Differentials and Determinants of Reproductive Health Care Use Among Kenyan Women

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DECLARATION

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

Signed: _____ 21-09-2000

Teklie Abdata Abeitu

This research work has been submitted for examination with our approval as University Supervisors.

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DEDICATION

To the friendly people of Kenya.

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ABSTRACT

The study was aimed at identifying socio-economic and demographic factors affecting the utilization of reproductive health care among Kenyan mothers of reproductive ages.

The data were drawn from the 1993 KDHS. Both cross tabulation and logistic regression analysis were used as statistical tools.

The study found that the use of reproductive health care services and choices of services varied according to a number of socio-economic and demographic factors. The number of tetanus injections received for births varied strongly according to both mother's and father's educational level, type of place of residence, father's occupation, maternal age, children ever born , marital status and province of residence. Similarly, the type of prenatal care received before birth varied according to both mother's and father's educational level, father's occupation, children ever born and province of residence. Furthermore, significant variations were found between place of delivery and each dependent variable considered. Similarly, significant variations were observed between source of prenatal care and each of the dependent variables considered. For the source of delivery care, it was only earning cash for work which did not cause significant variation.

The study found that among all births adoption of at least two TT injections was significantly influenced by: the province of residence, children ever born and work status of the mother. Similarly, the factors which affected receiving adequate prenatal care among all the births were: children ever born, mother's educational level,

maternal age, province of residence and marital status of the mother. Factors which affected delivery at hospitals or clinics for the same births were: the province of residence, children ever born, work status and marital status of the mother. Factors which affected receiving prenatal care from doctors or nurses for all births were: the province of residence, mother's educational level, children ever born, maternal age and marital status of the mother. Factors which affected receiving delivery care from doctors or nurses for all births were: the province of residence, mother's educational level, type of place of residence, receiving prenatal care from doctors or nurses, children ever born, marital status and work status of the mother.

The study also found that among births to married mothers, adoption of at least two TT injections was significantly influenced by: the province of residence, children ever born and father's educational level. Similarly, factors which affected receiving adequate prenatal care for births to married mothers were: the province of residence, mother's educational level, father's educational level, children ever born, maternal age and marital status. Factors which affected delivering at hospitals or clinics for births to married mothers were: the province of residence, mother's educational level, type of place of residence, father's occupation and work status of the mother, father's educational level and children ever born. Factors which affected receiving prenatal care from doctors or nurses for births to married mothers were: the province of residence, children ever born, mother's educational level and maternal age. Factors which affected receiving delivery care from doctors or nurses for births to married mothers were: the province of residence, mother's educational level,type of place of

residence, receiving prenatal care from doctors or nurses, father's occupation, work status of the mother, father's educational level and children ever born.

Recommendations for policy interventions and academic interest are given. For example, it is recommended that for more births to be born in hospitals or clinics such that more births be delivered at hospitals or clinics, programmes should focus on those mothers who have no education and those who have primary level education only, rural residents, those not working, those who have given birth to at least five children, those who never married and those whose partner has never worked or has worked in agriculture. Furthermore, the need for research to investigate why maternal age has a positive effect on receiving adequate prenatal care is called for.

CHAPTER ONE

GENERAL INTRODUCTION

1.0 Introduction

Reproductive health and reproductive rights have become topic of growing interest in demographic studies. The concept of reproductive health gained currency in the 1980's as a symbol of women's rights and family planning." (Dixon-Mueller, 1993:269). Consistent with this, reproductive health and reproductive rights are concepts which are currently gaining attention in developing countries. In Africa, for example, health researchers have become interested in these areas. On the regional level (east, central and southern Africa) health researchers have co-ordinated their research on reproductive health care throughout the 1990's. But it was only in March 1997 that demographers in the regions mobilized their interest to research on reproductive health from an academic perspective. Kenya is one of the east African countries which takes initiative in researching in the area.

Concerned with the high population growth rate and the related demographic issues, the Kenya Government became the first African country to adopt explicit population policy in 1967. However, the policy had major limitations. It was not targeted to improve future demographic landscape of Kenya. "Critics of the Kenya population policy assert that it's main thrust has consistently been fertility regulation initially through family planning and more recently embracing other components." (Oucho, 1994:3). Improvements have been effected through each population policy ever since Sessional Paper No.1 of 1997 on National Population Policy and Sustainable Development (NCPD, 1997: 22-24,43) has widened the scope by integrating the

programme action of International Conference on Population and Development (ICPD) held in Cairo from September 5-13,1994.

During this conference, reproductive health was adopted, modified and redefined as: "Reproductive health is a state of complete physical, mental and social being and not merely the absence of disease or infirmity in all matters related to the reproductive system and its functions and processes." (UN, 1994: 43). It is this definition which was adopted in Sessional Paper No.1 of 1997 on Population and Development Policy (NCPD, 1997). Maternal health care also falls in this broad area of reproductive health care.

Reproductive health care in the context of primary health care includes family planning services, education and service for prenatal care, safe delivery and post-natal care, especially breastfeeding and infant and maternal health care (UN, 1994:64). Factors affecting health, such that the reproductive process is affected, may occur before physiological capability is achieved for healthy reproduction, or during the prime time for reproduction. Both male and female reproductive processes are liable to be affected. Nevertheless, women are more at risk of being victims of reproductive health problems because of their biological make up that exposes them to pregnancy risks and delivery hazards.

Many countries have adopted the ICPD guidelines in their population policies. Kenya too has adopted the ICPD policy guideline as is reflected in it's revised policy document (NCPD, 1997: 23-24). Thus, this study addresses the issues and the use of

reproductive health care services of Kenyan women in light of the new approach to it's population issues.

1.1 Problem Statement

For some developing countries, differentials and determinants of reproductive health care use among women of different backgrounds have been identified and the determinants are established. In this regard, findings mainly from Asia, Bahatia and Cleland (1995), Ragupathy (1996a, 1996b), Toan et al. (1996); Latin America McCow et al. (1995), Potter (1988) have been reported. Similarly, there are a few reports of findings on differentials and determinants of reproductive health care service utilization from countries of North Africa:- Egypt, Morocco and Tunisia Abdel El Fattah and Osman (1995) and Obermeyer (1993) respectively.

For Kenya, despite reproductive health care policies being adopted in the population and development programme in 1997, following the Cairo ICPD, very few studies have been carried out. Nor are the determinants of various reproductive health care uses ever determined. Thus, little is known about these issues in the Kenyan context. This study, therefore, focuses on these issues with a view to improving our knowledge and understanding of the differentials and determinants of reproductive health care use of Kenyan women of reproductive age.

1.2.0 Study Objectives

1.2.1 General Objective

This study establishes the differentials and determinants of reproductive health care use for Kenyan mothers of reproductive age.

1.2.2 Specific Objectives

The specific objectives of this study are:

(i). to investigate the level of association between use of reproductive health care services and providers of the services, and selected socio-economic and demographic factors;

(ii). to identify factors affecting the use of reproductive health care services and the source of the services among Kenyan mothers of reproductive age.

1.3 Justification of the Study

Despite the fact that the concept of reproductive health care use was adopted by the national population and development policy of Kenya (NCPD, 1997: 22,24), knowledge about differentials and determinants of reproductive health care use of Kenyan women is low. Therefore, any attempt to address the problems of reproductive health care use is limited by lack of knowledge. However, if the policy is ever to be implemented on the ground, policy makers and programme designers need to have a clear knowledge about which group of mothers to target and which ones most among the identified within the safe motherhood component of primary reproductive health care use drafted by (Ministry of Health, 1997: 2). Hence,

Primarily, this research provides information about which group of mothers differ in reproductive health care services utilization and which particular sub- group of mothers among the identified should be targeted for better use of the services.

Because reproductive health is becoming an academic of study, increasing our understanding on differentials and determinants of reproductive health care use of Kenyan mothers of reproductive age is of certain academic value. In this regard, this study adds knowledge about differentials and determinants of reproductive health care use in general and that of Kenya women in particular. Moreover, it might serve as a base and motivation for other researchers who might be interested to do similar studies or the same study at a different level.

Thus, the importance of this study is in providing needed information to policy makers and to programme designers about the group of mothers to focus on inorder to improve reproductive health care use among the group. And also, this study is valuable from an academic perspective by improving knowledge about differentials and determinants of reproductive health care utilization.

1.4 Scope and Limitation

This study covers differentials and determinants of reproductive health care use among Kenyan women using the KDHS, 1993 data. To that end, it examines the interaction of selected socio-economic (educational level of both the mother and the father, work status, earning cash for work, occupation of the father, type of place of residence) and demographic (maternal age, children ever born, marital status, province of residence) factors upon selected reproductive health care use indicators, namely: receiving a number of TT injections, prenatal care visits, delivering in hospitals or clinics, providers of prenatal and delivery care. The study is done at the national level. It covers the 6030 births the mothers gave birth to in the five years preceding the 1993 KDHS.

The limitations of this study is in such areas as under coverage of the survey and possible inaccurate responses to some questions. The data set does not cover the North Eastern province and a few districts in Eastern and Rift Valley provinces. Therefore, the study does not cover the areas cited above and hence could be unrepresentative.

An example of the limitation of inaccurate data can be illustrated as follows: as a result of memory lapse, a woman may not remember precisely how many times she received TT injections for each birth she gave in the five years preceding the survey. Similarly, she may not remember how many prenatal care visits she had made for each of her pregnancies. Potentially, this could result in casting doubts on the

credibility of the data set. Nevertheless, the inaccuracy in reporting the number of prenatal care visits paid or the number of TT injections received is minimal. To confirm this assertion, the analytic report of KDHS 1993 indicates that a negligible proportion (0.08) of women reported that they did not know the number of TT injections they received before they gave birth.

Such areas as source of health services, qualification of reproductive health care providers, distance from the centre of health care service, membership in a club, age at first marriage, age at first birth, number of children under five, owning certain amenity items, owning and listening/watching mass media receivers, ethnicity, husband's health insurance coverage, number of dependent children, distance from a hospital or a clinic, special (health) risk, last pregnancy complication, presence of senior family member in the family, population growth rate, language, previous caesarean delivery, low height, country of residence, smoking and drinking habits, previous elective abortion and early neonatal death are covered in similar studies of reproductive health care use. These areas are purposely not included in this study such that priority areas may be looked at and data is lacking also.

Similarly, cultural sensitivity, Reproductive Tract Infections (RTIs) and Acquired Immuno Deficiency Syndrome (AIDS) are important areas of study in reproductive health care use. However, since data is not available in these areas, this study cannot include them in analysis. Also, contraceptive knowledge, attitudes and practices are not covered in this study as the study focuses only on use of maternal health care services.

Despite the fact that the development planning offices target districts in Kenya, analysis is not done at district level because handling analysis at district level demands time and the resources available are inadequate. Moreover, cases of births may be too few to analyze at district level applying the methods used for this research. Nevertheless, since province of residence is one of our variables of interest, this study can be taken to be fairly representative in identifying the difference in the utilization of reproductive health care services among regions of Kenya.

CHAPTER TWO

LITERATURE REVIEW

2.0 Introduction

Factors that affect the use of reproductive health care services are many. In this chapter a review is presented for only those factors that are relevant to this study.

Some existing literature on the reproductive health care use of women stress statistical descriptions of the utilization of services, and some others stress the socio-economic and demographic explanations for differentials in the level of use. Still others point out the status of women as care and service differentials. Medical literature on the reproductive health care use of women introduce the concept "socio-medical" factors explaining medical care that women in gestation receive involving their social backgrounds. Therefore, the existing literature on this subject is diverse.

A study by Mati (1993: 24) suggest that factors affecting maternal health care are the classical "four too's": too many, too close, too early and too late. Furthermore, he states the four toos are the major causes of maternal, infant and child mortality. These factors explain constellation of demographic factors: parity, duration of spacing, age at birth as affecting maternal morbidity. The four too's are taken to be established determinants of reproductive health care for women regardless of a woman's setting or life circumstances (Black, 1987: 10). But problems are many for women in developing countries. The effect of the same factors on these women are worse and are worsened by other factors. Another study by Jacobson (1991: 22) identified additional, yet related "four too's", with specific reference to women in developing

countries. Jacobson listed them to include :" too far from home, too few birth attendants, too poorly equipped to identify or handle complications, and too deficient in quality of care." These later factors embrace environmental, economic and social factors.

Both "four too's" put together make "eight too's" since none of the too's overlap. As a result, women in the developing countries are affected by the eight too's namely: too many, too close, too early and too late births that they share with all women, and four more specific to them, namely: too far from home, too few birth attendants, too poorly equipped to identify or handle complications, and too deficient in quality of care. In this regard, the World Health Organization (WHO, 1992: 1) estimates that six to eight out of ten deliveries in developing countries occur outside health facilities, and are attended to untrained persons or not attended at all.

In developing countries, limited maternal health care services are coupled with uneven distribution of services. Significant variations are reported especially for sub-saharan African countries (UNFPA, 1997: 29). The uneven distribution of services coupled with region of residence, acts as a differential in health care delivery by doctors or nurses (institutional delivery).

The same idea was put in a different way to express the root causes of the variation in the level of maternal health care services. "Availability of adequate health services to prevent maternal morbidity and mortality is constrained by lack of infrastructure, equipment, and trained personnel that hampers development in general, and thus,

adverse maternal health outcomes are related to the difficult economic situation that characterizes many developing countries." (Obermeyer, 1993: 354).

Similar explanations (Anonymous, 1993) portray similar scenarios with respect to problems affecting rural African women. The report explains "...a pregnant rural woman might know she needs a cesarean section to prevent a ruptured uterus but she may lack the bus fare to the city hospital. Or she may have the bus fare but the hospital may lack a surgeon. Or there may be a surgeon, but she might need a blood transfusion and there might not be an administering kit." These may make a cluster of socio-economic factors affecting maternal health care use namely: income, availability of transportation network, availability of able medical personnel and availability of sufficient and appropriate medical supplies.

2.1 World Overview

Researchers have been collecting and analyzing data and interpreting results in search for differentials and determinants of reproductive health care use, especially for developing countries. Population Action International (1996) used data from 118 countries including almost all populations of the world, to indicate the health risks of women resulting from sexual activity and maternity care. Results showed that the life time risk of death from causes related to pregnancy and child birth ranged from 1 in 1700 in Italy, to 1 in 16 in Zaire. In more than half of the countries the risk exceeded 1 in 100. Access to prenatal care is readily available in developed countries. But at global level, nearly half of the women lack the services of trained person for prenatal care.

Italy, Denmark, Norway, and Sweden, the countries with low adolescent pregnancy rate, low fertility in general and nearly universal access to maternal health services experience far less of maternal health care risk. Though classification of countries tended to correlate with income level, poor countries such as Cuba, Costa Rica and Tunisia exhibit a low rate of maternal health care risk because of long term investment in family planning. Among those who invested in long term family planning, poor care during pregnancy and delivery were associated with higher levels of risk. Seven out of ten of the 78 high risk countries in the world are found in Africa. The poor status of women in many societies and specific cultural traditions such as genital mutilation or food taboos during pregnancy, adds to the risk. The findings confirm statement by (WHO, 1992: 1) that there exist differences in services among regions of developing countries and women in developing countries, are far behind in access and utilization of reproductive health care services.

A report of a study by (Plan International, 1996), conducted on mothers of children ages 0-23 old covered four countries: Bolivia, Colombia, Peru and Ecuador. The findings indicate large differences in and between the countries in the type of delivery providers. Less than half of medical personnel cut the umbilical cord at delivery. Community based deliveries range with wide gap least for Tarija and highest for Piura in Peru. Family members and neighbours participated in negligible percentages of deliveries in Piura and nearly all in Tarija.

McCow-Binns (1995) used the Jamaican Perinatal Morbidity and Mortality Survey taken between September 1986 and August 1987 to make comparisons of non-

attenders and late attenders of prenatal care. Multiple logistic regression was used to determine the independent association between each set of variables (demographic, behaviourial, environmental, economic and obstetric history).

Findings indicate that only four percent of the sample women had not attended prenatal care visit. Teenagers were most likely not to attend or attend late. Married women were good attenders. Odds of non-attendance doubled for women in common law marriages and more than tripled for other unions (separated, visiting). Women in lone adult households were at higher risk also. Compared with primigravidae, women who were gravida 1-2 and gravida 3-4 were more likely to attend. Women who felt friends and relatives were supportive during their pregnancy were twice as likely not to attend. Smokers were at higher risk of non-attendance, while alcohol users were in the low risk group of non-attenders. The risk of non-attendance increased as parity increased for short birth interval. Women with previous elective abortion, early neonatal deaths, forceps deliveries, or some other unspecific pregnancy complication were highly motivated to attend early.

A study by (Rodrigues et al., 1994) examined the determinants of prenatal care in the state of Parabia, in Brazil. The study found that the percentage of urban women who had some prenatal care was double the percentage of rural women who had the same prenatal care. It was found that there was a positive association between education and pregnancy, and the use of prenatal care and a negative association between rural residence and the use of prenatal care.

Afsar and Biliker (1996) used the Turkish Demographic and Health Survey (TDHS, 1993) to evaluate maternal health service in Turkey. The findings indicate that more than half in ten pregnant women made at least one prenatal care visit from health professionals. Six out of ten deliveries occurred in health institutions. Half of the births that occurred outside health institutions occur without the assistance of health professionals. Less than two in ten received one TT injection while far less than three in ten received two. Institutional deliveries and prenatal care use were related with place of residence, region, mother's age, mother's education, birth order and type of health insurance.

A hospital based study was carried out by (Soltan et al., 1993) to evaluate the coverage of prenatal care and to identify determinants of prenatal follow up among users of maternity wards. While less than half of the women paid four prenatal care visits, more than one in ten did not receive prenatal care at all. The frequency of adequate (four) prenatal care visits decreased with age; mothers who did not work paid the least number of prenatal care visits. The amount of prenatal care received increased with an increase in educational level. Primiparous women were more likely to receive adequate prenatal care than multiparous. The influence of parity on prenatal care use continued even when the researchers controlled for age.

Azelmat (1996) used a Moroccan Sample Survey on population and health (EEPS) to assess maternal health care. The study found that in almost half of the births, the mothers received no prenatal care. Uneducated and rural women were least likely to receive prenatal care. Six out of ten births were protected against tetanus. TT

injection coverage was highest for women aged 35 and over, urban women, and women with primary education. Nearly six out of ten births occurred at home. Births at home were associated with older women, women with parity six or more, rural women, women with no formal education, and illiterate women. Four out of ten births were assisted by traditional birth attendants (TBAs), three out of ten by nurses, nearly two out of ten by parents and one out of ten by doctors.

Education is one of the most important factors in studies of demographic interest. Ragupathy (1996a) used the Thailand Demographic and Health Service (1988) to examine the effect of education on receipt of TT inoculation, prenatal care through the formal sector, and delivery assistance through the formal sources (institutional delivery). Bivariate analysis shows that odds for prenatal care and formal delivery service assistance increased with each educational attainment.

For TT immunization, however, the relationship was curvilinear, increasing until secondary education and then dropping off as controls were attenuated over all the three educational levels. When age, childhood residence, and religious affiliation were controlled, the impact of education was reduced most dramatically for TT injection. When husband's education, household income, and current residence were controlled, the drop was steepest for college educated women, suggesting the significant part of the effect of higher education on health care utilization was due to its association with higher socio-economic status and urban residence. Women with primary education lost their advantage over uneducated women in terms of delivery assistance. When parity and whether the birth was intended were introduced, there was no difference

in the use of formal delivery assistance between uneducated women and those with primary education. Overall, secondary education was the most likely predictor of utilization.

Ragupathy (1996b) used the Philippine National Demographic Survey 1993 to desegregate determinants of preventive health care in Philippines. The use of prenatal care was associated with a distance of 4 kms in radius and availability of a government hospital within the 4 kms distance. But neither distance nor availability of a government hospital was associated with the utilization of institutional delivery.

Weeks (1993) carried out a study aimed at determining the influence of socio-economic factors on the use of prenatal care use among urban and rural Peruvian women using the 1984 national survey on nutrition and health and 1981 censuses. The findings indicate that higher prenatal care use is associated with higher educational levels, a first birth order, ownership of a television and social security insurance coverage. Private care is more likely if the spouses income is higher. Except for living in the North Cone area, living outside the Lima province indicated less likelihood of public prenatal care. A higher number of pregnancies and presence of a senior family member indicates less initiation for prenatal care. Low user women seek prenatal care earlier. Complete coverage of women with social security insurance would significantly increase the level of public care among high users.

Westley and Kanter (1996) used data from National Demographic Survey of Philippines 1993 to find out the accessibility and use of reproductive health service

in the Philippines. Findings indicate that the majority (seven out of ten) births occurred at home. Only half of the births were attended by trained persons while only three out of ten received post partum care. Women in the following categories were often found to have unmet needs: adolescents, over forty years of age, uneducated, muslim and rural residents.

Anonymous (1995) researched on women's health status using pregnancy, and 12 months of postpartum, in three rural areas of the Manikganj District, Bangladesh. Findings indicate that in one village eight out of ten women had some degree of ill health due to pregnancy or delivery. Almost all deliveries took place at home, and nearly all of those births were attended by TBAs, but only half of the TBAs were trained.

Bhatia and Cleland (1995) used the cross sectional survey conducted in 1993 in a sub district of the Karnataka State of India. The sample included women less than 35 years of age who had at least one child under five years. Findings indicate that nine out of ten pregnant women reported consultation with a health care provider during the prenatal period. Urban women thought earlier and had more prenatal care visits than rural women. Education and personal hygiene emerged a strong predictor of prenatal care. Nearly four out of ten deliveries occurred at a hospital. Urban residence, six or more years of education, 25 or more years of age, delivery in private hospitals and delivery complications were associated with prenatal checkups.

Kakkar et al. (1995) carried out a study on the availability of prenatal and perinatal care in the Chakasu Rural Integrated Child Development Service (ICDS) block near Jaipur, India. Interviews were conducted with all lactating mothers living near the centres, sub centre and peripheral areas to determine availability of prenatal and perinatal care. Nearly all the interviewed mothers were in between 18 to 35 years of age. More than seven out of ten women received prenatal care . Nearly, seven out of ten women received TT injections during pregnancy. All mothers received labour and delivery care, mainly from untrained traditional birth attendants or from others. Nearly eight out of ten deliveries occurred at home. Distance from service centre was found to be one of the determinants of delivering in hospitals or clinics.

Gupta (1986) sorted out factors influencing the mother's decision regarding hospitalisation for child birth. The study found that as the birth order of the child increased, the utilization of hospital based delivery care services declined. A significant number of high gravida mothers gave birth to their child at home. However, respondents of high economic levels stand better chance of utilizing hospital services at the time of delivery.

A study by Pebley et al. (1996) using data from maternal and child health survey conducted in Guatemala in 1989 reported the extent of the effect of family and community characteristics on health care utilization. The findings of multivariate logistics regression indicate that use of formal health services, and use of institutional delivery differs among them substantially according to ethnic, social and economic factors and availability of health services. In particular, the findings pointed out

controlling for ethnic composition, the Latinos and the indigenous people were as likely to use maternal health care services as much as each other. Better educational level of both the mother and the father, ownership of and watching a TV set, and short distance to a health centre were found to be good indicators of better prenatal care attendance and professional assistance during delivery.

Rahman et al. (1997) used multivariate regression to find out demographic, socio-economic and cultural factors related to prenatal care seeking behaviour among rural women in Bangladesh. The study found that only 5 percent of the 10, 638 reported six or more times of prenatal care visit. Only half of the women consulted someone for prenatal care. Only one in a hundred delivered in a hospital otherwise at home. The study also found the poorer women were less likely to seek prenatal care or to consult qualified personnel. Younger and more educated women were more likely to seek prenatal care. Younger, low parity women were more likely to go for a qualified person for delivery.

Toan et al. (1996) used data obtained from a cross sectional survey of 1132 mothers with children younger than five years. The study was conducted in the Tien Hai district of Thai Binh province to determine utilization of reproductive health care services. The findings indicate that seven out of ten mothers did not receive any prenatal care during the last pregnancy. More than one in ten received TT inoculation twice. Notably, women who were pregnant for the first time were more likely to have received prenatal care and more tetanus toxoid injections. Mothers with fewer deliveries, higher education, and who were of the Buddhist faith or had no religion

used prenatal care services more than their counterparts did. Nearly four births out of ten occurred at home for the last birth; a quarter of the births were not attended by professionals. The socio- economic determinants of hospital or clinic deliveries were found to be higher education, adhering to Buddhism, and adequate caloric intake.

Potter (1988) reflects the findings of the Mexican Institute of Social Security Survey conducted in 1981. The objective of the survey was to find out factors involved with utilization of modern medical services for prenatal care and hospital delivery in rural areas. Results of multivariate analysis indicate that use of prenatal care services and hospital delivery were associated with maternal education levels and housing characteristics. The results appear to indicate that isolation, poverty and lack of familiarity with western culture constitute important barriers to use of modern maternal health services.

Abd El-Fattah and Osman (1995) used data from Counties of Menoufia in Egypt collected from March 1992 to August 1993 to describe differentials in maternal health care use emanating from socio-economic status. The study found that nearly three out of four births were delivered at home. Receipt of prenatal care in either the first or the second trimester was positively associated with residence in urban area, a high maternal educational level, and lower parity. Residence in rural areas, low maternal education and higher parity were related to lower use of prenatal care.

A comprehensive and detailed study was done by Obermeyer (1993) on the role of demographic, socio-economic, and cultural factors explaining differentials in maternal health care use in two Northern African countries. Data used were from the Demographic and Health Surveys of Morocco and Tunisia carried out in 1987 and 1988 respectively. In both countries, urban residence, higher standards of living, education and exposure to the media were positively associated with the use of maternal health services. Earlier age at marriage, age at first birth, higher parity, and number of people in the household were all negatively correlated with prenatal care and delivery in hospital. The pattern did not differ for the two countries. Upon introducing the country variable, it was determined that Tunisian women received nearly thrice of prenatal cares and six times of institutional deliveries. The variable did not decrease the effect of background variables for Morocco.

Nougtara et al., 1989 used a survey of a district of Burkina Faso to analyze the utilization of trained birth attendants versus professional health workers as providers of under 5's, prenatal, and maternity care. The study revealed that the presence of a village health post did not increase utilization of maternal and child health care. Furthermore, the utilizer preferred professional midwives for prenatal care but traditional (old women) for deliveries. Determinants of utilization of maternal health care were sorted out using multivariate logistic regression. The level of care offered at a village (health post, dispensary, and medical centre), educational level of both the mother and her husband, and ethnic group were identified as major factors influencing health seeking behaviour in maternal and child health care.

Mhango et al., (1986) carried out a hospital based study on maternal mortality and maternal health care utilization in Lusaka, Zambia. The research found that giving birth beyond 35 years of age is found to have adverse effect on service utilization and pregnancy outcome.

2.2 Kenya

Like many countries in the region, Kenya experiences high maternal mortality and morbidity with significant variation among regions (NCPD, 1997). Such a variation may also be observed in maternal health care use among mothers of different regions and different socio-economic and demographic factors.

Muinga (1994) states that not all women in Kenya can experience a 100 percent safe pregnancy and child birth. She notes many pregnant manual labourers go straight from the field to childbirth. Six out of ten rural births in Kenya occur at home with traditional birth attendants, a friend or family members often helping.

Maternal health care use for Kenyan women varied according to marital status of pregnant women. It is found that unmarried women are less likely to deliver at health institutions than their married counterparts. Grage (1996) used KDHS 1993 and Namibia's 1992 DHS to examine the impacts of premarital childbearing on the timing and extent of prenatal care visits and safe delivery service. The findings indicate that premarital child bearing had a greater adverse effect on the number of prenatal care visits and hospital or clinic delivery in Kenya than in Namibia. Yet in both countries women with premarital births were less likely than those with marital births to seek

prenatal care in the first trimester of the pregnancy. The findings suggest that cultural norms may shape use of prenatal and delivery care for premarital childbearing women.

In a study conducted in a rural setting of Kenya to establish the effect of breastfeeding on infant and child mortality, Akwara (1994) collected data from 1030 women who had already given birth between January 1988 and December 1992. The study indicates nearly three out of ten births were delivered at a health institution for the last birth; but nearly eight out of ten were delivered at a health institution for next to the last birth.

Vootroeve et al., (1984) collected and analyzed data on maternal health care use of a rural district of Kenya. Distance, previous hospital delivery and age were factors related to intent to deliver at a hospital.

A Maternal Mortality Survey carried out in Kenya in 1994 found that siblings reported the deceased sisters delivered nearly half of their births at home and almost half of their births at hospitals and in clinics respectively (PSRI, 1994). Reasons for not delivering in a hospital were: distance being far from hospital, the deceased being ignorant or the deceased kept harmful traditional beliefs or the deceased lacked emergency transportation.

Siblings who were the respondents to this survey reported the deceased sisters had sought prenatal care for more than a quarter of their births. For slightly more than

a quarter of their births the deceased sisters never sought prenatal care visits. For a substantial proportion of the births, the sisters did not report whether the deceased thought prenatal care or not.

Some of the differentials as cited in Ministry of Health (1997) refer to availability and distribution of services. There are approximately 3500 health facilities in Kenya, with a sizable concentration of health facilities in urban areas, but significant differences between districts; there are major staff deficits at health centres and dispensary, with variations in the country, though the extent of variation is not yet estimated.

It is also documented that because of lack of appropriate skilled personnel and outdated delivery guidelines, many health centres in Kenya remain underutilized. The underutilization varies from place to place. However, almost all Kenyan women live within 6 km distance from antenatal care service delivery point. Even then, in urban areas where distance is the least likely hinderance, or not a constraint at all, almost a quarter of deliveries take place outside of health facilities.

From the literature cited above, it is evident that the differentials and determinants of maternal health care use are diverse. For Kenya, further progress may best be achieved if appropriate determinants are sorted out such that better health status of mothers and their children could be reached as planned in the current National Population Policy and Sustainable Development (NCPD, 1997).

2.3 Conceptual Model

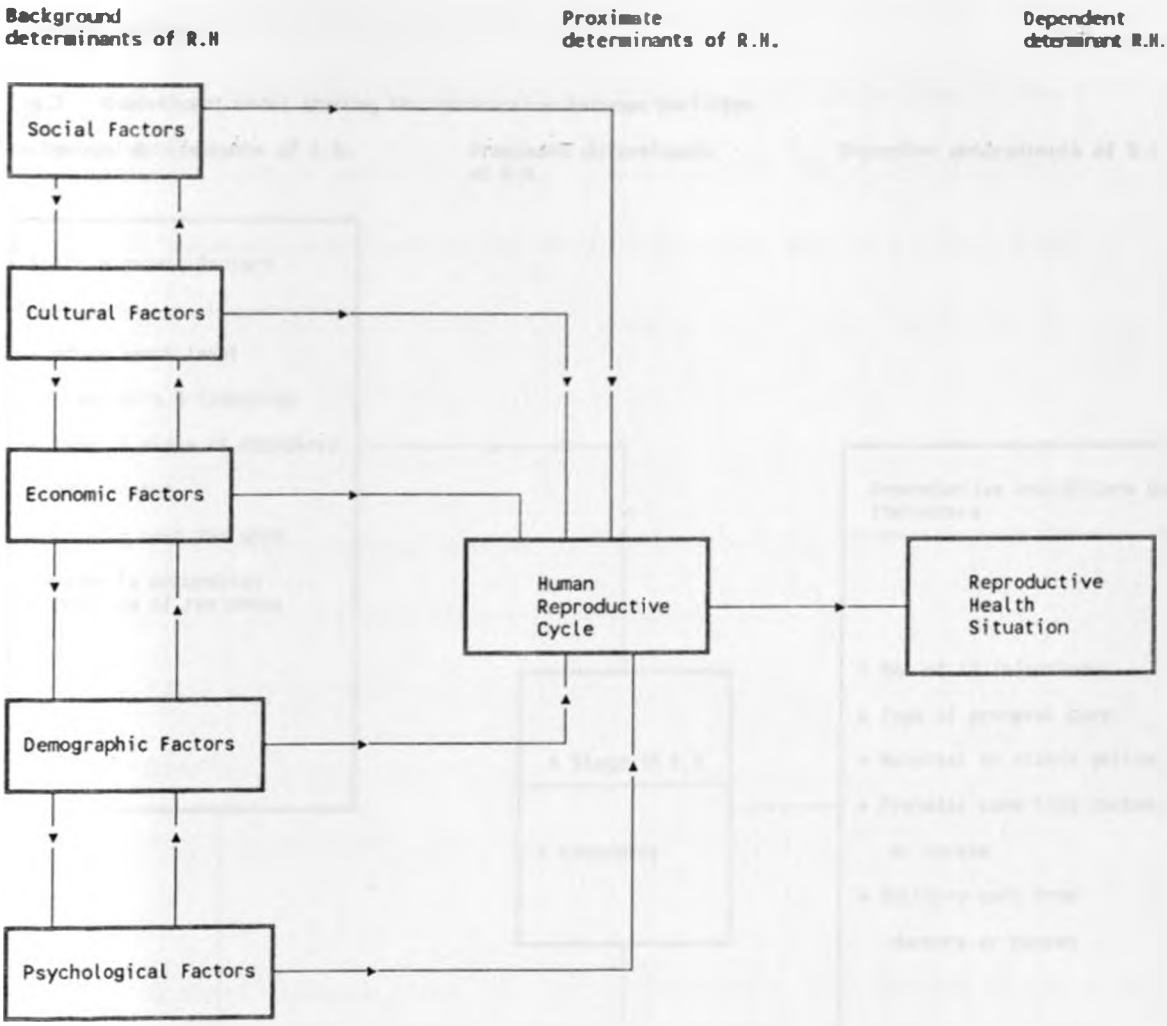
The model used for this study is one produced by the Union of African Population Studies (UAPS, 1997:13). The model is used to sort out determinants and differentials of reproductive health care use (prenatal care visits, hospital or clinic deliveries, providers of the cares and receiving TT injections). The model is based on several hypotheses as listed in (UAPS, 1997: 11-12). In this particular, it is used to conceptualize and put in operation how the interaction between socio-economic and demographic factors make difference and determine prenatal care use, receiving TT injection and delivering at hospitals or in clinics in the course of reproduction. Therefore, it helps to differentiate and quantify the weight that can be attributed to each of the proximate determinants in determining reproductive health care service utilization.

The original model is well suited for this purpose. However, it has concepts which are beyond the scope of this study. Therefore, it was modified accordingly such that only what is relevant to the study is included.

Similarly, though not indicated in the operational model, use of prenatal care was put as one among the independent variables in the actual operation so as to determine if it has effect on delivering birth at hospitals or in clinics. Therefore, for this particular study, prenatal care is used as explanatory variable also to see its effect on delivering in hospitals or clinics though it does not appear in the operational model. Further, concepts beyond the scope of the study are omitted.

The whole of the conceptual model given by (UAPS, 1997: 13) appears:

Fig.1 Conceptual model showing the relationship between concepts



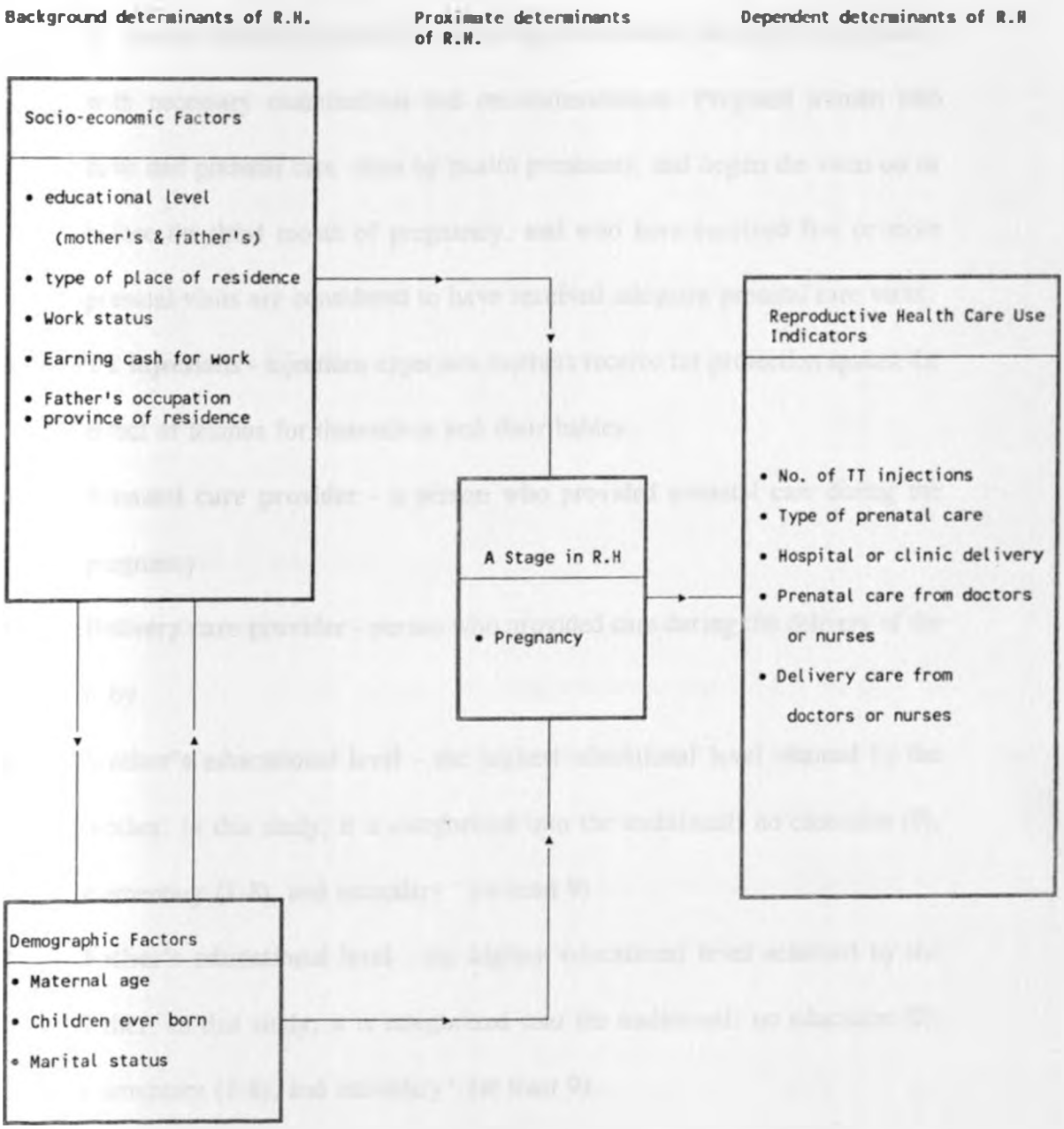
Key: R.H. stands for reproductive health.

Source: UAPS, 1997:13
N.B: Arrows indicate the direction of relationship between the concepts.

2.4 Operational Model

This operational model is derived from the literature reviewed and conceptual model discussed. Thus the operational model modified and adopted for this particular study appears below.

Fig.2 Operational model showing the interaction between variables.



Key: R.H. stand for reproductive health.

source: modified from UAPS. 1997: 13.

N.B: Arrows indicate the direction of relationship between the variables.

2.5 Definition of Key Variables

1. **Hospital or clinic delivery (Institutional delivery/safe delivery)** - delivering birth at hospitals or in clinics as opposed to at homes.
2. **Prenatal care visit** - is the regular observation and care of pregnant mother by trained health personnel (a doctor/nurse/midwife) throughout pregnancy with necessary examinations and recommendations. Pregnant women who have had prenatal care visits by health personnel, and began the visits on or before the third month of pregnancy, and who have received five or more prenatal visits are considered to have received adequate prenatal care visits.
3. **TT injections** - injections expectant mothers receive for protection against the effect of tetanus for themselves and their babies.
4. **Prenatal care provider** - a person who provided prenatal care during the pregnancy.
5. **Delivery care provider** - person who provided care during the delivery of the baby.
6. **Mother's educational level** - the highest educational level attained by the mother. In this study, it is categorized into the traditional: no education (0), elementary (1-8), and secondary+ (at least 9).
7. **Father's educational level** - the highest educational level achieved by the father. In this study, it is categorized into the traditional: no education (0), elementary (1-8), and secondary+ (at least 9).
8. **Residence** - the place where the respondent usually resides, which can be classified into either rural or urban as conventionally defined in Kenya.

9. **Work status** - refers to whether the woman is working to generate income (e.g.run her own or family business).

10. **Earning cash for work** - is an indicator of economic status used to elicit whether the respondent is paid cash for work or not.

11. **Father's occupation** - is what the father of the child does for a living.

12. **Maternal age** - age of the mother at the time she gave the birth in question.

13. **Children ever born** - the number of children a mother has given birth to.

14. **Marital status** - the status of a mother as being: never married, or married, or living together, or divorced, or widowed, or not living together.

15. **Province of residence** - refers to the province where the respondent usually lives.

2.6 Operational Hypotheses

1. Mother's educational level, father's educational level, urban residence, the status of the mother as currently working and earning cash for work are each expected to be positively associated but maternal age and children ever born are each expected to be negatively associated with the number of TT injections received before birth. Father's occupation, marital status and province of residence are each expected to influence the number of TT injections received before birth.

2. Mother's educational level, father's educational level, urban residence, the status of the mother as currently working and earning cash for work are each expected to be positively associated but maternal age and children ever born

are each expected to be negatively associated with the reception of adequate prenatal care. Father's occupation, marital status and province of residence are each expected to influence the reception of adequate prenatal care.

3. Mother's educational level, father's educational level, urban residence, the status of the mother as currently working and earning cash for work are each expected to be positively associated but maternal age and children ever born are each expected to be negatively associated with delivering birth at hospitals or in clinics. Father's occupation, marital status and province of residence are each expected to influence delivering birth at hospitals or in clinics.

4. Mother's educational level, father's educational level, urban residence, the status of the mother as currently working and earning cash for work are each expected to be positively associated but maternal age and children ever born are each expected to be negatively associated with receiving prenatal care from doctors or nurses. Father's occupation, marital status and province of residence are each expected to influence the reception of prenatal care from doctors or nurses.

5. Mother's educational level, father's educational level, urban residence, the status of the mother as currently working and earning cash for work are each expected to be positively associated but maternal age and children ever born are each expected to be negatively associated with the reception of delivery care from doctors or nurses. Father's occupation, marital status and province of residence are each expected to influence the reception of delivery care from doctors or nurses.

6. Mother's educational level, father's educational level, the type of place of residence, work status, father's occupation, maternal age, children ever born, marital status and the province of residence each affect the reception of at least two TT injections before birth.

7. Mother's educational level, father's educational level, the type of place of residence, work status, father's occupation, maternal age, children ever born, marital status and the province of residence each affect the reception of adequate prenatal care.

8. Mother's educational level, father's educational level, the type of place of residence, work status, father's occupation, maternal age, children ever born, marital status and the province of residence each affect delivering birth at hospitals or in clinics.

9. Mother's educational level, father's educational level, the type of place of residence, work status, father's occupation, maternal age, children ever born, marital status and the province of residence each affect the reception of prenatal care from doctors or nurses.

10. Mother's educational level, father's educational level, the type of place of residence, work status, father's occupation, maternal age, children ever born, marital status, receiving prenatal care from doctors or nurses and the province of residence each affect the reception of delivery care from doctors or nurses.

CHAPTER THREE

STUDY METHODOLOGY

3.0 Introduction

The purpose of this chapter is to describe four primary aspects namely: the source of data, method used for analysis, the data set and the statistical models used. Discussions about the merits and limitations of the data set and the models are also given. Moreover, the assumptions of the models and approach to understand the output of interest are briefly discussed.

3.1 Data Source

The Kenya Demographic and Health Survey, KDHS, 1993 was carried out by NCPD in collaboration with the Central Bureau of Statistics (CBS). The survey was conducted in collaboration with Macro International Inc. of Cleverton, Maryland, USA. The survey covered 7540 women of reproductive ages (15-49) and 2,336 men of ages 20-54 who are husbands to the sample women. It was conducted between mid February to mid August 1993.

It was a national survey, which covered most parts of Kenya excluding three districts in the North Eastern Province; the Samburu and Turkana districts in the Rift Valley province; and Isiolo and Marsabit districts in the Eastern Province. The population of these excluded districts account for less than four percent of the Kenyan national population (NCPD et al., 1994: 180).

3.1.1 Survey Sampling Procedure

The sampling frame used to select samples was that which was maintained by CBS and used in the 1989 census. The master plan had 1,048 rural and 324 urban clusters altogether 1,373. Out of those 1,373 clusters, 536 (92 urban and 444 rural) were selected for coverage. Households in the cluster were listed by CBS staffs. The selection of households for interview was done by selecting every 20th and every 16th from rural and urban clusters respectively. Therefore, the survey employed multistage sampling procedure.

3.1.2 Quality of Data

Questionnaires for the survey were pretested. A good proportion of the interviewers had experience in the area of interviewing in the former, 1989 survey. The trainee interviewers benefited from lectures of NCPD, CBS, and Macro Inc. professionals. Guest lecturers from public service ministries had also participated in the training of interviewers (NCPD et al., 1994: 183).

Interviewers were selected on the basis of knowledge of local language, educational attainment, maturity, ability to spend two months in the field and experience in the other surveys. Trainees were evaluated upon completion of the training programme and those of higher calibre were even assigned to be supervisors. Each interviewing team was dispatched comprising supervisors, field editors, female and male interviewers. Interviewers were assisted by CBS staff in the field.

The DHS questionnaires were returned to NCPD headquarters for data processing. At the NCPD Headquarters, data were edited, coded, and entered into computer. The entire process of editing, coding and entering was supervised by NCPD officials. Therefore, the chances of non-sampling errors were minimized.

3.1.3 Limitations

As a national survey, KDHS 1993 should have covered the entire nation of Kenya. Yet seven districts of the forty one were not covered. This implies nearly one out of six districts was not covered. Likewise, 8,805 households were listed to be interviewed; yet only 7,950 were successfully covered. Of 7,952 eligible households, only 7,540 (95 percent) were interviewed. Similarly, of 2,762 eligible men, who are husbands to the sample women, only 2,336 (85 percent) responded (NCPD, 1994). Therefore, the survey was not entirely free from undercoverage.

With respect to analysis on the data sub set labelled "child file", there is some risk about the inaccuracy of responses which needs to be pointed out. When reporting about her and her partner's background (e.g. educational level), the woman was supposed to have reported the highest educational attainment at the day of the reporting. In instances where a woman who completed eleven years of formal education just a few months ago gave birth in the previous year and four years earlier is a respondent, it might go as follows. The way KDHS questionnaires were designed, the mother reported her highest educational achievement at the time of the interview.

Therefore, the child file would have a maternal educational level of eleven years for each child instead of seven for one and eleven for the other. Hence, during analysis the children fall in the same category instead of one falling in one and the other in another category. As mother's highest educational level might be different for index child, so may be father's educational level, type of place of residence, work status, father's occupation, and province of residence. Furthermore, in situations where a woman gave birth to more than one child fathered by different men, she would be just reporting the highest educational achievement and latest occupation of the latest partner. Nevertheless, there are no such particular mass cases of change in type of place of residence, region of residence, father's occupation, etc. that the risk in accuracy would not sway the validity of the data.

Though it may not be argued that KDHS 1993 was not entirely accurate inso far as undercoverage and non sampling errors, as errors in coding and entering data obtained, risks of only minor inaccuracy needs to be acknowledged in using child file for data set. Therefore, the data set is reliable and of high quality.

3.2 Methods of Data Analysis

The methods of data analysis used for the study are cross tabulation with chi-square test and multiple logistic regression.

3.2.1 Cross Tabulation

Cross tabulation gives a primary glimpse of frequency distribution of events against background factors. In this study, frequencies of receiving none, one or at least two TT injections; receiving the type of (adequate/inadequate) prenatal care; delivering at hospitals or in clinics or at homes; receiving prenatal care from formal, informal source or not from any at all; receiving delivery care from doctors, nurses, trained traditional birth attendants (TTBAs), traditional birth attendants (TBAs), relatives, other sources or no one are cross tabulated against the selected socio-economic and demographic factors.

3.2.2 Chi-square (X^2)

The chi-square is applied to test the hypotheses of the variance of a normally distributed population, goodness of fit of the theoretical distribution to observed frequency of distribution, in one way having **K** categories. It is used for testing independence of attributes, when the frequencies are presented in a two way classification called the contingency table (Agrawal, 1988: 230). In this study the chi-square is used to test the independence of attributes of a set of grouped data. For instance, the independence (no association) of place of delivery from mother's educational level, etc.

The test of independence of attributes uses the contingency table (cross tabulation) which is a matrix array of two way classification of units of observation. As a matrix, it has an *i* rows and *j* columns which make the total of *i* by j (*ij*) cells. The cell frequency O_{ij} represents the number of cases in a single cell *ij* possessing the same characteristics of A_i and B_i where A and B represent different attributes. Column and row sums are given in respective columns and rows as is the grand total.

After setting the contingency table, the hypothesis that one factor is independent of the other factors tested by the Chi-square test. In this case the hypothesis is given:

H_o= The two factors are not associated to each other.

H_1= The two factors are associated to each other (H_o is not true).

In this particular study, a hypothesis is set in such a way that a particular reproductive health care use indicator is independent of the selected socio-economic and demographic factor. For example, to test the association between place of delivery and educational level, the hypothesis may be formulated:

H_o= There is no an association between place of delivery and mother's educational level.

H_1= There is an association between place of delivery and mother's educational level (H_o is not true).

The Parson chi-square distribution is used to determine the level of significance of the association between the variables in the hypotheses. The parson chi-square distribution is given by the equation:

$$X^2 = \Sigma(O_{ij}-E_{ij})^2/E_{ij}$$

Where X^2 = the calculated value of chi-square,

O_{ij} = observed frequency in the cell *ij*,

E_{ij} = expected frequency in the cell *ij* obtained by the row total multiplied by the column total and divided by the grand total.

To make a decision about the hypothesis, the calculated value of X^2 is compared with the table value against (R-1) (C-1) degree of freedom and α (the level or error one risks in accepting or rejecting the hypothesis). The null hypothesis is rejected if the calculated value of chi-square is greater than the table value (visa versa). Rejecting the null hypothesis meant accepting the alternative hypothesis (visa versa).

In using the Chi-square test of independence, the convention that not more than 20 percent of the expected values be less than five and none of the expected values be less than one (Norusis, 1990: 244) was observed.

3.2.3 Regression

The use of regression analysis is to describe the nature of relation between dependent and independent variables. It can also be used to measure or infer how a change in one or more independent variables are related to changes in the dependent variable. In this study, it is used to describe the nature of relation between receiving two or more TT injections, receiving adequate prenatal care visits, mother delivering at a hospital or in a clinic, receiving prenatal care from either a doctor or a nurse or not and mother receiving care from doctors or nurses during delivery as dependent

variables and selected socio-economic and demographic factors as independent variables.

a) **The Logistic Regression: Models**

This study utilizes logistic regression in particular. The logistic regression model may be summarized as :

$$\pi(x) = e^{(\beta 0 + \beta 1(x1))} / 1 + e^{(\beta 0 + \beta 1(x1))}$$

where $\pi(x)$ = conditional probability of π given x,

e = the inverse of the natural logarithm,

β_0 = the constant of the regression,

β_1 = regression coefficient between the dependent and independent variables.

The model makes use of logistic coefficient. The logistic transformation of $\pi(x)$ makes the coefficient of logistic regression. The transformation is given by

$$g(x) = \ln(\pi(x)/1-\pi(x)).$$

b) **The Logistic Regression Model: Simple**

Thus the simplest regression equation is given by

$$Y_i = \beta_0 + \beta_1 x_1 + e_i$$

Where e_i = random error expected in computation.

Such a model is used only for a bivariate analysis. But in social studies, as with such a one, no single variable causes the whole effect, but many of them combined. Thus, multiple logistic regression is used so that multiple causes (variables) may be

accommodated to explain and estimate a single on a variable of interest. Multiple logistic regression helps to give a fuller explanation of determinants of reproductive health care use indicators and taking as many as desired variables by sorting which one(s) is/are the determinant(s).

c) The Logistic Regression Model: Multiple

The model is given by

$$g(x) = \beta_0 + \beta_1 x_1 + \ldots + \beta_n x_n + e_n$$

$\beta_0, \beta_1, \ldots, \beta_n$ are parameters and $X_1, \ldots, X_n$ are explanatory variables.

$\pi(x) = e^{g(x)}/1 + e^{g(x)}$.

Besides giving a fuller explanation, the model has two other magnificent merits. It is possible to sort out the effect of an explanatory variable on a reproductive health care use indicator by introducing the control system. However, measuring the effect of a variable on the other is out of the scope of this study. Moreover, the possibility of distorting the estimation as caused by error terms of a variable may be balanced with the error term of the other. Using the model it is possible to sort out a single straight line of best fit to predict receiving at least two TT injections, receiving adequate prenatal care, delivering at hospitals or in clinics, receiving prenatal care from doctors or nurses, receiving delivery care from doctors or nurses.

The logistic model can also be rewritten in terms of the odds of events occurring. The odds of events occurring is defined as the ratio of the probability that it will fall in one category or the other. The log odd is given by:

$$\frac{\text{The probability of event}}{\text{The probability of no event}} \quad e^{\beta 0+\beta 1x1+\_+\beta nxn}$$

In this particular study, the odds are used to quantify, for example, the probability of a child to a mother educated to secondary or higher level and delivering at a health institution to her/his own probability of being delivered at home. The inverse of the exponantiated value of natural logarithms gives **odds ratio** which is a ratio of use of reproductive health care use indicator of one group in terms of the reference group. Both the log odds and odds ratio are used in this study.

d) Logistic Regression: Tests of Coefficients and Models

Assessing the accuracy of regression coefficients and the entire model are important. The idea behind testing coefficients of a variable is to find out if the model containing the variable can explain more than one which does not. Assessing the accuracy of coefficient of logistic regression can be done using the score, the walda and the maximum likelihood test.

The walda test employs the maximum likelihood estimate and its coefficient's standard error under the assumption $\beta_1=0$ are distributed normally. Thus, $W=\beta_1/SE(\beta_1)$, where W stands for walda value and SE stands for standard error. The normal distribution (Z) test is used to determine whether to accept or reject the null hypotheses. However, (Hauck and Donner, 1977 cited in Hosmer and Lemeshow, 1989: 13) argued that walda test behaves in an aberrant manner often failing to reject when the coefficient was insignificant. Therefore, they recommended the use of the likelihood ratio. The maximum likelihood estimation technique can be applied where

the explanatory variables are categorical (Hanushek and Jackson, 1977: 181). In this study, each variable considered is either a categorical or is categorised. Therefore, the maximum likelihood test is used. The likelihood ratio test, **G**, requires the maximum likelihood estimate for β_1.

For coefficients in the multivariate model, the maximum likelihood test uses observed and predicted values. It is given as:

$$D = -2 \ln \frac{\text{likelihood of current model}}{\text{likelihood of saturated model}}$$

Where D is deviance of logistic regression; equivalent to the natural sum of squares in linear regression. Likelihood ratio, therefore, is the likelihood of the current model divided by the likelihood of the saturated model.

To assess the significance of the difference, the statistics of **G** is used. The **G** statistics is given by:

G= D (for the model without the variable) - D (for the model with the variable), which is the same as:

$$\mathbf{G} = \frac{-2 \ln \text{likelihood with out the variable}}{\text{likelihood with the variable}}$$

Under the hypothesis $\beta_1 = 0$, the statistics of chi-square at the degree of freedom being equal to the number of variables in the equation is used.

Forward stepwise was chosen for the method. The method helps to introduce one explanatory variable at a time among the many in the model, and retain the ones

exerting significant effect . Only those factors which have significant effect remain in the final model (Retherford and Choe, 1993:63).

CHAPTER FOUR

RESULTS OF LEVELS AND DIFFERENTIALS IN THE USE OF MATERNAL HEALTH CARE SERVICES

4.0 Introduction

In this chapter only cross tabulation results are presented and discussed. As was mentioned in the previous chapter, births that had occurred in the five years preceding the 1993 survey are the unit of analysis.

4.1.0 Results

Table 4.1 shows the levels and differentials in receiving the number of TT injections before birth by the following factors: mother's and father's educational level, type of place of residence, work status, earning cash for work, father's occupation, maternal age, children ever born, current marital status and province of residence.

Table 4.1: Percentage distribution of the births by the number of TT injections received as per selected variables: Kenya, KDHS 1993

Background variables	None	One	≥ Two	# of cases
Mother's education level				
no education	12.5	36.3	51.2	1033
primary	7.8	38.4	53.8	3428
secondary+	5.0	37.6	57.5	1145
Total	8.1	37.9	54.0	5606
X^2=43.71572		d.f. = 4	p = 0.00000	
Father's educational level				
no education	14.6	34.7	50.7	548
primary	8.9	38.4	52.7	2770
secondary+	3.9	39.0	57.1	1776
Total	7.8	38.2	54.0	5094
X^2= 79.20491		d.f. = 4	p = 0.00000	
Type of place of residence				
urban	5.1	36.9	57.9	604
rural	8.5	38.0	53.6	5002
Total	8.1	37.9	54.0	
5606				
X^2= 9.41150		d.f. = 2	p = 0.00904	
Currently working				
no	8.6	38.9	52.5	2442
yes	7.8	37.0	52.5	3160
Total	8.1	37.8	54.1	5602
X^2= 4.21923		d.f. = 2	p = 0.12128	
Earning cash for work				
no	8.7	33.1	58.2	641
yes	7.6	38.0	54.4	2497
Total	7.8	37.0	55.2	3138
X^2 = 5.55992		d.f. = 2	p = 0.06223	

Table 4.1, continued from page 45

Background variables	None	One	≥ Two	# of cases
Father's occupation				
never worked	23.3	37.0	39.7	73
white collar	5.7	39.1	55.1	1150
agriculture	9.3	38.5	52.2	1923
blue Collar	6.1	38.2	55.7	1318
Total	7.7	38.5	53.8	4464
X^2 = 44.50160		d.f = 6	p = 0.00000	
Maternal age				
< 20	10.9	31.5	57.6	76
20-34	7.4	38.7	53.9	4246
35+	10.1	36.2	53.8	1084
Total	8.1	37.9	54.0	5606
X^2 = 15. 38437		d.f. = 4	p = 0.00397	
Children ever born				
1	9.0	30.0	61.1	647
2-4	7.2	38.4	54.4	2573
5+	8.8	39.4	51.8	2386
Total	8.1	37.9	54.0	5606
X^2 = 25.38582		d.f. = 4	p= 0.00004	
Marital status				
never ma.	12.4	33.7	53.8	403
mar., liv.tog.	7.6	38.4	54.0	4774
wid.,div., nlt	9.3	35.9	54.8	3030
Total	8.1	37.9	54.0	5606
X^2 = 13.97542		d.f. = 4	p = 0.00737	

Table 4.1, Continued from page 45 and 46

Background variables	None	One	≥ Two	# of cases
Province of residence				
Nairobi	6.1	36.7	57.2	180
Central	7.6	31.2	61.2	629
Coast	9.1	34.1	56.8	703
Eastern	7.7	41.7	50.6	842
Nyanza	6.4	42.5	51.1	1012
Rift Valley	9.6	38.1	52.3	1412
Western	7.9	36.4	55.8	828
Total	8.1	37.9	54.0	5606
X^2 = 41.40300		d.f. = 12	p = 0.00004	

Source: Primary analysis of KDHS, 1993.
nev ma., mar., liv.tog., and wid., div., nlt stand for never married, married and living together, and widowed, divorced and not living together respectively.

4.1 Mother's Educational Level by the Number of TT Injections Received Before Birth

Mother's educational level is expected to be positively associated with the number of TT injections received before birth. From Table 4.1, mother's educational level is negatively associated with not receiving TT injection at all. But it is positively associated with receiving at least two TT injections. The results presented in Table 4.1 confirm that mother's educational level is strongly associated with the number of TT injections received before birth.

4.2 Father's Educational Level by the Number of TT Injections Received Before Birth

Father's educational level is expected to be positively associated with the number of TT injections received before birth. From Table 4.1, the father's educational level is negatively associated with mother receiving none or one TT injection before birth. However, it is positively associated with receiving at least two TT injections before

birth. The results shown in Table 4.1 confirm that father's educational level is strongly associated with the number of TT injections received before birth.

4.3 The Type of Place of Residence by the Number of TT Injections Received Before Birth

Urban residence is expected to be positively associated with the number of TT injections received before birth. Table 4.1 shows that rural mothers received no TT injections before birth for a greater percentage of their births than their urban counterparts. However, urban mothers received at least two TT injections for a greater percentage of their births than their rural counterparts. The result shown in Table 4.1 confirm that the type of place of residence is closely associated with the number of TT injections received before birth.

4.4 Work status of the Mother by the Number of TT Injections Received Before Birth

Mother's current work status being working is expected to be positively associated with the reception of the number of TT injections before birth. From Table 4.1, we can see mothers who were not working received none or one TT injection before birth for a greater percentage of their births than their counterparts who were working. However, both groups of mothers received at least two TT injections before birth for an equal (52.2) percent of their births. The results from Table 4.1 show that work status of the mother is not associated with the number of TT injections received before birth.

4.5 Earning Cash for Work by the Number of TT Injections Received Before Birth

Earning Cash for work is expected to be positively associated with the number of TT injections received before birth. From Table 4.1 we see mothers who were not earning cash for work received none or at least two TT injections before birth for a greater percentage of their births than their counterparts who were earning cash for work. However, mothers who were earning cash for work received one TT injection before birth for a greater percentage of their births than their counterparts who were not. The results found in Table 4.1 show that the number of TT injections received before birth was not associated with whether the mother earned cash for work or not.

4.6 Father's Occupation by the Number of TT Injections Received Before Birth

Father's occupation is expected to influence the number of TT injections received before birth. From Table 4.1 we see the percentage of births for which the mothers received no TT injection varied according to the father's occupation. For example, for the births to never worked fathers, the mothers received no TT injections for 23.3 percent of their births. For births to fathers who held blue collar jobs or white collar jobs, the mothers received at least two TT injections for 51.1 percent of their births. This is much higher than the percentage for births among never worked fathers. The result presented in Table 4.1 confirm that father's occupation strongly influenced the number of TT injections received before birth.

4.7 Maternal Age by the Number of TT Injections Received Before Birth

Maternal age is expected to be negatively associated with the number of TT injections received before birth. From table 4.1, we see that receiving none or only one TT injection before birth varied unpredictably; however, this was not true in case of receiving at least two TT injections before birth. A negative relationship is evident between maternal age and receiving at least two TT injections before birth. The results in Table 4.1 show that maternal age is positively associated with the number of TT injections received before birth.

4.8 Children Ever Born by the Number of TT Injections Received Before Birth

Children ever born is expected to be negatively associated with the number of TT injections received before birth. From Table 4.1, we learn that the children ever born was positively associated with receiving one TT injection. However, the relationship was negative between receiving at least two TT injections and children ever born. The results in Table 4.1, it is shown that children ever born is negatively associated with receiving at least two TT injections. Moreover, children ever born is associated closely with the number of TT injections received before birth.

4.9 Marital Status by the Number of TT Injections Received Before Birth

Marital status is expected to influence the number of TT injections received before birth. From Table 4.1, we see that the never married mothers received no TT injections for a greater percentage of their births than mothers in other marital relationship. The married and the living together lead in percentage of births for which they received one TT injection. Mothers of all marital categories received at least two TT injections for nearly equal percentage of their births. The results found in Table 4.1 confirm that marital status closely influences the number of TT injections received before birth.

4.10 The Province of Residence by the Number of TT Injections Received Before Birth

The province of residence is expected to influence the number of TT injections received before birth. From Table 4.1, we find that mothers in the Rift Valley received no TT injections for a greater percentage of their births than mothers in other provinces. However, mothers in Nyanza province received one TT injection for a greater percentage of their births than mothers in other provinces. Mothers in Central Province received at least two TT injections before birth for a greater percentage of their births than mothers in other provinces. The results found in Table 4.1 confirm that the province of residence closely influences the number of TT injections received before birth.

Table 4.2 shows the levels and differentials in the type of prenatal care received according to mother's and father's educational level, type of place of residence, work status, earning cash for work, father's occupation, maternal age, children ever born, current marital status and province of residence.

Table 4.2: Percentage distribution of births by the type of prenatal care received as per selected variables: Kenya, KDHS 1993.

Background variables	Inadequate	Adequate	# of cases
Mother's educational level			
no education	16.3	83.7	1120
primary	9.9	90.1	3680
secondary+	8.4	91.6	1230
Total	10.8	89.2	6030
X^2= 46.17062	d.f.= 2	p= 0.00000	
Father's educational level			
no education	15.5	84.5	582
primary	11.5	88.5	3000
secondary+	7.8	92.2	1907
Total	10.6	89.4	5489
X^2= 32.47464	d.f.= 2	p= 0.00000	
Type of place of residence			
urban	11.7	88.3	668
rural	10.7	89.3	5362
Total	10.8	89.2	6030
X^2= 0.60493	d.f.= 1	p= 0.43670	
Currently working			
no	10.5	89.5	2604
yes	11.0	89.0	3422
Total	10.8	89.2	6026
X^2= 0.48521	d.f.= 1	p= 0.48607	

Table 4.2, Continued from page 52

Background variables	Inadequate	Adequate	# of cases
Earning cash for work			
no	10.2	89.5	2604
yes	11.2	88.8	2712
Total	11.0	89.0	3397
$X^2 = 0.58772$	d.f. = 2	p= 0.44330	
Father's occupation			
never worked	21.0	79.0	81
white collar	9.6	90.4	1246
agriculture	11.6	88.4	2066
blue collar	8.8	91.2	1381
Total	10.5	89.5	4774
$X^2 = 17.35927$	d.f. = 3	p= 0.00060	
Maternal age			
< 20	9.7	90.3	278
20-34	9.7	90.2	4562
35^+	13.8	86.2	1190
Total	10.8	89.2	6030
$X^2 = 13.75901$	d.f. = 2	p= 0.00103	
Children ever born			
1	6.7	93.3	657
2-4	9.8	90.2	2761
5^+	12.9	87.1	2612
Total	10.8	89.2	6030
$X^2 = 25.81503$	d.f. = 2	p = 0.00000	
Marital status			
Never married	12.9	87.1	426
mar., liv.tog.	10.5	89.5	5143
wid., div., nlt.	12.4	87.6	461
Total	10.8	89.2	6030
$X^2 = 3.68826$	d.f. = 2	p = 0.15816	

Table 4.2; Continued from page 52 and 53

Background variables	Inadequate	Adequate	# of cases
Province of residence			
Nairobi	14.2	85.8	204
Central	11.3	88.7	698
Coast	11.3	88.7	741
Eastern	7.5	92.5	883
Nyanza	10.5	89.3	1090
Rift Valley	10.8	89.2	1503
Western	12.5	87.5	906
Total	10.8	89.2	6080
$X^2 = 15.29291$	d.f. = 6	p= 0.01810	

Source: Primary analysis of KDHS, 1993.
mar., liv tog; wid., div., nlt stand for married and living together, and widowed, divorced and not living together respectively

4.11 Mother's Educational Level by the Type of Prenatal Care Received

Mother's educational level is expected to be positively associated with the reception of adequate prenatal care. From Table 4.2, we see that the mother's educational level is positively associated to receiving adequate prenatal care. Conversely, the mother's educational level is negatively associated with receiving inadequate prenatal care. From the results in Table 4.2, it is evident that mother's educational level is strongly associated with the type of prenatal care received before birth.

4.12 Father's Level of Education by the Type of Prenatal Care Received

Father's educational level is expected to be positively associated with the reception of adequate prenatal care. From Table 4.2, we find the father's educational level is negatively associated with receiving inadequate prenatal care. However, it is positively associated with receiving adequate prenatal care. The results in the Table

4.2 show that father's educational level is strongly associated with the type of prenatal care received before birth.

4.13 The Type of Place of Residence by the Type of Prenatal Care Received

Urban residence is expected to be positively associated with receiving adequate prenatal care. From Table 4.2, we find urban mothers received inadequate prenatal care for a slightly a greater percentage of their births than their rural counterparts. Conversely, rural mothers received adequate prenatal care for a slightly greater percentage of their births than their urban counterparts. The direction of the association is against expectation. However, the result in Table 4.2 show the type of place of residence is not significantly associated with the type of prenatal care received before birth.

4.14 Work Status of the Mother by the Type of Prenatal Care Received

Mother's current work status being working is expected to be positively associated with receiving adequate prenatal care. From Table 4.2, we see that both the mothers who were working and who were not working received both adequate and inadequate prenatal care for nearly equal percentages of their births. Therefore, Table 4.2 shows that work status of the mother is not associated with the type of prenatal care received before birth.

4.15 Earning Cash for Work by the Type of Prenatal Care Received

Earning cash for work is expected to be positively associated with receiving adequate prenatal care. From Table 4.2, we find that mothers who were earning cash for work

and those who were not, received both inadequate and adequate prenatal care for nearly equal percentage of their births. The results in Table 4.2 show that earning cash for work is not associated with the type of prenatal care received.

4.16 Father's Occupation by the Type of Prenatal Care Received

Father's occupation is expected to influence the reception of adequate prenatal care. From Table 4.2, it is evident that the births to never worked fathers are the least in percentage for mothers receiving inadequate prenatal care. Births to fathers who held blue collar jobs lead in percentage for births receiving adequate prenatal care, followed by births to fathers who held white collar jobs. The results from Table 4.2 show that father's occupation closely influences the type of prenatal care received.

4.17 Maternal Age by the Type of Prenatal Care Received

Maternal age is expected to be negatively associated with receiving adequate prenatal care. However, from Table 4.2 neither increase nor decrease in maternal age indicated more than a negligible variation in receiving inadequate or adequate prenatal care before births. The result from Table 4.2 show that maternal age is not associated with the type of prenatal care received before birth.

4.18 Children Ever Born by the Type of Prenatal Care Received

Children ever born is expected to be negatively associated with receiving adequate prenatal care. Results in Table 4.2 show that children ever born is positively associated to the mother receiving inadequate prenatal care. However, it is negatively associated with the reception of adequate prenatal care. The result from Table 4.2

show that children ever born is strongly associated with the type of prenatal care received before birth.

4.19 Marital Status by the Type of Prenatal Care Received

Marital status is expected to influence the reception of adequate prenatal care. From Table 4.2, we see the percentage of births for which the mothers received inadequate or adequate prenatal care is nearly equal among mothers of different marital status. The results from Table 4.2 show that marital status does not influence the reception of the type of prenatal care status.

4.20 Province of Residence by the Type of Prenatal Care Received

Province of residence is expected to influence the reception of adequate prenatal care. From Table 4.2, it is clear that the type of prenatal care received before birth varied for province of residence. For example, mothers from Eastern Province received inadequate prenatal care for 7.5 percent of their births, but the percentage is almost double for Nairobi mothers. For mothers in other provinces, the percentages varied in the ranges. Variations were also present in receiving adequate prenatal care for births among women of different provinces. The results found in Table 4.2 show that province of residence influences the reception of adequate prenatal care. Moreover, province of residence has a close impact on the type of prenatal care received.

Table 4.3 shows the levels and differentials of the place of delivery according to mother's and father's educational level, type of place of residence, work status, earning cash for work, father's occupation, maternal age, children ever born, current marital status and province of residence.

Table 4.3: Percentage distribution of births by the place of delivery as per selected variables: Kenya, KDHS 1993

Background variables	Home	Hos./Clinics	# of Cases
Mother's educational level			
no education	76.8	23.2	1006
primary	59.0	41.0	3389
secondary+	30.0	70.0	1130
Total	56.3	43.7	5525
X^2 = 500.39237	d.f. = 2	P=0.00000	
Father's educational level			
no education	74.2	25.6	539
primary	63.8	36.2	
2724			
secondary+	39.9	60.1	1752
Total	56.6	43.4	5015
X^2 = 324.51920	d.f. = 2	P = 0.0000	
Type of place of residence			
urban	27.2	72.8	596
rural	59.8	40.2	4924
Total	56.3	43.7	2525
X^2 = 324.51920	d.f. = 2	p = 0.0000	
Currently working			
no	61.4	38.6	2407
yes	52.4	47.6	3114
Total	56.3	43.7	5521
X^2 = 44.34706	d.f. = 1	P = 0.00000	

Table 4.3, continued from page 58

Background variables	Home	Hos./Clinics	# of Cases
Earning cash for work			
no	54.8	45.2	631
yes	51.8	48.2	2461
Total	52.4	47.6	3092
X^2 = 1.84309	d.f. = 1	p = 0.017459	
Father's occupation			
never worked	65.8	34.2	73
white collar	43.2	56.9	1135
agriculture	66.0	34.0	1891
blue collar	50.5	49.5	1234
Total	55.6	44.4	4393
X^2 = 171.09664	d.f. = 3	p = 0.00000	
Maternal age			
< 20	54.0	46.0	643
20-34	54.4	45.6	4195
35^+	64.4	35.6	2537
Total	56.3	43.7	5525
X^2 = 36. 04319	d.f. = 2	p = 0.0000	
Children ever born			
1	40.4	59.6	403
2-4	51.4	48.6	2537
5^+	66.0	34.0	2345
Total	56.3	43.7	5525
X^2 = 180.48217	d.f. = 2	p = 0.00000	
Marital status			
never married	50.6	49.4	403
mar. or liv.tog.	56.5	43.5	4700
wid., div.,nlt.	60.2	39.8	422
Total	56.3	43.7	5525
X^2 = 7.93241	d.f. = 2	p = 0.01845	

Table 4.3, continued from page 58 and 59

Background variables	Home	Hos./Clinics	# of Cases
Province of residence			
Nairobi	20.0	80.0	175
Central	25.0	75.0	624
Coast	67.4	32.6	691
Eastern	51.0	49.0	827
Nyanza	61.1	38.9	998
Rift Valley	62.3	37.7	1394
Western	68.0	32.0	816
Total	56.3	43.7	5525
X^2 = 461.57099	d.f. = 6	p = 0.00000	

Source: Primary analysis of KDHS, 1993
Mar. or liv. tog; wid., div., nlt. stand for married and living together, and widowed, divorced or not living together respectively.

4.21 Mother's Educational Level and Place of Delivery

Mother's educational level is expected to be positively associated with delivery at hospitals or in clinics. From Table 4.3 we can see that the educational level is negatively associated with delivering at home; but it is positively associated with delivering at hospitals or in clinics. The results in table 4.3 confirm that mother's educational level is strongly associated with the place of delivery.

4.22 Father's Educational Level and Place of Delivery

Father's educational level is expected to be positively associated with delivery at hospitals or in clinics. From Table 4.3 we see that the father's educational level is found to be negatively associated with delivery at home. However, it is positively associated to delivery at hospitals or in clinics. The results from Table 4.3 confirm that father's educational level is strongly associated with the place of delivery.

4.23 Place of Residence by Place of Delivery

Urban residence is expected to be positively associated with delivery at hospitals or in clinics. From Table 4.3 we find that rural mothers delivered a greater percentage of their births at homes than their urban counterparts. Conversely, urban mothers delivered a greater percentage of their births at hospitals or in clinics. The results from Table 4.3 show that the type of place of residence is closely associated with the place of delivery.

4.24 Work Status by Place of Delivery

Work status of the mother being working is expected to be positively associated with delivery at hospitals or in clinics. From Table 4.3 we see mother's who were not working delivered a greater percentage of their births at homes than their working counterparts. But, mothers who were working delivered a greater percentage of their births at hospitals or in clinics than their counterparts who were not working. The results from Table 4.3 confirm that the work status of the mother is strongly associated with the place of delivery.

4.25 Earning Cash for Work by Place of Delivery

Earning cash for work is expected to be positively associated with delivery at hospitals or in clinics. From Table 4.3 we see that mothers who did not earn cash for work delivered a greater percentage of their births at home than their counterparts who earned cash for work. Conversely, mothers who earned cash for work delivered a greater percentage of their births at hospitals or in clinics than their counterparts

who did not earn cash for work. The results in Table 4.3 show that whether earning cash for work or not is closely associated with the place of delivery.

4.26 Father's Occupation by Place of Delivery

Father's occupation is expected to influence delivery at hospitals or in clinics. From Table 4.3 we see that for births to fathers who worked in agriculture, the mothers delivered a greater percentage of their births at home than for corresponding occupation of fathers. For births to fathers who held white collar jobs, the mothers delivered a greater percentage of their births at hospitals or in clinics than for mother's with husbands in corresponding occupations. The results from Table 4.3 confirm that father's occupation strongly influences the place of delivery.

4.27 Maternal Age by Place of Delivery

Maternal age is expected to be negatively associated with the place of delivery. From Table 4.3 we find that the maternal age is positively associated with delivering at home. But, it is negatively related with delivering at hospitals or in clinics. The results from Table 4.3 show that maternal age strongly associated with the place of delivery.

4.28 Children Ever Born and Place of Delivery

Children ever born is expected to be negatively associated with delivering at hospitals or in clinics. From Table 4.3 we find that the children ever born is positively associated with delivering at home; but it is negatively associated with delivering at

hospitals or in clinics. The result from table 4.3 show that children ever born is strongly associated with the place of delivery.

4.29 Marital Status by Place of Delivery

Marital status is expected to influence delivery at hospitals or in clinics. From Table 4.3 we see that the mothers who were widowed, divorced or not living together with the father of the child delivered a greater percentage of their births at homes followed by mothers who were married or living together. Mothers who were never married delivered a greater percentage of their births at hospitals or in clinics than their counterparts. The result in Table 4.3 confirm that marital status strongly influences the place of delivery.

4.30 Province of Residence by Place of Delivery

Province of residence is expected to influence the place of delivery. It is to be seen in Table 4.3 that mothers in Western province delivered a greater percentage of their births (68.0 percent) at home than their counterparts; e.g. Nairobi (20.0 percent). However, mothers in Nairobi delivered a greater percentage of their births at hospitals or in clinics than their counterparts in other provinces; Rift Valley (37.7 percent). The results in Table 4.3 show that the province of residence strongly influences the place of delivery.

Table 4.4 shows the levels and differentials in prenatal care providers used in relation to the following factors: mother's and father's educational level, type of place of

residence, work status, earning cash for work, father's occupation, maternal age, children ever born, current marital status and province of residence.

Table 4.4: Percentage distribution of births by prenatal care providers as per selected variables: Kenya, KDHS 1993

Background variables	Doctors, Nurses (formal source)	TTBA, TBA, OR (infor. source)	No One	# of cases
Mother's educational level				
no education	87.2	4.1	8.7	1013
primary	92.4	4.5	3.1	3415
secondary+	94.7	3.9	1.4	1143
Total	91.9	4.3	3.8	5571
X^2 = 90.98489	d.f. = 4	p = 0.00000		
Father's educational level				
no education	86.3	4.3	9.5	539
primary	92.2	3.9	3.9	2753
secondary+	93.7	5.5	0.8	1770
Total	92.1	4.5	3.4	5062
X^2 = 31.7922	d.f. = 4	p = 0.00000		
Type of place of residence				
urban	96.5	1.2	2.3	602
rural	91.5	4.7	3.9	4969
Total	91.9	4.3	3.8	5571
X^2 = 19.03291	d.f. = 2	p = 0.00003		
Currently working				
no	90.2	5.7	4.1	636
yes	93.3	3.2	3.5	3140
Total	91.9	4.3	3.8	5567
X^2 = 17.58874	d.f. = 2	p = 0.00001		
Earning cash for work				
no	95.1	1.3	3.6	75
yes	92.7	3.7	3.5	2482
Total	93.2	3.2	3.5	3118
X^2 = 10.00819	d.f. = 2	p = 0.00671		

Table 4.4, continued from page 64

Background variables	Doctors, nurse (formal source)	TTBA, TBA, OR (infor. source)	No One	# of cases
Father's occupation				
never worked	82.2	5.5	12.3	75
white collar	92.8	5.2	1.9	1145
agriculture	91.2	4.1	4.7	1908
blue collar	93.5	4.4	2.1	1310
Total	92.2	4.5	3.3	4436
$X^2 = 44.86661$	d.f. = 6	p = 0.00000		
Maternal age				
< 20	91.0	4.1	4.9	1367
20-34	92.8	4.1	3.1	3545
35^+	89.5	5.6	4.9	659
Total	91.9	4.3	3.8	5571
$X^2 = 13.76989$	d.f. = 4	p = 0.00807		
Children ever born				
1	91.5	3.4	5.1	275
2-4	93.0	4.1	2.9	2560
5^+	90.9	4.8	4.3	2366
Total	91.9	4.3	3.8	5571
$X^2 = 13.87816$	d.f. = 2	p = 0.00769		
Marital status				
never married	90.3	1.7	8.0	402
mar.,liv. tog.	92.2	4.6	3.2	4745
wid., div., nlt.	90.6	3.8	5.7	424
Total	91.9	4.3	3.8	5571
$X^2 = 34.05605$	d.f. = 4	p = 0.00000		

Table 4.3, continued from page 64 and 65

Background variables	Doctors, nurse (formal source)	TTBA, TBA, OR (infor. source)	No One	# Cases
Province of residence				
Nairobi	97.2	0.0	2.8	178
Central	97.3	1.1	1.6	629
Coast	91.9	2.0	6.0	695
Eastern	96.2	1.3	2.5	836
Nyanza	94.7	1.7	3.6	836
Rift Valley	91.4	4.1	4.5	1401
Western	80.0	16.1	3.9	827
Total	91.9	4.3	3.8	5571
X^2 = 220.17543	d.f. = 12	p = 0.00000		

Source: Primary analysis of KDHS, 1993.
mar., liv. tog.; wid., div., nlt stand for married and living together, and widowed, divorced or not living together respectively.

4.31 Mother's Educational Level by Prenatal Care Providers

Mother's educational level is expected to be positively associated with receiving prenatal care from doctors or nurses. From Table 4.4, it is shown that mother's educational level is positively associated to receiving prenatal care from doctors or nurses but negatively related to receiving prenatal care from the informal source. The results in Table 4.4 confirm that mother's educational level is strongly associated with the source of prenatal care.

4.32 Father's Educational Level by Prenatal Care Providers

Father's educational level is expected to be positively associated with receiving prenatal care from doctors or nurses. From Table 4.4 we see that father's educational level is positively associated with receiving prenatal care from doctors or nurses but negatively associated to receiving no prenatal care. The results in Table 4.4 confirm that father's educational level is strongly associated with the source of prenatal care.

4.33 The Type of Place of Residence by Prenatal Care Providers

Urban residence is expected to be positively associated with receiving prenatal care from doctors or nurses. From Table 4.4 we find that urban mothers received prenatal care from doctors or nurses a greater percentage of their births than their rural counterparts. Rural mothers received prenatal care from the informal sources and from no one for a greater percentage of their births than their urban counterparts. The results from Table 4.4 confirm that the type of place of residence is closely associated with the source of prenatal care.

4.34 Work Status of the Mother by Prenatal Care Providers

Work status of the mother being working is expected to be positively associated with receiving prenatal care from doctors or nurses. From Table 4.4 it is seen that mothers who were working received prenatal care from doctors or nurses for a greater percentage of their births than their non-working counterparts. However, non working mothers received prenatal care from doctors or nurses and from no one for a greater percentage of their births than their respective working counterparts. The results reflected in Table 4.4 show that work status of the mother closely influenced the source of prenatal care.

4.35 Earning Cash for Work by Prenatal Care Providers

Earning cash for work is expected to be positively associated with receiving prenatal care from doctors or nurses. From Table 4.4, prenatal care providers differed for mother earning cash for work or not. Mothers who were not earning cash for work received prenatal care from doctors or nurses for a greater percentage of their births

than their counterparts. However, mothers who were earning cash for work received prenatal care from the doctors or nurses for a less percentage of their births than their not working counterparts. The results from table 4.4 confirm that earning cash for work or not closely influences the source of prenatal care.

4.36 Father's Occupation by Prenatal Care Providers

Father's occupation is expected to influence the reception of prenatal care from doctors or nurses. From Table 4.4 we can see that the prenatal care providers varied according to the father's occupation. For example, for births to never worked fathers the mothers received prenatal care from doctors or nurses for the least percentage (82.2). However, for births to fathers who held blue collar jobs, the mothers received prenatal care from the formal source for the highest percentage, (93.5). The percentage varied for other categories. For births to fathers who never worked, the mothers received prenatal care from no one for a greater percentage of their births than for corresponding counterparts. The results from Table 4.4 show that father's occupation closely influences the source of prenatal care.

4.37 Maternal Age by Prenatal Care Providers

Maternal age is expected to be negatively associated with receiving prenatal care from doctors or nurses. From Table 4.4, it is evident that mother's of age 20-34 years received prenatal care from doctors or nurses for a greater percentage of their births followed by teenage mothers and mothers who are at least 35 years of age respectively. Though the direction of the association is not so clear, it is evident from the table that maternal age is closely associated with the source of prenatal care.

4.38 Children Ever Born by Prenatal Care Providers

Children ever born is expected to be negatively associated with receiving prenatal care from doctors or nurses. From Table 4.4 we see that difference in percentage distribution of prenatal care providers varied for children ever born. For example, while mothers who had given birth to 2-4 children received prenatal care from doctors or nurses for 93.0 percent of their births, the corresponding percentage was 91.9 for those who had given birth to at least five children. Mothers who had given birth to at least five children received prenatal care from the informal source and from no one for a greater percentage of their births than their counterparts. Though the direction of association between children ever born and receiving prenatal care from TTBAs or TBAs is not clear as opposed to receiving from doctors or nurses, the results from Table 4.4 show that children ever born is closely associated with the source of prenatal care.

4.39 Marital Status by Prenatal Care Providers

Marital status is expected to influence receiving prenatal care from doctors or nurses. From Table 4.4 we find that births to mothers who were married or living together lead in percentage for receiving prenatal care from doctors or nurses. Births to mothers who are never married lead in percentages for receiving prenatal care from no one, followed by births to the widowed, divorced, and not living together respectively. The results from Table 4.4 confirm that marital status strongly influences the source of prenatal care.

4.40 Province of Residence by Prenatal Care Providers

Province of residence is expected to influence the reception of prenatal care from doctors or nurses. From Table 4.4 we see that the births for which the mother received prenatal care from the formal source vary from 97.3 percent for births to mothers in Central province to 80.0 percent for births to mothers in Western province. Mothers in Western province received prenatal care from doctors or nurses for 16.0 percent of their births. The results from Table 4.4 confirm that the province of residence is strongly associated with the source of prenatal care.

Table 4.5 shows the levels and differentials in delivery care providers used in relation to the following factors: mother's and father's educational level, type of place of residence, work status, earning cash for work, father's occupation, maternal age, children ever born, current marital status, whether prenatal care was received from doctors or nurses and province of residence.

Table 4.5: Percentage distribution of births that had occurred in the five years preceding the survey by source of delivery care as per selected variables: Kenya, KDHS 1993.

Background variables	Doctors	Nurses	TTBAs	TBAs	Relatives	Others	No one	# of Cases
Mother's educational level								
no education	1.9	21.2	8.5	14.6	34.9	0.2	18.8	1015
primary	5.6	35.5	8.4	11.5	28.6	0.4	10.0	3416
secondary+	7.8	62.0	6.1	4.7	14.2	0.6	4.5	1144
Total	5.4	38.3	7.9	10.7	26.8	0.4	10.5	5575
X^2 = 553.61653				d.f. = 12		p= 0.00000		
Father's educational level								
no education	3.1	22.6	7.0	16.6	34.2	0.7	15.7	541
primary	4.4	31.5	8.5	12.2	30.1	0.3	13.0	2754
secondary+	7.3	53.3	7.7	6.0	18.6	0.5	6.7	1170
Total	5.3	38.2	8.1	10.5	26.5	0.4	11.1	5065
X^2 = 377.43700				d.f. = 12		p = 0.00000		
Type of place of residence								
urban	9.6	64.9	4.0	2.5	15.8	0.2	3.2	602
rural	4.8	35.1	8.4	11.7	28.1	0.5	11.3	4973
Total	5.4	38.3	7.9	10.7	26.8	0.4	10.5	5575
X^2 = 267.854				d.f = 6		p = 0.00000		

Table 4.5, continued from page 71

Background variables	Doctors	Nurses	TTBAs	TBAs	Relatives	Others	No one	# Cases
Currently working								
no	4.5	34.2	9.1	12.4	31.0	0.5	8.4	3800
yes	6.0	41.5	7.1	9.3	23.6	0.4	12.1	3144
Total	5.4	38.3	8.0	10.7	26.8	0.4	10.5	5571
$X^2 = 11.86954$				d.f. = 6		p = 0.00000		
Earning cash for work								
no	5.0	40.7	5.8	11.9	22.3	0.3	14.0	637
yes	6.3	41.7	7.4	8.7	23.8	0.4	11.7	2485
Total	6.0	41.5	7.1	9.4	23.5	0.4	12.1	3122
$X^2 = 11.86954$				d.f. = 6		p = 0.64940		
Father's occupation								
never worked	4.1	31.5	6.8	4.1	42.5	0.0	1.0	73
white collar	7.4	49.5	7.9	6.7	18.6	0.3	9.4	1145
agriculture	3.8	29.8	8.3	14.1	30.9	0.4	12.6	1910
blue Collar	5.9	43.6	8.0	8.8	23.7	0.4	9.6	1310
Total	5.4	39.0	8.1	10.5	25.8	0.4	10.9	4438
$X^2 = 208.7703$				d.f. = 18		p = 0.00000		

Table 4.5, continued from page 71

Background variables	Doctors	Nurses	TTBAs	TBAs
Maternal age				
< 20	6.3	41.2	7.5	10.5
20-34	5.4	39.2	8.2	10.2
35+	3.3	28.0	7.4	11.8
Total	5.4	38.3	7.9	10.7
X^2 = 168.68321				d.f. =
Children ever born				
1	9.0	51.0	5.7	7.9
2-4	6.5	42.6	7.3	10.1
5+	3.1	30.3	9.2	12.1
Total	5.4	38.3	7.9	10.7
X^2 = 344.414				d.f. =
Marital status				
never married	6.0	42.7	6.7	13.9
mar. or liv.tog.	5.1	38.4	7.9	10.6
wid.,div., nlt.	7.8	33.5	10.1	9.0
Total	5.4	38.3	7.9	10.7
X^2 = 45.14962				d.f. =

	Relatives	Others	No one	# Cases
	29.5	0.4	4.5	1368
	26.0	0.5	10.5	3546
	25.3	0.0	24.2	661
	26.8	0.4	10.5	5575
= 12		p = 0.00000		
	24.5	0.2	1.7	645
	26.5	0.7	6.4	2501
	27.8	0.3	17.3	2369
	26.8	0.4	10.5	5575
= 2		p = 0.00000		
	27.0	0.7	3.0	403
	26.9	0.4	10.8	4748
	25.9	0.5	13.2	583
	26.8	0.4	10.5	5575
= 12		p = 0.00001		

Table 4.5, continued from page 71, 72 and 73

Background variables	Doctors	Nurses	TTBAs	TBAs	Relatives	Others	No one	# Cases
Prenatal care from doc/nurse								
no	2.0	16.1	16.6	9.1	38.7	2.0	15.5	453
yes	5.7	40.3	7.2	10.8	25.7	0.3	10.0	5122
Total	5.4	38.3	7.9	10.7	26.8	0.4	10.5	5575
X^2 = 187.42586				d.f.= 6		p = 0.0000		
Province of residence								
Nairobi	12.4	67.4	6.7	2.2	7.3	0.0	3.9	178
Central	12.1	61.5	1.0	2.9	14.3	1.0	7.3	629
Coast	4.3	29.9	5.9	12.1	39.9	0.6	7.3	695
Eastern	6.6	41.9	2.0	13.3	23.8	0.5	6.0	856
Nyanza	4.7	34.5	8.9	7.4	25.8	0.2	18.5	1007
Rift Valley	3.3	33.8	7.6	20.0	29.6	0.2	5.5	1403
Western	2.8	30.4	14.5	2.7	29.0	0.6	20.1	827
Total	5.4	38.3	7.9	10.7	26.8	0.4	10.5	5575
X^2 = 908.9112				d.f.= 12		p = 0.00000		

Source: Primary analysis of KDHS, 1993

mar., liv. tog., wid., div., nlt stand for married and living together, and widowed, divorced or not living together respectively.

4.41 Mother's Educational Level by Delivery Care Providers

Mother's educational level is expected to be positively associated with the reception of delivery assistance by doctors or nurses. From Table 4.5 we see that the mother's educational level is positively associated with receiving delivery care from doctors or nurses but negatively associated with receiving the same care from TTBAs, TBAs, relatives, others and no one. The results from Table 4.5 shows that mother's educational level is strongly associated with the source of delivery care.

4. 42 Father's Educational Level by Delivery Care Providers

Father's educational level is expected to be positively associated with the reception of delivery care from doctors or nurses. From Table 4.5 we find that the father's educational level is positively associated with receiving delivery care from doctors or nurses but negatively associated with receiving delivery care from TBAs, relatives and from no one. The results in Table 4.5 show that father's educational level is strongly associated with the source of delivery care.

4.43 The Type of Place of Residence by Delivery Care Providers

Urban residence is expected to be positively associated with the reception of delivery care from doctors or nurses. From Table 4.5 we see that urban mothers received delivery care from doctors or nurses for a greater percentage of their births than their rural counterparts. However, rural mothers received delivery care from TTBAs, TBAs, relatives, others and no one for a greater percentage of their births than their urban counterparts. Furthermore, the results in table 4.5 show that the type of place of residence is strongly associated with who provided delivery care.

4.44 Work Status of the Mother by Delivery Care Providers

The status of mother as working is expected to be positively associated with receiving delivery care from doctors or nurses. From Table 4.5 we find that mothers who were working received delivery care from doctors or nurses and from no one for a greater percentage of their births than their non-working counterparts. However, mothers who were non-working received delivery care from TTBAs, TBAs, relatives and others for a greater percentage of their births than their counterparts. Moreover, the results in Table 4.5 show that work status of the mother is strongly associated with who provided delivery care.

4.45 Earning Cash for Work by Delivery Care Providers

Earning cash for work is expected to be positively associated with reception of delivery care from doctors or nurses. From Table 4.5 we see that mothers who were earning cash for work received delivery care from doctors or nurses, TTBAs and relatives for a greater percentage of their births than their counterparts who were not earning cash for work. However, mothers who were not earning cash for work received delivery care from TBAs and from no one for a greater percentage of their births than their respective counterparts who were earning cash for work. The results in Table 4.5 show that earning cash for work is not associated the source of delivery care.

4.46 Father's Occupation by Delivery Care Providers

Father's occupation is expected to influence the reception of delivery care from doctors or nurses. From table 4.5 we find that for births to fathers who held white

collar jobs, the mothers received delivery care from doctors or nurses for a greater percentage of their births than their counterparts. For births to fathers who held jobs in agriculture, the mothers received delivery care from TTBAs and TBAs for a greater percentage of their births than counterparts who held jobs in other areas. For a greater percentage of births to fathers who never worked or held blue collar jobs, the mothers received delivery care from relatives and no one. The results from Table 4.5 show that father's occupation is closely associated with the source of delivery care.

4.47 Maternal Age by Delivery Care Providers

Maternal age is expected to be negatively associated with the reception of delivery care from doctors or nurses. From Table 4.5 we see that the maternal age was negatively associated with receiving delivery care from doctors or nurses or relatives. However, it was positively associated with receiving delivery care from no one. For other providers the pattern did not confirm gradual decrease or increase, yet difference was evident. The results from the table 4.5 show that maternal age is strongly associated with the source of delivery care.

4.48 Children Ever Born by Delivery Care Providers

Children ever born is expected to be negatively associated with the reception of delivery care from doctors or nurses. From Table 4.5 we find that children ever born is negatively associated to receiving delivery care from doctors or nurses and from relatives. But it is positively related to receiving delivery care from no one. The

results from Table 4.5 show that children ever born is strongly associated with the source of delivery care.

4.49 Marital Status by Delivery Care Providers

Marital status is expected to influence the reception of delivery care from doctors or nurses. From Table 4.5 we can see that mothers who are widowed, divorced or not living together with the father to the child received delivery care from doctors, nurses and relatives for a greater percentage of their births than their respective counterparts. However, mothers who were never married received delivery care from relatives and no one for a greater percentage of their births than their respective counterparts. The results in Table 4.5 show that marital status is closely associated with the source of delivery care.

4.50 Receiving Prenatal Care from Doctors or Nurses by Receiving Delivery Care from Doctors or Nurses

Receiving prenatal care from doctors or nurses is expected to influence the reception of delivery care from doctors or nurses. From Table 4.5 we find that mothers who received prenatal care from doctors and nurses delivered a greater percentage of their births with the assistance of doctors or nurses than their counterparts who did not receive prenatal care from these sources. However, mothers who did not receive prenatal care from doctors or nurses received delivery care from relatives, and no one for a greater percentage of their births than their respective counterparts who received prenatal care from doctors or nurses. The results from Table 4.5 show that reception of prenatal care from doctors or nurses strongly influences the reception of delivery care from doctors or nurses.

4.51 Province of residence by Delivery Care Providers

Province of residence is expected to influence the reception of delivery care from doctors and nurses. From Table 4.5 we see that mothers in Nairobi received delivery care from doctors and nurses for a greater percentage of their births than their counterparts in other provinces. Mothers in Western province received delivery care from TTBAs for a greater percentage of their births than mothers in other provinces. Mothers in Coast province received delivery care for a greater percentage of their births from relatives than mothers in other province did. Mothers in Western province, closely followed by mothers in Nyanza province received delivery care from no one for a greater percentage of their births than mothers in other provinces. The results in the table show that the province of residence strongly influences the source of prenatal care.

CHAPTER FIVE

RESULTS OF MULTIVARIATE ANALYSIS

5.0 Introduction

In this chapter the results obtained by performing multiple logistic analysis are discussed. Logistic regression models are carried out on the following dependent variables: receiving at least two TT injections or not, receiving adequate prenatal care or not, either delivering in hospitals or clinics or not, either receiving prenatal care from doctors or nurses or not and either receiving delivery care from doctors or nurses or not. The independent variables used are: both mother's and father's educational level, type of place of residence, work status, father's occupation, maternal age, children ever born, current marital status and province of residence.

Due to the fact that some births belonged to unmarried, divorced, widowed or separated mothers, it was found necessary to fit two different models: models for births to all women and models for births to married women. This was done in order to retain sufficiently large numbers of observations in the analysis. Earning cash for work was one of the independent variables considered to be operationalised; however, it was excluded from the multiple analysis. This was necessitated after observing that including the variable limited the analysis to cases of births for which the mother worked only.

Distribution of cases of births selected and included in the analysis are reported in Table 5.1 and Table 5.2.

5.1 Results

Table 5.1: Distribution of the number of births included in the analysis for all births to all mothers: Kenya, KDHS 1993.

Background variables	At least 2 TT injections	Adequate prenatal care	Hos/clinic Delivery	Prenatal Doc/Nur	Delivery Doc/nur
Mother's educational level					
no education	1033	1120	1006	1120	1015
primary	3424	3676	3385	3676	3412
secondary +	1145	1230	1130	1230	1144
Type of place of residence					
urban	604	668	596	668	602
rural	4998	5353	4925	5358	4969
Currently working					
no	2442	2604	2407	2604	2427
yes	3160	3422	3114	3422	3144
Maternal age					
< 20	1375	1478	1359	1478	1368
20-34	3556	3830	3509	3830	3542
35+	671	718	653	718	661
Children ever born					
one	647	657	643	657	645
2-4	2571	2759	2535	2759	2559
5+	2384	2610	2343	2610	2367
Marital status					
never married	403	426	403	426	403
mar. or liv.tog.	4770	5139	4696	5139	4744
wid., div., nlt.	429	461	422	461	424
prenatal from doc.or nurse					
no	—	—	—	—	453
yes	—	—	—	—	5118
Province					
Nairobi	180	204	175	204	178
Central	629	698	624	698	629
Coast	703	741	691	741	695
Eastern	840	886	825	886	834
Nyanza	1010	1088	996	1088	1005
R.Valley	1412	1503	1394	1503	1403
Western	828	906	816	906	827
# of case	5602	6026	5521	6026	5571

Source: Primary analysis of KDHS, 1993.

Table 5.2: Distribution of the number of births included in the analysis for births to married mothers: Kenya, 1993 KDHS.

Background variables	At least 2 TT injections	Adequate prenatal care	Hos/clinic Delivery	Prenatal Doc/nur	Delivery Doc/nur
Mother's educational level					
no education	740	804	720	804	729
primary	2288	2462	2260	2462	2280
secondary+	830	894	820	894	829
Father's educational level					
no education	404				
primary	2038	433	398	433	399
secondary+	1416	2203	2006	2203	2027
		1524	1396	1524	1412
Type of place of residence					
urban	414	458	406	458	412
rural	3444	3702	3394	3702	3426
Currently working					
no	1678	1802	1653	1802	1668
yes	2180	2358	2147	2358	2170
Father's occupation					
never worked	59	67	59	67	59
white collar	1005	1094	992	1094	1001
agriculture	1682	1803	1657	1803	1679
blue collar	1112	1196	1092	1196	1107
Maternal age					
< 20	774	834	760	834	769
20-34	2578	2782	2550	2782	2572
35+	506	544	490	544	497
Children ever born					
one	283	285	280	285	282
2-4	1770	1902	1747	1902	1764
5+	1805	1973	1773	1973	1792
Prenatal (doc/nur)					276
no	—	—	—	—	3562
yes	—	—	—	—	
Province					
Nairobi	130	145	125	145	128
Central	410	460	407	460	410
Coast	482	511	473	511	477
Eastern	611	652	606	652	612
Nyanza	611	658	602	658	608
R. Valley	1014	1084	1003	1084	1009
Western	595	650	584	650	594
# of cases	3858	4160	3800	4160	3838

Source: Primary analysis of KDHS, 1993.

5.1.0 Multivariate Analysis of Factors Determining Reproductive Health Care Use for all Cases of Births

5.1.1 TT Injections Before Birth

It was hypothesised that for all births: mother's educational level, the type of place of residence, work status, father's occupation, maternal age, children ever born, marital status and the province of residence each affect the reception of at least two TT injections before birth.

Factors affecting receiving at least two TT injections before birth are presented in Table 5.3. The table shows the determinants of receiving at least two TT injections before birth for all births were: province of residence, children ever born and work status.

Variations were evident for chance of receiving at least two TT injections before birth among mothers of different provinces of Kenya. For births to mothers in other provinces, the mothers were more likely to have received at least two TT injections before birth when each was compared with mothers in Central province in the order indicated in the table. However, for births in Coast (P=0.2432), Western (P=0.0963) and Nairobi (P=0.2624) provinces, mothers did not make significant difference in receiving at least two TT injections before birth when each was compared with their counterparts in Central province.

5.3: **Odds ratio and related statistics indicating the effect of factors determining the reception of at least two TT injections before birth, Kenya: KDHS, 1993.**

Explanatory variables	Log odds	LRX^2	d.f	P	Odds ratio
Province of residence		23.85	6	0.0000***	
Central	0.0000			0.0000***	1.0000
Coast	-0.1320			0.2423	0.8764
Western	-0.1805			0.0963	0.8348
Nairobi	-0.1932			0.2624	0.8243
R.Valley	-0.3134			0.0015***	0.7310
Nyanza	-0.3910			0.0002***	0.6764
Eastern	-0.4019			0.0002***	0.6690
Children ever born		16.20	2	0.0003***	
one	0.3660			0.0001***	1.4420
2-4	0.0889			0.1230	1.0930
5^+	0.0000			0.0000***	1.0000
Currently working		5.43	2	0.0000***	
yes	0.0000			0.0000***	1.0000
no	-0.1306			0.0198**	0.8776
Constant = 0.3972			**S.E. = 0.0926**		

Source: primary analysis of KDHS, 1993.
Note:5602 cases were included in the analysis.
** Significant at 0.01 *** significant at 0.001.

Children ever born was negatively associated with receiving at least two TT injections before birth. Thus, the lower the birth order was, the more likely the mother had received at least two TT injections before birth. However, having given birth to 2-4 children (P=0.1230) did not make a significant difference in receiving at least two TT injections before birth when compared with having given birth to at least five children.

Work status had a significant effect on receiving at least two TT injections before birth. Mothers who were not working were less likely to have received at least two TT injections before birth than their counterparts who were working.

5.1.2 Adequate Prenatal Care

It was hypothesised that for all births: mother's educational level, the type of place of residence, work status, maternal age, children ever born, marital status and the province of residence each affect the reception of adequate prenatal care.

Children ever born was negatively associated with receiving adequate prenatal care. The lower the birth order, the more likely the mother received adequate prenatal care. The difference in chance of receiving adequate prenatal care was more than quadruple between those who ever gave birth to one child and those who gave birth to more than five children.

Mother's educational level was positively associated with receiving adequate prenatal care. The higher the educational level was, the more likely the mother had received adequate prenatal care. However, mothers having primary level education ($p = 0.4945$) did not make significant difference in receiving adequate prenatal care for birth when compared to having secondary or higher level education.

Table 5.4: Odds ratio and related statistics indicating the effect of factors determining the reception of adequate prenatal care: Kenya, KDHS 1993.

Explanatory variables	Log odds	LRX^2	d.f.	P	Odds ratio
Children ever born		48.28	2	0.0000***	
one	1.3943			0.0000***	4.0320
2-4	0.5192			0.0000***	1.6807
5+	0.0000			0.0000***	1.0000
Mother's educational level		32.75	2	0.0000***	
secondary+	0.0000			0.0000***	1.0000
primary	-0.0836			0.4945	0.9198
no education	-0.6801			0.0000***	0.5066
Maternal age		27.70	2	0.0000***	
35+	0.8852			0.0000***	2.4235
20-34	0.5726			0.0000***	1.7729
< 20	0.0000			0.0000***	1.0000
Province of residence		23.349	6	0.0007***	
Eastern	0.5806			0.0010***	1.7871
R.Valley	0.2454			0.0993	1.2782
Coast	0.2368			0.1713	1.2672
Nyanza	0.2291			0.1470	1.2575
Western	0.0049			0.9755	1.0049
Central	0.0000			0.0000***	1.0000
Nairobi	-0.3917			0.9980	0.6759
Marital status		16.63	2	0.0001***	
mar., liv.tog.	0.7268			0.0000***	2.0685
wid.,div.,nlt	0.5274			0.0176**	1.6945
never married	0.0000			0.0000***	1.0000
Constant = 0.6498			**S.E. = 0.2698**		

source: primary analysis of KDHS, 1993.
Note: 6026 cases were included in the analysis.
** Significant at 0.01 *** Significant at 0.001
mar., liv.tog; wid., div.; and nlt stand for married and living together, and widowed, divorced and not living together respectively

Maternal age was positively associated with receiving adequate prenatal care. The higher the maternal age was, the more likely the mother had received adequate prenatal care. Mothers who had given birth to at least five children stood higher chance of receiving adequate prenatal care.

Factors affecting receiving adequate prenatal care are presented in Table 5.4. The table shows the determinants of receiving adequate prenatal care were: children ever born, mother's educational level, maternal age, province of residence and marital status.

Chances of the mother receiving adequate prenatal care for births varied for provinces of Kenya. Mothers in every province of Kenya except mothers in Nairobi were more likely to have received adequate prenatal care for births when compared with mothers in the Central province. However, mothers in the Rift Valley ($p=0.0993$) or Coast ($p=0.1713$) or Nyanza ($p=0.1470$) or Western (0.9755) or Nairobi ($p=0.0998$) province did not make significant differences in receiving adequate prenatal care for births when compared to mothers in the Central province.

Marital status was significantly associated with receiving adequate prenatal care for births. Both mothers who were either married or living together, and the divorced, the widowed and those not living together with the father of the child were more likely to have received adequate prenatal care than their never married counterparts.

5.1.3 Delivering at Hospitals or in Clinics

It was hypothesised that for all births: mother's educational level, the type of place of residence, work status, maternal age, children ever born, marital status and the province of residence each affect delivering birth at hospitals or in clinics.

Factors affecting mothers delivering at hospitals or in clinics are presented in Table 5.5. The table shows the determinants of delivering at hospitals or in clinics are: province of residence, mother's educational level, type of place of residence, children ever born, work status and marital status.

Being a resident of any province of Kenya made a significant difference in mothers delivering in hospitals or in clinics when compared to being residents of the Central province. However, the magnitude of the difference varied in terms of ratio. For example, mothers in Eastern province delivered more than three out of ten of their births at hospitals or in clinics when compared with mothers in Central province. Similarly, mothers in Western and Coast provinces delivered nearly a quarter and less than quarter of their births at hospitals or in clinics when compared to mothers in Central province.

Mother's educational level was positively associated with delivering birth at hospitals or in clinics. The higher the educational level was, the more likely the mother delivered the birth either at a hospital or in a clinic.

Table 5.5: Odds ratio and related statistics indicating the effect of factors determining delivering at hospitals or in clinics: Kenya, KDHS, 1993.

Explanatory variables	Log odds	LRX^2	d.f.	P	Odds ratio
Province of residence		352.78	6	0.0000***	
Central	0.0000			0.0000***	1.0000
Eastern	-0.0049			0.0001***	0.3698
Nairobi	-1.2242			0.0000***	0.2940
R.Valley	-1.4315			0.0000***	0.2390
Nyanza	-1.4777			0.0000***	0.2282
Western	-1.9159			0.0000***	0.1472
Coast	-1.2242			0.0000***	0.1361
Mother's educational level		263.577	2	0.0000***	
secondary+	0.0000			0.0000***	1.0000
primary	-1.0549			0.0000***	0.3482
no education	-1.6441			0.0000***	0.1932
Type of place of residence		83.67	1	0.0000***	
urban	0.0000			0.0000***	1.0000
rural	-1.3813			0.0000***	0.2513
Children ever born		43.22	2	0.0000***	
one	0.7473			0.0000***	2.1112
2-4	0.2071			0.0021**	1.2301
5+	0.0000			0.0000***	1.0000
Currently working		21.68	1	0.0000***	
yes	0.0000			0.0000***	1.0000
no	-0.2930			0.0000***	0.7460
Marital status		20.54	2	0.0000***	
mar.,liv.tog.	0.5386			0.0000***	1.7137
wid.,div.,nlt.	0.2972			0.0752	1.3461
never married	0.0000			0.0000***	1.0000
Constant = 2.7278			**S.E.= 0.2131**		

Source: primary analysis of KDHS 1993.
Note: 5521 cases were included in the analysis.
** Significant at 0.01 *** Significant at 0.001.

mar.,liv.tog; wid., div., nlt stand for married or living together, and widowed, divorced and living together respectively .

Type of place of residence had a significant effect on place of delivery. Rural mothers were less likely to have delivered either at hospitals or in clinics than their urban counterparts. The difference was so large that rural mothers delivered less than a quarter of their births at hospitals or in clinics.

Children ever born was negatively associated with delivering at hospitals or in clinics. Thus, the lower the birth order was, the more likely the birth was delivered at a hospital or in a clinic. Mothers who gave birth to only one child were more than twice as likely to have delivered at hospitals or clinics when compared to their counterparts who had given birth to at least five children.

Work status had a significant effect on delivering at hospitals or in clinics. Mothers who were not working were less likely to have delivered their births at hospitals or in clinics than their counterparts who were working.

Marital status had a significant effect on delivering births at hospitals or in clinics. Both, married or living together with the father of the child, the widowed, the divorced and those not living together with the fathers were more likely to have delivered their births at hospitals or in clinics than their never married counterparts. However, being widowed, divorced or not living together with the father ($p=0.0752$) did not make significant differences in delivering birth at hospitals or in clinics when compared with their counterparts who were never married.

5.1.4. Receiving Prenatal Care from Doctors or Nurses

It was hypothesised that for all births, mother's educational level, the type of place of residence, work status, father's occupation, maternal age, children ever born, marital status and the province of residence each affect the reception of prenatal care from doctors or nurses.

Factors affecting mothers receiving prenatal care from doctors or nurses are presented in Table 5.6. The table shows the determinants of receiving prenatal care from doctors or nurses are: province of residence, mother's educational level, children ever born, maternal age and marital status.

Province of residence had an effect on receiving prenatal care from doctors or nurses. For instance, mothers in Eastern, Nyanza and Coast provinces were more likely to have received prenatal care from doctors or nurses for births than their counterparts in Central province. However, mothers in the Rift Valley, Nairobi and Western provinces were less likely to have received prenatal care from doctors or nurses for births than their counterparts in the Central province. The table shows being a mother in Nyanza ($p=0.4713$), Coast ($p=0.6547$), Rift Valley ($p=0.6316$) or Nairobi ($p=0.1317$) did not make significant difference in receiving prenatal care from doctors or nurses for births when compared with being a mother in Central province.

Mother's educational level was positively associated with receiving prenatal care from doctors or nurses. The higher the educational level, the more likely the mother had received prenatal care from doctors or nurses.

Table 5.6: Odds ratio and related statistics indicating the effect of factors determining the reception of prenatal care from doctors or nurses: Kenya, KDHS 1993.

Explanatory variables	Log odds	LRX^2	d.f.	P	Odds ratio
Province of residence		124.54	6	0.0000***	
Eastern	0.4094			0.0287*	1.3758
Nyanza	0.1076			0.4713	1.0466
Coast	0.0724			0.6547	1.0405
Central	0.0000			0.0000***	1.0000
R.Valley	-0.0664			0.6316	0.8458
Nairobi	-0.3463			0.1317	0.5511
Western	-0.8827			0.0000***	0.3872
Mother's educational level		32.00	2	0.0000***	
secondary+	0.0000			0.0000***	1.0000
primary	-0.1318			0.2220	0.8765
no education	-0.6367			0.0000***	0.5291
Children ever born		31.187	2	0.0000***	
one	0.9667			0.0000***	2.6291
2-4	0.3448			0.0004***	1.4117
5+	0.0000			0.0000***	1.0000
Maternal age		19.23	2	0.0001***	
20-34	0.5301			0.0007***	1.6291
35+	0.4642			0.0000***	1.5908
< 20	0.0000			0.0000***	1.0000
Marital status		7.40	2	0.0213	
mar,liv.tog.	0.4144			0.0108**	1.5134
wid., div., nlt.	0.2392			0.2738	1.2702
never married	0.0000			0.0000***	1.0000
Constant = 1.0969			**S.E. = 0.2464**		

Source: primary analysis of KDHS, 1993.
Note: 6024 cases were included in the analysis.
* Significant at 0.05 ** Significant at 0.01 *** significant at 0.001
mar.,liv.tog, wid., div., nlt stand for married or living together, and widowed, divorced and living together respectively.

However, mothers having primary level education (p=0.2110) did not make a significant difference in delivering births at hospitals or in clinics when compared with mothers having secondary or higher level of education.

Children ever born was negatively associated with receiving prenatal care from doctors or nurses. The lower the birth order was, the more likely the mother received prenatal care from doctors or nurses.

Maternal age had an effect on delivering prenatal care from doctors or nurses. Mothers who were 20-34 or at least 35 received prenatal care from doctors or nurses for more of their births than their teenager counterparts.

Marital status had a significant effect on receiving prenatal care from doctors or nurses. Both the married or living together, and the widowed, the divorced and those not living together were more likely to have received prenatal care for their births than their counterparts who were never married. However, the table shows being widowed, divorced or mother not living with the father to the child ($p=0.2738$) did not make significant difference in receiving prenatal care from doctors or nurses when compared with birth to mothers who were never married.

5.1.5 Receiving Delivery Care from Doctors or Nurses

It was hypothesised that for all births: mother's educational level, the type of place of residence, work status, maternal age, children ever born, marital status, receiving prenatal care from doctors or nurses and the province of residence each affect the reception of delivery care from doctors or nurses.

Factors affecting mothers receiving delivery care from doctors or nurses are presented in Table 5.7. The table shows that the determinants of receiving delivery care from

doctors or nurses are: province of residence, mother's educational level, type of place of residence, receiving prenatal care from formal sources or not, children ever born, marital status and work status.

Being a resident of any province of Kenya made significant difference in receiving delivery care from doctors or nurses for births when compared to being a resident of the Central province. However, chances of receiving delivery care from doctors or nurses differed in terms of magnitude. For example, mothers in Nairobi and the Rift Valley received delivery care from doctors or nurses for far more than a quarter and more than a quarter of their births respectively when compared with mothers in Central Province.

The mother's educational level was positively associated with receiving delivery care from doctors or nurses. The higher the educational level, the more likely the mother had received delivery care from doctors or nurses. Secondary or higher educational level made a large difference in receiving delivery care from doctors or nurses. Mothers who had secondary or higher level education were almost twice as likely to have delivered with the assistance of doctors or nurses as compared to mothers who had no eduction at all.

Table 5.7: Odds ratio and related statistics indicating the effect of factors determining the reception of delivery care from doctors or nurses: Kenya, KDHS 1993.

Explanatory variables	Log odds	LRX^2	d.f.	p	Odds ratio
Province of residence		276.43	6	0.0000***	
Central	0.0000			0.0000***	1.0000
Eastern	-0.9351			0.0000***	0.3926
Nairobi	-1.2352			0.0000***	0.2908
R.Valley	-1.3462			0.0000***	0.2602
Nyanza	-1.3700			0.0000***	0.2541
Western	-1.6328			0.0000***	0.1954
Coast	-1.8310			0.0000***	0.1603
Mother's educational level		239.75	2	0.0000***	
secondary+	0.0000			0.0000***	1.0000
primary	-1.0115			0.0000***	0.3637
no education	-1.5634			0.0000***	0.2094
Type of place of residence		133.72	1	0.0000***	
urban	0.0000			0.0000***	1.0000
rural	-1.4533			0.0000***	0.2338
Prenatal from doc. or nurse		66.71	1	0.0000***	
yes	0.0000			0.0000***	1.0000
no	-0.0206			0.0000***	0.3604
Children ever born		55.72	2	0.0000***	
one	0.8418			0.0000***	2.3206
2-4	0.2676			0.0001***	1.3069
5+	0.0000			0.0000***	1.0000
Marital status		19.55	2	0.0001***	
mar.or liv.tog.	0.5528			0.0000***	1.7381
wid.,div.,nlt.	0.3775			0.0240*	1.4587
never married	0.0000			0.0000***	1.0000
Currently working		18.19	1	0.0000***	
yes	0.0000			0.0000***	1.0000
no	-0.2676			0.0000***	0.7645
Constant = 2.6419			**S.E. = 0.2135**		

Source: primary analysis of KDHS, 1993
* Significant at 0.05 ** Significant at 0.01 *** Significant at 0.001
Note: 5571 cases were included in the analysis.

Type of place of residence had a significant effect on receiving delivery care from doctors or nurses. Rural mothers were by far less likely to have received delivery care from doctors or nurses for their births than their urban counterparts. The

difference was high in that rural mothers received delivery care for less than a quarter of their births as compared to their Urban counterparts.

Receiving prenatal care from doctors or nurses had a significant effect on receiving delivery care from doctors or nurses. Mothers who did not receive prenatal care from doctors or nurses were by far less likely to have received delivery care from doctors or nurses.

Children ever born was negatively associated with receiving delivery care from doctors or nurses. The fewer the children ever born, the more likely the mother received delivery care from doctors or nurses. Having given birth only to one child made a large difference in receiving delivery care from doctors or nurses.

Marital status had a significant effect on receiving delivery care from doctors or nurses. Mothers who were married or living together with the father of the child, and the widowed, the divorced and those not living together with the father of the child were more likely to have received delivery care from doctors or nurse for birth than their never married counterparts.

Work status had significant effect on receiving delivery care from doctors or nurses. Mothers who were not working received delivery care from doctors or nurses for births for far less than their counterparts who were working.

5.2 Multivariate Analysis of Factors Determining Reproductive Health Care Use for Births to Currently Married Mothers

5.2.1 TT Injections for Births to Married Mothers

It was hypothesised that for births to married mothers: mother's educational level, father's educational level, type of place of residence, work status, father's occupation, maternal age, children ever born and the province of residence each affect the reception of at least two TT injections before birth.

Factors affecting married mothers receiving at least two TT injections before birth are presented in Table 5.8. The table shows that the determinants of receiving at least two TT injections before birth for married mothers are: province of residence, children ever born and the father's educational level.

The chance of receiving at least two TT injections before birth varied for married mothers of the Provinces of Kenya. Married mothers in other provinces of Kenya were more likely to have received at least two TT injections before birth when compared to mothers in Central province in the order listed in the table. However, being a married mother in Nairobi ($p=0.1021$) did not make significant difference in receiving at least two TT injections before birth when compared to being a married mother in Central province.

Table 5.8: Odds ratio and related statistics indicating the effect of factors determining the reception of at least two TT injections before birth for births to married mothers: Kenya, KDHS 1993.

Explanatory Variables	Log odds	LRX^2	d.f	P	Odds ratio
Province of residence		13.97	6	0.0310*	
Central	0.0000			0.0000***	1.0000
Western	-0.1743			0.0000***	0.8401
Coast	-0.1877			0.0000***	0.8289
R.Valley	-0.2972			0.0138**	0.7429
Nairobi	-0.3359			0.1021	0.7147
Eastern	-0.3761			0.0038**	0.6865
Nyanza	-0.4029			0.0020**	0.6684
Children ever born		10.74	2	0.0053**	
one	0.4157			0.0021**	1.5154
5+	0.0000			0.0000***	1.0000
2-4	-0.0055			0.9374	0.9945
Father's educational level		7.05	2	0.0296*	
secondary+	0.0000			0.0000***	1.0000
primary	-0.1766			0.0551*	0.8382
no education	-0.2274			0.0144**	0.7966
Constant = 0.4970			**S.E. = 0.1211**		

source: primary analysis of KDHS, 1993.
Note: 3858 cases were included in the analysis.
* Significant at 0.05 ** Significant at 0.01 *** Significant at 0.001

Children ever born to married mothers had a significant effect on receiving at least two TT injections before birth. Married mothers who gave birth to only one child were more likely to have received at least two TT injections before birth when compared to those who gave birth to at least five children. However, having given birth to 2-4 children (p=0.9374) did not make significant difference in receiving at least two TT injections before birth when compared to having given birth to at least five children.

The father s educational level was positively associated with the partner receiving at least two TT injections before birth. The higher the educational level of the father was, the more likely the married mother had received at least two TT injections before birth.

5.2.2 Adequate Prenatal Care

It was hypothesised that for births to married mothers: Mother's educational level, father's educational level, type of place of residence, work status, father's occupation, maternal age, children ever born and the province of residence each affect the reception of adequate prenatal care.

Factors affecting married mother receiving adequate prenatal care are presented in Table 5.9. The table shows the determinants of receiving adequate prenatal care for births to married mothers are: children ever born, province of residence, maternal age, father's occupation, mother's educational level and father's educational level.

Children ever born was negatively associated with receiving adequate prenatal care. The lower the birth order was, the more likely the married mother received adequate prenatal care. Chances of receiving adequate prenatal care for birth was much higher for mothers who gave birth to only one child.

Being a resident of any province of Kenya made a significant difference in receiving prenatal care from doctors or nurses for births to married mothers when compared with being a resident of the Central province. However, chances of receiving

adequate prenatal care for births varied in terms of ratios. For instance, married women of every province of Kenya except Nairobi were more likely to have received adequate prenatal care for births than married mothers in the Central province in the order indicated in Table 5.9.

Table 5.9: **Odds ratio and related statistics indicating the effect of factors determining the reception of adequate prenatal care for births to married mothers: Kenya, KDHS 1993.**

Explanatory variables	Log odds	LRX^2	d.f.	P	Odds ratio
Children ever born		27.32	2	0.0000***	
one	1.4715			0.0000***	4.3557
2-4	0.4549			0.0009***	1.5760
5+	0.0000			0.0000***	1.0000
Province of residence		18.31	6	0.0049**	
Eastern	0.7446			0.0004**	2.1055
R.Valley	0.5019			0.0057**	1.6518
Coast	0.4206			0.0472*	1.5228
Nyanza	0.4133			0.0361*	1.5118
Western	0.2622			0.0000***	1.2998
Central	0.0000			0.0000***	1.0000
Nairobi	-0.1975			0.0000***	0.8208
Maternal age		14.17	2	0.0008***	
35+	0.7900			0.0004***	2.2053
20-34	0.5277			0.0008***	1.6950
< 20	0.0000			0.0000***	1.0000
Father's occupation		11.46	3	0.0057**	
blue collar	0.0000			0.0000***	1.0000
agriculture	-0.1653			0.2242	0.8477
white collar	-0.2841			0.0573*	0.7527
never worked	-1.0432			0.0009***	0.3523
Mother's educational level		9.17	2	0.0091**	
primary	0.0093			0.9556	1.0093
secondary+	0.0000			0.0000***	1.0000
no education	-0.4091			0.0443*	0.6643
Father's educational level		8.34	2	0.0147*	
secondary+	0.0000			0.0000***	1.0000
primary	-0.2589			0.0037**	0.7719
no education	-0.5754			0.0645	0.5625
Constant = 1.5493				**S.E. = 0.2964**	

Source: primary analysis of KDHS, 1993.
Note: 4160 cases were included in the analysis.
* Significant 0.05 ** Significant at 0.01 *** Significant at 0.001.

Maternal age was positively associated with receiving adequate prenatal care. The higher the maternal age was, the more likely the married mother received adequate prenatal care for birth. Chances of receiving adequate prenatal care for birth is exceedingly high for mother's of age 35 years or older.

The father's occupation had a significant effect on mother receiving adequate prenatal care. For fathers who held jobs in agriculture, had a white collar job or never worked, the married mothers were less likely to have received adequate prenatal care as compared to births among women whose husband held blue collar jobs. However, holding jobs in agriculture ($p=0.2242$) did not make significant difference in receiving adequate prenatal care when compared to holding blue collar jobs.

The educational level of married mothers had a significant effect on receiving adequate prenatal care for births. Married mothers having primary level education were more likely than those having no education to have received adequate prenatal care when compared to those having secondary or higher level education. However, having a primary level education ($p=0.9556$) did not make significant difference in receiving adequate prenatal care when compared to those secondary or higher level education.

The father's educational level was positively associated with receiving adequate prenatal care. The higher the educational level of the father was, the more likely the married mother received adequate prenatal care for births. The table shows being a married mother having primary level education ($p=0.0645$) did not make significant

difference in receiving adequate prenatal care for a birth when compared with being married mother having secondary or a higher level education.

5.2.3 Delivering in Hospitals or Clinics for Births to Married Mothers

It was hypothesised that for births to married mothers, mother's educational level, father's educational level, type of place of residence, work status, father's occupation, maternal age, children ever born and the province of residence each affect delivering birth at hospitals or in clinics.

Factors affecting married mothers delivering in hospitals or clinics are presented in Table 5.10. The table shows that the determinants of delivering in hospitals or clinics for married mothers are: province of residence, mother's educational level, type of place of residence, father's occupation, work status, father's educational level and children ever born.

Married mothers residing in any province of Kenya had a significant difference in delivering births at hospitals or in clinics when compared with being a married mother in the Central province. For example, married mothers in the Western and the Coast provinces delivered far less than a quarter of their births at hospitals or in clinics when compared with married mothers in the Central province.

Table 5.10: Odds ratio and related statistics indicating the effect of factors determining delivery in hospitals or clinics for births to married mothers: Kenya, KDHS 1993.

Explanatory variables	Log odds	LRX^2	d.f.	P	Odds ratio
Province of residence		259.43	6	0.0000***	
Central	0.0000			0.0000***	1.0000
Eastern	-0.8879			0.0000***	0.4115
Nairobi	-1.1074			0.0000***	0.3304
R.Valley	-1.3694			0.0000***	0.2543
Nyanza	-1.5226			0.0000***	0.2181
Western	-2.0161			0.0000***	0.1332
Coast	-2.0339			0.0000***	0.1308
Mother's educational level		100.41	2	0.0000***	
secondary+	0.0000			0.0000***	1.0000
primary	-0.8689			0.0000***	0.4194
no education	-1.4027			0.0000***	0.2459
Type of place of residence		64.13	1	0.0000***	
urban	0.0000			0.0000***	1.0000
rural	-1.2971			0.0000***	0.2733
Father's occupation		29.00	3	0.0000***	
white collar	0.0563			0.9829	1.0579
never worked	0.0066			0.5768	1.0066
blue collar	0.0000			0.0000***	1.0000
Agriculture	-0.4024			0.0000***	0.6687
Currently working		24.09	1	0.0000***	
yes	0.0000			0.0000***	1.0000
no	-0.3769			0.0000***	0.6860
Father's educational level		19.96	3	0.0000***	
secondary+	0.0000			0.0000***	1.0000
primary	-0.3902			0.0000***	0.6769
no education	-0.4004			0.0096**	0.6700
Children ever born		12.86	2	0.0012***	
one	0.5615			0.0003***	1.7533
2-4	0.0488			0.5421	1.0500
5+	0.0000			0.0000***	1.0000
Constant = 3.6350			**S.E. = 0.2348**		

Source: Primary analysis of KDHS, 1993.
Note: 3800 cases were included in the analysis.
** Significant at 0.01 *** Significant at 0.001.

The educational level of married mothers was positively associated with delivering in hospitals or clinics. The higher the mother's educational level was, the more likely the married mother had delivered at a hospital or in a clinic. Secondary or higher level education increased the chance of delivering birth at hospitals or in clinics with large difference.

Type of place of residence had effect on delivering at hospitals or in clinics. Married rural mothers were far less likely to have delivered births at hospitals or clinics than their urban counterparts. The difference was so high that married rural mothers delivered slightly more than a quarter of their births at hospitals or in clinics as compared to urban married mothers.

The father's occupation had effect on delivering births at hospitals or in clinics. Births to mothers whose husbands held white collar jobs or who never worked were more likely to have been delivered at hospitals or in clinics when compared to births to mothers whose husbands held blue collar jobs. Births to mothers whose husbands held jobs in agriculture were less likely to have been delivered at hospitals or in clinics when compared to births to mothers whose husbands held blue collar jobs. However, the fathers having white collar jobs ($p=0.9829$) or having never worked ($p=0.5768$) did not make significant difference in the births having been delivered at hospitals or in clinics or not.

Work status had significant effect on delivering births at hospitals or in clinics. Married mothers who worked were more likely to have delivered in hospitals or clinics than their counterparts who were not.

The father's educational level was positively associated with the married mothers delivering at hospitals or in clinics. The higher the father's educational level was, the more likely the married mother delivered birth at a hospital or in a clinic. However, married mothers whose partner had primary level education or no education at all stood nearly equal (0.6769 and 0.6700 respectively) of delivering births at hospitals in clinics in respect to married mothers whose partner had secondary or higher level education.

The children ever born was negatively associated with married mothers delivering at hospitals or in clinics. The lower the birth order was, the more likely the married mother delivered birth at a hospital or in a clinic. However, giving birth to 2-4 children ($p=0.5421$) did not make a significant difference in married mothers delivering birth at hospitals or in clinics.

5.2.4. Receiving Prenatal Care from Doctors or Nurses

It was hypothesised that for births to married mothers: mother's educational level, father's educational level, type of place of residence, work status, father's occupation, maternal age, children ever born and the province of residence each affect the reception of prenatal care from doctors or nurses.

Factors affecting married mothers receiving prenatal care from doctors or nurses are presented in Table 5.11. The table shows that the determinants of receiving prenatal care from doctors or nurses are: province of residence, children ever born, mother's educational level and maternal age.

Table 5.11: Odds ratio and related statistics indicating the effect of factors determining the reception of prenatal care from doctors or nurses for births to married mothers: Kenya, KDHS 1993.

Explanatory variables	Log odds	LRX^2	d.f.	P	Odds ratio
Province of residence		91.03	6	0.0000***	
Eastern	0.5612			0.0041**	1.7528
R.Valley	0.2470			0.1819	1.2802
Nyanza	0.2088			0.0000***	1.2322
Coast	0.1954			0.0000***	1.2156
Central	0.0000			0.0000***	1.0000
Nairobi	-0.1212			0.0000***	0.8858
Western	-0.7516			0.0000***	0.4716
Children ever born		21.52	2	0.0001***	
one	1.0909			0.0013***	2.9769
2-4	0.3349			0.0043**	1.3978
5+	0.0000			0.0000***	1.0000
Mother's educational level		20.70	2	0.0000***	
secondary+	0.0000			0.0000***	1.0000
primary	-0.1905			0.1383	0.8265
no education	-0.6507			0.0000***	0.5217
Maternal age		13.73	2	0.0009***	
20-34	0.5045			0.0002***	1.6561
35+	-0.4931			0.0009***	1.6374
< 20	0.0000			0.0000***	1.0000
Constant = 1.4071			**S.E. = 0.2473**		

Source: primary Analysis of KDHS, 1993
Note: 4160 cases were included in the analysis.
** Significant at 0.01 *** Significant at 0.001.

The chance of receiving prenatal care before birth varied for married mothers of the provinces of Kenya. Married mothers in Eastern, Nyanza, Rift Valley and Coast provinces were more likely to have received prenatal care from doctors or nurses when compared with their counterparts in the Central province. Married mothers in Nairobi and Western provinces were less likely to have received prenatal care from doctors or nurses when compared with their counterparts in the Central province. The table shows being a married mother in the Nyanza province ($p=0.1819$) did not make significant difference in receiving prenatal care from doctors or nurses for births when compared to being a married mother in the Central Province.

The children ever born was negatively associated with receiving prenatal care from doctors or nurses. The higher the children ever born was, the more likely the married mother received prenatal care for births from doctors or nurses.

The educational level was positively associated with married mothers receiving prenatal care from doctors or nurses for birth. The higher the educational level was, the more likely the married mother received prenatal care from doctors or nurses.

Maternal age had significant effect on married mothers receiving prenatal care from doctors or nurses. Married mothers aged 20-34 years or at least 35 years were more likely to have received prenatal care from doctors or nurses when compared to their teenager counterparts.

5.2.5 Delivery Care from Doctors or Nurses

It was hypothesised that for births to married mothers: mother's educational level, father's educational level, type of place of residence, work status, father's occupation, maternal age, children ever born, receiving prenatal care from doctors or nurses and the province of residence each affect the reception of delivery care from doctors or nurses.

The factors affecting married mothers receiving delivery care from doctors or nurses are presented in table 5.12. The table shows that the determinants of receiving delivery care from doctors or nurses are: province of residence, mother's educational level, type of place of residence, having received prenatal care from the formal source or not, father's occupation, work status, father's occupation, work status, educational level and children ever born.

Being a resident of any province of Kenya made a significant difference in receiving delivery care from doctors or nurses when compared to being a married mother in Central province. The magnitude of the difference varied in terms of ratio. For example, married mothers in Nyanza received delivery care from doctors or nurses for less than quarter of their births when compared to married mothers in Central province.

Table 5.12: Odds ratio and related statistics indicating the effect of factors determining the reception of delivery care from doctors or nurses for births to married mothers: Kenya, KDHS 1993.

Explanatory variables	Log odds	LRX^2	d.f.	P	Odds ratio
Province of residence		190.73	6	0.0000***	
Central	0.0000			0.0000***	1.0000
Eastern	-0.8264			0.0000***	0.4384
Nairobi	-1.0603			0.0012***	0.3464
R.Valley	-1.2458			0.0000***	0.2877
Nyanza	-1.4510			0.0000***	0.2343
Western	-1.6614			0.0000***	0.1899
Coast	-1.8091			0.0000***	0.1638
Mother's education level		92.79	2	0.0000***	
secondary+	0.0000			0.0000***	1.0000
primary	-0.8395			0.0000***	0.4319
no education	-1.3392			0.0000***	0.2621
Type of Place of residence		66.15	1	0.0000***	
urban	0.0000			0.0000***	1.0000
rural	-1.3226			0.0000***	0.2665
prenatal from doc. or nurse		46.33	1	0.0000***	
yes	0.0000			0.0000***	1.0000
no	-1.1008			0.0000***	0.3326
Father's occupation		30.01	3	0.0000***	
never worked	0.1436			0.6396	1.1545*
white collar	0.0757			0.4526	1.0786
blue collar	0.0000			0.0000***	1.0000
agriculture	-0.3926			0.0000***	0.6753
Currently working		22.88	1	0.0000***	
yes	0.0000			0.0000***	1.0000
no	-0.3673			0.0000***	0.6926
Father's educational level		20.86	2	0.0000***	
secondary+	0.0000			0.0000***	1.0000
no eduction	-0.3579			0.0175**	0.6991
primary	-0.4102			0.0000***	0.6635
Children ever born		18.69	2	0.0001***	
one	0.6656			0.0000***	1.9456
2-4	0.0923			0.2481	1.0967
5+	0.0000			0.0000***	1.0000
Constant = 3.5119				**S.E. = 0.2336**	

Source: Primary analysis of KDHS, 1993.
Note: 3838 cases were included in the analysis.
** Significant at 0.01 *** Significant at 0.001.

Educational level of the married mother was positively associated with receiving delivery care from doctors or nurses. The higher the educational level of the married mother was, the more likely the married mother received delivery care from doctors or nurses.

The type of place of residence had a significant effect on married mothers receiving delivery care from doctors or nurses. Married rural mothers were less likely to have received delivery care from doctors or nurses when compared to their rural counterparts. For slightly more than a quarter of their births, rural mothers received delivery care from doctors or nurses when compared to their urban counterparts.

Married mothers receiving prenatal care from doctors or nurses had effect on the mothers receiving delivery care from the same source for births. Married mothers who did not receive prenatal care from doctors or nurses for births were less likely to have received delivery care from doctors or nurses when compared with their counterparts.

The father's occupation had effect on married mothers receiving delivery care from doctors or nurses for births. For example, for births to fathers who never worked or had white collar jobs, the mothers received delivery care for more of their births than they did for births to fathers who held blue collar jobs.

Work status of married mothers had significant effect on receiving delivery care from doctors or nurses. Married mothers who were not working were less likely to have

received delivery care from doctors or nurses than their counterparts who were working.

The father's educational level had effect on receiving delivery care from doctors or nurses for births. For births to father's who had only a primary level education, the mothers were less likely to have received delivery care from doctors or nurses when compared to corresponding educational level of the fathers.

The children ever born was negatively associated with married mothers receiving delivery care from doctors or nurses. The lower the birth order was, the more likely the married mother received delivery care from doctors or nurses. However, the table shows, having given birth to 2-4 children ($p=0.0923$) did not make a significance difference in receiving delivery care from doctors or nurses when compared with having given birth to more than five children.

CHAPTER SIX

SUMMARY OF FINDINGS AND RECOMMENDATIONS

6.0 Introduction

In this chapter, summary of research objectives, research hypotheses, data source and methods of data analysis are reviewed. On the basis of major findings, conclusions are stated and recommendations are given.

The research aimed at achieving the following objectives:

a) to investigate the levels of association between reproductive health care use and selected socio-economic and demographic factors;

b) to identify factors affecting the use of reproductive health care services among selected socio-economic and demographic backgrounds for Kenyan mothers of reproductive age.

A number of hypotheses were stated. To test the hypotheses, data from KDHS 1993 was used. To limit the analysis to births that had occurred in the five years preceding the survey, a data sub-set called "child file" was created. Cross tabulation and multivariate logistic regression were used.

6.1 Conclusions

It was assumed that mother's educational level, father's educational level, urban residence, the status of the mother as currently working and earning cash for work

are each expected to be positively associated but maternal age and children ever born are each expected to be negatively associated with the number of TT injections received before birth. Father's occupation, marital status and province of residence are each expected to influence the number of TT injections received before birth. Based on the findings the study concludes both mother's and father's educational level, father's occupation strongly influence the number of TT injections received before birth; and the type of place of residence, work status, earning cash for work, maternal age, children ever born, marital status and province of residence closely influence the number of TT injections received before birth. The findings are consistent with those of Ragupathy, 1996a; Azlemat, 1996; Pebley et al., 1996 and Toan et al., 1996.

It was assumed that mother's educational level, father's educational level, urban residence, the status of the mother as currently working and earning cash for work are each expected to be positively associated but maternal age and children ever born are each expected to be negatively associated with the reception of adequate prenatal care. Father's occupation, marital status and province of residence are each expected to influence the reception of adequate prenatal care. Based on the findings it is concluded that both mother's and father's educational level and children ever born strongly influence the type of prenatl care received; and father's occupation, maternal age and province of residence closely influence the type of prenatal care received. The study by Soltani et al., 1993; Ragupathy, 1996a; Weeks, 1993; Pebley et al., 1996; Rodrigues et al., 1994 reported similar findings.

It was assumed that mother's educational level, father's educational level, urban residence, the status of the mother as currently working and earning cash for work are each expected to be positively associated but maternal age and children ever born are each expected to be negatively associated with the delivering birth at hospitals or in clinics. Father's occupation, marital status and province of residence are each expected to influence delivering birth at hospitals or in clinics. Based on the findings the study concludes that mother's and father's educational level, type of place of residence, work status, and province of residence strongly influence the place of delivery; and earning cash for work and marital status closely influence the place of delivery. Similar findings were reported by Plan International, 1996; Ragupathy, 1996a; Azlemat, 1996; Pebley et al., 1996 and Toan et al., 1996.

It was assumed mother's educational level, father's educational level, urban residence, the status of the mother as currently working and earning cash for work are each expected to be positively associated but maternal age and children ever born are each expected to be negatively associated with receiving prenatal care from doctors or nurses. Father's occupation, marital status and province of residence are each expected to influence the reception of prenatal care from doctors or nurses.

Based on the findings, it is concluded both mother's and father's educational level, father's occupation, marital status, and province of residence strongly influenced the source of prenatal care; and the type of place of residence, work status, earning cash for work, maternal age and children ever born closely influenced the source of prenatal care. The findings are consistent with those of Rahman et al., 1997;

Rodgigues et al., 1994; Ragupathy, 1996a; Azlemat, 1996 and Westley and Kanter, 1996.

It was assumed that mother's educational level, father's educational level, urban residence, the status of the mother as currently working and earning cash for work are each expected to be positively associated but maternal age and children ever born are each expected to be negatively associated with the reception of delivery care from doctors or nurses. Father's occupation, marital status and province of residence are each expected to influence the reception of delivery care from doctors or nurses. Based on the findings, the study concludes both mother's and father's educational level, type of place of residence, work status, father's occupation, maternal age, children ever born, receiving prenatal care from doctors or nurses and province of residence strongly influenced the source of delivery care; and marital status closely influenced the source of delivery care. Studies by Rahman et al., 1997; Azlemat, 1996; Voorhove et al., 1984; Ragupathy, 1996a; Gupta, 1986; Westley and Kanter, 1996; Bahatia and Cleland, 1995; Toan et al., 1996 and Plan International, 1996 reported similar findings.

It was assumed that mother's educational level, father's educational level, the type of place of residence, work status, father's occupation, maternal age, children ever born, marital status and the province of residence each affect the reception of at least two TT injections before birth. Based on the findings, the study concludes that the factors determining receiving at least two TT injections before birth were province of residence, children ever born and work status for births to all mothers; and province

of residence, children ever born and father's educational level for births to married mothers. The findings are in agreement with findings by Azlemat, 1996; Ragupathy, 1996a; Obermeyer, 1993 and Pebley et al., 1996.

It was assumed that mother's educational level, father's educational level, the type of place of residence, work status, father's occupation, maternal age, children ever born, marital status and the province of residence each affect the reception of adequate prenatal care. Based on the findings the study concludes that the factors determining receiving adequate prenatal care for births to all mothers were children ever born, mother's educational level, maternal age, province of residence and marital status. For births to married mothers the determining factors were: children ever born, province of residence, maternal age, father's occupation, mother's educational level and father's educational level. The findings confirm other findings by Rahman et al., 1997; Rodrigues et al., 1994; Obermeyer, 1993; Azlemat, 1996; Abd El Fattah and Osman, 1995; Nagutara et al., 1989; Potter, 1998; Bahatia and Cleland, 1995 and McCow et al., 1995.

It was assumed that mother's educational level, father's educational level, the type of place of residence, work status, father's occupation, maternal age, children ever born, marital status and the province of residence each affect delivering birth at hospitals or in clinics. Based on the findings the study concludes that factors determining delivery at hospitals or in clinics for births to all mothers were province of residence, mother's educational level, type of place of residence, children ever born, work status, marital status. For births to married mothers the determining factors were:

province of residence, father's occupation, work status, father's educational level and children ever born. The findings are consistent with other findings by Rahman et al., 1997; Rodrigues et al., 1994; Weeks, 1993; Obermeyer, 1993; Ragupathy, 1996; Ibid, 1996b, Bahatia and Cleland, 1995 and Pebley et al., 1996.

It was assumed that mother's educational level, father's educational level, the type of place of residence, work status, father's occupation, maternal age, children ever born, marital status and the province of residence each affect the reception of prenatal care from doctors or nurses. Based on the findings the study concludes that factors determining receiving prenatal care from doctors or nurses for births to all mothers were: province of residence, mother's educational level, children ever born, maternal age and marital status. For births to married mothers the determining factors were: province of residence, children ever born, mother's educational level and maternal age for births.

It was assumed that mother's educational level, father's educational level, the type of place of residence, work status, father's occupation, maternal age, children ever born, marital status, receiving prenatal care from doctors or nurses and the province of residence each affect the reception of delivery care from doctors or nurses. Based on the findings the study concludes that factors determining receiving delivery care from doctors or nurses for births to all mothers were: province of residence, mother's educational level, type of place of residence, receiving prenatal care from doctors or nurses, children ever born, marital status and work status. For births to married mothers, the determining factors were: province of residence, mother's educational

level, type of place of residence, receiving prenatal care from doctors or nurses, father's occupation, work status, father's educational level and children ever born.

6.2 Recommendations

Based on the conclusions, the following recommendations are given such that they would be used for programme planning and to initiate further research.

1. Programmes should target minimizing differences in the number of TT injections received before birth, which emanate from father's and mother's educational level, type of place of residence, father's occupation, maternal age, children ever born, marital status and province of residence.

2. Programmes should target minimizing the variation in the type of prenatal care received before birth which, emanate from both mother's and father's educational level, children ever born, father's occupation, maternal age and province of residence.

3. Programmes should target minimizing variations in place of delivery, which emanate from both mother's and father's educational level, type of place of residence, work status, earning cash for work, father's occupation, maternal age, children ever born, marital status and province of residence.

4. Programmes should target minimizing variations in the choice of prenatal care providers, which emanate from both mother's and father's educational level,

type of place of residence, work status, earning cash for work, father's occupation, maternal age, children ever born, marital status and province of residence.

5. Programmes should target minimizing variations in choice of delivery care providers, which emanate from both mother's and father's educational level, type of place of residence, work status, father's occupation, maternal age, children ever born, marital status and province of residence.

6. For better coverage of births with at least two TT injections before birth, programmes need to target residents of Nairobi, Rift Valley, Nyanza and Eastern provinces, who gave birth to at least five children, who are not working and those whose partners have primary level or no education at all.

7. For better coverage of births with adequate prenatal care, programmes should focus on mothers: who have given birth to 2-4 children or at least five children, who are 20-34 in age and teen agers, who are residents of Eastern province, who are never married, whose partners hold blue collar jobs or never worked and whose partners have primary or no education at all. Moreover, programmes should put more attention on residents of every province of Kenya when considering married mothers alone.

8. For better coverage of births by hospital or clinic delivery, programmes should target: residents of every province of Kenya, those who have no

education or have primary level education, rural residents, those not working, mothers who have given birth to at least five children, mothers who never married and mothers whose partner never worked or worked in agriculture.

9. For better coverage of births with prenatal care from doctors or nurses, programmes should target residents of Eastern and Western provinces, those who have no education, those who have given birth to 2-4 or at least five children, teenagers and never married mothers. Moreover, programmes should put more attention on residents of every province of Kenya when considering married mothers alone.

10. For better coverage of births by delivery care from doctors or nurses, programmes should focus on residents of every province of Kenya, mothers who have primary or no education at all, rural residents, those not receiving prenatal care from doctors or nurses, those who do not work, who have given birth to 2-4 children or at least five children, who are widowed or divorced or not living together with partner, whose partners have primary level education or no education at all and whose partners hold jobs in agriculture.

11. Educational level of the mother and the province of residence proved to influence and determine the use of every reproductive health care service. Higher maternal age was seen having positive effect on receiving adequate prenatal care. This situation is unique to Kenya. Therefore, further studies need to be done to:

a) identify the mechanism through which education influences use of reproductive health care services;

b identify differentials and determinants of reproductive health care use at the provincial level;

c) find out why higher maternal age has positive effect on the use of adequate prenatal care.

REFERENCES

Abdel El Fattah, F. and E.E. Osman (1995). "Patterns and Determinants of Utilization of Maternity Care in Menoufia Governate" in CDC 24th Annual Seminar on Population Issues and the Challenges in the 21th Century in the Middle East, Africa and CDC Annual Seminar 1994. compiled by Cairo Demographic Centre; PP. 896-905.

Afsar, A. and M.A. Biliker (1996). "Utilization of Maternal Health Service in Turkey." In Ayse Akin, Munevver Bertan *Contraception, Abortion, and Maternal Health Services in Turkey*. Ankar, Turkey, Ministry of Health and Family Planning. December 1996:115-36.

Agrawal, B.L. (1988). Basic Statistics, Wiley Eastern Limited, New Delhi.

Akwara, P. (1994). The Impact of Breast Feeding on Infant and Child Mortality in Amogaro Division of Busia, Kenya. M.A. Thesis, P.S.R.I. (UoN).

Anonymous (1995). "Bangladesh: Eight in Ten Women Have Maternal Health Problems". *Safe Motherhood Newsletter.*19:3.

Anonymous (1993). "Going Beyond Disease." *Women and Health Newsletter". 2 (1): 4-5.*

Azlemat, M. (1996) "Health of Mother and Child" in Royaume du Marco. Enguete deanel Sur la Population et la Sante (EEPS), 1995, [edited by] Mustapha Azelmat, Mohamed Avad, El Arbi Housni. Rabat, Morocco, Ministwrw de la Sante Publique, Direction de la Planification et des Ressources Financieres, Service de ls etudes et de l'information Sanitaire, 1996 January: 67-82.

Bahatia, J.C. and J. Cleland (1995). " Determinants of Maternal Care in a Region of South India, October; 5(2): 127-42.

Black, Maggie (1987)."Family planning: An Essential Ingredient of Family Planning"Better Health for Women and Children Through Family Planning. The Population Council, New York.1-39.

Dixon-Mueller, Ruth (1993). " The Sexual Connection in Reproductive Health." *Studies in Family Planning*: September/October, (24) 5.

Feifer, C.N. (1992). Determinants of Prenatal Care Utilization in Jamaica. A Doctoral Thesis, University of California at Los Angeles.

Fikree, F.F., H. W. Berendes and J. Villar (1995). " A Rapid Community Based Health Evaluation of Pregnant Women in Low Socio-economic Settlement of Karachi." Journal of The Pakistan Medical Association: July; 45 (7) 107-3.

Grage, A. J. (1996). "Does Fertility Timing Influence the Limitation of Maternal Care Services? Evidence From Kenya and Namibia." *Population Research Institute Working Paper on African Demography, Working Paper.* AD 96-05.

Gupta, S.C. (1986). "Social Correlates of the Mother's Intra-natal Health Behaviour" in *Journal of Family Planning Welfare*, June: 32(4): 43-9.

Hanushek, E. A. and John E. Jackson (1977). Statistical Methods for Social Scientists. Academic Press, Inc., U.S.A.

Hosmer, D. and S. Lemeshow (1989). Applied Logistic Regression. Wiley Interscience Publication, John Wiley and Sons, New York.

Jacobson, J.L. (1991). "Women's Reproductive Health: The Silent Emergency." World Watch Paper 102, June.

Kakkar, M., U. Sharma, A. Kabra, S. Kakkar (1995). " Availability of Antenatal and Perinatal Care in an ICPDs area." Indian Paediatrics. May: 597-9.

Mati, J.K.G. (1993). "An Over View of Reproductive Health in East, Central, Southern Africa." In Proceedings of the Regional Conference on Policy Implication of Reproductive Health Research in East, Central, and Southern Africa. Lilongwe, Malawi; August: 1993.

McCow-Binns, A., J. La Grenade , D. Ashley (1995). " Under-users of Antenatal care: a Comparison of Non-attenders for Antenatal Care, with Early Attenders." *Social Science and Medicine.* October; 40 (7): 1003-12.

Mhago, Chisale, R. Rochat, A. Arkute (1986). "Reproductive Mortality in Lusaka, Zambia 1982-1983. *Studies in Family Planning*; 17(5): 234-252.

Ministry of Health, Kenya, Division of Primary Health Care (1997). "A Question of Survival? Review of Safe Motherhood."

Muinga, M. (1994)."The Tragedy of Motherhood" in *Conveying Concerns: Women Write on Reproductive Health* [compiled by] Population Reference Bureau [PRB]. Washington, D.C., PRB, 1994 July: 17.

National Council for Population and Development (NCPD) (1997). Sessional Paper No. 1 of 1997 on Natational Population Policy for Sustainable Development. Office of the Vice President, Kenya.

National Council for Population and Development (NCPD) NCPD et al., Central Bureau of Statistics (CBS) (Office of the Vice President and Ministry of Planning and National Development [Kenya], and Macro International Inc. (MI) (1994). *Kenya Demographic and Health Survey 1993*, Maryland. NCPD, CBS and MI.

Norsis, J. Warija (1990). The SPSS Guide to Data Analysis for SPSS/Pc+

Nagtara, A., R. Sauerborn, C. Oepen, H.J. Diesfeld (1989). " Assessment of MCH Services Offered by Professional and Community Health Workers in the District of Solenzo, Burkina Faso." *Journal of Tropical Paediatrics.* June 35 (supply 1): 2-9.

Nsg, D.C. (1995). "Beliefs and Practices of Antenatal Mothers in a Rural Setting. A Survey by Students of D.C.H. Nsg." Nursing Journal of Indian; January 86 (1): 4-6.

Obermeyer, C.M. (1993). " Culture, Maternal Health Care, and Women's Status: A Comparison of Morocco and Tunisia." *Studies in Family Planning*; 24(6):354-365.

Oucho, J.O. (1994). " Kenyan Population Policy and Programmes: From Scepticism to Credibility." A Paper Presented to the First Conference of the Population Association of Kenya (PAK) on Demographic Prospects for Kenya in the 1990's." 7-9 November, 1994 Machacos, Kenya.

Pebley, A.R., N. Goldman and G. Rodriguez (1996)." Prenatal and Delivery care and Childhood Immunization in Guatemala: Do Family and Community matter?" *Demography.* May; 33(2): 231-47.

Plan International: South American Health Network (1996). [unpublished] Presented at the 124th Annual Meeting of the American Public Health Association [APPHA], New York, November 17-21.

Population Action International (1996). " Reproductive Risk: Worldwide Evaluation of the Sexual and Maternal Health of Women. Extract of a Study of More than 100 countries by Population Action International." *Dialogos.* January-March; 3(26): 19-21.

Potter, J.E. (1988). " Use of Maternal Health Services in Rural Mexico." *Salud Publica De Mexico.* May-June; 30(3): 387-402.

Raghupathy (1996a). " Education and the Use of Maternal Health Care in Thailand." *Social Science and Medicine.* August; 43(4): 457-71.

———————— **(1996b).** " The Determinants of Preventive Health Care Use in the Philippines" [unpublished] Presented at the Annual Meeting of the Population Association of America, New Orleans, Louisiana. May, 9-11.

Rahman, M.M., Barkat-e-Khuda and T. Kane (1997)."Determinants of Antenatal Care Seeking Behaviour in Rural Bangladesh." In: *Reproductive Care in Rural Bangladesh: Policy and Pragmatic Applications.* Volume 1, edited by Thomas T. Kane, Barkat-e-Khuda, James F. Phillips.

Dhaka, Bangladesh, International Centre for Diarrhoeal Disease Research, Bangladesh.

Retherford, R.D. and M.K. Choe (1993). Statistical Models for Casual Analysis. John Wiley and Sons, Inc., Canada.

Rodrigues, F.J., W. Costa, G.M. Leno (1994). "Determinants of Prenatal Care Utilization Among Low Income Families in Paraiba State, Brazil in Revisits." *De SAU.DE PUBLICA.* August; 28(4):284-9.

Sarge, C. and J. Rowlins (1991). "Factors Affecting Prenatal Care Among Low-income Jamaican Women." Human Organization (50): 2, pp. 179-187.

Toan, N.v., H.T. Hoa, P.V. Trong, B. Hojer, L. A. Persson, K. Sandstorm (1996). "Utilization of Reproductive Health Care Services in Rural Vietnam; Are There Equal Opportunities to Plan and Protect Pregnancies?". *Journal of Epidemiology and Community Health.* Augusts; 50(4): 451-5.

Union of African Population Studies (UAPS) (1997). "Convergence and Divergence on the Situation of Reproductive Health in Africa." Yaunde: November 18-30, pp. 1-26.

United Nations (UN) (1994). International Conference on Population and Development. Cairo, Egypt, 5-13 September: 43-62.

United Nations Fund for Population Agency (UNFPA) (1997). The State of World Population. Rights and Reproductive Health. UNFPA.

Voorhove, A.M., C. Kars , J.K. Van Ginneken (1984). "Modern and Traditional Antenatal and Delivery Care" In: *Maternal and Child Health in Rural Kenya: an Epidemiological Study*, edited by J.K. Van Ginneken and A.S. Muller. London, England. Croon Helm: 309-22.

Weeks, E.C. (1993). "An Econometric Study of Prenatal Care in Peru" Ann Arbor, Michigan, University Microfilms International: X, [2], 141 p. order No. 9407175. Doctoral Dissertation, State University of New York at Stony Brook.

Westley, S. and K.A. Band (1996)."Who Uses Reproductive Health Care Service in the Philippines (and who doesn't?)." Asia Pacific Population Policy. April (37): 1-4.

World Health Organization (WHO) (1992). Traditional Birth Attendants: A Joint WHO/ UNFPA/ UNICEF Statement. Geneva.