective of the study, frequency distributions of the dependent variables was carried out. The findings of this study indicate that antenatal clinic checks begin late in Nyanza province. For a majority of the births, the mothers went for fewer than 4 antenatal clinics for the entire pregnancy. Secondly, the quality of antenatal care for over 60 per cent of the sample was inadequate. Third, a majority of the births occurred at home assisted by non-professionals (i.e. TBAs, relatives and self).

However, the results indicate that tetanus toxoid injections were widely received in the study area. Moreover, for over 90 per cent of births, the mothers sought prenatal care from professional personnel; including doctors, nurses and midwives.

In order to achieve the second objective cross tabulations and the chi-square test was performed. Factors that were found to be related to receipt of tetanus toxoid inoculation were father's education and whether the mother had ever used family planning methods. Timing of the first antenatal check was seen to be significantly associated with earning cash for work. The choice of a prenatal care provider was associated with maternal and paternal education and children ever born. Quality of prenatal care received, i.e. adequate or some was significantly related to maternal age and education of both parents. Place and assistance during delivery were

associated with maternal and paternal education, earning cash for work, household economic status, place of residence, ever use of family planning, scale and number of antenatal checks. These findings indicate that there are differentials in the use of maternal health care services. Most outstanding is that there was above average uptake of preventive services (tetanus injections and prenatal care by professionals), and very low usage of curative services (hospital delivery assisted by professionals). These findings have implications for strategic intervention in that coverage and uptake of curative services should be widened.

The third objective was to investigate factors that might predict use of maternal health care services. To achieve this goal, logistic regression analysis, using the stepwise method was employed.

Ever use of family planning was found to be a most important factor in predicting use of most of the forms of maternity health services. Never use of any methods increased the likelihood of receiving tetanus injections more than use of traditional or modern methods. Secondly, it was found that mothers who used traditional methods were more likely to go for early antenatal checks compared to those who never or used modern methods. Also remarkable is the fact that mothers who had ever used modern methods had the greatest chances of a hospital delivery, assisted by professional personnel. This linkage between use of maternal health care services and use of family planning leads one to suggest that coverage of family planning, which is normally provided alongside maternal health care services, should be improved in rural areas. Rural areas experience much of the problems associated with access, which may be the actual reason why urban mothers were seen to be more likely to deliver in a hospital.

Both mother's and father's education were significant determinants of utilisation of services. None education of the father negatively impacted on receipt of tetanus injection. The same levels of education for the mother reduced the chances of receipt of adequate prenatal care. In regard to place of delivery, no education of the mother reduced the chances of a hospital delivery. However, paternal primary and above education had a negative effect on hospital delivery and professional assistance. Maternal and paternal education therefore had a key role to play in the use of maternal health care services.

Apart from serving as a measure of socio-economic conditions, type of place of residence can be a proxy for accessibility, such that urban residents are usually more accessible to services than their rural counterparts. Place of residence had an effect only on the use of delivery services. The results reveal that rural residents had less probability of seeking a hospital delivery and professional assistance during delivery. At this point, it is worth remembering that in rural areas, most health institutions that offer antenatal services do not have facilities for delivery. In fact, the majority of women are attended at government health centres that are basically outpatient oriented. The urban areas on the other hand, are well served with private and public hospitals that offer both prenatal and delivery services. Moreover, district and provincial hospitals in Nyanza province are located in the major towns. Therefore, accessibility tends not to be an issue among urban women seeking maternity care.

Household economic status was found to affect choice of prenatal care provider and place of delivery. Births in upper status households were most likely to be delivered in hospital. Otherwise household economic status did not affect use of other services.

Both mother's and father's education were significant determinants of utilisation of services. None education of the father negatively impacted on receipt of tetanus injection. The same levels of education for the mother reduced the chances of receipt of adequate prenatal care. In regard to place of delivery, no education of the mother reduced the chances of a hospital delivery. However, paternal primary and above education had a negative effect on hospital delivery and professional assistance. Maternal and paternal education therefore had a key role to play in the use of maternal health care services.

Apart from serving as a measure of socio-economic conditions, type of place of residence can be a proxy for accessibility, such that urban residents are usually more accessible to services than their rural counterparts. Place of residence had an effect only on the use of delivery services. The results reveal that rural residents had less probability of seeking a hospital delivery and professional assistance during delivery. At this point, it is worth remembering that in rural areas, most health institutions that offer antenatal services do not have facilities for delivery. In fact, the majority of women are attended at government health centres that are basically outpatient oriented. The urban areas on the other hand, are well served with private and public hospitals that offer both prenatal and delivery services. Moreover, district and provincial hospitals in Nyanza province are located in the major towns. Therefore, accessibility tends not to be an issue among urban women seeking maternity care.

Household economic status was found to affect choice of prenatal care provider and place of delivery. Births in upper status households were most likely to be delivered in hospital. Otherwise household economic status did not affect use of other services.

The significance of the results of this study is that education of both parents, urban residence, ever use of modern contraception and higher household economic status, all increase probability of use of maternal health care services. The implication for these observations is that more effort should be exerted in ensuring education of couples, increasing accessibility in rural areas and formulation of policies and programmes to improve the economic status of people of Nyanza province. Awareness needs to be created among women and their families of the existence and usefulness of professional assistance in the prenatal, intrapartum and postpartum period.

From the results obtained, the conclusion drawn is that women in Nyanza province receive some maternal health care, but a greater percentage is not adequately covered.

6.3 Recommendations

The findings of this study have important implications for improving utilisation of maternal health care services and further research. The study has provided evidence that except for tetanus injections and professional prenatal care, usage of other forms of maternal health care services is low in Nyanza province.

6.3.1 Recommendations for policy

- The study found that uptake of tetanus was almost universal and that over 90% of women saw a professional for antenatal care. However, when it came to delivery, more than 60 per cent of the women sought assistance delivery away from health facilities. The study therefore recommends that the scope of coverage of delivery services be increased in the Province.
- There is need for concerted efforts to increase coverage of maternal health care services.

Previously, most communities addressed health problems in terms of their effects on children. More focus should be placed on women's health problems.

- With regard to the prevailing pattern of late and irregular prenatal clinic attendance, it is recommended that public health needs to focus particularly on this dimension of maternal health care both in rural and urban areas.

- This study has found that women who had ever used modern methods of family planning were more likely to deliver in hospital. This may be attributed to the fact that such women were more exposed to modern medical services especially MCH/FP services. These women are more informed than their counterparts by virtue of their exposure. It is suggested here that more IEC is required for the communities in Nyanza province about the existence and importance of seeking maternal health care services.

- All members of the community in general and the family in particular should be made aware of the value of prenatal care as a preventative service. Women should be encouraged to deliver in health facilities under the care of health professionals for the sake of the children's and their health.

- Another challenge is to overcome barriers of access to maternal health care services. This study has shown that urban women in the sample were more likely to use services than rural women. This observation may be due to differential access to maternal health care services. The rural women often have to cover long distances to the services, a fact that could discourage others. Therefore, maternal health care services should be made more accessible

to rural women.

- The role of the family especially that of men, in women's health needs to be re-emphasised. In Nyanza province, paternal education was seen to be a significant factor in utilisation of maternal health care services. It may as well be that the decision to seek care for pregnant women is mostly influenced by husbands. Therefore, they should be informed of the importance of ensuring their spouses seek proper antenatal and delivery care.

- Female education was associated with patterns of maternal health care service use. Education levels in Nyanza province need to be improved. In the sample studied, most of the women had either none or primary education. Education affects maternal health care service use by changing ideas about maternal health and attitudes toward risk prevention by using the maternal health care services.

6.3.2 Recommendations for further Research

- Further research needs to be done to explain the patterns observed in this study. It would be useful to know why the women begin antenatal clinics late, go for only a few clinics and why they prefer to deliver at home. The present study has not been able to explain these and has only provided possible suggestions.
- The relationship between use of maternity care services and maternal mortality is another area that needs to be researched on in Nyanza Province, as it was not done in this research. Such a study would give a true picture of whether the effects of the former really do impact on the latter. Nyanza being a high maternal mortality zone would be a most appropriate area to test the relationships.

REFERENCES

Basu, A.M. (1990)

"Cultural Influence on Health Care Use: Two regional Groups in India". *Studies In Family Planning* 21 (5).

Bhatia, J.C. (1993)

"Levels and Causes of Maternal Mortality in Southern India". *Studies in Family Planning* 24 (5).

Bicego, G and J. T Boerma (1991)

"Maternal education and Child Survival: A comparative analysis of DHS data", DHS *Proceedings of Demographic and Health Surveys World Conference*, Washington D.C. August 5-7.

Boerma, J.T and J.K.G Mati (1987)

"Identifying Maternal Mortality Networking; results from Coastal Kenya". *Studies in Family Planning* 20 (5).

Bulut, A. (1995)

"Post partum Family Planning and Health needs of Low income in Istanbul". *Studies in Family Planning* 26 (6).

Central Bureau of Statistics (Kenya) 1996

Welfare Monitoring Report 1996. Central Bureau of Statistics, Ministry of Planning and National Development, Nairobi.

Chaiken, M. S. (1986)

"Traditional Patterns and Modern Dilemmas: Designing Locally appropriate Health Interventions". IDS Working paper No. 442, University of Nairobi.

Dissevelt, A.G. (1978)

Integrated Maternal and Child Health Services: A Study at a Rural Health Centre in Kenya.Royal Tropical Institute, Nairobi.

Donabedian, L. and S. Rosenfield (1983)

"Some Factors Influencing Prenatal Care". *New England Journal of Medicine.* 264: 1-6.

Ebrahim, G.J. (1972)

Practical Maternal and Child Health in Developing Countries. East African Literature Bureau. Nairobi.

Etten, G.M Van (1976)

Rural Health Development in Tanzania. Van Gorcum. Assen Netherlands.

Goodburn, E., R. Gazi, and M. Choudhury (1995)

"Beliefs and practices regarding delivery and Post partum Maternal Morbidity in

Rural Bangladesh". *Studies in Family Planning* 26 (1).

Kars, C. (1974)
The Use of Modern and Traditional Forms of Maternity Care among the Akamba in Kenya. Unpublished Thesis. University of Leyden, Netherlands.

Kasl, S and G. Cobb (1966)
"Health Behaviour, Illness Behaviour and Sick role Behaviour." *Archives of Environmental Health* Vol. 12: pp 246-266.

Khayundi, F.E. (1998)
"Lay People's Response to Malaria in Pregnancy in Siaya District, Kenya". Unpublished MA Thesis Institute of African Studies, University of Nairobi.

King, M. (1966)
Medical Care in Developing Countries. Oxford University Press. Nairobi.

Kpedekpo, G.M.K (1982)
Essentials of Demographic Analysis for Africa. Heinemann Educational Books Ltd, London.

Kroeger, A. (1983)
"Anthropological and Sociomedical Health Care Research in Developing Countries". *Social Science and Medicine* 17(3):147-161.

Kuria, E.W. (1989)
"Factors that Influence Maternal and Child Health among the Maasai: A Case Study of Olosho-Oiborr Sub-Location in Kajiado District. Postgraduate Diploma Thesis. Population Studies and Research Institute, University of Nairobi.

Lettenmaier, C.L. and C. Liskin (1988)
Mother's Lives Matter: Maternal Health in the Community. *Population Reports* series L No. 7. 16 (2).

Macro International (1994)
"Use of Antenatal and Delivery Services in Morocco". DHS Newsletter. 6 (2).

Macro International (1997)
"New Findings from Egypt Assess Women's and Children's Health". DHS Newsletter. 8 (2).

Maine, D. (1996)
"Why did Maternal Mortality decline in Matlab?" *Studies in Family Planning* 27 (4).

McKinlay, J. (1972)
"Some Approaches and problems in the Study of the Use of Services: An

Overview". *Journal of Health and Social Behaviour*. 13: 115-152.

Mbura, C. (1985)

Use of Herbal medicine by women attending Antenatal Clinics in Rural and Urban Tanga. *East African Medical Journal* 62 (8):540-550.

Mburu, F.M (1983)

Health Behaviour in Kenya: A comparative multivariate analysis of Factors associated with Child Health in Rural Communities. Unpublished PhD Thesis.Makerere University.

McCarthy, M. and Maine, D. (1992)

"A Framework for Analysing the Determinants of Maternal Mortality and Morbidity". *Studies in Family Planning* 23 (1). 23-33.

Miles-Doan, R. and K.L. Brewster (1998)

"The Impact of Type of Employment on Women's Use of Prenatal care Services and Family Planning in Urban Cebu, the Philippines." *Studies in Family Planning.* 29 (1).

Ministry of Health (MOH), Kenya, (1996)

National Reproductive Health Strategy 1997-2010. Ministry of Health, Nairobi.

Ministry of Health (MOH), Kenya, (1997)

A question of Survival? Review of Safe Motherhood. Ministry of Health - Division of Primary Health Care, Nairobi.

Ministry of Planning and National Development (MPND), Kenya, (1996)

National Development Plan 1996. Government Printer, Nairobi.

Moses S, E.N Ngugi and J.E Bradley (1992)

"Health care seeking behaviour related to the transmission of transmitted diseases in Kenya". *American Journal of Public Health* 84: 1947-51.

Mosley W.H. and Chen L.C. (1984)

An Analytical Framework for the Study of Child Survival in Developing Countries. *Population and Development Review* Supplement 10:25-48.

National Institute of Nutrition (Kazakstan) and Macro International (1996)

Kazakstan Demographic and Health Survey 1995. Calverton, Maryland.

National Council for Population and Development, Central Bureau of Statistics (Kenya) and Macro International (1999)

Kenya Demographic and Health Survey (KDHS) 1998. Calverton, Maryland USA: National Council for Population and Development, Kenya.

National Council for Population and Development, Central Bureau of Statistics (Kenya) and Macro International (1994)

Kenya Demographic and Health Survey (KDHS) 1993. Calverton, Maryland USA: National Council for Population and Development, Kenya.

National Population Council (Egypt) and Macro International (1996)
Egypt Demographic and Health Survey 1995. Calverton, Maryland USA: National Population Council, Egypt.

Nginya, M.L. (1980)
Rural Health Development in Kenya: An Analysis of Health Services Availability and Utilisation within the framework of class formation in rural areas. PhD thesis. Bradford University.

Obermeyer, C.M. and J.E. Potter (1991)
"Maternal Health care Utilisation Patterns in Jordan: A study of Patterns and Determinants". *Studies in Family Planning* 22 (3): 177-187.

Okafor, C.B. and R. Rizutto (1994)
"Women's Health Care Providers Views of Maternal Practices and Services in Rural Nigeria. *Studies in Family Planning* 25 (6): 353-361.

Poland, M.L, J.W. Ager, K.L.Olson and R.J Sokol (1990)
"Quality of Prenatal Care; Selected Social, Behavioural and Biomedical factors" Obstetrics *and Gynaecology* 75 (4).

Population Action International (1995)
Reproductive Risk: A worldwide Assessment of Women's Sexual and Maternal Health. Population Action International, Virginia.

Population Studies and Research Institute (PSRI) and UNICEF (1994)
Kenya Maternal Mortality Baseline Survey (KMMBS). Unpublished Report.

Republic of Kenya (1994a)
Homa Bay District Development Plan 1994-1996. Government printer Nairobi.

Republic of Kenya (1994b)
National Development Plan 1994-1996. Nairobi Government Printer.

Rosen, J.E and Shanti R. Conly (1998)
"Africa's Population Challenge: Accelerating Progress in Reproductive Health" Country series No. 4. Population Action International, Washington DC.

Sargent, C and J. Rawlings (1991)
"Factors Influencing Prenatal Care among Low -Income Jamaican Women". *Human Organisation* 50 (2).

Silberschmidt, M (1991)
Women's Position in the Household and their Use of Family Planning and Antenatal Services: A case study of Kisii District Kenya. Centre for

Development Research, Project Paper 91.4. Copenhagen.

Stewart, K.M (1996)
"Issues in Measuring Maternal Morbidity: Lessons from the Philippines Safe Motherhood Survey Project". *Studies in Family Planning* 27 (5).

Stuebing, D. (1997)
"Maternal Schooling and Comprehensive Information of Child Health in Urban Zambia". *Health Transition Review* 7: 151-171.

Toppozada, H.K. (1977)
"Perinatal Mortality and Morbidity in Egypt". In Rooth, et al (1977) Perinatal Care in Developing Countries. Perinatal Research Labs, University of Uppsala, Sweden.

United Nations (1995)
Report of the International Conference on Population and Development No. E. 95.x111.18. UN New York.

United Nations (1998)
Health and Mortality: A Concise Report. UN Department of Economic and Social Affairs, Population Division, New York.

UNICEF (1998)
Situational Analysis of Women and Children in Kenya. UNICEF/PSRI.

Ward, H; T. Mertens and C. Thomas (1997)
"Health seeking behaviour and the control of sexually transmitted disease". *Health Policy and Planning* 12 (1): 19-28.

WHO (1997a)
Coverage of Maternity Care: A tabulation of available Information. WHO, Geneva.

WHO (1997b)
Coming of Age: From Facts to Action for Adolescents Sexual and Reproductive Health. WHO, Geneva.

Winikoff, B. (1987)
"Assessing the role of Family Planning in Reducing Maternal Mortality". *Studies in Family Planning* 18 (3).