LEVELS AND DIFFERENTIALS OF INFANT AND CHILD MORTALITY IN MACHAKOS DISTRICT

BY

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DECLARATION

This project is my original work and to the best of my knowledge it has not been presented for a degree in any other university.

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DEDICATION:

To My Parents Aaron Kiandiko Munywoki and Monica Wanza Kiandiko for deeming it necessary for me to go to school, and equally, to my husband Muia Malinda and son Muema, whose encouragement, patience and understanding gave me the impetus to achieve academically.

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CHAPTER ONE

1.1 INTRODUCTION

Infant and child mortality is one of the indicators of the physical well-being of a society. Extensive evidence from studies suggests that the economic and social conditions into which a child is born strongly influence their survival. As a result, child mortality has been used to measure the standards of living of a society. Excessive fertility, poverty, ignorance, isolation and lack of basic necessities may make children more vulnerable to diseases and also hinder access to or reduce the efficacy of medical services (Kiome, 1992).

Reflecting its intermediate position on the world development scale, Kenya at this time has a mortality level which is more or less midway between the extremely high mortality of some African countries and low mortality levels of developed nations of the world (Mott, 1979). Studies however, suggest that infant and child mortality have been on the decline in Kenya. Kenya Demographic and Health Survey (KDHS, 1989) suggests that child mortality rate for 1984 to 1989 was 32 per 1000 live births and infant mortality rate for the same period was 60 per 1000 live births. This may have been under estimated due to under-reporting of children who had died. Comparisons with the rates for the period 1974 to 1978 indicate that child mortality has declined steadily in the recent years. Child mortality rates for the period 1984 to 1989 are 29% lower than the rate for the period 1974 to 1978 (KDHS, 1989). Changes in socio-economic

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conditions in the developing countries and Kenya in particular, are responsible for the substantial decline in infant and child mortality. These changes include improvement in medical technology, disease control, improved nutrition, parental education and improvement in the general living conditions (Mwangi, 1989).

Infant and child mortality is however still high in developing countries. The rapid pace of mortality decline achieved in most of these countries after World War II has not been sustained due to the slow pace of economic development. There are variations however from country to country and within regions of a country. From an interpretative perspective, overall estimates of infant and child mortality mask major variations within a heterogenous society such as Kenya. For example, an overall infant mortality rate for Kenya disguises the fact that there are major mortality differentials within the country by socio-economic status and geography. Children born within two years of a preceding birth are more than twice likely to die before reaching age one as children born after an interval of four or more years (Hill, 1988). Mortality is high to mothers with little or no education and only slightly higher in rural areas than urban areas (Hill, 1988).

In Kenya, Coast and Nyanza provinces are high mortality zones with infant mortality rates of 107 and 165 per 1000 births respectively (Kichamu, 1986). Low mortality areas include Central province with an infant mortality rate of 61 per 1000

births (Kichamu, 1986). These differences are due to differences in socio-economic, socio-cultural and environmental conditions. They reflect a myriad of factors such as differential access to health care, basic nutrition and knowledge about child care. Improvement of such conditions is likely to bring about further decline of infant and child mortality.

1.2 STATEMENT OF THE PROBLEM

Infant mortality in Kenya is generally high being 72 per 1000 births according to the world population chart 1993 and 60 per 1000 births (KDHS 1989).   Compared to countries like Japan with about 4.4 deaths per 1000 births (World Population Chart, 1993) Kenya´s infant mortality rate is very high.   In Kenya, as stated earlier on, the rate varies from one region to another. Thus while some regions like Nyanza province experience a higher mortality rate of 165 per 1000 births others like Central province experience a death rate of 61 per 1000 births (Kichamu, 1986).

Although there are pockets of low mortality especially in the town areas, Machakos district is a moderately high infant and child mortality zone (Machakos DDP, 1989-1993).   The high mortality rate is attributed to low socio-economic development like lack of clean drinking water, low parental education, low income mainly from agriculture among other demographic, socio-cultural and environmental factors.   Thus, a study of socio-

economic factors and their influence on infant and child mortality may help to find out these aspects that need close attention in development planning so as to reduce the mortality rate.

This study is therefore designed to look at some of the socio-economic, socio-cultural and demographic factors that affect infant and child mortality in the district.

1.3 OBJECTIVES OF THE STUDY

1.3.1 GENERAL OBJECTIVES

The general objective of this study is to determine the associations between socio-cultural, socio-economic and demographic factors on one hand and infant and child mortality in Machakos district.

1.3.2 SPECIFIC OBJECTIVES

1. To investigate the association between maternal education and infant and child deaths.

2. To determine the association between mothers religion and the survival status of their children.

3. To determine the association between mother's marital status and the survival status of their children

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1.4 SIGNIFICANCE OF THE STUDY

An investigation of the effects of socio-economic, socio-cultural and demographic factors on infant and child mortality will be important for social and economic planning. If the high infant and child mortality in the district is to be reduced, the study will play a role in determining what social and economic aspects in Machakos district should be given priority in planning.

There is an overwhelming need for policy measures aimed at promoting social and economic development inorder to reduce the level of mortality. These measures would only be most effective if based on information gathered from the study of those factors that affect mortality.

A child's death is a psychological and economic loss to the parents and even the society as a whole. Thus, efforts directed at identifying factors associated with the death rates are of great importance.

Studies have shown that high infant and child mortality contributes to high fertility which leads to rapid population growth (Preston, 1977). Rapid population growth has been said to depress and slow down social and economic development. Studies done on infant and child mortality will not only affect mortality rate but also indirectly influence the fertility hence showing down to some degree the rate of population growth.

1.5 BACKGROUND OF THE STUDY AREA

Machakos district, one of the six districts within Eastern province lies within foreland plateau between the Eastern Rift Valley and the Nyika plateau. It borders Kajiado district to the South East, Kitui district to the East, Embu to the North-East, Murang'a to the north and Nairobi province to the North West.

It has an area of approximately 14,250 sq km ranging from 125 km, wide in the north and less than 20 km. Wide in the south. It extends some 275 km from north west to south-east. The land rises from slightly below 600 m above sea level in Tsavo at the southern end of the district to above 1,100 m above sea level in the northwest outskirts of Nairobi province.

The most striking physiographic unit of Machakos district is a series of hill masses at the centre between the Athi-Kapiti plains in the north-west and laval Yatta plateau in the north-east. To be noted are the Mua, Iveti and Kangundo massifs of basement complex rock. The Mbooni and Kilungu hills which are granitic are to the south of Machakos town and rise to a height of 1900 m above sea level. The volcanic Chyulu hills in Kibwezi division lie along the south-western border of the district while the volcanic Ol Donyo Sabuk (the highest point in the district at 2144 m) lies near the northern border. Much of the southern part of the district is low lying with a gently slopping plain towards the river Athi broken by occasional hills and rivers. This land

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is ideal for ranching.

The overall drainage pattern of Machakos district is from west to east. Although there are few permanent rivers and streams most of the streams flow only during some part of the year. Athi river, which is the major perennial river in the district, drains most of it. The districts northern most parts are drained by Tana and Thika rivers. The perennial rivers and streams offer water for domestic and livestock uses. Surface water is scarce but subsurface water resources (found in sandy river beds) are an important source of domestic and livestock water in many parts of the district.

The distribution of water sheds and soils offer only limited low cost irrigation potential in the district. Some divisions such as Kibwezi and Yatta are better favoured for irrigated agriculture because they have more access to perennial rivers. Machakos district falls within the zone of arid/semi-arid lands, more correctly it can be characterised as an area of extreme variability of rainfall. Good seasons are interspersed with extremely dry periods and variation in the outset of rainy seasons add to the difficulty of ensuring adequate crop production. Rainfall in the district varies roughly with the altitude. Average annual rainfall ranges from about 1000 mm in some of the highlands to slightly below 500 mm in the low-lying south and south-east parts of the district. The rainfall has a bimodal pattern with a significant difference in distribution during different years. The two rainy seasons occur from March

to April and November to December.

Farmers in Machakos district mainly carry out subsistence farming due to shortage of land in the high potential areas and low rainfall in most of the district (Machakos DDP, 1989-1993). Crops grown in the two rainy seasons include maize, beans, peas (pigeon and cow), green grams and the like. The zone that are classified as high potential are already suffering from population pressure and the only remedy is to increase the yield per hectare by introducing high yielding varieties of food crops suitable to the kind of climate in the district.

Administratively Machakos is divided into nine (9) divisions. These divisions are further divided into forty one (41) locations, two hundred and thirty three (233) sub-locations.

The districts population was 1,022,512 in 1979 and was estimated to be 1,505,539 in 1988.

The number of urban centres has nearly doubled since 1969 as compared to the urban population which has tripled in the same period. Machakos town however, remains the capital of the district with a population of 84,320 persons (National Census, 1979).

The economic activities of the people include small businesses, public sector employment and to some extent livestock keeping and crop rearing (Machakos DDP, 1989-1993). The income is relatively low and hence the level of development in the district is relatively low.

Quite notable, is the fact that the provision of social

amenities in the district is inadequate (Machakos DDP, 1989-1993). People have to travel far for medical services. The good news, however is that mortality has been declining (Machakos DDP, 1989-1993). Compared to other parts of the country, literacy level in the district is relatively low.

Thus, the socio-economic conditions in the district require improvements.

1.6 SOURCE OF DATA

The study covers the whole of Machakos district using the data provided by Kenya Demographic and Health Survey (KDHS, 1989). It has to be noted however, that the estimates should be considered as approximate. More notable still is the fact that just like census data in most African countries, the survey may have suffered some problems such as under reporting of children ever born and children dead. This is most common in older mothers due to forgetfulness after a long period of time or due to cultural beliefs and concepts about death. This tends to give lower values of infant and child mortality when in actual fact the value could be higher. The information derived from the data is:-

(a) The total female population of reproduction age by five year age groups.

(b) Children ever born and children dead reported by women

in reproductive ages by five year age groups.

(c) Children ever born and children dead by mothers education:-

(i) No education

(ii) Primary school education

(iii) secondary education plus.

(d) Children ever born and children dead by mothers' marital status:-

(i) Never Married

(ii) Married

(iii) divorced

(iv) widowed.

(e) Children ever born and children dead by mothers' religion:-

(i) Catholic

(ii) Protestant

(iii) Others

1.7 SCOPE AND LIMITATIONS

This study will look at three variables (education, marital status and religion) which influence the levels of infant and child mortality in Machakos district. This does not minimize the importance of other variables that might be contributing to the observed levels of infant and child mortality in the district.

Due to the limited time and resources, it is not possible to undertake an intensive field study in Machakos district. This study therefore, uses secondary data collected by the KDHS 1989 on Machakos district which might suffer some biases such as use of small sample size or being incomplete due to the fact that it was targeting national and not district level estimates.

CHAPTER TWO

2.1 LITERATURE REVIEW

Various studies have shown certain factors that influence the levels and differentials of infant and child mortality. Such factors are socio-economic, social-cultural environmental or even demographic (Kiome, 1992).

Some scholars have argued that for mortality to decline there must be improvement in socio-economic and environmental conditions. Study by Newland (1981) advances the argument that rapidly declining rates of infant mortality signify improvement in socio-economic and environmental conditions. The decline occurs where there is improvement in direct causes of death such as sanitation, water supply, nutrition, access to medical care. education and access to high quality fertility control. This signifies the fact that high infant mortality is associated with certain social problems.

In developing world, there is now clear evidence of differentials in child survival rates associated with the education of mothers. Data from Latin America (Behm, 1976-78; Haines and Avery, 1978) Asia (Cochrane, 1980; Caldwell and McDonald, 1981) and Africa (Caldwell, 1979; Farah and Preston, 1982) all shows a negative relationship between the extent of maternal education and the level of child mortality. The amount of education required however, to produce a significance

reduction in mortality also varies by cultural factors.

Mohadevan's (1981) study in India found that socio-cultural factors played a great role in determining the levels of infant and child mortality in the three cultural groups; Hindus, Muslims and Haryiens. The socio-cultural factors included age at marriage, practices of midwifery and child weaning. Other factors affecting infant mortality were birth order and mothers nutritional status.

Bixby (1986) in Costa Rica found that improvement in public health and education can reduce infant mortality without much economic development. Primary health care contributed three quarters of mortality decline in Costa Rica. This was inspite of Costa Rica's state of uneconomic development. He concluded that intervention aimed at controlling diseases can overcome socio-economic obstacles. Provision of health services to all decreases socio-economic differentials related to children's risk of death.

Mortality in Africa has been falling although it is still higher than in any other continent (Hill, 1989). Pockets of high mortality exist in Asia and Latin America but are more balanced out by the existence of a number of low mortality populations in those continents. In Africa however, the pockets are of low mortality mainly in Island groups such as Mauritius and Seychelles otherwise moderate to high mortality is still predominant. More still, little is known about mortality in Africa compared to other continents. This lack of knowledge

greatly hampers attempts to design and implement health intervention programmes.

Studies done in Kenya (Mott, 1979) found out that one in every two deaths is a young child of less than five years of age. Thus mortality in Kenya is high because of the high infant and child mortality. Most of the infant and child deaths occurred among women with no education and those having either first birth or high birth order. However, the greatest decline in infant and child mortality has occurred amongst these same women due to improved food distribution changing demographic factors and improved health measures.

Studies also show association between infant and child mortality with age of mothers who are under 20-29 years and those of more than 40 years. Other factors related also include the length of interval between births (which influences the health and well being of the mother, suckling child and the new born), education of the mother and father and mothers place of residence.

Kibet (1981) found that regional differences in mortality are due to differences in education of women, availability of health services, knowledge of sanitation and willingness to utilise the health services.

Studies by Arriaga (1981) found out that the level of mother's education is more influential if she lives in urban than rural areas. He noted that educated women breastfed for a shorter period thus exposing their infants to the possibility of

adverse effects but these women were also evidently able to accommodate with quality care in other respects.

Koyugi (1982) found that mother's economic status had an effect on the survival status of their children in Siaya District. The better economically the lower the mortality. Mothers residing in urban areas had lower mortality than those in rural areas.

Mosley (1983), observed that provision of health services to all decreases socio-economic differentials related to children's risks of death.

In his analysis of levels and differentials of infant and child mortality in Kenya, Kichamu (1986), states that there is a general decline in infant and child mortality with the rise of mother's education. Single mothers had the lowest infant mortality followed by the married, next divorced and separated and lastly the widows who had the highest mortality rate.

Mutai (1987) studied Kericho's child mortality by locations. He found that generally urban areas had higher infant and child mortality than the rural. For marital status, divorced mothers had the highest child mortality followed by married, then widowed mothers, while single mothers had the last.

Otieno (1988) found that geographical factors, diseases specific to the area, and availability of medical and health facilities affected child mortality in Bondo Division.

Reduction in infant and child mortality in Kenya has been due to the socio-economic development the country has experienced

(Muganzi, 1988). The development has led to increased availability of health services, improved parental care through education and general improvement in living conditions. This development consists of numerous inter-related factors including education, health improvement, a just distribution of income, political stability and higher levels of per capita income.

On the basis of the reviewed literature above, it can be concluded that socio-economic development plays a major role in the reduction of mortality.

2.2 THEORETICAL FRAMEWORK

2.2.1 Mosley and Chen Framework

As was stated earlier, socio-economic, socio-cultural, environmental and demographic factors influence infant and child mortality. Levels of these factors have been considered as social and economic development.

Any framework attempting to analyse infant and child mortality must take into account variables which influence or determine the levels of mortality.

The factors can be classified as follows:-

(a) Demographic

(b) Cultural

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(c)   Environmental

(d)   Economic and Political

(e)   Geographical

(f)   Medical and Health.

Mosely and Chen developed an analytical framework for the study of child survival. The framework shows that socio-economic determinants of mortality operate through biological mechanisms or proximate determinants to influence mortality.

This study will use Mosley and Chen's analytical framework which is useful in explaining the determinants of infant and child mortality.

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                    ┌──────────────────┐
        ┌───────────┤ Socio-economic   ├──────────────┐
        │     ┌──────┤ determinants    ┼──────┐        │
        │     │      └──────────────────┘      │        │
  ┌─────┴─┐ ┌─┴─────────────┐ ┌──────────────┐ ┌───────┐
  │Maternal│ │Environmental  │ │ Nutrition    │ │Injury │
  │factors │ │contamination  ├─┤ deficiency   │ │       │
  └────────┘ └───────────────┘ └──────────────┘ └───────┘
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Maternal factors   Environmental contamination   Nutrition deficiency   Injury

Health   Sick

Personal illness control   Growth faltering   Infant and child mortality
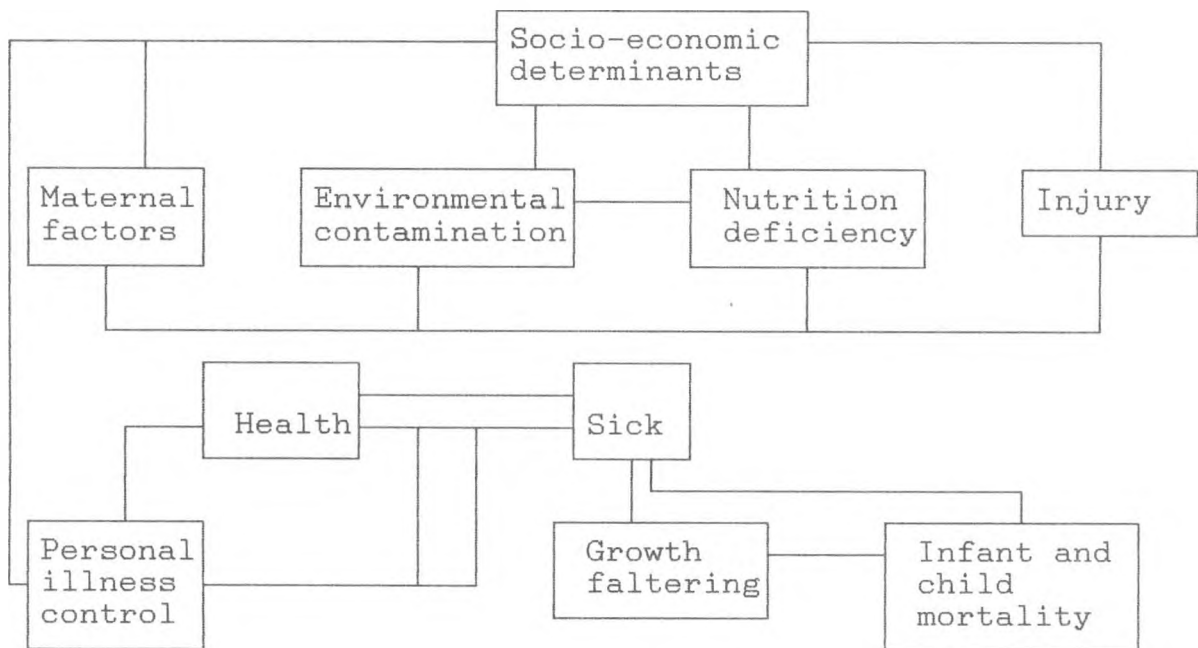
Source: W. Henry
          Lincoln Chen (1984)

By use of the above framework the socio-economic, socio-cultural and environmental factors which determine infant and child mortality will be studied.

The variables to be measured are:

(i)   Maternal education

(ii) Marital status

(iii) Maternal religion.

2.2.2   Operational Model

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┌─────────────────────────────┐      ┌─────────────────────────────┐
│ Socio cultural factors      │      │ Socio-economic              │
│ Marital status              │      │ factors                     │
│ Never married               │      │ Education                   │
│ Married                     │      │ No education                │
│ Divorced                    │      │ Primary education           │
│ Widowed                     │      │ Secondary education         │
│ Religion                    │      │                             │
│ Catholic                    │      │                             │
│ Protestant                  │      │                             │
│ Others                      │      │                             │
└──────────────┬──────────────┘      └──────────────┬──────────────┘
               └──────►┌──────────────┐◄────────────┘
                       │ Child deaths │
                       └──────────────┘
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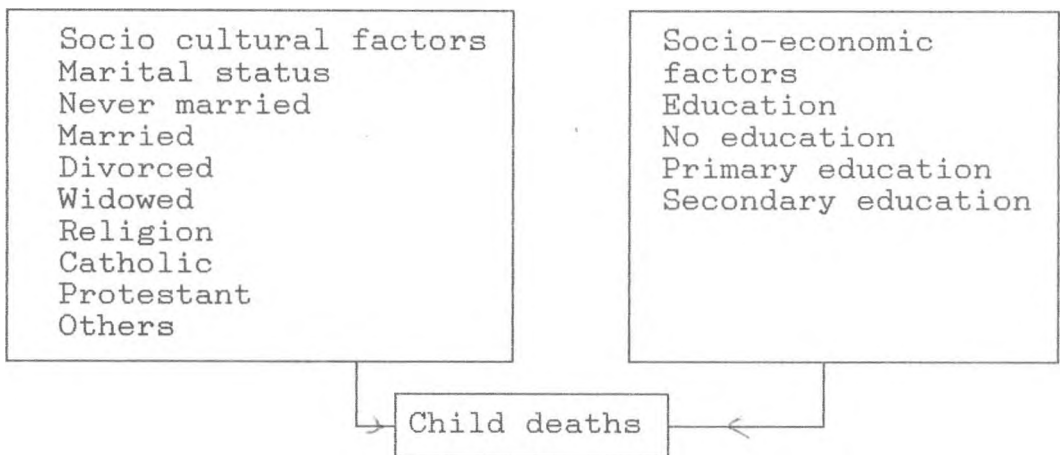
2.2.3   Conceptual Hypotheses

1.   Infant and child mortality is likely to differ by mother's education in Machakos district.

2.   Infant and child mortality is likely to differ by marital status of the mother in Machakos district.

3.   Infant and child mortality is likely to differ by maternal religion in Machakos district.

2.2.4   Operational Hypotheses

1.   The   level of maternal education is inversely related to child mortality in Machakos district.

2.   The married and single women have lower child mortality than the   widowed   and   divorced/separated   women   in   Machakos district.

3.   Infant and child mortality is lower for Christian religions such as Protestants and Catholics than in other religions.

2.2.5   **METHOD OF DATA ANALYSIS**

Cross-tabulation method will be used since the sample size is very small.   It is considered to be the most appropriate method of analysis.   Cross tabulation is also quite useful for comparison purposes.   The study deals with child mortality differentials by education, religion and marital status of the mothers.

Information on children ever born (CEB) and children dead (CD) classified by the age group of the mother is required.   We also require the female population (Fpop) classified by the five year age groups.

The proportion of children ever born (ACEB) is given by dividing the number of children ever born (CEB) in a particular age group by the female population in the same age group.

Thus; $ACEB_i = \dfrac{CEB_i}{Fpop_i}$ --------------(i)

The proportion of children dead (ACD) is given by dividing the children dead (CD_i) in the ith age group by the female population in the ith age group.

Thus; $ACD_i = \dfrac{CD_i}{Fpop_i}$ ---------------(2)

AD_i is the proportion dead in the ith age group.   It is given
by the formula;

$$AD_i = \dfrac{ACD}{ACEB}$$ -----------------(3)

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As stated earlier, three variables namely maternal education, marital status and religion are used in the study. These variables are further broken down into variable categories such as no education, primary education, secondary plus education for the variable education; catholic, protestant and others for religion and never married, married, widowed and divorced for marital status.

The overall average are obtained by getting the row averages for the number of observations of children (prop) dead in each variable category. This is calculated using the formula;

$$\text{Row Average} = \frac{\sum_{i=1}^{n} x_i}{n}$$

Where!

X_i = each observation of prop dead in the age groups of the variable category.

n = number of observations

3.1 Child Mortality differential by mother's education

TABLE 1

DISCUSSION OF THE FINDINGS

MATERNAL AGE-GROUP AD	NO EDUCATION AD	PRIMARY AD	SECONDARY EDUCATION AD
15 – 19	0	0.131	0
20 –24	0	0.089	0.046
25 – 29	0.030	0.048	0.059
30 – 34	0.018	0.117	0
35 – 39	0.140	0.058	0
40 – 44	0.175	0.124	0.167
45 – 49	0.088	0.143	–
TOTAL CHILD MORTALITY	0.451	0.598	0.272
AVERAGE	0.064	0.085	0.045

In Table 3.1 above, education is classified into three categories namely; no education, primary education, secondary education and above.

Of the three education categories, child mortality is higher for primary educated women aged 15-19, 20-24 and 45-49 being

0.131, 0.089 and 0.143 respectively. No mortality occurred to children of women aged 15-19, 20-24 of the category no education thus they recorded zero mortality. Women aged 45-49 in the no education category recorded 0.088 deaths of their children which is less than the 0,143 recorded by women of the same age group with primary education. This mortality pattern differs with what some scholars have found out that child mortality is higher for women with no education than for women with primary education. (Mott, 1979; Kibet, 1981). This could be attributed to the fact that the data used in this study was gathered from a small sample of the population.

It is important to note that women with secondary education recorded the lowest mortality to their children. In the age groups 15-19, 30-34 and 35-39 no mortality occurred to their children meaning that they recorded zero mortality for their children. Caldwell (1979) observed the same pattern.

The highest child mortality occurred to women with no education in the age group 40-44 who recorded 0.175 deaths followed by women with primary education in the age group 45-49 who recorded 0.143 children dead.

Quite notable is the fact that child mortality increases with the age of the mother. Women in all the education categories aged 40-44 recorded increased mortality to their children being 0.175 for no education, 0.012 for primary education and 0.167 for secondary education.

From the above overview, it is quite evident that high

education level is quite crucial in mortality reduction. Maternal education plays a significant role in reduction of mortality.

Observations made from the above table to some extent confirm the observed pattern of child mortality as differentiated by maternal level of education. Only age-group 35-39 however, conforms to the expected pattern. Child mortality is lowest, on average, among mothers with secondary and above education. It can be deduced therefore, that education is inversely related to child mortality. As mother's education rises, mortality of her children decline (Kichamu, 1986).

A rise in education level promotes better utilization of the limited resources for meeting individual's needs. Educated women are also aware of proper hygiene and sanitation for the prevention of diseases. Education has also been found to free women from traditional cultural ties making them able to manipulate the modern world better by ensuring that their children have access to the health facilities as soon as possible (Caldwell, 1979). They therefore tend to make use of the available health and medical services than the un educated mothers.

Education has also been found to be inversely related to income (Mosley and Chen, 1984). Mothers with education are also earning income in most cases. This raises the family's income status such that the family can afford better living conditions such as balanced diet, good housing and even improved medical

care.

Thus education, through its proxies affects infant and child mortality.

3.2 Child mortality differential by mother's marital status
TABLE 2

MATERNAL AGE-GROUP AD	NEVER MARRIED AD_i	MARRIED AD_i	WIDOWED AD_i	DIVORCED AD_i
15 – 19	0	0.117	–	0
20 –24	0.200	0.053	–	0.181
25 – 29	0.222	0.043	0	0
30 – 34	0	0.053	0.286	0.263
35 – 39	0.115	0.096	0	0
40 – 44	–	0.138	0	0
45 – 49	–	0.103	0.056	0
TOTAL CHILD MORTALITY	0.537	0.603	0.342	0.444
AVERAGE	0.107	0.086	0.068	0.063

In table 3.2 above marital status is categorised into never married, married, widowed and divorced.

It is clear from the table that, there are a lot of differentials arising from the various marital categories. While the never married and divorced in the age group 15-19 recorded zero mortality for their children, the married in the same age group recorded as high as 0.177 mortality rate for their children.

Widowed mothers aged 30-34 reported the highest column child mortality of 0.286 followed by divorced women in the same age group who reported 0.263 children dead. This column pattern conforms to findings by Kibet (1981), Kichamu (1986), Munala (1988) and Ndede (1988).

It is also notable that while married women in all the age groups reported some mortality to their children, only two age groups (20-24 with 0.181 and 30-34 with 0.263) in the divorced category reported mortality and the rest recorded zero mortality to their children.

On average, single (never married) have higher child mortality (0.107), followed by the married (o.086), the widowed (0.068) and last the divorced (0.063).

It is worthy stating however, that no pattern can be deduced from the age group data owing to the very small and incomplete data used for the analysis.

3.3 Child Mortality differential by mother's religion

TABLE 3

MATERNAL AGE-GROUP AD_I	CATHOLIC AD_I	PROTESTANT AD_I	OTHERS D_I
15 - 19	0.307	0	1
20 -24	0.083	0.078	-
25 - 29	0.040	0.041	0
30 - 34	0.102	0.055	0
35 - 39	0.129	0.039	-
40 - 44	0.126	0.154	-
45 - 49	0.067	0.118	0.04
TOTAL CHILD MORTALITY	0.854	0.485	0.04
AVERAGE	0.122	0.069	0.013

In table 3.3 mother's religion has been classified into Catholic, Protestant and others.

A comparison of the three religious categories shows that at the earliest age of 15-19 mothers in the Catholic religion reported the highest mortality to their children of 0.307 while mothers in the protestant reported zero mortality to their children.

For catholic mothers, child mortality declines from age 20–29 and then picks up again from ages 29-39 before it starts to decline again. For children born to protestant mothers mortality keeps on fluctuating.

On average, catholics have relatively higher child mortality (0.122) followed by protestants (0.069) and other religions (0.013).

It has to be noted however, that no observable pattern has been deduced. This can be attributed to the fact that the data used is small and incomplete.

CHAPTER FOUR

SUMMARY AND IMPLICATIONS:

4.1 SUMMARY

This study has used cross tabulation to estimate infant and child mortality in Machakos district by socio-economic and socio-cultural differentials namely education, marital status and religion. Kenya Demographic and Health Survey (KDHS) 1989 is used in the study.

Despite the shortcomings encountered such as use of KDHS (1989) data which is based on a small sample of the population and which turned out to be incomplete due to the fact that the sample was targeting national and not district level estimates, the study was able to come out with some findings. It must be mentioned here however, that some of the findings of the study do not differ with what has already been found out by other studies

The study found out that on average, there are differences in child mortality levels based on maternal education, religion and marital status.

4.1.1   THE FINDINGS OF THE STUDY

(1) Education is inversely related to infant and child mortality. Mothers with secondary education have lower infant and child mortality than those with primary or no education on average being 0.045 compared to no education

(0.064) and primary education (0.085)

(2)   Women who   never married,   on average, recorded   the highest
      mortality (0.107) to their   children followed by the married
      (0.068) and   the divorced   recorded the lowest   mortality to
      their   children   (0.063).   This   does   not   conform to   the
      pattern   of earlier   findings   by Kibet   (1981) and   Kichamu
      (1986) who   found out that the widowed   recorded the highest
      mortality to   their children   followed by the   single mother
      (never married)   and finally   the married.   This difference
      could   be attributed to the fact that   the data used in this
      study   was   limiting   as   well as   incomplete.   Columnwise
      however,   the age   group 30-34   which has the   highest child
      mortality (0.286 per 1000 births) is among the widowed.

(3)   Religion   of the   mother   has been   found   to influence   the
      survival status of her children.   Infant and child mortality
      has been found to be higher, on average, for women belonging
      to the   catholic religion than   for women in   protestant and
      other   religion.   While   the catholic   women recorded   0.22
      mortality to their children,   protestants recorded 0.069 and
      other religions 0.013.

4.1.2   Policy Implications:

This study has shown the importance of education in determining the level of infant and child mortality. Mother with secondary education and over have been found to have lower mortality to their children than those who have attained primary or no education. This is useful information for the planners and implementers of policies whose wish is to see that mortality in the district is reduced. Close attention should be paid to the education of women in the district.

Since we have seen that education plays a major role in the reduction of infant and child mortality, the government should encourage the enrolment of girls in primary and secondary schools. This will be an indirect way of reducing child mortality.

By improving the education and job opportunities for women it will mean that single, widowed and divorced mothers will be economically independent and able to take care of their children better. This will increase the survival status of their children.

Although, the study limited its scope to three variables (education, religion and marital status), there are many other factors that interact to determine the level of infant and child mortality in the district, which should be considered while planning for mortality reduction.

4.2 RECOMMENDATIONS

Emphasis should be laid on secondary level of education as it has been shown to be essential for decline of infant and child mortality. More women should be encouraged to enroll for secondary education.

4.3 RECOMMENDATIONS FOR FURTHER RESEARCH

1. There is need for study of all other factors that influence infant and child mortality. Such a study will include all the factors that have not been discussed here.

2. Since no strong specific patterns have been establiched in this study, an intensive study of infant and child mortality by the differentials religion and marital status in Machakos district should be done.

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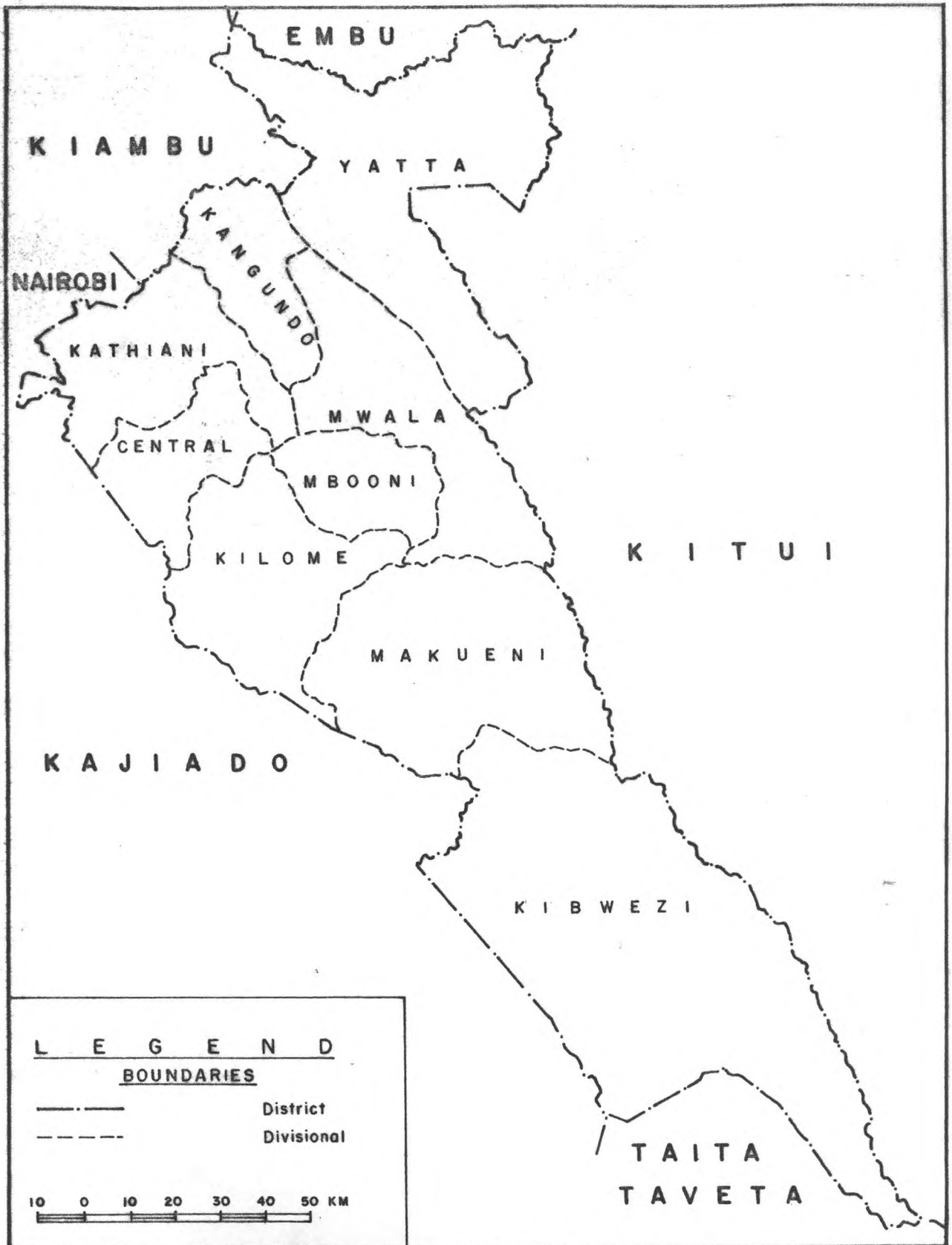   Academic Press.

Fig. 1 : LOCATION OF MACHAKOS DISTRICT IN KENYA

Fig. 2 : MACHAKOS DISTRICT — ADMINISTRATIVE UNITS BY DIVISIONS