

**PROXIMATE DETERMINANTS AFFECTING CHILD
SURVIVAL THROUGH MATERNAL EDUCATION
A CASE STUDY OF KISUMU DISTRICT**

BY

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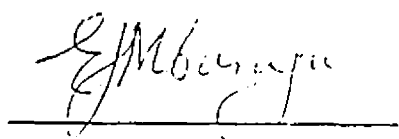
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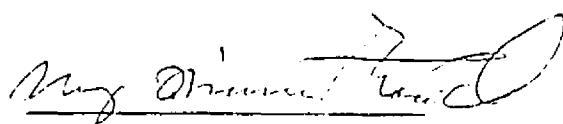


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Thesis has been submitted for examination with our approval as University
visitors.

A handwritten signature in dark ink, appearing to read 'E.K. Mburugu', is written over a horizontal line.

Professor E.K.Mburugu

A handwritten signature in dark ink, appearing to read 'Ulf Himmelstrand', is written over a horizontal line.

Professor Ulf Himmelstrand

DEDICATION

To my husband Peter and our daughter Kemunto for their moral support and encouragement.

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ABSTRACT

The impact of Maternal Education on child survival in a cohort of women aged 15-49 years was examined in three divisions, Winam, Kisumu Municipality and Nyando in Kisumu District, Western Kenya. The influence of Education in promoting Child Survival was compared with other intermediate variables of Infant and Child mortality. The Socio-economic variable mainly considered was the mother's formal education. Other Proximate determinants of Child mortality considered were maternal factors such as, age at first marriage, age at first birth, parity, birth interval, personal health control measures such as immunization and environmental factors. A total of 391 were selected to constitute the sample size. Samples of 123 women in Nyando, 124 in Kisumu Municipality and 144 in Winam were interviewed between August and October 1991, using an interview schedule and simple observation. The main findings of this study were as follows: The educational background of the mother was seen to influence child survival. Mortality was highest for children whose mothers had no education. Maternal education was found to influence the family size, especially number of children born and number of children dead. However, differences in child mortality were not entirely attributable to education and Socio-economic variables alone but could also point to cultural beliefs and different perceptions on causes of Child morbidity and mortality.

CHAPTER ONE

1.1. INTRODUCTION

In most parts of Kenya, the mortality rate has been declining since 1948 . Crude death rate went down to between 18 and 23 per 1000 in 1962 and from 17 per 1000 in 1969 to 14 per 1000 in 1979. The current estimate gives about 13 deaths per 1000. Infant and child mortality has shown similar trends. In 1948, the infant mortality rate was 184 per 1000 live births. This has been declining steadily to 122 per 1000 live births in 1969, 119 per 100 live births in 1979. The recent surveys reveal infant mortality of less than 80 per 1000 live births.

The Government of Kenya has long been concerned about the high rates of infant and childhood mortality in the country and has made considerable efforts to reduce them. The infant mortality rate, is often cited as a basic indicator of general health and welfare.

Mortality rates are comparatively lower in Kenya than in other regions of Africa. The child survival improvement in Kenya has been attributed to the improvement of medical facilities, increase of health care facilities and programmes aimed at improving the child's health such as immunization, nutrition and maternal health care services.

Table 1.1: Population reference bureau estimates (1989)

REGION/COUNTRY	CRUDE DEATH RATE	INFANT MORTALITY RATE
AFRICA	15	133
WEST AFRICA	18	124
EAST AFRICA	17	118
KENYA	13	79

Source: Population Reference Bureau - UN 1989.

Despite the general improvement in child survival in Kenya, there exists distinct regional variations. Analysis of child mortality by regions shows the highest infant mortality of 216 per 1000 live births in South Nyanza and the lowest mortality rate of 49 per 1000 live births in Nyeri district , according to the Kenya Demographic and Health Survey (1989) and Population census (1979). Provincial rates also display marked differentials. The infant mortality rate is highest for Coast Province 107 per 1000 live births, followed by Nyanza 94 per 1000 live births, Western 75, Nairobi 46, Eastern 43 and Central 37(per 1000 live births). Rift Valley has the lowest infant mortality rate of 35 per 1000 live births. Childhood mortality differentials are even larger with the rates in Western and Nyanza Provinces (63 and 60) respectively being six times the rate in Central Province which is 10 (Kenya Demographic Health Survey 1989) .

Estimates of the proportions of children dying in one year in the first five years of life by district and province shows great variation (WHO 1989), for example, in Kisii District the infant mortality rate is 120 per 1000 live births whereas Nyeri has the rate of 49 per 1000 live births. However, Kilifi has the highest of about 132.6 per 1000 live births. In terms of provinces, Coast Province is leading with the infant mortality rate followed by Nyanza Province. The national figure is 75.5 per 1000 live births (WHO 1989).

This study addresses itself to factors such as formal education of mothers (maternal education) which can promote child survival but has hitherto been ignored. Maternal education is seen as one of the major ways of reducing childhood mortality and improving the health of the family. Educated mothers are believed to be individuals with capabilities to analyze and rationalize problems especially if they affect the quality of lives of their families.

1.2. PROBLEM STATEMENT

A number of studies on child survival have been carried out in Kenya and these studies have clearly shown a declining trend of mortality since 1948. Most of the studies have shown regional variations in child survival and this is attributed to the problem of unequal distribution of resources to the rural communities such as education, health and other social infrastructures. These inequalities coupled with

socio-economic and environmental factors have contributed to child survival differentials. Mortality differentials by mother's level of formal education display expected differentials. Mortality is highest for children whose mothers have no education and declines for children whose mothers have some primary education and is lowest for children whose mothers have attained secondary education and above (KDHS 1989). These findings are similar to those of Mosley (1980), Kibet (1981), Anker (1982), Ndede (1989,1990) and many others, who have associated the child survival differentials with differences in maternal education amongst other factors like household income and residence (rural and urban). Children whose parents reside in the urban areas tend to survive more than those in the rural areas.

However, it is important to note that majority of these studies that have identified the mother's level of formal education to have an impact on infant and child mortality differentials, do not explain further the mechanisms by which the maternal education operates to produce the observed child survival differentials.

There are other intermediate variables of maternal fertility such as age, parity and birth interval that have been shown to have an effect on child survival. The health of infants is affected by their mother's age at birth. Children born to older women have a much greater risk of having birth defects than those born to younger women and the number of children a woman has already had affects her chances of having a successful pregnancy and a child who survives. Because of the risks to fetal and

infant health linked with short intervals, high birth order, and maternal age, family planning can make a substantial contribution to child survival. When women have access to family planning information and contraceptive methods, many of them choose to delay motherhood, space their births and stop childbearing earlier and subsequently have smaller families. Other intermediate variables to be considered in this study are environmental factors and disease control factors.

This study therefore intends to examine mortality differentials associated with Education in Kisumu District. One might ask "is it that education delays marriage and therefore delays age at first birth?" or "is it that education creates awareness and therefore mothers with formal education easily adapt and appreciate preventive measures such as immunization, proper nutrition and become more conscious of their environment?"

According to the WHO annual report of 1989, the infant mortality rate of Kisumu District was 120.1 per 1000 live births and just like other districts, maternal education seems to have a major influence on child survival.

Despite the many attempts to address the health care problems at the district level, for example, increasing health care facilities, there still remains the problem of slow improvement in health and death of children.

Even though health care facilities may be placed within a District, there appears to be a difference in child mortality and morbidity rates in relation to the mother's level of education.

This thesis therefore aims at finding out what maternal education does to produce the already observed differences in infant and child mortality. The study also hopes to identify the underlying variables that directly influence child survival in Kisumu District.

1.3 OBJECTIVES

1. To find out whether mother's formal education creates awareness of the importance of preventive measures such as immunization or personal illness control.
2. To determine whether maternal education influences the choice of the family size and contraceptive use.
3. To examine whether education delays marriage and hence delays age at first birth.
4. To determine whether education influences the availability and utility of latrines.
5. To determine whether education affects the choice of improved water usage.
6. To examine the inter-division variation in child survival

1.4 JUSTIFICATION

The intention of this work is to add to the understanding of the determinants of child survival and to our understanding of the many factors involved in the family's production of healthy children in order to provide a foundation for formulating health policies and strategies and health care programmes that are aimed at improving child survival. More information is needed on how education influences child mortality and morbidity in Kisumu District. The goal here is to assist in determining an appropriate approach towards health care services and facilities, which subsequently serve in reducing mortality rates and increasing the quality life for all members of the household. It is hoped that this study will add to the available body of knowledge and increase the understanding of how maternal education operates to cause the differentials in child survival.

CHAPTER TWO

LITERATURE REVIEW

The world summit for children has adopted the goal of a one-third reduction in child deaths by the year 2000. UNICEF urges that reducing child deaths is essential to the process of reducing birth rates. Every year, more than 14 million children die in the world before reaching the age of five. Many of these deaths occur when births are more than four in total or are closer together than 2 years or to women who are younger than 18 or older than 35 years (UNICEF 1991). The education of girls and women for example is known to be one of the best ways of improving child health. Even when differences in income are allowed for, the survival chances of a child born to a woman with even a few years of education are much greater than those of a child born to a woman who has never been to school.

When child deaths have fallen to a point of being very unlikely, then the family size becomes more predictable and controllable. Confidence begins to grow and family planning becomes more attractive. Reducing child deaths therefore helps to make a crucial transition from "families by chance" to families by "design". Countries such as Chile, Sri Lanka and the Indian state of Kerala, show how important this factor can be. UNICEF has called for a world wide effort to end mass child deaths and child malnutrition by the year 2000. In the world as a whole, there is a quarter of a million

children still dying every week from common illnesses and one child in every three still stunted by malnutrition.

Mosley (1980) argues that traditionally, social research on child survival has mainly focussed on the association between socio-economic status, levels and patterns of mortality in populations. Correlations between mortality and socio-economic characteristics have been used to generate casual inferences. Income and maternal education for example are two commonly measured correlates in developing countries. On a global basis, the trend is that child survival seems to be improving but there are certain regions which seem to be lagging behind and most of these regions are in the developing world.

2.1. CHILD SURVIVAL IN THE DEVELOPING WORLD

A picture of health in a society is, to a great extent, extrapolated from what knowledge there is of diseases and deaths. Data on life expectancy and major causes of death reveal alot about the prevailing social and environmental conditions of a society. There is a severe health problem in Africa where "...the lowest life expectancies at birth and the highest infant mortality occurs"(UNEP,1987;182). As indicated in the World Development Report (1984) children under five years of age represent approximately 15% of Africa's population, but in all parts of the continent, except southern Africa, they represent 50% or more of all reported deaths (World

Bank,1984). Some of the leading causes of child illness and death are problematic, since curing is further complicated with poor sanitation, lack of diagnostic and treatment capabilities and lack of vital resources.

A general trend observed in developing countries depict a high fertility rate, while mortality seems to be declining rapidly in some areas. However, mortality levels still remain high in developing countries despite the development of increasingly sophisticated medical technology to combat diseases. A number of studies on child survival have been carried out in many developing countries. For example, Meegama (1981) carried out a study in Sri Lanka on the socio-economic determinants of child survival. In his study, he revealed that age of the mother and birth order had a strong influence on neonatal mortality and also the economic level of the household. He also found out that the post-neonatal and childhood survival was influenced by the economic level of the household, environmental conditions and mother's education. The study also established rural-urban differentials in mortality in favour of urban setups.

Thomas (1985) carried out a study on the effect of piped water on early childhood mortality in urban Brazil. He found a strong correlation between poor nutrition and environmental factors and concluded that children who were poorly nourished after birth were also more susceptible to infections associated with unsafe water, poor

sanitation and inadequate housing. Clean water reduces exposure to waterborne diseases such as diarrhoeal disorders.

Al-kabir (1984) examined the effect of community factors on child survival in rural Bangladesh. In his study, he concluded that if all mothers in Bangladesh spaced their children or births by at least three years, child survival would improve. The influence of religion on mortality was also evident. The strongest determinants of child survival in rural Bangladesh were the length of the previous interval and birth order of the child. The distance to a family planning clinic, distance to a primary school, maternal education and region of residence had a role to play.

In Colombia, Somoza (1980) carried out a study on infant and child mortality. This study showed that the level of child survival is determined by the age of the mother, sex of the child, mother's education, urban or rural residence.

A study carried out in Lesotho by Timaeus (1982) found that major factors influencing child survival in Lesotho are malnutrition and infectious diseases due to the physical environment and economic conditions. Other factors affecting child survival included maternal education, birth order and birth intervals. In developing countries just like the developed countries, the vast majority of the deaths that occur among children under five years of age have been associated with diarrhoea. Studies have shown a negative correlation between diarrhoea and maternal education.

A study carried out on the comparative analysis of Kerala and West Bengal on the impact of social and economic development on mortality, had very interesting findings. The level of child survival was higher in Kerala than West Bengal not only because of environmental and hygienic conditions that are more favorable in Kerala and due to the wider distribution of health facilities in the rural areas of Kerala but also due to the fact that the proportion of literate particularly among the females was much higher than in West Bengal. Historically, Kerala has always put greater emphasis on education and public health. In general, West Bengal has always been characterized by a high level of economic development and Kerala by a higher level of social development. The lower mortality rate in Kerala can be attributed mostly to its higher social development, maternal education and partly to its favorable environmental and hygienic conditions.

High infant and childhood mortality induces parents to bear a relatively large number of children to ensure that some survive to adulthood. Early marriage is assumed to have a negative impact on a girl's educational career. Married women are expected to settle down to child bearing which of course jeopardizes their educational career ambitions. They are subjected to early motherhood and a long childbearing career.

Level of maternal education appears to be negatively associated with breast feeding in much of the developing world. Evidence suggests that women with more education breastfeed less (Jelliffe and Jelliffe 1978, Atkin et al. 1986 b, Butz et al 1981). High levels of education are closely linked with many other factors, also

known to be associated with lower levels of breast feeding. These factors include increased income, greater exposure to infant formula advertizing, greater likelihood of working in formal employment setting less compatible with child care and less likelihood of living in traditional households where support for breast feeding is high. In a few countries a positive association between education and breast feeding has been found. In Sri Lanka, for example, more educated women were found to be more likely to initiate breast feeding and continue it to the recommended age(Akin et al 1981). People tend to believe in the supernatural causation of disease, rather than actual cause itself. Low socio-economic status and especially low educational level of the mother is usually associated with low acceptance of immunization (Heggenhougen and Clements 1987: 19-20).

In nearly all countries, mothers who are illiterate or who have little formal education are less likely to have their children immunized. A study in Nigeria found that children of illiterate mothers or mothers with only primary education had the least complete immunization (Adekunle 1978).

Infant and child mortality is a sensitive indicator of the level of general health of the population and especially of the well being of mothers and children. There is a high correlation worldwide between gross national product and infant mortality (Favis and Dobbling, 1974). In the low income countries of Africa and Asia mortality rates are 10 times those of Industrialized countries in Europe and North America. Within the

low or high income countries there are large differences in mortality rates. It is not so much the level of the gross national product of a country as the distribution and the share that goes to the poorer half of the population that seems to have most effect on infant mortality (Grant, 1982). Economic development without simultaneous improvement in social organization, nutrition, hygiene, communications and literacy is likely to raise the infant death rate even more.

In the Netherlands the infant mortality decreased from 200 per 1000 a hundred years ago to 50 per 1000 fifty years later and less than 10 per 1000 in 1980. Improved housing conditions, provision of safe drinking water and propagation of breastfeeding contributed even more to this decrease than the almost 100 percent coverage with childhood vaccinations and the developed medical technology.

In tropical Africa Infant mortality is somewhere between 100 and 200 per 1000 live births and the main causes of death are more or less the same in most countries: birth trauma, prematurity, neonatal tetanus in the first month, respiratory infections, diarrhoea, measles and malaria.

Numerous studies undertaken in developed as well as in developing countries have produced empirical evidence indicating that environmental factors, and more particularly the socio-economic status of households, are related to mortality in the under fives. In parts of Asia, Latin America and Africa certain favorable

environmental conditions have been shown to be associated with relatively low child mortality (Anker and Knowles 1977; Chew Rahman and Sander, 1980; Meegama 1980; Puffer and Serrano, 1973. D'Souza and Bhuija, 1980).

2.2. KENYA

In most of rural Kenya, the mortality rate has been declining since 1948 as already indicated. In 1967, children under one year accounted for approximately 33.33% of all deaths in the country, while those under five years accounted for approximately 54%. When compared with other regions in Africa, Kenya's mortality rates lower (See Table 1.1). A report by the World Bank(1980) shows that the infant and child mortality takes a big proportion of the population i.e., 80% of the total deaths in Kenya. Though child death is declining in Kenya and other developing countries, the Kenya level of child survival is still described as high (Kibet 1981).

As already indicated, in Kenya just like other developing countries, there is a significant difference of varying degrees of child survival in various provinces. Two factors are responsible for much of the observed variation: the prevalence of malaria and Education of Mothers (Fleurent, et al. 1982). Several studies have been conducted in various parts of the country on determinants of child survival. Environmental, personal hygiene and nutritional status have been shown to play a major role. Educational status of mothers has also been identified to have an impact

on child survival (Mosley 1980, Osiemo 1986, Henin 1982, Ominde et al 1983).

Kenya's demographic picture reveals that the population of the country has grown at a very fast rate since independence. This is due to a sustained high and perhaps rising birth rate coupled with a falling death rate. Indirect estimates of children dying by the age of 2 years from the 1962, 1969 and 1979 census show rates of 174, 157 and 125 per 1000 respectively. This is a remarkable decline, with the result that Kenya has one of the lowest infant mortality rates of 87-90 per 1000 among sub-saharan African countries (Mott 1982).

Social differentials in child survival reveals a large effect of mother's education in both the 1969 and 1979 census data. For 1979, the number of children dying by age two per 1000 by level of mother's education are: no education -163 deaths per 1000 live births, 1-7 years of education - 104 deaths per 1000 live births and 8+ years of education - 61 deaths per 1000 live births (Kibet 1982). This is a 36% decline in child mortality with primary education and 63% decline with secondary education below the level for uneducated women. The logical question is how much of the decline in child mortality since 1962 might be attributed simply to the education level of the child bearing women? The estimated effect of changes in educational level of women on child mortality is shown in the table below:

TABLE 2.1 The estimated effect of changes in educational level of women on child mortality

% of Women age 20-24 with				Child deaths by age 2		Estimated ration based on educational level of women b.
Year	No. ed.	1-7 yrs.	8+ yrs.	Rate per 1000 a.	Ratio to 1962	
1962	84	15	1	174	1.00	1.00
1969	61	34	5	157	0.90	0.90
1979	35	47	18	125	0.72	0.76

a - from census data

b - Estimated based on proportion of women by each education level as noted in test.

Source:- "Further Development in Indirect Mortality Estimation". Population studies by Hill K and Trussel J.

This analysis suggests that essentially all the observed mortality declined between 1962 and 1969 and about 86% of the decline between 1962 and 1979 can be accounted for only by the change in the education level of the mother. Kenya, however has a great regional variation in child survival which cannot be fully explained by maternal education.

An examination carried out in the rural districts of Kiambu and Muranga districts in Central Province which have benefitted maximally from Kenya's development programmes over the past decades, have enjoyed a 26% and 39% child mortality

decline between 1969-1979.

A comparison of two urban areas gives a different picture. Overall Nairobi has better child survival than Mombasa but when examined by educational groups, the advantage is limited to women with some education. There are results of household survey carried out in 1974 by the ILO which gave results largely consistent with the conclusions drawn from the 1979 census.

Looking at factors influencing child survival at age three, it was found that maternal literacy, income and toilet facilities gave a positive association but use of traditional medicine and mother's illness gave a negative association. Urban residence appeared to give a positive association, but this factor could be shown to be working largely through other variables such as toilet facilities. There was no association with use of hospitals. Residence in a malaria region was also shown to have an independent effect (Anker and Knowles).

Using the 1984 Kenya contraceptive prevalence data, Ondimu (1986) analyzed child survival on socio-economic variables. He found out that mortality is lower with the increase in the level of maternal education.

Probability of a child surviving up to the age of three years increases as the maternal years of schooling also increases. He also found that mother's attendance at a

maternity clinic seemed to be the principle variable that determines childhood survival up to the age of 3 years. The tendency to visit clinics was highly associated with mother's formal education. Studies by Ndede (1990) and Atichi (1989) on smaller administrative units (districts) i.e., South Nyanza, Kisumu, Siaya and Kakamega districts respectively confirmed a relationship between maternal education and child survival. Ndede found that child survival is lower for mothers with no education. It has been found that primary education makes it possible for women to be more conscious of the importance of hygiene and other basic requirements which promote survival in children. This suggests that secondary education is a pre-requisite for a woman to change her attitudes towards family size as was suggested by Ominde (1983).

Apart from the socio-economic factors, other determinants that affect child survival include areas of origin. A study carried out in Nairobi city on infant and child mortality differentials found that in-migrants from high infant and child mortality regions tended to have higher infant and child mortality rates. This finding could be explained by investigating the socio-economic characteristics of these immigrants and probably their cultural practices.

Regional variation in child survival is evident in Kenya and Kibet (1981) using the census observed that child survival is higher in the highland areas of Kenya and that as one moves towards the Indian Ocean Coast to the East, the rate of early childhood

survival decreases.

Analysis of the Kenya Contraceptive Prevalence Survey (1984) revealed that child survival is higher for monogamous homes as compared to polygamous unions where it is 118 deaths per 1000 live births. This can be explained by the fact that children in polygamous families could be receiving less attention from both parents than children in a monogamous union. It is possible that the general level of well being and income levels in polygamous unions is relatively low and this reduces the potential for child survival. It has also been revealed that women in polygamous unions reside mostly in the rural areas and this could influence child survival to some extent.

A study on marital status by Kichamu (1981) found that the widowed had the highest child mortality followed by the divorced, then the married and finally the single registering the lowest. High mortality among the widowed may reflect high economic dependency of women on their husbands. K'Oyugi (1982) in analyzing both adult and infant and child mortality for Siaya District, treated the district as one block unit without sub-dividing it into administrative divisions. He found out that children of single mothers had the lowest mortality level and children of the widowed registered high child deaths.

Using the 1979 census data to analyze child survival in Kericho at a locational level, Mutai (1987) found that mothers with no education have the highest infant and child

mortality followed by those with primary education and then lastly secondary education and higher. A study also carried out by Munala (1988) in Kakamega district also revealed that child survival is inversely related to mothers education and all these findings conform to other findings of Kibet (1981) and K'Oyugi (1982).

Anker (1982) and Kibet (1981) made similar independent studies correlating child mortality with other variables such as percentage of total fertility rate of urban population, percentage of urban population total fertility rate, percentage of malaria cases, percentage of female literacy, beds per 1000 population and population density. While Anker used the Kenya 1969 census Kibet used the 1979 census. Anker measured child mortality in terms of life expectancy at birth and Kibet used the probability of dying at age two. They both used the regression model to find out which factors were significantly correlated to child mortality. The most important findings was that malaria and mother's education were the two major factors that influence child survival.

The areas associated with huge water bodies (Indian Ocean in Coast Province; Lake Victoria in Nyanza and Western Provinces) are known to be areas of high malarial incidence and this prevalence of malaria is quite an important factor for child survival.

The child survival improvement in Kenya has largely been attributed to the

improvement of medical facilities, increase of health care facilities and programmes aimed at improving child health, programmes such as immunization, nutrition, maternal health care services and the improved standards of living.

There is a significant difference of varying degrees of child mortality in Kenya, between provinces. Two factors are responsible for much of the observed variation; the prevalence of malaria and education of women ... Multiple regression analysis reveals that malaria is by far the most important variable explaining differences in the distribution of infant and young child mortality (Fleuret, et al., 1982; 208). Nyanza province has the second lowest level of child survival in Kenya and the three districts of Nyanza Province (South Nyanza, Siaya and Kisumu) have also been identified as regions of high child mortality.

In Kenya the AIDS epidemic poses major challenges to the national policy makers. The number of people who have contracted the HIV virus have steadily increased since it was first diagnosed in the country in 1984. Many people are at risk of HIV infection, it is now posing a challenge to the health sector and is likely to reverse many of the gains made so far in child survival and life expectancy. So far it is estimated that AIDS has already raised infant and child mortality rate by 20 per cent and a rising number of orphans is estimated to be 300,000 and expected to be 600,000 by the year 2000.

It is estimated by the ministry of health and the National Aids Control Programme that 30,000 children below age 5 in Kenya are infected with the HIV virus and 10,000 dying each year.

2.3 KISUMU DISTRICT AND CHILD SURVIVAL

A study carried out in Kisumu by Ndede (1990) on the "Infant and Child Mortality Differentials" reveals a lot about the trend in Kisumu district as a whole. In his study, he looked at Kisumu District in terms of its different divisions and in his study he registered variations within the different divisions of the district. The lowest infant and child mortality was seen in Kisumu municipality and Nyando division registered the highest infant and child mortality among the rural divisions.

Ndede (1990) also found that there was a slight difference in child survival between Kisumu district and Siaya district. In his findings, education tended to lower infant and child mortality by possibly enabling mothers to know proper hygienic conditions of bringing up and feeding their babies. It also tends to break women from traditional norms and attitudes towards child health care, economic choices and health related practices. Ndede's findings in Kisumu district in terms of child differential conforms with most of the findings already discussed. However, his findings clearly indicate that child mortality trends are higher in Siaya than in Kisumu.

Most of the factors responsible for child deaths in these two areas are as follows:-

- a) The prevalence of malaria
- b) Poor environmental conditions
- c) Poor use of water and sanitation

According to the KEPI report of 1989 (Kenya Expanded Programme for Immunization) these two districts also register very low immunization coverage, being less than 50% in Kisumu and Siaya. This is very low when compared with areas such as Muranga in Central Province. Immunization programme has been found to have a lot of impact on infant mortality not only in Kisumu district but in Kenya and the world as a whole. The low infant mortality is attributed to the immunization programme administered during 0-1 year of the infant life. This coupled with Oral Rehydration Solution(ORS) therapy, lowers infant and child mortality. More deaths at childhood (1-4 years) are largely attributed to malnutrition and other child care factors. Intensification of the immunization programme is very necessary for Nyanza province. More participation in immunization programmes has been seen more among mothers below the age of 30 years.

Mosley, as already mentioned before, identified several factors affecting infant and child mortality. Among these were, environmental factors, institutional and cultural factors.

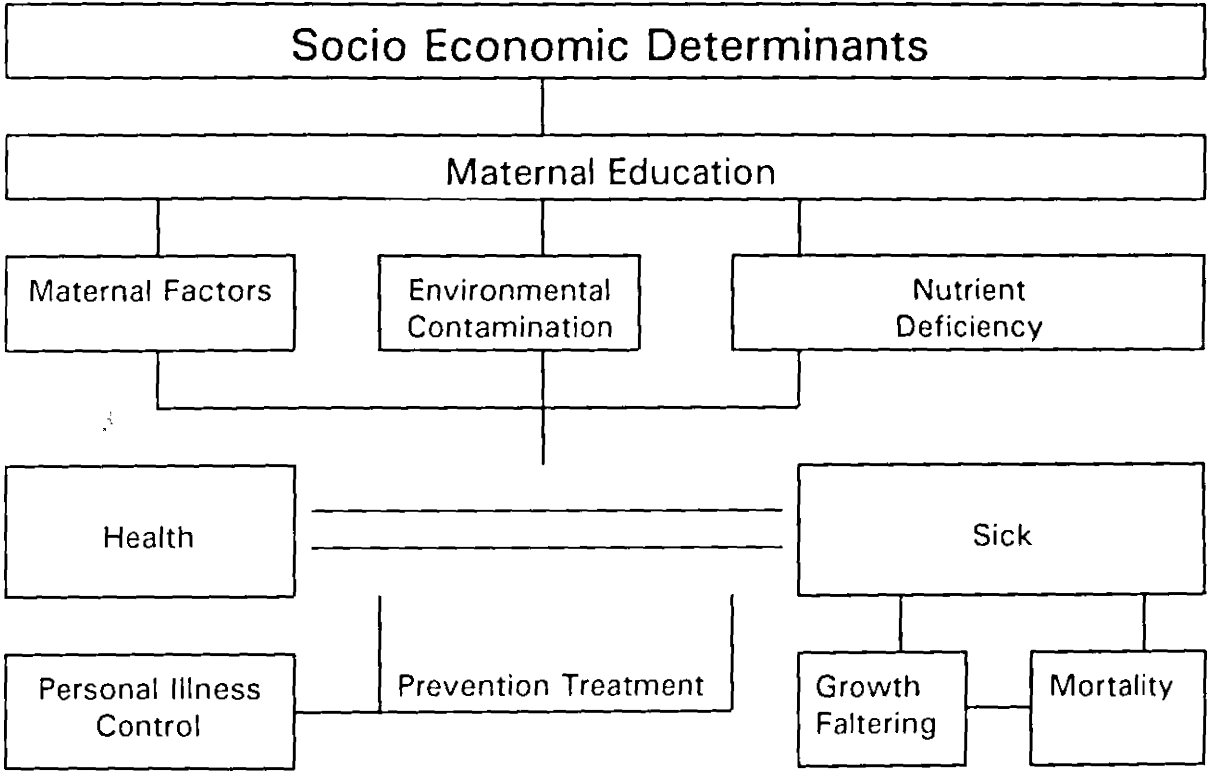
Through proximate determinants, these factors affect mortality differently in different areas thereby causing infant and child survival variations. More detailed data containing variables necessary for analysis of proximate determinants of mortality is needed to explain these differences experienced in different areas. It is important, given the current trends that HIV/AIDS could be another independent factor that contributes significantly to infant and child mortality in the district.

The literature reviewed herein does not clearly illustrate what mothers with education do that mothers of no education do not do to promote child health. The current study therefore hopes to contribute additional information as to what maternal education does to improve child survival.

2.4 CONCEPTUAL FRAMEWORK

The health and mortality issue of children under the age of five years can be understood by developing a conceptual framework of proximate determinants of mortality. Mosley and Venkatacharya have made attempts to develop a conceptual framework for the study of child health and mortality. Although their conceptual frameworks are similar in theme, they differ in the operational stage. This study will however utilize the model developed by Mosley and Venkatacharya. Maternal education seems to work through proximate determinants to influence child survival.

Figure 1: Operation of four groups of proximate determinants on the health dynamics of population.



Source : Mosley 1980.

The key to the model is the identification of a set of proximate determinants or intermediate variables, that directly influence the risk of morbidity and mortality. All social and economic determinants operate through these variables to affect child survival.

Mosley identified some of these variables which can be integrated, they include:

I. Maternal Factors

1. Age of child bearing
2. Parity
3. Birth Interval

II. Environmental Contamination and Sanitation:

1. Safe drinking water/food
2. Toilet facilities
3. Incidence and prevalence of diseases such as diarrhoea, malaria, measles and tetanus

III. Availability of nutrients to the foetus and infant

1. Maternal nutrition during pregnancy
2. Breast feeding
3. Child feeding-calories, protein, vitamins and minerals.

IV. Personal Illness Control:

1. Personal preventive measures such as immunization, antenatal care, malaria prophylaxis.
2. Treatment - curative and medical care.

The figure illustrates in a simplified form the conceptual model of the determinates of child mortality. This identifies the relevant social practices that are related to the categories of intermediate variables. The figure illustrates why some direct biomedical interventions have a far more limited impact than expected, but it also clarifies why a few basic social changes such as mother's education may be associated with such large effects on child survival.

The model also emphasizes that an infant or child death usually does not have a discrete cause, but in most cases is as a result of a long series of individually minor biological insults which cumulatively retard growth, lead to wasting and progressively wear down the resistance of the individual. Ultimately an ordinarily minor illness such as respiratory infection or diarrhea results in death.

Each of the intermediate variables will be discussed in turn to illustrate briefly what is known on how it operates to directly influence the risk of mortality but more importantly, to identify the social and economic factors that may operate through it. With this framework, it will then be easier to comprehend how determinants such as maternal education can have such a profound effect on the level of child mortality.

I. Maternal factors

The intermediate variable of maternal age, parity, and birth interval, have each been shown to have an independent effect on risk of infant mortality. Higher risks of infant

deaths are biologically associated with childbearing at very young (under 18) and older (over 40) and with shortbirth intervals (under 1 year). Further, there are important synergies which compound the risks, for example high parity among very young women. Among the socio-economic determinants which operate to influence the risk of infant and child mortality, through these intermediate variable are: age at first sexual union, desire regarding family size, benefit about use of fertility control practices, knowledge of and access to methods of contraception, practices of breast feeding and age of weaning.

II. Environmental contamination:

Contamination of food and water, this intermediate variable relates to infectious agents which are acquired by swallowing, primarily with food and water, but also in some cases direct hand-to-mouth. This water or food contamination may cause diarrhoea disease and dysenteries which is caused by many types of bacteria and viruses and some parasites. Noteworthy diseases include cholera, typhoid, infectious hepatitis and the intestinal parasites such as round worms.

In considering how social determinants operate through this intermediate variable, special note must be made of the technical ease with which a mother can avoid use of contaminated food and water. For example if a mother can give careful attention to heating all food just before eating, boiling and properly storing the drinking water and ensure that family members wash their hands, she can dramatically reduce the

risk of acquiring this group of infections in her household. The availability and proper usage of latrines can also reduce the risk of acquiring the above mentioned infectious diseases. Maternal education helps to create awareness on the importance of hygiene and therefore reduction in diseases caused by a contaminated environment.

III. Availability of nutrients to the fetus and infant

Each of the four classes of nutrients, i.e calories, protein, vitamins and minerals may show isolated deficiencies among selected populations in different ecological settings. It must be noted that a mother's own nutritional status also has direct effects on infant survival through fetal nutrition. The level of calorie intake during pregnancy is associated with the birth weight of newborns and thus with mortality risks.

Because the mother is the key actor in providing the child's nutrition, her participation in work outside the home may affect the child's health because of the numerous competing claims on the mother's time and attention. But the problem of women's

labour force participation and infant mortality is more complicated. The situation described above provide clues on how maternal education and economic development can operate to have such profound impact on child mortality and by improving food availability in the family and transforming the social and economic conditions within the household.

IV. Personal illness control

More relevant to this conceptual framework is the distinction between "illness and disease". Illness refers to the bodily condition, which then determines the choice of healing strategies. Disease refers to the biomedical definition of that condition. In traditional culture there is no dichotomy between preventive and therapeutic measures. In fact prevention is usually accorded far more attention. Every stage of life is accompanied by rituals and actions to assure health and welfare. Furthermore, life may be filled with all sorts of taboos, many related to diet to avoid illness. When an illness is recognized, therapy will be selected based on the presumed cause. In most traditional systems, the specific physical symptoms, unless for a well recognized disease, usually do not give a clue to the cause and the correct choice of therapy. They will attempt the trial and error approach which will involve several different traditional measures, including modern medicine when available. But, because the modern active system is alien to the local culture, there will be under-utilization of modern facilities except for the educated ones. The consequence of this is that there will be a wide gap between the levels of mortality among educated ones versus the traditionally uneducated families, who will not benefit from modern medicine which offers very effective preventive and therapeutic technologies, and the scientific conception of disease causation.

The introduction of immunization programmes should be expected to reduce the death

rate or save the lives of children who might otherwise die from preventable diseases. Even when a child is immunized successfully, the protection is only against a specific agent. The child remains at risk to all other causes of death, and all things being equal, a certain proportion will die of other causes. For example preventing measles among children may not necessarily save a life, but only change the biological cause of death, i.e. if the child's nutritional status is so poor, that child is likely to die of another infectious disease. This discussion does not imply that preventive and curative technical interventions are ineffective but rather there are many intervening variables that can lead to infant and child mortality. Thus as formulated in the conceptual model, the effective technologies must operate as Intermediate variables in relation to mortality impact. Finally the model illustrates that the risks of mortality are moderated by treatments which are a function of sickness care behaviour.

2.5 HYPOTHESES

1. Education tends to delay marriage and hence delay in first conception
2. Education creates awareness on the importance of preventive services such as immunization
3. Mothers with formal education tend to have fewer children as compared to mothers of no education
4. Availability and utilization of latrines is dependent on education
5. Education tends to liberate a mother from traditional beliefs and practices that hinder the utilization of modern health care facilities.

2.6 OPERATIONAL DEFINITIONS

CHILD SURVIVAL: This starts from the time of gestation until the child is born. The crucial age here is 0-5 years.

CHILD HEALTH CARE: Health care that is administered to a child that is five years or younger.

CROSS SECTION STUDY: A study that examines variables of interest as they exist in a defined population at one particular time.

HEALTH CARE FACILITIES: This term will include all modern facilities within the district that serve health care. All those taken into consideration will be:- hospital, clinic, sub-health centre and dispensary.

HOUSEHOLD: A household is made up of a group of persons bound by kinship ties, who reside within a single compound, are answerable to the same head and share a common food source.

Polygamy: A concept referring to plural marriage.

Polygyny: A man marrying several wives.

PROXIMATE DETERMINANTS: These are factors having direct influence on mortality i.e., age at first birth, breast feeding, immunization, etc.

RETROSPECTIVE: A research design which seeks data or information relating to characteristics of the persons under study of events experienced in the past.

CHAPTER THREE

RESEARCH METHODOLOGY

3.1 SITE DESCRIPTION

The study was carried out in Kisumu district which is located in Nyanza Province of Kenya. The district lies within longitudes 33° 20'E and 35° 20'E and Latitudes 0° 20'S and 0° 50'S and covers a total area of 2660 sq. km., of which 567 sq. kilometers are under water. It is the second largest of the five districts that form Nyanza Province, namely Kisii district to the South, Nyamira district, South Nyanza district to the Southwest and Siaya district to the West.

Kisumu district is divided into seven administrative divisions, twenty nine locations and one hundred and seventeen sub-locations. The divisions are Winam, Municipality, Maseno, Muhoroni, Nyando, Lower Nyakach and Upper Nyakach. The district lies in a depression that is part of a large lowland and can be divided into three(3) topographical zones; The Kano plains, the upland area of Nyabondo and the midland areas of Maseno.

The population in Kisumu district increased from 400,643 in 1969 to 536,754 in 1979, representing an increase of 34.0%. The central bureau of statistics estimated

that by 1988 the population was 715,346, representing a further increase of 33.3% between 1979 and 1988. Population projections by the Central Bureau of statistics further indicate that the population in the district will reach around 830,000 people by the year 1993. This reflects a total growth of 16% or an annual growth rate of 3.0% during the period.

The district derives most of its livelihood from small scale farming, fishing and industrial activities. These are the major sources of income for the basic needs such as adequate nutrition, shelter, clothing, good health and education. The indigenous inhabitants of the district are the Luo community, however there are members of other ethnic groups who have migrated into the district.

This study focussed on three divisions of the district, namely; Winam, Nyando and Kisumu Municipality. The entire district could not be studied due to time constraints and problems related to retrieving data.

The population in Winam including the municipality was estimated to be 300,402 in 1991 and is estimated at 318, 505 people by the year 1993. Whereas the population of Nyando was estimated to be 126, 732 in 1991 and 134,369 people by the year 1993 (Central bureau of Statistics 1987 population projections).

3.2 INFRASTRUCTURE

The distribution of infrastructure in the district is varied and in some cases inadequate and uncoordinated. Some facilities have been constructed without due regard to the availability of other complementary facilities; for instance a health centre being constructed in an area that is not accessible by road, on a market centre with no water. Because of this some facilities are not fully utilized. The other major bottleneck has been noted in the implementation of agricultural programmes, the need for accessibility through a transportation network cannot be over emphasized. The district education board co-ordinates and runs all educational institutions and activities in the district from nursery through primary, secondary and continuing education. The educational administration follows the same boundaries as the provincial administration.

Table: 3.1 Enrolment rates for Primary Schools

YEAR	BOYS	GIRLS	TOTAL
1986	70,401	63,633	134,034
1987	74,032	66,820	140,852
1988	76,374	69,662	146,036

Source CBS (1987)

Table: 3.2 Enrolment Rate for Secondary Schools

YEAR	BOYS	GIRLS	TOTAL
1986	8,673	4,263	12,936
1987	11,527	5,628	17,155
1988	10,047	5,519	15,566

Source CBS (1987)

The number of girls in schools almost equal that of boys in primary schools course. The number drastically drops to half of boys in secondary schools. The growth of secondary schools has been slow, at the rate of 4-5 school annually. This is because secondary schools are started through the interest and efforts of the community. The projected nursery school numbers over the period were 500 in 1989, rising to 680 by 1993. There are 563 primary schools and about 113 secondary schools.

3.3 TECHNIQUES OF DATA COLLECTION

The appropriate methodology to estimate child survival indices is mainly dictated by the type and quality of data one has. The quality of data depends largely on the method of data collection.

In this study I required the following information:

- (a) Total number of children ever born (CEB) and the total number surviving among the ever born classified by age of mothers at the time of the survey (for the sampled mothers).
- (b) Children dead (CD) by age group of mothers (sampled mothers)
- (c) The data collected specified differentials of education categorized into the following categories:
 - (i) Women with no education
 - (ii) women with Primary education
 - (iii) Women with secondary education plus.

The study specifically focused on mothers falling under the child bearing category (15-49 years). Children of interest were from 0-5 years of age because these are the ones who fall under the risk group or they are more prone to diseases that easily cause child mortality as compared to the older children.

The collected data was used to assess the survival of children under each category of women classified into seven groups using 5 year classification for women of

reproductive age group (15-49 years). Under age groups 15-19, 20-24, 25-29, 30-34, 35-39, 40-44, 45-49. The effect of mother's age on child survival was also analyzed under each category.

3.3.1 Sample Design

The study involved a cross section of women of the study area sampled to represent the true population of the study area.

Sampling was carried out in two stages. The first stage of sampling was where the villages in Winam and Nyando were treated as a cluster of units. (The villages in this region are similar to the ten households called "Mji Kumi" under a village leader). The same case applied for Kisumu Municipality where different estates were treated as, a cluster of units. All the villages and estates (clusters) were listed down and then by using a simple random technique the clusters to be studied were selected, and finally the households.

In the second stage of sampling, simple random technique with replacement (SPWR) was used to sample 391 households for analysis. While in the households the eligible women (15-49 years) were selected for interview. In cases where more than one eligible respondent was present in the household, a simple random technique was again used to select one respondent.

The sampling was done in two stages, so as to enable the researcher to easily sample out evenly the sample size required. For example, a two-stage sample here consisted of first taking a random sample of villages/estates and then taking a random sample of households from each selected village. The villages/estates would be called first stage units and the households second stage units. The advantage of using this was that resources would be concentrated in a limited number of places and that a sampling frame was not needed for the whole population. A list of first stage units was required, but second stage units need only be listed for those first stage units which were selected.

In the second stage of sampling, simple random technique with replacement (SPWR) was used. The main reason for using this technique was to save time and resources. Once a selected household had no eligible candidate that household was replaced there and then, by using simple random technique.

The sample size was determined statistically by using the formula given below. To determine the sample size, it was assumed that there are variations in proportions of children who die below age of 5 years between the urban and rural settings. The proportion for the urban area was assumed to be 0.3 (or 30%) while that of rural area to be 0.5. These proportions were drawn from a study carried out by Ndede(1990), in Kisumu district on child survival differentials. To have a 90% confidence of detecting the true difference between the two settings and testing the null hypothesis

of no difference versus the alternative of $P_1 - P_2 = 0$ at the 5% level we require 101 women from each area or division. The following formula was used:

$$n = \frac{\{Z_{1-\alpha}\sqrt{2P(1-P)} + Z_{1-\beta}\sqrt{P_1(1-P_1) + P_2(1-P_2)}\}^2}{(P_1-P_2)^2}$$

where

- n = sample size to be determined
- P = Proportion of children dying below age of five years from a rural setting.
- P₁ = Proportion of children dying below age of five years from an urban setting.
- P₂ = Proportion of children dying below age of five years from a rural setting.
- P = $\frac{P_1 + P_2}{2}$
- α = Type I error and β = type II error
- Z_{1-α} = Standard errors from the mean corresponding to 100 (1-α) % confidence level.
- Z_{1-β} = Standard errors from the mean corresponding to 100(1-β)% power.

The 101 women from each division was rounded off to at least 120 respondents from each of the three divisions giving a total of at least 360 respondents to be interviewed. But the researcher chose to interview 400 respondents and the main purpose of this was to allow for the questionnaires that were not well answered or incomplete. However at the end of the field study 391 questionnaires were analyzed and nine questionnaires were destroyed since they had distorted and incorrect

information.

The researcher first and fore-most explained the purpose of coming to that particular household before any interview was conducted. Once permission was granted by the respondent the interview was then carried out. The purpose of all this was to ensure smooth running of the research exercise and ensure that almost, if not all, questions could be answered.

3.2.2 Data Collection

A method that was considered to be appropriate as a tool of data collection in this study was mainly the interview schedule (questionnaire). This method was found to be appropriate because it facilitates probing, and can be used in areas of illiteracy. It provides room for clarification, where questions are not clear. This method was heavily supported by two other methods of data collection namely; simple observation and available data (documentation), simple observation was used to confirm some of the verbal statements given by the respondents. Most of the information was collected by the researcher and two research assistants over a period of three months.

The Research Assistants were trained before proceeding to the field and their primary objective as Research Assistants was explained. Their duty was mainly to ask questions and record the answers correctly and to make every effort to obtain

complete and accurate answers. The success of the study depended upon the public's willingness to co-operate. It was our duty therefore to ensure this co-operation by being always polite, patient, tactful and friendly. The Research Assistants during their training were taught on how to approach the study population and how to conduct themselves appropriately. An enumeration manual was developed by the researcher to assist the Research Assistants to understand what was expected of them, who to interview, how to approach the respondents, what to do if there was no eligible respondent at home and the survey methodology. The enumerator's manual also contained definitions of certain terminologies that were used in the questionnaire.

During the training I went through the questionnaire to ensure that the Research Assistants understood the questionnaire well and were in a position to translate it into Luo and still maintain the question as it were without any distortion of information or misunderstanding.

The researcher and the research Assistants pretested the questionnaire in the divisions under study. A sample size of 40 people were sampled for the purpose of pretesting the questionnaire. However, after the pretesting, about five questions had to be paraphrased to ensure clarity of what the question was asking. Two more questions had to be added to ascertain some of the answers given. During the entire research exercise, the Luo language was used for interviews.

a) The Interview Schedule (Questionnaire)

The study's questionnaire contained both structured and unstructured questions. The unstructured or open ended questions gave the respondents the freedom to decide on the form, detail and length of their answers. This helped to gain more insight and knowledge, some of which was not anticipated, from the respondents. It sought to collect child survival information which include the age, socio-economic status of the respondents, age at first birth, age at first marriage, education (level of schooling) and other proximate determinants of child survival through education which includes:-

(i) Maternal factors

1. Age of child bearing
2. Birth Interval

(ii) Environmental factors

Indices that are known to be correlated with the levels of biological contamination of the environment i.e. water contamination, waste disposal and other modes of contamination which directly influences child survival

(iii) Health care

1. Mother's awareness of hygienic conditions
2. Immunization
3. Breast feeding e.t.c.
4. Family Planning

The questions in the questionnaire were geared towards answers which could provide more information on the subject under study. There were nine(9) sections within the Interview schedule. The first section was on personal details and background information of the respondent, including education

2. Maternal History
3. Reproductive History
4. Work status
5. Pregnancies and Breastfeeding
6. Weaning foods
7. Water and latrine usage
8. Health, Health education and family Planning
9. Traditional Practices

(iv) Information on Morbidity and Mortality

Questions on fertility and mortality for Instance, when a woman was asked to state her total number of births, there was a further probing question on the number of her live births that survived until the time of the interview. The discrepancy between her total births and those who survived upto the study period indicated the proportion that died some time before the study period. Cases where one reported that some of

their/her children had died before the time of study were asked to report on age of each child, when the child was born, when the child died and the cause of death.

Each respondent was asked to state the common diseases of children below the age of five. The purpose of this questions was to establish the major diseases of children in Kisumu district.

The researcher ensured confidentiality on the part of respondents and their responses by carrying out the interviews in total absence of a third party to avoid fear of publicity on the respondent's or misconception and misunderstanding on the part of the third party. Respondents were briefed on the purpose of the interview and made to understand that it was purely an academic exercise.

b) Simple Observation

The observation method was employed whenever it was possible as an attempt to support some of the verbal statements made by the respondents. By using both the observation and the interview schedule the data obtained was made richer and this method greatly enhanced the researcher's understanding of the problems the study was attempting to investigate.

Observation in this study involved observing the respondent during the interview, as

well as observing the physical conditions of both the mother and the children under the age of five as well as the immediate environment.

c) Available Data

Available data (documentation) was used to obtain more information for the study. Hospital records on maternal child health and family planning (MCH/FP), and general health records were used as an extra source of information. Studies carried out before were also consulted.

3.4 FIELD EXPERIENCE AND POSSIBLE SOURCES OF ERROR

The actual interviewing exercise proceeded on well, although certain problems were encountered in the course of the research period.

One of the major problems that the researcher encountered is that, in the initial stages there was lack of co-operation between the researcher and the respondents. The respondents had this feeling that they had been subjected to too many people interviewing them for research or academic purposes but they had never gained much from such researchers or studies. For example many respondents in Nyando Division commented that many researchers have often recorded problems of their community i.e. water problems and poor sanitation; but the community members have hardly had those problems minimized as a result of any research findings carried out. Due to this,

the attitudes expressed by many respondents in the area were not in favour of research and would therefore at times refuse to give out any information required by the researcher. This to some extent explains why some respondents could not answer all the questions asked correctly i.e information on income, number of children born, number of children dead, actual age e.t.c. Considering that some of the respondents were not giving the right information which they themselves knew, cross checking some of the information given was not an easy task. This was a problem that could possibly be a source of error, accounting for understating or overstating

figures related to income, age, level of education and family size. However the incorrect data was discarded.

As opposed to Nyando, Winam respondents were used to these kind of studies and were willing to give information more freely. In Kisumu municipality it was more difficult to deal with the respondents because they were of higher level of education and thus social status. They (respondents) felt that the researcher was intruding into their personal affairs and as such were not willing initially to part with any information.

Another problem faced in Nyando mainly was that most of the homes are scattered. The researcher had to walk long distances before reaching the next homestead unlike the municipality and part of Winam where homesteads were fairly close. Another

problem faced was that getting the eligible respondents at home. This made the fact finding exercise difficult.

A problem was encountered in obtaining information on infant and childhood mortality especially since parents did not want to think of their dead children. In most cases the respondents could not remember the age of the deceased child at the time he or she died.

In all cases the researcher had to translate the interview schedule into the vernacular language during the interview process. The translation from English to Luo was rather time consuming and led to loss of accurate and exact information. Whenever the translation is done, information can be distorted and this can be a limiting factor. However this was not much of a problem since all Research assistants were Luos and had gone through a training which ensured that all questions were asked and recorded correctly. On the whole the exercise was very challenging on the part of the researcher and very useful and reliable data was gathered for the purpose of this study.

3.5 METHOD OF DATA ANALYSIS

Data collected was first coded using a codebook or a coding manual which had been prepared. The coded data was entered into a computer using Dbase III programme and analyzed using statistical package for social sciences (SPSS). A printout of the

entered data was produced and counter checked with the data forms to check for errors which were then corrected before starting the analysis. Preliminary analysis involved production of frequency distributions for all variables and cross-tabulations for some variables

Different statistical techniques were used depending on the nature of the variables and their relevant levels of measurement. The various statistical methods were used to assess the association of the variables to child survival and also to determine the degree of significance of the observed phenomena. The data obtained from the study was both qualitative (mainly categorical) and quantitative. For qualitative data chi-square statistic was used to test for any association between two qualitative variables.

$$\text{chi-square } (\chi^2) = \frac{(O-E)^2}{E}$$

where O is the observed frequency and E, the expected frequency.

In this study a chi-square statistic was accepted as valid if the expected frequencies from all cells were greater than 5 or at most one cell out of 6 had an expected frequency less than 5 but greater than 1. Where possible, rows and columns were combined to overcome the problems of expected frequencies being less than 5. For 2X2 contingency tables, Yates correction was applied and small observed frequencies, Fishers exact test was used.

For $2 \times K$ (where $K > 3$) contingency tables, where an association was found to be significant and there was an apparent increase or decrease in proportions from one category to the other, two further tests were done to determine whether there was a linear trend in proportions. These tests are chi-square for linear trend and chi-square for deviation for linearity.

For quantitative data e.g. age at first birth and age at first marriage, the students t-test was used and where grouping variable had two categories; one way analysis of variance (ANOVA) was used where grouping variable had three or more categories. For quantitative data, the variance ratio test was checked first to see whether it was significant in order to determine whether a T-test with a pooled variance or separate variances for the groups should be used in the analysis. Where significant differences were found in one way analysis a multiple range test using Scheffee's method was applied to identify the groups that differed from each other.

To identify the variables that mainly contribute to child mortality, multiple regression analysis was also done by fitting variables to the model below. This was possible for only quantitative data.

$$Y = a + bx_1 + bx_2 + \dots + bx_h + \text{where } x_1, x_2, \dots, x_h \text{ are fitted variables e.g. age at first birth, age of respondent, age at marriage e.t.c}$$

To get a best subset of variables that influence the number of dead children in a household, stepwise method was used to enter the variables into the model. The variables fitted into the model and those retained are given in Chapter 5.

Data was analyzed according to the objectives of the study which were similar to the hypothesis. The first objective which was, to find out whether mother's formal education creates awareness on the importance of preventive measures such as immunization or personal illness control; the following dependent variables which could prove or disprove the hypothesis were considered:-

- antenatal clinic attendance
- foods eaten while pregnant
- immunization attendance
- duration of breastfeeding
- Clinic attendance when children are sick
- Nutritional value e.t.c.

For the section of nutrition a classification was given to the various types of food.

Two categories were to be considered here:-

- (i) Balanced diet (if foods eaten have carbohydrates, proteins, vitamins and minerals)
- (ii) Unbalanced diet (if one of the above was missing)

For the second objective which was "To determine whether maternal education influences the choice of the family size and contraceptive use". The dependent variables considered/analyzed were:-

Total number of children ever born

Total number of children living

Family planning awareness

Clinic attendance for Family Planning

Total number of children dead

Objective No: 3

"To examine whether education delays marriage and hence delays age at first birth."

The following dependent variables were considered:-

Age at first marriage

Age at first birth

Objective No 4:

"To determine whether education influences the availability and utility of latrines"

The following dependent variables were taken into account:-

Availability of latrines

Place of rubbish disposal (waste)

Place of defecation for children

Objective No: 5

"To determine whether education affects the choice of improved water usage."

Dependent variables considered were:-

Source of water

Source of drinking water

Are they good sources of water

Boiling of drinking water

Objective No: 6

"To examine the inter-division variation in child survival"

Dependent variables considered were:-

Total number of children ever born

Total number of children dead

Total number of children living and all the above variables for the other objectives.

The analysis of this study was done in three parts as follows:-

- (i) Taking mother's education as an independent variable and using the given educational level categorization:
 - (a) No education
 - (b) Primary education
 - (c) Secondary education and above
- (ii) Taking age group of mothers (5 years classification) as the independent variable. Only those variables which can be influenced by age were considered.
- (iii) Taking the different divisions as the independent variable.

The results of the analysis given in chapter four highlights the variables used during the analysis that are influenced by education, age group or division. The next Chapter mainly deals with data presentation using frequency tables and percentage tables. The chapter finally deals with the implication and effects of formal education on child survival.

CHAPTER FOUR

PRESENTATION OF DATA

The main purpose of this chapter is to present the data gathered from the field using simple descriptive statistics. The data was collected from three divisions of Kisumu district mentioned in the previous chapter. The total sample size used for analysis was 391, of this 123 were from Nyando division, 124 from Kisumu Municipality and 144 from Winam division.

Since this study is attempting to explain how proximate determinants affect child survival through maternal education, it is considered appropriate to take note of certain background characteristics of the respondents and their physical environment so as to give an insight into the type of people the study was dealing with and this will include the respondent's age, education, ethnic group, religion, marital status and occupation.

4.1 AGE

A description of age distribution of the female respondents is very important for this

analysis, since fertility of a woman refers to the number of live births she has had, taking her age into consideration. The age category of the respondents interviewed during this study period ranged between 15-49 years (women who fall under the bearing age bracket).

Table 4.1 : Age Distribution of Respondents

AGE DISTRIBUTION	FREQUENCY	(PERCENTAGE)
15-19	82	(21.0)
20-24	94	(24.0)
25-29	89	(22.8)
30-34	55	(14.1)
35-39	40	(10.2)
40-44	24	(6.1)
45-49	9	(1.8)
TOTAL	391	(100.0)

From the table above it is shown that there were more women in the age category of 20-24 than in the other categories. This age category had 94 respondents which was 24% of the entire sample size. The age group with the least number was that of 45-49 which had 9 respondents representing 1.8% of the entire sample size.

Table 4.2: Age of Respondents and their level of Education

AGE GROUPS	NO EDUCATION N (%)	PRIMARY EDUCATION N (%)	SECONDARY AND ABOVE NO (%)	TOTAL N (%)
15-19	1 (1.2)	55 (67.1)	26 (31.7)	82 (100.0)
20-24	3 (3.2)	52 (55.3)	39 (41.5)	94 (100.0)
25-29	8 (9.0)	39 (44.0)	42 (47.0)	89 (100.0)
30-34	4 (7.3)	26 (47.3)	25 (45.4)	55 (100.0)
35-39	13 (32.5)	14 (35.0)	13 (32.5)	40 (100.0)
40-44	5 (20.8)	12 (50.0)	7 (29.2)	24 (100.0)
45-49	2 (28.6)	4 (57.1)	1 (14.3)	7 (100.0)
TOTAL	36 (9.2)	202 (51.7)	153 (39.1)	391 (100.0)

N - Number

The 25-29 age group had more respondents with secondary education and above. The age group had 42 respondents (with secondary education plus) whereas 45-49 age group had the least, only one with secondary education or higher. The 35-39 age group had majority of the respondents with no education (See table 4.2).

Table 4.3 : Husband's level of Education

LEVEL OF EDUCATION	FREQUENCY	(PERCENTAGE)
NO EDUCATION	23	(7.9)
PRIMARY EDUCATION	129	(44.5)
SECONDARY AND ABOVE	138	(47.6)
TOTAL	290	(100.0)

4.2 MARITAL STATUS

In this study there were five different categories of marital status of the respondents sampled. However, the majority (66%) of the respondents were married.

Table 4.4 : Marital Status of the Respondents

MARITAL STATUS	FREQUENCY	(PERCENTAGE)
MARRIED	258	(66.0)
WIDOWED	13	(3.3)
DIVORCED	9	(2.3)
NOT LIVING TOGETHER	14	(3.6)
SINGLE	97	(24.8)
TOTAL	391	(100.0)

It is also important to note that more than half of the married cases, were in a polygynous union, for example, Winam and Nyando had majority (94 respondents) of such cases. In Luo community just like other African Societies, polygyny is encouraged and practiced.

The effect of many types and forms of marriage has not been sufficiently studied. The complex family structures must be having some impact on fertility; and the changes that occur in some of them must also have impact on fertility levels and differentials.

Majority of the single parents sampled were in Kisumu Municipality and had a lower fertility rate, and this explains why the ratio of child survival was higher among the single parents as compared to the married group, contrary to what one would expect.

Majority, (27.1%), of the respondents who were married were in the age group of 25-29 years followed by those in the age group of 20-24 years with a percentage of (24.8). The single status was more predominant (55.7%) with the age group of 15-19 years, followed by the age group of 20-24 years with a percentage of (30.9).

4.3 ETHNICITY/TRIBE

The sample was almost wholly composed of members of the Luo Community. Winam and Nyando Division are exclusively inhabited by the Luo ethnic group, whereas the municipality had few other tribes who had migrated into Kisumu town.

4.4 RELIGION

There were a number of religious groups common in the areas interviewed/sampled but Catholics, Protestants were predominant. Majority of the respondents were regular church goers.

Table 4.5 : Religious Affiliation of the Respondents

RELIGION	FREQUENCY	(PERCENTAGE)
CATHOLIC	116	(29.7)
PROTESTANT	201	(51.4)
OTHERS	74	(18.9)
TOTAL	391	(100.0)

4.5 INCOME AND OCCUPATION

Small scale agriculture and fishing were the most important sources of household income. Incomes, however were difficult to measure because no proper records are kept and income from other sources was not always accurately recalled. Livestock farming was being practiced but at a subsistence level in Winam and Nyando. Very few attempts have been made to commercialize it. All the cattle kept in the homesteads were all local (Zebu) breeds. A few homes also kept sheep and goats. Most of the farmers in Winam and Nyando kept poultry, although the productivity was low.

Most of the crops grown are maize, beans, rice, cotton and in some cases vegetables. In Nyando division there was low agricultural productivity which was being hampered by recurrent drought, floods and inadequate extension services. This gives the division poor or no sufficient source of income. Of the 184 respondents, 104 were wage earners, 76 were self employed While 4 did not indicate their type of job.

Majority of the wage earners were found within the municipality.

Majority of the respondents (59.6%) bought food from the market, whereas 0.8% got food from the garden. The remaining percentage got their food from both market and garden.

Table 4.6: Distribution of Working Respondents

WORKING WOMEN	FREQUENCY	(PERCENTAGE)
YES	184	(47.1)
NO	207	(52.9)
TOTAL	391	(100.0)

Table 4.7 Wife's Main Job

TYPE OF JOB	FREQUENCY	(PERCENTAGE)
WAGE EMPLOYED	104	(57.8)
SELF EMPLOYED	76	(42.2)
TOTAL	180	(100.0)

missing cases 4
N/A 207

Table 4.8: Husband's Main Work

TYPE OF JOB	FREQUENCY	PERCENTAGE
WAGE EMPLOYED	152	54.0
WORKING IN OWN'S FARM	15	5.0
WORKING ON SOMEONE'S FARM	9	3.0
BUSINESS	74	27.0
SELF EMPLOYED	27	10.0
NONE	2	1.0
TOTAL	279	100.0

4.6 EDUCATION

The education levels of the respondents sampled varied widely. Table 4.9 shows the distribution of respondents in the three divisions by their level of education.

Table: 4.9 : Respondents Level of Education

LEVEL OF EDUCATION	FREQUENCY	(PERCENTAGE)
NO EDUCATION	36	(9.2)
PRIMARY EDUCATION	202	(51.6)
SECONDARY EDUCATION AND ABOVE	153	(39.1)
TOTAL	391	(100.0)

From table 4.9, it is indicated that only 36 (9.2%) respondents out of the entire sample size did not have any formal education. Majority of the respondents had

Primary education, and then followed by respondents of secondary education and above. In this study education was treated as an independent variable. High levels of education were closely linked with many other proximate determinants and other intervening variables that affect child survival. Maternal formal education being the major variable in this study, it will be given more emphasis in the following chapters.

4.7 SOURCES OF FAMILY PLANNING AND HEALTH INFORMATION

Most respondents stated different sources of Information. In the study findings, 272 or 69.6% of the respondents reported having a radio (mass media) which acted as their main source of Information . However other respondents got their information from the health centres besides the mass media. Those respondents who did not own radios reported having their information from community health workers besides the clinic source . Out of all the respondents interviewed 95.7% reported as having health facilities within reach, and only 4.3% did not have any health facilities within easy reach, but the furthest distance to a health clinic was 11 kilometers. The fact that transport was a serious problem in certain divisions, especially in Nyando, this distance of 11 km was considered too far.

About 225 (57.5%) respondents had heard of ORS (oral rehydration solution) and 36.6% reported having used it before. Most mothers (37.4%) who gave their children

supplementary foods at the right age (4 months) reported having been taught the composition of the weaning foods at the health centres by the nurses .

4.8 FACTORS RESPONSIBLE FOR INFANT/CHILD MORBIDITY AND MORTALITY

There were mortality differentials in the three divisions. This indicates that there are geographical variations in mortality in the sampled areas. The infant and child mortality rates differed with Winam division reporting the highest infant and child mortality rate. The death rates for Nyando, municipality and Winam were 204, 113 and 239 per thousand live births respectively.

At childhood ages of one-five years, a strikingly high percentage of deaths was caused by measles. Malnutrition and diarrhoea were also found to be leading causes of death for children under the age of five. Other diseases that were ranked as causes of Infant and Child Mortality were pneumonia and malaria. Malnutrition was a severe problem in Winam and Nyando at the time of the study.

This study revealed that the majority of the children under five who died of measles were not fully immunized and this was especially so with children of mothers with primary or no education.

The respondents considered child illness to be mainly:

1. Measles
2. Diarrhoea
3. Malnutrition
4. Worms
5. Malaria
6. Pneumonia
7. Anemia
8. Skin diseases
9. Flu

The following diseases were regarded as adult diseases in order of prevalence

1. Typhoid
2. Malaria
3. RTI (Respiratory tract infection)

4.9 MISCARRIAGE AND STILLBIRTH

The rate of intra-uterine mortality is estimated globally to be around 12%-15% with rates being lowest amongst women in the early twenties, rising gradually to the mid thirties and remaining at high level thereafter (Bongaarts and Potter 1980). In the case of this study, for the three divisions, low levels of miscarriage and still birth was recorded. In the entire study only 9 still births were reported and 13 miscarriages.

It is likely that in both cases miscarriages and stillbirths have been under reported. The main causes of death, as deduced from hospital records are complications of labour and low birth weight which contribute more than a half the early neonatal deaths. After the first week of birth, infections were the most important cause of death, mainly respiratory infections, with gastro intestinal infections becoming an important cause of death after the age of 6 months and measles after 9 months.

The highest infant mortality was found in Winam Location followed by Nyando and finally Kisumu Municipality.

4.10 HYGIENIC CONDITIONS

The majority of the respondents in Winam and Nyando got their drinking water from a river or a well, or more often from a dam. None of the families visited had tap water in their compounds. Few homes had latrines and used them, but a proper clean latrine was an exception. In the majority of households at least four people shared one bedroom. In some cases, some people shared their rooms with chickens and goats at night.

A significant difference was found between the three divisions of Winam, Nyando and Kisumu municipality. Kisumu municipality being in an urban setting, almost all homes

had running tap water and latrines. The hygienic conditions were not as poor as those observed in Winam and Nyando. Boiling of drinking water was more of a luxury to most households.

When walking through Nyando and Winam divisions, one does not get the impression of a particularly prosperous area: housing, sanitation, communications and basic medical provisions are poor, and another unfavorable aspect in Nyando is the climate; mainly the problem of floods in the Kano plains.

Under all the circumstances mentioned above, it seems that parental care and foresight is more important for the children's well being than actual income or possessions.

CHAPTER FIVE

TESTS OF HYPOTHESES AND INTERPRETATION OF THE FINDINGS

The study endeavored to establish how proximate determinants affect child survival through maternal education. In this chapter the information gathered is used to test the study's hypotheses. The interpretation of the study findings is presented in greater depth.

5.1 AGE AT FIRST MARRIAGE AND AGE AT FIRST BIRTH OF RESPONDENTS

A description of age distribution of the female respondents is very important since fertility of a woman refers to the number of live births she has had taking her age into consideration. The findings of this study highly support the hypothesis stated in chapter one that "Education tends to delay marriage and hence delay first conception". The age at which women marry is increasing in much of the world and this implies that there is more time for education, more time to learn job skills and this in turn results in maturity of women both physically and socially before starting a family.

In African societies the transition from childhood to adulthood was rapid. Girls married at early ages, infact shortly after reaching puberty. But now with education being

advocated for both boys and girls as a necessity for better paying jobs; marriage then tends to come later in life. However, in most cases fewer girls are being educated as compared to boys at the Secondary level and the discrepancy is greater at the post-professional and vocational training. With no education most women tend to enter matrimony for lack of a better alternative and hence start an early childbearing career and early motherhood.

The first hypothesis stated above was tested using a one-way analysis of variance test of significance. The findings revealed that there is a significant difference in age at first marriage ($F_{2,284} = 41.96$; $P < 0.001$) and age at first birth ($F_{2,288} = 28.65$; $P < 0.001$) among the three education levels, with secondary and above differing from no education and primary education categories (see table 5.1).

Table 5.1 : Age at first marriage for each level of education

LEVEL OF EDUCATION	FREQUENCY	MEAN	(STANDARD DEVIATION)
NO EDUCATION	31	17.3871	(4.7235)
PRIMARY EDUCATION	160	17.6563	(2.8988)
SECONDARY AND ABOVE	93	21.3548	(3.1850)
TOTAL	284	18.8380	(3.6723)

$F_{2,284} = 41.96$; $P < 0.001$

Missing cases 10

N/A cases 97

The study revealed that pregnancies occurred as early as 11 years of age while the youngest mother also got married at 11 years. The latest marriage among the respondents occurred at 36 years of age, whereas the latest age at first birth occurred at 34 years of age.

Table 5.2: Age at first birth for each level of education

LEVEL OF EDUCATION	FREQUENCY	MEAN	(STANDARD DEVIATION)
NO EDUCATION	28	17.5714	(3.5842)
PRIMARY EDUCATION	157	17.7134	(3.2789)
SECONDARY AND ABOVE	101	20.8317	(3.4031)
TOTAL	286	18.8007	(3.6647)

$F_{2,286} = 28.65; P < 0.001$

Missing cases 7

N/A cases 98

It is evident from the study's findings that education delays marriage and age at first conception. Factors such as age at marriage are very important and have effects on child survival. Children born when the mother was too young or too old had narrow chances of survival. Age at birth is therefore essential for both the health of the mother and the child. Studies have shown that children born to older women have a much greater risk of having birth defects than to those born to younger women.

Infant and child survival was shown to be affected by factors such as age, parity and birth interval. Infact studies have shown that these maternal fertility factors have an independent effect on the risk of infant and child mortality. Higher risks of infant deaths are biologically associated with child bearing at very young (under 18) and older (over 35) ages, with high parity (over 4) and with short birth intervals (under 1 year). The specific biological mechanisms causing these increased risks are not fully defined, but common features, of many births to these high risk mothers are immaturity and low birth weight, which do not favour child survival.

5.2 MOTHER'S FORMAL EDUCATION AND CHILD SURVIVAL

Mother's formal education as a social factor showed an Independent effect on child survival. Maternal education influences the family life especially the number of children ever born and number of children dead. The study revealed that there is a significant difference in the number of children ever born among the three education levels ($F_{2,290} = 8.870$, $P < 0.001$) with no education level group, differing from the others. There is also a significant difference in the number of dead children among the three education levels ($F_{2,293} = 16.92$, $P < 0.001$).

Table 5.3: Number of children dead for each level of Education

LEVEL OF EDUCATION	FREQUENCY	MEAN	(STANDARD DEVIATION)
NO EDUCATION	30	1.4667	(1.4320)
PRIMARY EDUCATION	161	0.8385	(1.0056)
SECONDARY AND ABOVE	102	0.3725	(0.6737)
TOTAL	293	0.7406	(1.0107)

$$F_{2,293} = 16.92; \quad P < 0.001$$

Mother's formal education was found to play a role on the following variables:-

5.3 PLACE OF DELIVERY

There was an association between place of delivery and education level i.e. the proportions for those who deliver at hospital are not equal for the three education levels. infact the proportion increases as one moves from a lower level of education to a higher level of education ($\chi^2 = 48.75, P < 0.001$). Table 5.4 shows clearly the level of schooling against place of delivery,(see fig.6).

Table 5.4 : Level of Education and place of delivery

PLACE OF DELIVERY	NO EDUCATION (%)	PRIMARY EDUCATION (%)	SECONDARY AND ABOVE (%)	TOTAL (%)
HOSPITAL	9 (5.1)	81 (45.5)	88 (49.4)	178 (100.0)
HOME	13 (17.8)	54 (74.0)	6 (8.2)	73 (100.0)
BOTH	7 (17.5)	26 (65.0)	7 (17.5)	40 (100.0)
TOTAL	29 (10.0)	161 (55.3)	101 (34.7)	291 (100.0)

$$\chi^2 = 48.75 \quad DF = 4 \quad P < 0.001$$

Figures in the bracket indicate row percentage

Missing cases 1

N/A cases 99

Also see fig.6

5.4 PERSONAL DISEASE CONTROL FACTORS

Components of Primary health care like immunization and nutrition were examined in this study and this reflects on the first objective and second hypothesis of the study which stated that "Education creates awareness on the importance of preventive services such as Immunization."

The study revealed that mother's formal education creates awareness on the importance of preventive measures such as immunization and attending the antenatal clinic. Giving balanced weaning foods and foods for under five's, delivery in hospital and starting supplementary foods early was also associated with maternal education. As for the duration of breast feeding those with no education tend to breastfeed longer followed by those with primary education and then secondary education and above. The most likely explanation for decrease in duration of breast feeding from no education group to secondary education is probably due to the fact that majority of the female respondents of secondary education plus were working class female (wage employed). The fact that they were wage employed meant less time to spend with their infants and thus a shorter duration of breast feeding unlike their rural counterparts with no education who spent all their time with their infants (see table 5.5)

Table 5.5: Duration of breast-feeding for each level of Education

LEVEL OF EDUCATION	FREQUENCY	MEAN	(STANDARD DEVIATION)
NO EDUCATION	27	22.6296	(7.9477)
PRIMARY EDUCATION	144	22.4028	(8.1946)
SECONDARY AND ABOVE	92	18.8370	(8.7144)
TOTAL	263	21.1787	(8.5007)

$F_{2,263} = 4.59; P < 0.001$

Missing cases 3

N/A cases 103

Still breastfeeding 22

There was a significant difference in age of supplementary food among the three education levels ($F_{2,263} = 4.59, P < 0.001$) with no education group differing with secondary education and above. There was also a relationship between composition of weaning foods and the level of education ($\chi^2_2 = 13.74; P < 0.001$). The proportion with balanced diet increased in a Linear trend from no education to secondary education and above ($\chi^2_1 = 13.69; P = 0.0002$). There was also an association between foods for under five and level of education. There was a linear trend in proportions with balanced diet from no education to secondary education and above ($\chi^2_1 = 17.34; P < 0.001$) with no significant departure from Linearity ($\chi^2_1 = 2.21; P < 0.001$) see fig. 4 and 5.

Table 5.6 : Age of starting supplementary foods for each Level of Education

LEVEL OF EDUCATION	FREQUENCY	MEAN	(STANDARD DEVIATION)
NO EDUCATION	28	6.0357	(6.2567)
PRIMARY EDUCATION	151	7.2053	(7.1901)
SECONDARY AND ABOVE	97	4.8247	(3.4851)
TOTAL	276	6.2500	(6.1241)

$F_{2,276} = 4.59; P < 0.001$

Missing cases 6

N/A cases 107

Breastfeeding cases 2

5.5 IMMUNIZATION

Of all the child survival Interventions, immunization plays one of the major roles in child survival. The probable at risk population (children least likely to be taken for immunization) were children from large families of low socio-economic status in which their mothers had a low educational level. Studies carried out in different countries have supported this finding, mothers who are illiterate or who have little formal education are less likely to have their children immunized since the immunization acceptance is very low in this category. In this study majority of the respondents with a higher educational level were to be found in Kisumu municipality and this in turn explains why the municipality registered many cases of children who were fully immunized.

5.6 EDUCATION AND FAMILY SIZE

Majority, (57.1%), of the respondents had primary school education (table 4.9). An assessment of the association between education of women and their birth performance was based on two categories. The hypothesis that mothers with formal education tend to have fewer children as compared to mothers of no education was examined. This was analyzed under the context in which education affects family size and contraceptive usage.

The number of children a woman had affected the chances of having a successful pregnancy and a child who survives. The family size as well as birth spacing affected the nutritional status of children. The more children in the family, the larger the proportion of the family income spent on food, but less food per person. This can result in a higher rate of malnourished children in large families.

Table 5.7 : Level of Education and number of children ever born

LEVEL OF EDUCATION	FREQUENCY	MEAN	(STANDARD DEVIATION)
NO EDUCATION	30	5.3333	(3.0210)
PRIMARY EDUCATION	161	3.9814	(2.6492)
SECONDARY AND ABOVE	102	3.2059	(2.0554)
TOTAL	293	3.8498	(2.5679)

$$F_{2,293} = 8.87; \quad P < 0.001$$

The study revealed that majority of women who had many children had no education. It is indicated in the study findings that women who went to school constitute the majority of women who have small family sizes. Hence the study revealed that on the whole women who never went to school tend to have larger family sizes. This finding supports the hypothesis that mothers with formal education tend to have fewer children than their counterparts.

5.7 EDUCATION AND FAMILY PLANNING

Very interesting results were revealed when it came to education and contraceptive knowledge and usage. In all cases regardless of the level of education, majority of the respondents were aware and had knowledge of family planning, (see fig.2). However as it is revealed in table 5.8, the clinic attendance for family planning services was very low.

Table 5.8 Family planning clinic attendance for each level of Education

FP CLINIC ATTENDANCE	NO EDUCATION (%)	PRIMARY EDUCATION (%)	SECONDARY AND ABOVE (%)	TOTAL (%)
YES	3 (2.1)	50 (36.0)	86 (61.7)	139 (100.0)
NO	33 (3.4)	149 (60.3)	65 (26.3)	247 (100.0)
TOTAL	36 (9.3)	199 (51.6)	151 (39.1)	386 (100.0)

$\chi^2 = 50.94$ D.F = 2 P < 0.001
 Figures in the bracket indicate row percentage
 Missing cases 5

Because of the risks to fetal and infant health, linked with short intervals, high birth order, and maternal age, family planning can make a substantial contribution to child survival. When women have access to family planning information and contraceptive methods, many of them choose not to have children too early or too late. Family planning therefore could improve the health of women by helping them to avoid high risk pregnancies. Majority of the family planning users appeared to be mothers with higher formal education. This implies that formal education creates appreciation and better understanding about contraceptive usage.

Out of the 391 respondents 361 (92.3%) respondents were aware of Family Planning. Out of these cases mentioned only 36.0% were attending family planning clinics; Hence there is an association between family planning clinic attendance and formal education ($\chi^2_2 = 50.94$; $P < 0.001$). This shows a linear trend in proportions for those who use modern contraceptives from respondents with no education to secondary and above level of education ($\chi^2_1 = 49.01$; $P < 0.001$) with no significant departure from linearity.

5.7 WATER AND SANITATION

Water and sanitation were given special emphasis in this study because they promote child health and survival. Improved water supply and sanitation may improve the aesthetic quality of life. A clean water supply and a hygienic toilet are believed to be

cornerstones of those environmental and social changes that produce the dramatic decline in infectious diseases. Morbidity, infant and child mortality can significantly be reduced by preventive measures where improved water and latrine usage are central concepts of preventive medicine and public health.

This study showed that latrine usage in certain study areas was minimal and the usage of improved water was low. However from observations made in Nyando during the field study, there were latrines in certain homes that were never used. This was evident from the fact that there were no paths leading to those latrines. In cases where there were no latrines, the following reasons were given and in all cases similar cultural traits and taboos were identified. Some of the reasons given were as follows:-

- . A mother in law does not share a latrine with her son inlaw
- . The position of the latrine affects the choice of latrine usage by the head of the household, hence, The latrine should not be constructed in front of the homestead.
- . Mothers don't share latrines with their married children.
- . Poor soil composition because most homes claimed that their latrines sunk during the rainy season, thus it was expensive to put up and maintain latrines. A few elders claimed that now latrine usage was being encouraged by the existing environment which is bushy.

Most families in Nyando and part of Winam reported using the bush as their "helping place" or their gardens in the absence of latrines. The study findings revealed that majority of the respondents who used the bush or garden as their "helping place" i.e defecating place were of no education or lower primary education. These were the same respondents who did not show any concern as to where their children went to defecate. When asked by the researcher where their children under five went to defecate, they answered that this was done outside the house.

The problem was that the respondents were not able to associate child morbidity and mortality and the general health of the community with their ways of life. For example non-usage of latrines and usage of contaminated water has not been well correlated to diarrhoea, worms and amoeba amongst other infectious diseases. The diseases mentioned above are some of the major causes of infant/child morbidity and mortality.

The study showed that there is an association between toilet availability and the level of schooling ($\chi^2_2 = 19.73$; $P < 0.001$) which can be described in terms of a linear trend in proportions for those with toilets from no education category to secondary level and above. ($\chi^2_1 = 19.3$; $P < 0.001$) with no significant deviations from linearity. This finding is in agreement that education influences the availability and utility of latrines.

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Table 5.9 Availability of latrines for each level of education

LEVEL OF EDUCATION	YES (%)	NO (%)	TOTAL (%)
NO EDUCATION	24 (68.6)	11 (31.4)	35 (100.0)
PRIMARY EDUCATION	168 (84.0)	32 (16.0)	200 (100.0)
SECONDARY AND ABOVE	143 (94.7)	8 (5.3)	151 (100.0)
TOTAL	335 (86.8)	51 (13.2)	386 (100.0)

$$\chi^2 = 19.73; \quad D.F. 2 \quad P < 0.001$$

Missing cases 5

Figures in bracket indicate row percentage

5.8 WATER USAGE

The study revealed an association between boiling drinking water and formal education ($\chi^2 = 14.28; P < 0.001$) which can be described in terms of a linear trend in proportions from no education to secondary level and above ($\chi^2 = 11.93; P < 0.001$) with no significant departures from linearity ($\chi^2 = 2.35; P = 0.12$). This clearly illustrates that education influences use of drinking boiled water (see table 5.10 and fig. 8).

Majority of the homes in Nyando got their water from the stagnant ponds and river Nyando, whereas the municipality and Winam mainly got tap water. Majority of the respondents to some extent knew the importance of boiling drinking water but ironically many of the homes visited did not boil water. This was especially so for Winam and Nyando.

Through the study findings and even through observations made, it was established that the source of clean water especially in Nyando division was a problem.

Table 5.10 Women boiling drinking water for each level of education

LEVEL OF EDUCATION	YES (%)	NO (%)	SOMETIMES (%)	TOTAL (%)
NO EDUCATION	14 (38.9)	22 (61.1)	0	36 (100.0)
PRIMARY EDUCATION	81 (40.5)	116 (58.0)	3 (1.5)	200 (100.0)
SECONDARY AND ABOVE	91 (59.8)	58 (38.2)	3 (2.0)	152 (100.0)
TOTAL	186 (47.9)	196 (50.5)	6 (1.6)	388 (100.0)

$$\chi^2 = 15.79; \quad D.F. 4 \quad P < 0.001$$

Missing cases 3

Figures in bracket indicate row percentage

5.9 THE UTILIZATION OF MODERN AND TRADITIONAL MEDICAL CARE

The Luo community in Kenya is one of the communities that ranks traditional beliefs and practices as being very important. Because of this, they have different perceptions of causes of different diseases. Some of these causes can be classified as follows:-

The Luo traditional rural community believe that a disease like measles is as a result of "chira" (misfortune befalling a family) and because of this, they believe that once a child has measles he/she should never be taken to the hospital, but be treated with traditional medicine and this is by herbal treatment by persons who have the knowledge on how to cure the disease. A problem like that of malnutrition, was associated with witchcraft by some of the respondents in Nyando and Winam. They believed that someone with an evil eye had looked at a child and hence brought about the big stomach and head and the thin legs. Malnutrition was never associated with poor nutritional status.

Most respondents in Winam and Nyando believed that when their children fell sick constantly, an evil power was acting to harm them and their children. Another interesting belief was associated with the cause of still births and infant mortality at birth. The first (still births) was associated to an evil power "juogi" (evil power) who even had the powers to stop pregnancy from occurring or growing. Deaths that

occurred at birth were also associated with such powers. This was believed not only to endanger the child but also the mother. This Witchcraft was not only associated with morbidity and mortality but also with the failure of their crops. When good yields were not forthcoming it was claimed that an evil person had looked at their crops and thus the poor harvest.

When a disease did not respond well to modern medicine, this particular disease was associated with witchcraft.

Table 5.11: Witchcraft existence for each level of education

WITCHCRAFT EXISTENCE	NO EDUCATION (%)	PRIMARY EDUCATION (%)	SECONDARY AND ABOVE (%)	TOTAL (%)
YES	27 (11.6)	140 (60.3)	65 (28.1)	232 (100.0)
NO	9 (5.8)	59 (38.1)	87 (56.1)	155 (100.0)
TOTAL	36 (9.3)	199 (51.4)	152 (39.3)	387 (100.0)

$\chi^2 = 31.06$ D.f = 2 $P < 0.001$
 Figures in the bracket indicate row percentage
 Missing cases 4

This study revealed that there was an association between modern and traditional medicine preference and the level of formal education ($\chi^2 = 17.2$; $P = 0.02$). It further revealed that there is an association between belief in witchcraft and the level of education ($\chi^2 = 31.06$; $P < 0.001$) (see table 5.11).

During the analysis of the study there appeared to be an association between child bewitchment and the level of education ($\chi^2 = 38.54$; $P < 0.001$). This relationship can be described in terms of a linear trend ($\chi^2 = 35.4$; $P < 0.001$) with no significant departures from Linearity ($\chi^2 = 3.13$; $P > 0.05$). There is also a negative association between ever visiting a traditional healer and level of education ($\chi^2 = 30.92$; $P < 0.001$). These findings clearly support the hypothesis number five which stated that

5.1.10

"Education liberates a mother from traditional beliefs that hinder the utilization of modern health facilities".

5.1.11

Table 5.12: Traditional and Modern medicine preference for each level of Education

MEDICINE PREFERENCE	NO EDUCATION (%)	PRIMARY EDUCATION (%)	SECONDARY EDUCATION (%)	TOTAL (%)
TRADITIONAL MEDICINE	4 (10.0)	27 (67.5)	9 (22.5)	40 (100.0)
MODERN MEDICINE	24 (8.7)	125 (45.5)	126 (45.8)	275 (100.0)
BOTH	8 (10.7)	49 (65.3)	18 (24.0)	75 (100.0)
TOTAL	36 (9.3)	201 (51.5)	153 (39.2)	390 (100.0)

$\chi^2 = 17.32$; D.F. = 4; $P = 0.017$

Figures in bracket indicate row percentage

Missing cases 1

5.1.12

INTER DIVISION VARIATION IN CHILD SURVIVAL

There was a significant difference in child survival between the three divisions ($\chi^2 = 18.27$; $P = 0.0001$), the death rates for Winam Nyando and municipality were 239, 204, 113, per thousand respectively.

Table 5.13: Incident of infant and child mortality in each division

DIVISION	ALIVE (%)	DEAD (%)	TOTAL (%)
NYANDO	328 (79.6)	84 (20.4)	412 (100.0)
MUNICIPALITY	267 (88.7)	34 (11.3)	301 (100.0)
WINAM	316 (76.1)	99 (23.9)	415 (100.0)
TOTAL	911 (80.8)	217 (19.2)	1128 (100.0)

$\chi^2 = 18.27$; D.F = 2; $P < 0.001$
Figures in bracket indicate row percentage

There are many reasons as to why children tend to survive more in the municipality as compared to the other divisions. From the findings of this study it is evident that place of residence plays a role on infant/child morbidity and mortality. The municipality is an urban set up where modern health facilities are readily available. For example the majority of the respondents in the municipality had their deliveries in the hospital as compared to the other divisions

Table 5.14: Place of delivery in each division

PLACE OF DELIVERY	NYANDO (%)	MUNICIPALITY (%)	WINAM (%)	TOTAL (%)
HOSPITAL	48 (47.5)	73 (85.9)	57 (54.3)	178 (61.2)
HOME	42 (41.6)	7 (8.2)	24 (22.9)	73 (25.1)
BOTH	11 (10.9)	5 (5.9)	24 (22.9)	40 (13.7)
TOTAL	101 (100.0)	85 (100.0)	105 (100.0)	291 (100.0)

$\chi^2 = 43.93$; D.F = 4; P < 0.001

Figures in bracket indicate column percentage

Missing cases 1

N/A cases 99

Benefits of having to deliver at the hospital for both the mother and the child are well known. In hospital, any complications can be taken care of as compared to home deliveries.

In the municipality most of the children had been fully immunized, followed by Winam and finally Nyando. This further explains why the ratio of child survival is higher in the Municipality. Majority of the dead children (after their first birthday) in Winam and Nyando were not fully immunized. The respondents of the deceased children had stated measles as a major cause of infant and child mortality.

Out of the three divisions the municipality was not just leading in the awareness level of oral rehydration solutions (ORS) but was also leading in the usage of the oral rehydration solutions for helping their children whenever they suffered from diarrhoea.

Table 5.15: Oral rehydration awareness in each division

DIVISION	YES (%)	NO (%)	TOTAL (%)
NYANDO	69 (56.1)	54 (43.9)	123 (100.0)
MUNICIPALITY	79 (63.7)	45 (36.3)	124 (100.0)
WINAM	77 (53.5)	67 (46.5)	144 (100.0)
TOTAL	225 (57.5)	166 (42.5)	391 (100.0)

$\chi^2 = 3.01$; D.F = 2; P = 0.222
 Figures in bracket indicate row percentage

Table 5.16: Use of oral rehydration in each division

DIVISION	YES (%)	NO (%)	TOTAL (%)
NYANDO	48 (72.7)	18 (27.3)	66 (100.0)
MUNICIPALITY	50 (78.1)	14 (21.9)	64 (100.0)
WINAM	45 (72.6)	17 (27.4)	62 (100.0)
TOTAL	143 (74.5)	49 (25.5)	192 (100.0)

$\chi^2 = 0.68$; D.F = 2; P = 0.715
 Figures in bracket indicate row percentage
 Missing cases 1
 N/A cases 198

One of the obvious reasons as to why child survival is higher in the municipality is due to provision of proper weaning foods for the infants and also foods for under five's. The female respondents in the municipality started giving supplementary foods as early as the age of four months. As infants reach the age of four months to six

months they require more food than the mother's milk can provide. Female respondents in the municipality had fewer children and thus were able to cater for their nutritional requirements sufficiently as compared to their rural counter parts in Winam and Nyando, whose source of income could barely sustain the entire family.

The attendance of Family Planning Clinics was more favorable in the municipality as indicated in table 5.17.

Table 5.17: Family Planning clinic attendance in each division

DIVISION	YES	(%)	NO	(%)	TOTAL	(%)
NYANDO	39	(32.5)	81	(67.5)	120	(100.0)
MUNICIPALITY	70	(56.9)	53	(43.1)	123	(100.0)
WINAM	30	(21.0)	113	(79.0)	143	(100.0)
TOTAL	139	(36.0)	247	(64.0)	386	(100.0)

$$\chi^2 = 37.98; \quad d.f=2; \quad P < 0.001$$

Figures in bracket indicate row percentage

Missing cases 5

Factors such as proper nutrition, proper place of delivery, use of oral rehydration solution, immunization attendance, Family Planning Clinic attendance and even preference of modern medicine seems to prevail in the municipality more than in the other divisions because of the higher prevalence of formal education. There were differences in education between the three divisions ($\chi^2 = 146.2; P < 0.001$). 79.1% of the respondents from the Municipality were of secondary education and above while Nyando and Winam had 17% and 23.6% respectively.

It is therefore evident from the study findings that maternal formal education played a major role in the child survival differentials within the three divisions through the above stated variables. These findings are supported by similar findings in a study carried in Kisumu district by Ndede (1990).

Regression analysis was performed to determine which variables play a major role in determining child mortality and also total children ever born. For child mortality, the following variables were fitted into the model described in Chapter 3: - age of respondent, years in school, age at first birth, duration of breastfeeding, age of supplementary food, distance to health facility, number of children taken to traditional healer for treatment and total number of children ever born. Some variables were not included due to their high correlations with other variables listed above and these include:

- (a) Total number of living children which was found to have a very high correlation coefficient of 0.927 with total children ever born and
- (b) Age when left school which had a correlation coefficient of 0.754 with years in school. When such cases arise only one variable should be fitted into the model instead of both.

After fitting the listed variable to the model, only three variables were found to have a significant effect on the number of children dead , this was done using stepwise elimination method. The regression equation for those variables is as given below:-

$$Y = 0.97 + 0.26 X_1 + 0.21 X_2 - 0.05 X_3$$

where

Y = No of dead children

X_1 = Total number of children ever born

X_2 = No of children treated by traditional healer

X_3 = Age of respondent

Although some variables were significantly correlated to the number of dead children, when correlated individually, their effect when measured collectively with other variables was not significant enough for them to be included in the model. The three variables in the model account for 48.7% of the total variation in the variable, number of dead children. The remaining variation may be explained by other variables not fitted into the model such as immunization, family planning clinic attendance, marital status, weaning foods e.t.c.

From the model we can conclude that those with more children are younger and take most of their children to the traditional healer for treatment and hence have more children at risk of dying. For total number of children ever born, the same variables

were fitted into the model with an addition of number of children dead. The following equation was obtained:

$$Y = a + b_1X_1 + b_2X_2 + b_3X_3 + b_4X_4 + b_5X_5 + E$$

$$CEB = 0.734 + 0.25X_1 + 0.9X_2 - 0.186X_3 - 0.027X_4 - 0.066X_5$$

Where CEB = Total children ever born

X_1 = Age of respondent

X_2 = No of children dead

X_3 = Age at birth

X_4 = duration of breastfeeding

X_5 = Years in school

The fitted variables explains 73.5% of the total variation in total number of children ever born meaning that other variables not considered by the study or not fitted into the model explains the remaining variation

CHAPTER SIX

CONCLUSIONS AND RECOMMENDATIONS

The study made an attempt to understand the role of maternal education in influencing child survival. It examined proximate determinants and even to some extent intervening variables that influence infant/child morbidity and mortality through mother's formal education. In general, it can be concluded that the findings of this study highly supported the major hypotheses stated in Chapter two.

Taking certain variables into consideration, a tentative conclusion could be drawn that while formal education seems to have significant influence on age at first marriage, age at first birth, the family size/fertility performance of the respondents, income per se or occupation per se did not seem to have any significant impact on child survival in the surveyed divisions.

On the basis of the study findings, it can be seen that there seems to be many factors which could slow down childhood morbidity and mortality ranging from socio-economic factors to people's values and beliefs.

A brief discussion about some of the proximate determinants which were examined in this study form an important section in this chapter. A single social determinant,

such as the level of education of women can operate to produce very marked improvements in child survival through several intermediate variables simultaneously particularly those social changes that incorporate the scientific concept of disease causation. The three divisions were selected because of their socio-economic composition, showing how features such as age, education affect child survival. In general, the higher development level in Kisumu municipality especially in education was associated with lower infant and child mortality. It was found that the differences in infant and child morbidity and mortality were not, entirely attributable to education and socio-economic differences alone. For example the finding that age at first delivery is significantly higher for some educational levels between women in the three divisions points to the differences in cultural values, different perceptions of child rearing and place of residence. These cultural values obviously, have a bearing on child survival, and further research is needed to bring them more into focus.

The fertility patterns were found to differ markedly between women with education and those with no education over time. A number of proximate determinants and intervening variables were shown to have a strong effect on child survival in all the areas sampled.

From an operational research point of view, recommendations emanating from this study should be implemented, if they are to be of any value in promoting child survival. The study has found that the IEC effort of the formal health sector needs to

be intensified for the promotion of child survival. The need to identify high risk mothers and refer them to centres where they can be delivered under conditions of optimal care and safety is necessary.

These findings indicate that education plays a very important role in the promotion of child survival. It is also indicated that place of residence influences the survival rate of under fives. Children within the municipality (urban setting) had higher chances of survival as compared to children in Winam and Nyando which were a typical example of any rural set up in Kenya.

Most women in Winam and Nyando live on the margin, depending on day to day subsistence activities, with little surplus time for activities that are not essential for daily life. In many mothers' perception, immunization is one such activity, despite a positive attitude towards it.

Attitudes towards immunization ranged from positive to negative. For many mothers, given their incomplete knowledge of immunization and the constraints they face, they tend to neglect the value of immunization. Not surprisingly, these fears were more acute in the less educated mothers. Severe poverty also poses a great barrier to immunization especially in situations where immunization services are not conveniently accessible.

Immunization programs should attempt to provide services close to women's homes or places of work. Many mothers are sufficiently positive towards immunization to seek it if long travel and waiting time is not involved.

In certain cases, maternal negligence, played a role in the under utilization of health services, including immunization. This was especially so in very poor households where there were too many children and mothers lacked resources and supportive networks. These mothers were more likely to neglect immunizing a daughter than a son.

Health workers should develop better communication approaches to overcome parental fears, rumours and misconceptions in the community so as to have better understanding of preventive measure such as immunization in order to raise motivational levels. The motivation depend a great deal on education, poverty and on other circumstances and constraints of the individual mother.

Immunization programs should sufficiently provide education to parents about the value of immunization so that it can be accepted voluntarily. When all preventive services are being provided even free of charge at government health centres, illiteracy and poverty remains an obstacle to use such a facility. Mothers should be provided with ORS education in order for them to adopt it, so that they have confidence in both oral rehydration therapy and their own abilities. Informing mothers about ORS is not

enough but must be taught through demonstrations on how to prepare it so that they understand the severity of diarrhoea and dehydration.

There was lack of clean water, adequate sanitation and appropriate hygiene, which constituted a major health problem. Such unsanitary living conditions and contaminated or polluted water contributed to the spread of diarrhea and other disease such as typhoid.

Waste disposal facilities were inadequate or non existent especially in Nyando. Mere installation of latrines did not mean better sanitation because even where latrines were present, they were often not used. The rural people in Winam and Nyando disliked using latrines. The general practice was for children to defecate anywhere in the compound or in the bush. Children's faeces was viewed casually in contrast to adult faeces, thus constituting an unrecognized mode of disease transmission. There was limited access to safe drinking water. Water was procured from several different sources: Bore-holes, dams, ruins, stagnant pools, stand pipes or taps. Surface water sources like rivers, dams and stagnant water was used for urination and defecation , bathing, washing food and utensils, drinking ,fishing and cooking. Therefore most of these sources were not considered as safe water for drinking before boiling. Due to the climate conditions water supplies are generally limited and often contaminated or polluted. Majority of the respondents did not have piped water except for the municipality.

Lack of safe water, inadequate sanitation, poor hygiene are major contribution to the spread of disease especially diarrhea and hence need for health or hygiene education programmes. Mothers need to know that all excrement is a source of contamination which contributes to diseases such as diarrhoea and thus affect child survival.

Despite the high level of awareness of family planning regardless of the educational level, the family planning clinic attendance was low especially for women with no or low level of education. The possible reason for this finding is that women with secondary level of education tend to know and understand more about family planning and its consequences. This makes the adoption of family planning very uneven not just in the study area but in the country as a whole. Fears related to Family Planning inhibit some mothers from responding positively to family planning. One of the major fears was that Family Planning might result in sterilization. These fears were more predominant with women of lower educational level, as compared to those having secondary education and above. This calls for IEC programmes in the studied areas because child survival tends to influence fertility rates.

The, mother's formal education creates awareness on the importance of preventive measures such as especially giving balanced diets in their weaning foods and also foods for under fives, as well as delivering in hospitals, and starting supplementary foods early.

Maternal education seems to delay marriage and hence delay age at first birth and this in turn positively influences child survival through the already discussed proximate determinants. The child survival interventions should emphasize on health, education programmes that will assist the illiterate women to practice measures that will promote child survival.

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APPENDIXES

QUESTIONNAIRE TITLE: PROXIMATE DETERMINANTS AFFECTING CHILD SURVIVAL THROUGH MATERNAL EDUCATION

(A case study of Kisumu district)

DATE:

DIVISION/LOCATION:

INTERVIEWER:

Name of Respondent:

SECTION 1: PERSONAL DETAILS AND BACKGROUND OF THE RESPONDENT

1.1. Have you ever lived in a city or town?

Town 1

City 2

None 3

(If none go to question 1.3)

1.2 How long did you live in the town or city?

State in full years

1.3 In what month and year were you born?

Month -----

Year -----

1.4. How old are you? Age in complete years -----

1.5. Have you ever attended school?

Yes ----- 1

No. ----- 2

(If no go to 1.7)

If yes, how many years in school?

1.6. What was your highest level of schooling?

Primary (0-4) ----- 1

Primary (5-8) ----- 2

Secondary ----- 3

Above Secondary ----- 4

1.7 How old were you when you left school?

Record in complete years -----

1.8. Do you have a radio?

Yes -----

SECTION 2: MATERNAL HISTORY

2.1 Have you ever been married or lived with a man?

Yes ----- 1

No ----- 2

(If no go to 2.6)

2.2 Are you now married, widowed, divorced or not living together

Married ----- 1

Widowed ----- 2

Divorced ----- 3

Not living together ----- 4

2.3 How old is your husband? -----

2.4 Does your husband live with you here?

Yes ----- 1

No ----- 2

2.5 Does your husband have any other wife/wives now staying

elsewhere? Yes ----- 1

No ----- 2

2.6 When you were married how old were you?

Record in complete years -----

2.7. What is your religion?

Catholic ----- 1

Protestant ----- 2

S.D.A. ----- 3

Salvation Army ----- 4

Others specify ----- 5

SECTION 3 : REPRODUCTIVE HISTORY

3.1. Have you ever given birth?

Yes ----- 1

No ----- 2

3.2. How many children do you have?

Number of sons ----- 1

Number of daughters ----- 2

3.3 How many children are living with you here?

Sons ----- 1

Daughters ----- 2

3.4 How many are living elsewhere?

Sons ----- 1

Daughters ----- 2

3.5 How many children are dead?

Boys ----- 1

Girls ----- 2

3.6 Since X-mas last year have you eve given birth?

Yes ----- 1

No ----- 2

3.7. Names starting with First born to Last one.

SECTION 4: WORK STATUS

4.1. Have you ever worked regularly to earn money?

Yes ----- 1

No ----- 2

4.2 What type of job?

Wage employed ----- 1

Self-employed ----- 2

4.3 Has your husband ever attended school?

Yes ----- 1

No ----- 2

(If no go to 4.5)

4.4. What was the highest level of school?

Primary (0-4) ----- 1

Primary (5-8) ----- 2

Secondary ----- 3

Above secondary ----- 4

4.5. What kind of work does your husband mainly do?

Wage employed ----- 1

Working in farm ----- 2

Secondary ----- 3

Above secondary ----- 4

4.6 How many cows, hens, goats, sheep do you own?

Cows ----- 1

Hens ----- 2

Sheep ----- 3

Goats ----- 4

Others specify ----- 5

SECTION 5: PREGNANCIES AND BREASTFEEDING

5.1. How old were you when you first gave birth?

State in complete years -----

which year was it? -----

5.2 When did you have your last birth?

State in complete years -----

5.3 What type of food do you eat while pregnant?

Ugali ----- 1

Meat ----- 2

Fish ----- 3

Vegetables ----- 4

Sweet potatoes ----- 5

Cassava	----- 6
Beans	----- 7
Bananas	----- 8

5.4 For each type, indicate how many times in a week

Ugali	----- 1
Meat	----- 2
Fish	----- 3
Vegetables	----- 4
Sweet potatoes	----- 5
Cassava	----- 6
Beans	----- 7
Bananas	----- 8
Others	----- 9

5.5 While pregnant do you attend the antenatal clinic?

Yes	----- 1
No	----- 2

5.6 Did you get tetanus toxoid immunization

Yes	----- 1
No	----- 2

If yes during which month? -----

5.7 Where do you usually deliver your children?

Hospital ----- 1

Home ----- 2

Others specify ----- 3

5.8 Do you take your children for immunization?

Yes ----- 1

No ----- 2

Yes but not complete ----- 3

(If yes ask for the card)

5.9. Do you breastfeed your children when they are young?

Yes ----- 1

No ----- 2

If yes for how long do you breastfeed? -----

6.0 Have you ever heard of ORS?

Yes ----- 1

No ----- 2

If yes have you ever used it before for any of your children?

Yes ----- 1

No ----- 2

SECTION 6: WEANING AND ASSOCIATED ILLNESS

6.1. At what age do you start giving your child supplementary food?

In complete age -----

6.2. What was the composition of your weaning foods?

Porridge ----- 1

Milk ----- 2

Eggs ----- 3

Meat ----- 4

Vegetables ----- 5

Fruits ----- 6

Others specify ----- 7

6.3 Did someone advise you on the composition of the weaning food?

Yes ----- 1

No ----- 2

(If no go to 6.5)

6.4 Who was the person?

Where?

6.5. Did you learn it at school or in the clinic?

School ----- 1

Clinic ----- 2

Others specify ----- 3

6.6. What type of food do you give your children below the age of five?

Porridge ----- 1

Meat ----- 2

Ugali ----- 3

Fish ----- 4

Potatoes ----- 5

Rice ----- 6

Bread ----- 7

Fruits ----- 8

Others specify ----- 9

6.7. For each type indicate how many times

Porridge ----- 1

Meat ----- 2

Ugali	----- 3
Fish	----- 4
Potatoes	----- 5
Rice	----- 6
Bread	----- 7
Fruits	----- 8
Others specify	----- 9

6.8. Where do you get this food from?

Market	----- 1
Garden	----- 2
Others sources	----- 3

SECTION 7: WATER AND LATRINE USAGE

7.1 Where do you get your water from?

Bore-hole	----- 1
Well	----- 2
Lake	----- 3
River	----- 4
Dam	----- 5
Others specify	----- 6

7.2 Where do you get your drinking water from?

Pond ----- 1

Lake ----- 2

River ----- 3

Well ----- 4

Bore-hole ----- 5

Others specify ----- 6

7.3. Where else do you sometimes get your drinking water from?

7.4. Are these good sources of drinking water?

Yes ----- 1

No ----- 2

7.6. Do you have any toilets around?

Yes ----- 1

No ----- 2

(This should be observed instead of asking)

(or interviewer ask to use their toilets)

7.7. Where do children go to defecate? -----

7.8. What is done with faeces of small children? -----

7.9 Where do you dispose your rubbish?

outside the house ----- 1

in the garden ----- 2

Burn it ----- 3

Others specify ----- 4

SECTION 8: HEALTH AND HEALTH EDUCATION

8.1 What languages can you speak?

Luo ----- 1

English ----- 2

Swahili ----- 3

Others specify ----- 4

8.2. What languages can you read and write?

Luo ----- 1

English ----- 2

Swahili ----- 3

Others specify ----- 4

8.3 How do you get information about health?

Radio ----- 1

T.V.	----- 2
Newspaper	----- 3
Other people	----- 4
Other specify	----- 5

8.4 Are you aware of Family Planning?

Yes ----- 1

No ----- 2

(If no go to 8.6)

8.5. Have you ever attended family planning clinic?

Yes ----- 1

No ----- 2

8.6. Do you have any health facilities around?

Yes ----- 1

No ----- 2

(If yes where is the nearest clinic?)

8.7. What are the common diseases around for

Children	Adults
----------	--------

8.8. Have any of the children in this household been sick in the last one week?

Yes ----- 1

No ----- 2

(If yes, what were they suffering from?)

8.9. What do you do when your child falls sick -----

SECTION 9: TRADITIONAL PRACTICES

9.1. What do you prefer between Traditional medicine and modern medicine?

Traditional medicine ----- 1

Modern medicine ----- 2

9.2. Do you believe that witchcraft exists?

Yes ----- 1

No ----- 2

9.3. Do you believe that when your children get sick they are bewitched?

Yes ----- 1

No ----- 2

9.4. Have you ever at any one time visited a traditional healer to treat your sick children?

Yes ----- 1

No ----- 2

9.5. How many of your children have you ever taken to receive treatment from a traditional doctor (below age five)

9.6. Did any of your children who died receive treatment from a traditional doctor?

Yes ----- 1

No ----- 2

If yes, how many -----

9.7. Were your dead children fully immunized?

Yes ----- 1

No ----- 2

Thank you.

FAMILY PLANNING AWARENESS FOR EACH LEVEL OF EDUCATION

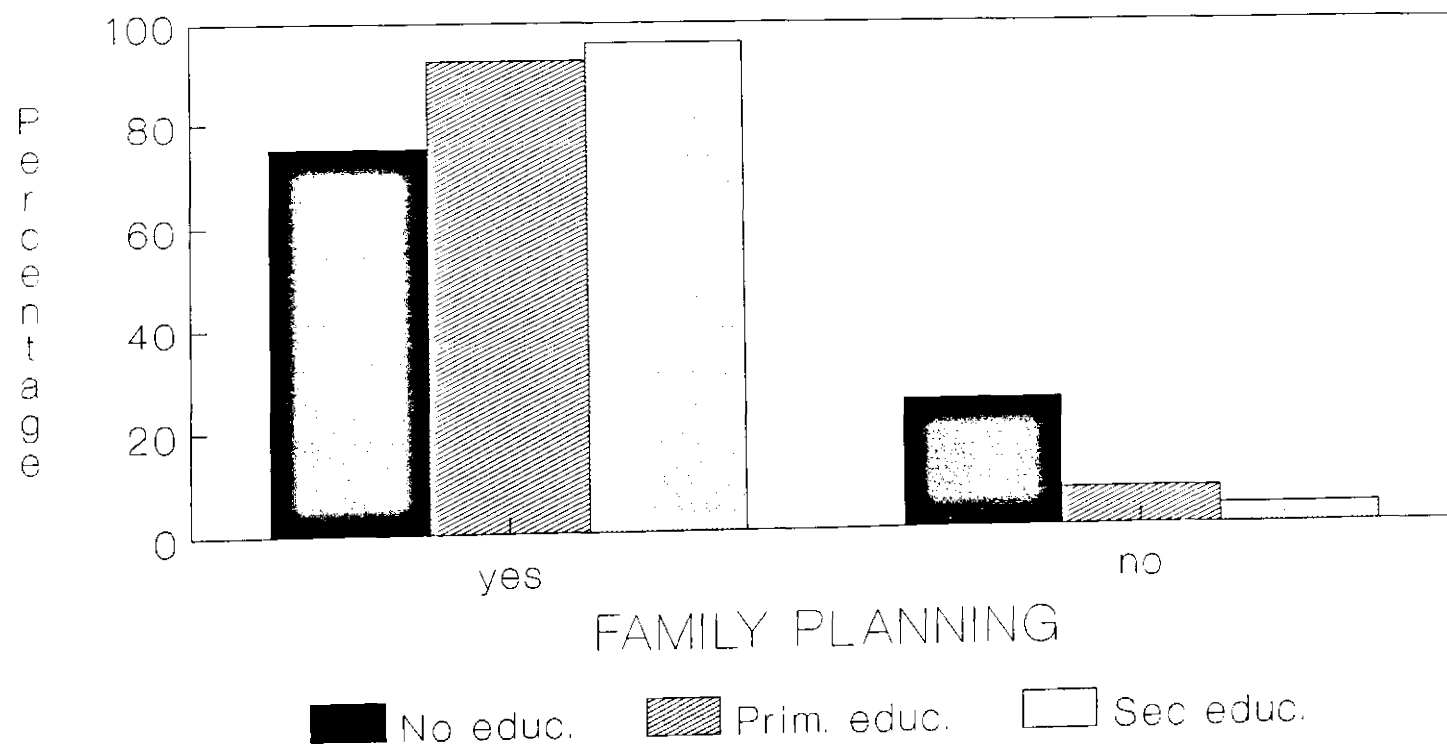


FIG. 2

PRESENCE OF LATRINES BY EACH LEVEL OF EDUCATION

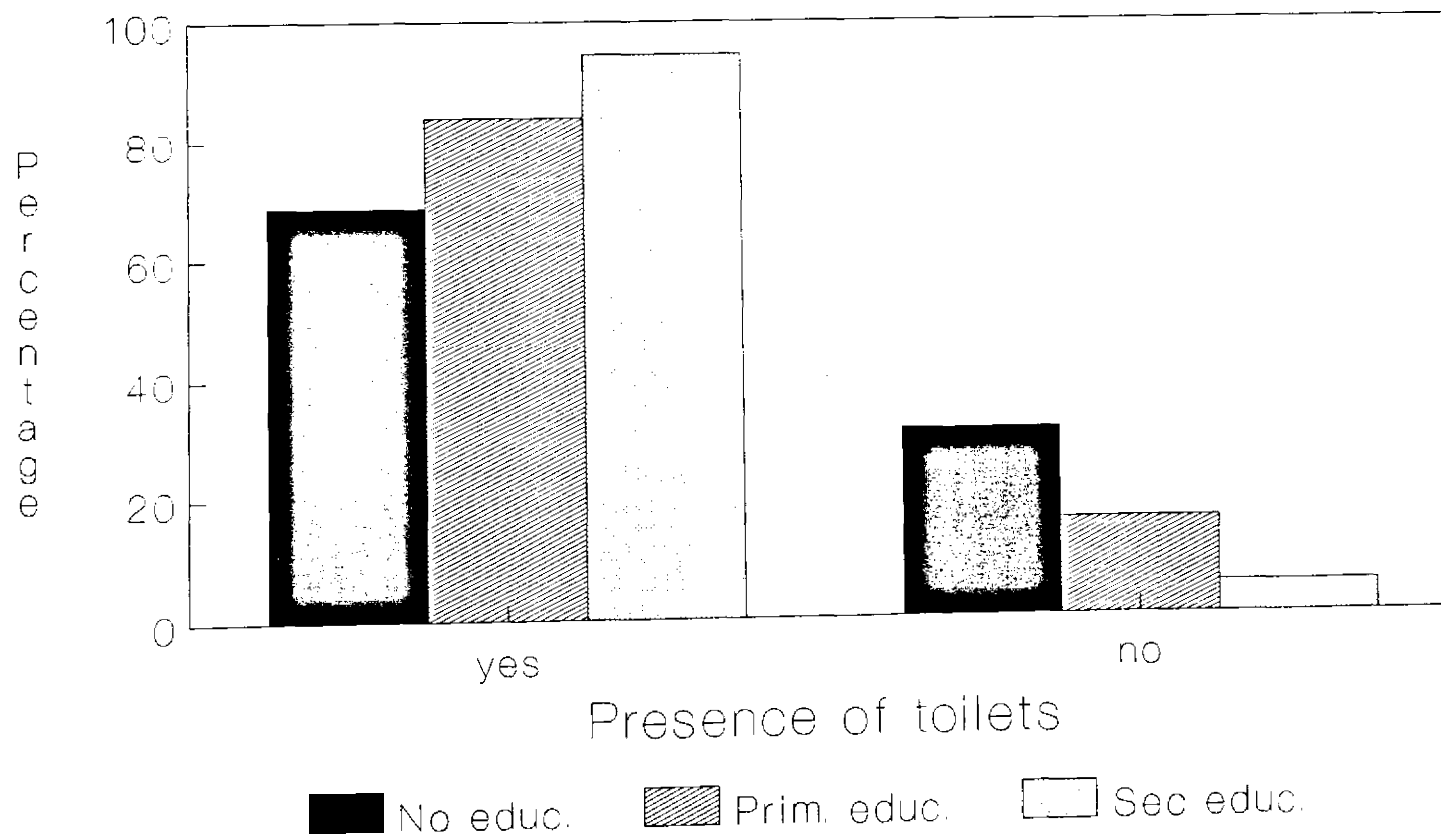


FIG3

TYPE OF WEANING FOODS FOR EACH LEVEL OF EDUCATION

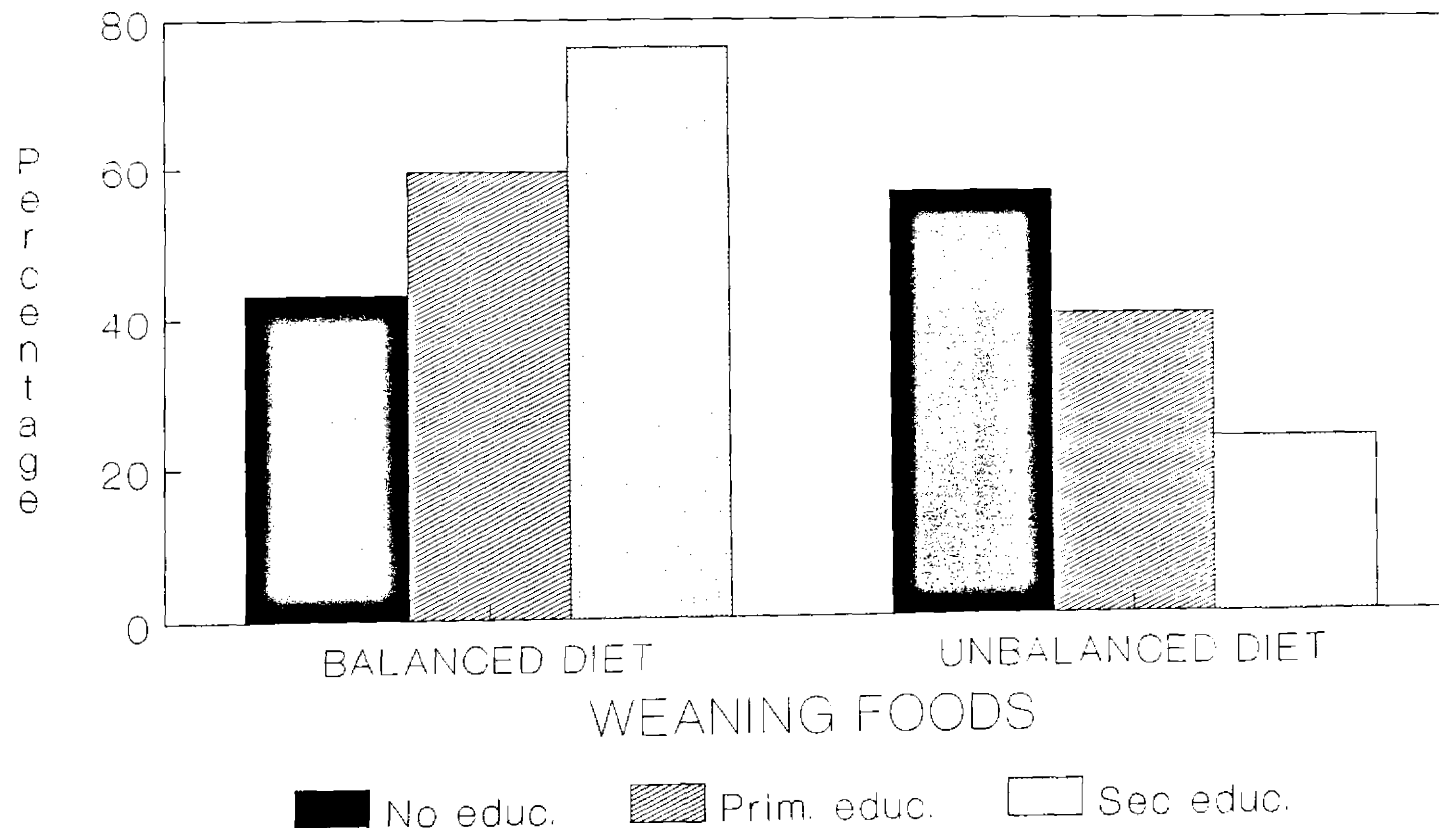


FIG4

TYPE OF FOODS FOR CHILDREN UNDER FIVE FOR EACH LEVEL OF EDUCATION

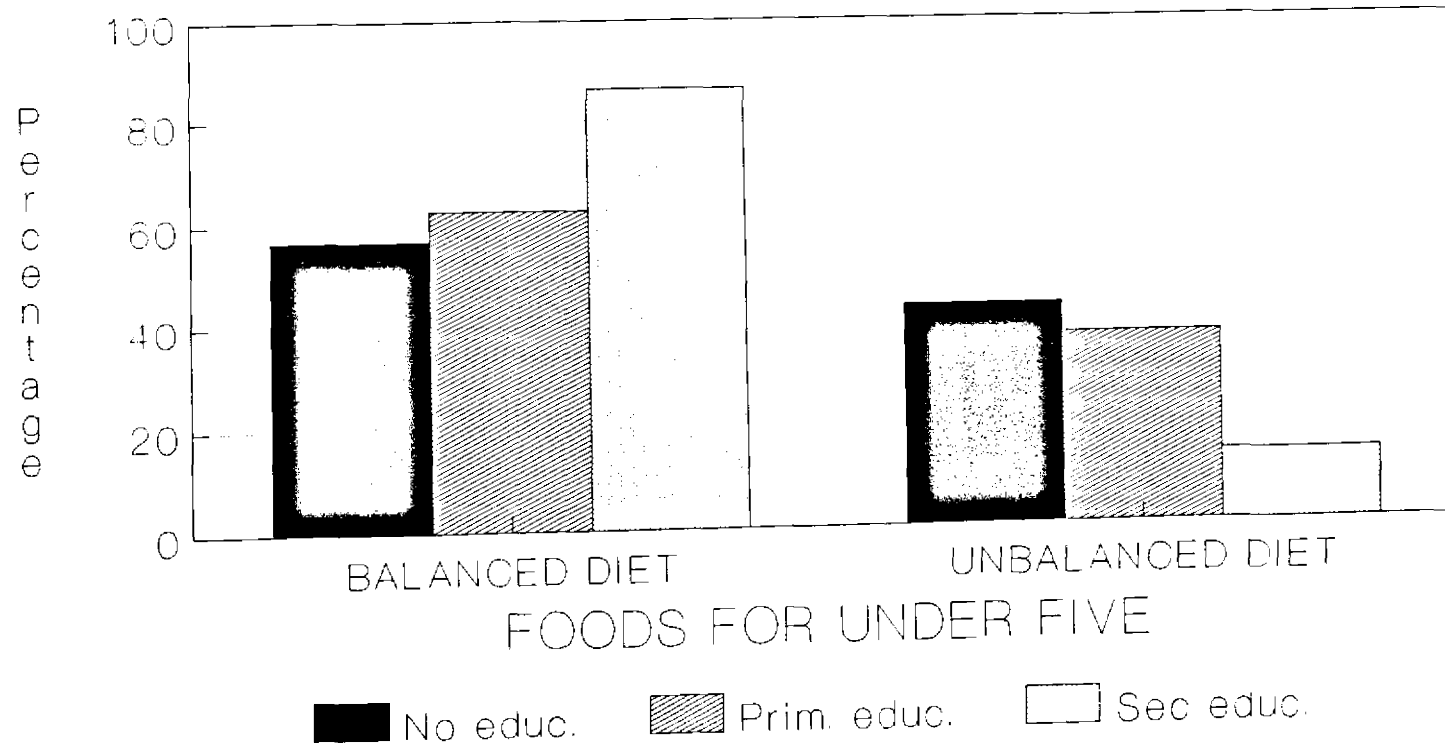


FIG5

PLACE OF DELIVERY AND LEVEL OF EDUCATION

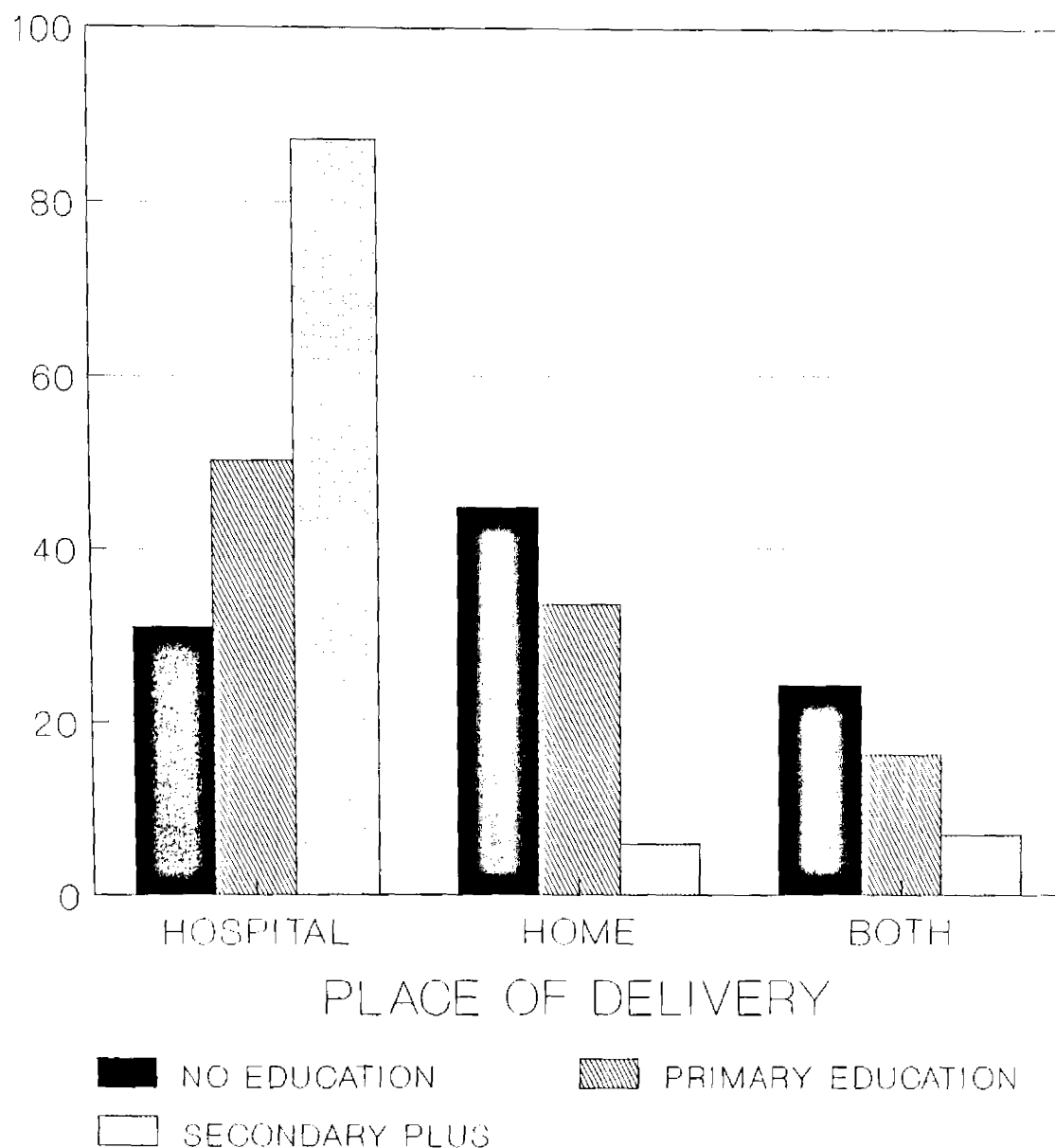


FIG.6

BELIEF IN CHILD BEWITCHMENT

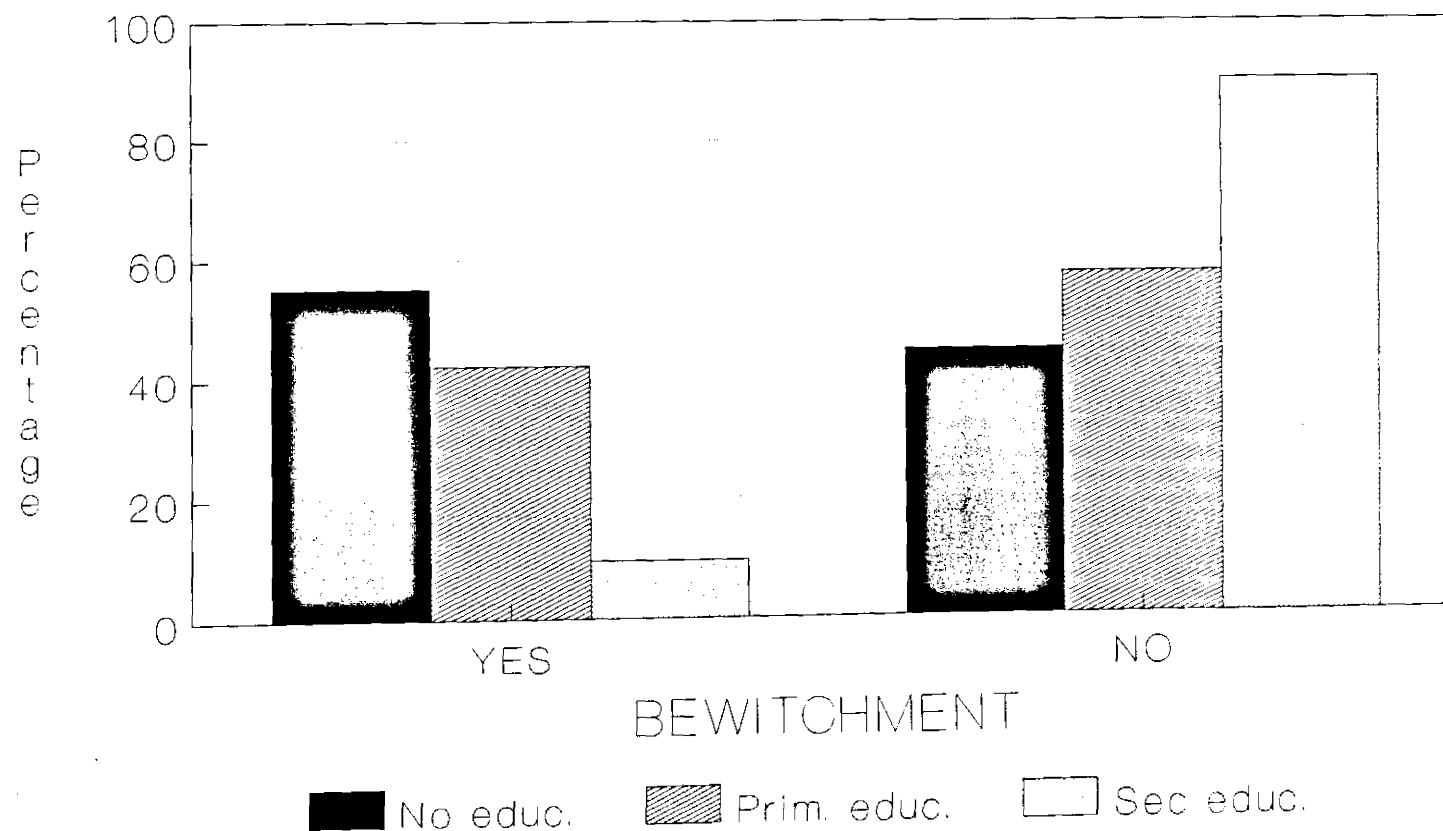


FIG7

WOMEN WHO BOIL DRINKING WATER FOR EACH LEVEL OF EDUCATION

