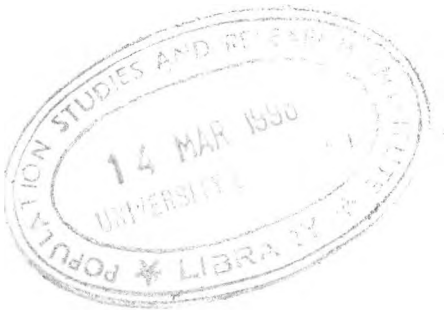
EFFECT OF NUTRITIONAL STATUS ON INFANT AND CHILD MORTALITY



BY

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THIS PROJECT IS SUBMITTED IN PARTIAL FULFILLMENT OF THE POSTGRADUATE DIPLOMA IN POPULATION STUDIES

POPULATION STUDIES AND RESEARCH INSTITUTE

UNIVERSITY OF NAIROBI.

MARCH, 1995.

DECLARATION

This study is my original work and to the best of my knowledge has not been submitted for a degree in any other University.

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This study has been submitted for examination with our approval as the University supervisors

Dr. B.O. K'oyugi

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DEDICATION

To my son

EDWARD

ACKNOWLEDGEMENT

My thanks are due to the Ministry of Agriculture for enabling me to pursue the course. Special thanks goes to the African Biodiversity Institute (ABI) for awarding me a scholarship that enabled me to undertake a full time study for the Postgraduate Diploma in Population Studies at the University of Nairobi.

I am geatly indebted to Dr. B.O. K'Oyugi my principal supervisor, and Mr. J. Mwaniki my second supervisor, both of Population Studies and Research Institute for their tireless effort, guidance, encouragement and keen supervision throughout the study.

I am also grateful to the PSRI library staff for the assistance they gave me during the course of my study. To Mr. Stephen Awino, I say thanks for the help he gave, and for the use of the computer facilities easy for my data analysis. My sincere thanks goes to Mrs. Agnes Anyango Olulo of Population Studies and Research Institute, for giving me assistance and co-operation during the study and finally typing the entire work.

Finally, my utmost appreciation is due to my parents, brothers, sisters and my son Edward for their support and encouragement which made every thing easy for the completion of this study. To them all, I say Asante Sana! - KIMANI N. TABITHA.

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CHAPTER ONE

GENERAL INTRODUCTION

1.0 INTRODUCTION

The study examined the association between nutritional status and childhood mortality in Kenya. Selected factors affecting nutritional status and their relationship with infant and child mortality were examined. These factors include the demographic characteristics of the mother and the number of household members. The variables covered in each of these selected factors are discussed in the subsequent chapters.

1.1 THE STUDY AREA AND DEFINITIONS.

This study was based on the data collected in the Kenya Demographic and Health Survey 1993 [KDHS 1993] which covered most of Kenya's districts including Nairobi. This survey was basically a rural survey. Bearing in mind that majority of the country's population lives in the rural areas, effective measures to check child mortality must take this in to account.

Kenya is unique in sub-saharan Africa with the rich diversity of it's demographic and epidemiological data. Various researchers have: estimated the trends and geographical differentials in mortality, studied socio-economic differentials, and examined national level data on causes of death or measured the importance of various diseases in small study area (Vogel et al, 1974).

TABLE 1: KENYA'S POPULATION CHARACTERISTICS OF 1993.

Total Population (in Million)	27.7
Population growth rate (per cent)	3.7
Crude birth rate (CBR)	45/1000
Crude death rate (CDR)	9/1000
Total Fertility rate (TFR)	6.5
Infant mortality rate (IMR)	72/1000
Expectancy of life at birth	64

SOURCE: UNFPA, 1993, Population Chart.

1.2 STATEMENT OF THE PROBLEM

The association between infant and child mortality and nutritional status has been there for a long time. Studies done by Mosley and Chen (1984) showed that infant and child mortality has been regarded as a very sensitive index of the socio-economic level of living of a population.

At present the population of Kenya is about 27.7 millions (CBS, 1993) and only 21.4 millions in 1989, but the overall level of mortality is unclear. It has been estimated that the crude death rate (CDR) is about 9 deaths per 1000 population (CBS, 1993). One out of every three Kenyans who dies is usually below the age of five. Effect of early mortality on the overall level of death rate is considerable. In Kenya a substantial proportion of mortality is premature and indeed, if the level of infant and child mortality in Kenya were immediately decreased the impact of the crude death rate would be reduced.

It can also be noted further that while the declines in mortality over the last two decades have been considerable from a policy view point, much remains to be done whether from perspective of health and medical resources. Differences in the chances of infant and child survival from different socio-economic backgrounds or geographic areas are still considerable (Third Rural Child Nutrition Survey 1987). Even in the more favourable segments of the society, infant and child mortality are still higher than those in most developed countries.

This study hopes that improvements in nutritional status will substantially reduce infant and child mortality. Further it can be noted that the degree of the malnutrition can best be

understood by considering it's effect on infant and child mortality. Malnutrition causes minor childhood diseases which become killers.

This study is based on secondary data collected in "Kenya Demographic and Health Survey" of 1993. It is the intention of this study to enhance the understanding of nutritional status as a factor of population change in Kenya with regard to infant and child mortality.

1.3 STUDY JUSTIFICATION

Various studies cited in the Literature Review indicate that malnutrition is a major public health problem. Of the many causes of illness and death among infant and children in Kenya and other developing countries, malnutrition is recognised as very important. Apart from it's direct effects on general health, it also exerts an indirect effect by lowering resistance to infectious diseases (Lakhan Jansen, 1987). The exact magnitude of malnutrition to total infant and child mortality is difficult to assess in view of other interrelated factors.

Poor families in Kenya, who form a vast majority of the population are not only undernourished but live under incredibly unhygienic and unsanitary conditions (Neumann and Bwibo, 1987). While these other factors considered in this study contribute to high infant and child mortality in Kenya and other developing countries,malnutrition also plays an important role.

Infant and children, expectant and nursing mothers constitute vulnerable groups of a population from the nutritional standpoint hence special consideration in studies on infant child mortality. Diets of expectant and nursing mothers, infants and children in most parts of Kenya and other developing countries have been found to be nutritionally inadequate receiving very little consideration in many parts of the world. (GOK and UNICEF, 1989)

Nutritional status is important in that the contribution of infant and child mortality to the total loss of years of human life and because it's level is relatively high in Kenya, it's measurement provides a useful index of the status of health and also the standard of living of a society.

The problem of relationship between nutritional and infant and child mortality can be examined under available facts regarding infant-child nutrition in Kenya.

1.4 OBJECTIVES OF THE STUDY

The aim of the study was to determine whether there is linkage between nutritional status on infant and child mortality. The study also discusses and investigates the feeding practices and the prevailing socio-economic and environmental conditions. The specific objectives of this study are:

1. To examine demographic factors that affect the nutritional status of children and infants. Such factors include marital status, age of mother, number of household members.
2. To examine the duration of breastfeeding by region.
3. To determine the association between environmental conditions and nutritional status on one hand and child and infant mortality on the other hand.
4. To find out the effect of nutritional status on the level of infant and child mortality.

1.5 HYPOTHESIS

The following is a list of hypotheses to be tested in this study. Various statistical methods will be used to test the undergoing hypotheses and it is given that the given contentions will hold.

1. The characteristics of the mother (i.e. level of education, marital status,age of the mother at first birth) affects nutritional status and child mortality.
2. Better household amenities results into lower infant and child mortality.
3. The longer the duration of breastfeeding the higher the chances of infant and child survival.
4 The higher the age at supplementation the higher the chances of infant and child survival.

1.6 SCOPE AND LIMITATIONS

This was a macro level study which utilised secondary data collected in the Kenya Demographic Health Survey of 1993. Data on mortality in relation to nutrition is very limited because when death occurs only the primary cause is recorded.

Four types of questionnaires were used for the KDHS: a Household Questionnaire, a Woman's Questionnaire, a Man's Questionnaire and a service availability Questionnaire. The questionnaires were developed in English and then translated into Kiswahili and eight of the most widely spoken local languages in Kenya.

The sample for the 1993 KDHS was national in scope with exclusion of seven districts which accounts for less than four per cent of Kenyan population. A total of 536 clusters were inaccessible for various reasons.

As in the 1989 KDHS fifteen districts, Nairobi and Mombasa were over sampled in the 1993 survey in order to produce more reliable estimates for certain variables at the district level.

About 400 rural household were selected in each of these 15 districts, just over 1000 rural household in other districts and about 1800 households in urban areas, for a total of almost 9000 households. Due to this over sampling, the KDHS sample is not self weighting at the National level.

1.7 LITERATURE REVIEW

Most nutritional surveys in the country have concentrated on the children aged 1 to 5 years. However, current evidence suggests that the problem of poor growth starts early in infancy. A study on the growth of infants 0-6 months in Embu District found that even at birth, the proportion of infants with a length-for-age below the 5th percentile was fairly high, 13% for male and 14.6% for female infants. This proportion increased with age to 57.2% and 37.7% respectively. The mean lengths of the infants were increasingly below the median of the reference population by the fifth and sixth month (Kiamba, 1990). An earlier longitudinal study in Machakos District (1971-81) showed an increasingly poorer growth in height and weight from infancy to 36 months in comparison to the reference population. There was indication of a reduction in height and weight increment in the first three years of life (van Ginneken and Muller, 1987).

National rural surveys carried out by the Central Bureau of Statistics to assess child nutritional status paint a gloomy picture. Four surveys have been done, the first one having taken place in 1977, then 1978/79, 1982, and 1987. Looking at the trend of the reported prevalence of malnutrition over the ten year period, there appears to be no significant change, except possibly a slight deterioration in nutritional status between 1977 and 1982 at the national level, and some improvement in 1987. Results of the four surveys show that the national percentages of children aged 1-4 years who were stunted were 24%, 27%, 28%, and 22% respectively. For specific provinces, significant deteriorations were notable in Western and Nyanza provinces in 1977, 1979 and 1982. However Nyanza Province showed a significant decline in the prevalence even in 1987. There was a marked improvement in Eastern province over the four survey periods. In Coast province the prevalence of stunting remained constant in 1979, 1982 and 1987. Rift Valley and Central provinces showed little change in the number of children stunted (CBS, 1977, 1979, 1982, 1987).

Nutritional stunting and wasting are clear indicators of the nutritional status of children in a country. Available data seem to have demonstrated clearly that the typical growth pattern of rural Kenyan children differs substantially from that of children from the developed world or the WHO reference population which is based on American children.

Results of different investigations on the factors underlying the different growth pattern of Kenya children suggest that the main reasons for the slower rate of growth for children between age 6-24 months are environmental rather than genetic (Lakhan and Jansen, 1987). These environmental factors relate to how the child is fed and cared for, the burden of repeated infections and low food intake.

Breastfeeding

Breastfeeding or the lack of it, is a pivotal factor between life and death for the vast majority of children in developing countries. Babies that are breast-fed for less than 6 months are 5-10 times more likely to die in the next 6 months than babies breast fed for 6 months or more. The emergence of bottle feeding using breast milk substitutes has therefore, resulted in increased infant morbidity and mortality.

The general decline in breast feeding observed in developing countries has occurred as women move into cities and joint the work force, and also due to mothers' constant exposure to advertisements for commercial baby foods. Bottle-feeding is thus, often perceived as the modern way, and breastfeeding as old fashioned and inconvenient.

In Kenya, the breastfeeding situation has only been determined nationally through data collected in the four rural child nutrition surveys and mainly deal with the prevalence of breastfeeding in terms of duration. But there have been scattered surveys which have reported the prevalence of breastfeeding in different regions of the country.

The average national breastfeeding duration in Kenya was 18.3 months in 1982. It was noted that as the mother's level of education increased, there was a decrease in the duration of breastfeeding as was the case with the age of the mother. In 1987 the reported average duration was 17.9 months. According to the (1982) Kitui registered an average length of breastfeeding of 20.2 months while in RNS (1987) this duration was 16.3 months (a decrease of 3.9 months). Data from the Third Rural Nutrition Survey (1982) showed a mean breastfeeding duration ranging from 14 months in Nyandarua District to 23 months in Meru District. Generally, the districts in Coast, Eastern and Western provinces had Western having a 19 month duration and

Eastern 21 months. However this does not necessarily correspond to the overall nutritional situation in these provinces.

A study done in Machakos District indicated that the majority of mothers (56%) breast-fed for a period ranging from 1½ to 2 years. Thirty-four percent breastfed for 18 months and 10% breastfed for less that a year.

Surveys in nairobi show that young single mothers (14-18 years) breastfeed for shorter durations compared to older married mothers. For example, among the urban low income groups in Kariobangi more mothers breastfed (73%) than in Dandora (59%). A study in Kibera on infant feeding indicated that babies who were bottlefed had more episodes of diarrhoea and vomiting as compared to breastfed infants.

The overall breastfeeding situation in Kenya in terms of duration is relatively good and the prevalence of breastfeeding is not lower than any other country in Africa for which data is available. The mean duration of breastfeeding has increased by few months and over 90 percent of mothers breastfeed for up to at least 6 months (KFS, 1977/78 KDHS, 1986).

However, the picture is different when you look at age of supplementation and the corresponding decline in exclusive breastfeeding in early weaning and an increase in the prevalence of malnutrition particularly in urban and peri-urban areas. Early supplementation is known to be unnecessary, and potentially harmful especially where hygiene is inadequate.

A study done in 1979 among 2,000 women in both rural and urban areas found that none of the urban elite mothers, and less than 10% of the poor urban and rural mothers, were still exclusively breastfeeding their children in the fourth month (GOK and UNICEF, 1989). The major reason for early supplementation was the belief by mothers that they did not have enough

milk. Only 48% of the mothers thought that breast milk alone was adequate for baby during the second month of life (Neumann and Bwibbo, 1987). Another study by Oniang'o (1985) in fourteen locations in Kenya also found mothers introduced pre-lacteal feeds. The babies were commonly given water before putting them to the breast. The practise was common among young mothers. These feeds have the same potential danger of introducing infectious agents as well as interfering with establishment of lactation.

There is need to ensure that breastfeeding is continued at least throughout the first year of life, and that suitable weaning foods are available and used too complement breast milk as the child's nutritional requirements increase beyond the levels that can be supplied by breast milk alone.

Nutritional adequacy is often taken for granted in the urban areas on the basis of resource availability, to the extent that few studies in the past were targeted at the urban population. The picture is slowly changing, firstly, with the realization that these resources are not evenly distributed in the urban population, thus, making the urban poor most at risk of poor nutrition. Secondly urban areas also comprise groups that are more vulnerable to the existing environmental conditions.

Studies so far indicate malnutrition levels that match or are even higher than the national rural averages. The stunting levels given for Nairobi, Mombasa and Kisumu in 1983 were given as 52.2%, 60.6% and 58.7% respectively. This is much higher than the national rural average given in the third rural average given in the third rural child nutrition survey in 1982.

A Nairobi survey covering nine villages of low socio-economic status revealed a wasting level of 5.4% and 29% stunting among the sample children (NCC, 1990). Another study in

Korogocho, a peri-urban squatter settlement in Nairobi, covering 957 children showed that 27% were stunted and 4.9% were wasted (Maina, Njama and Kielmann, 1988).

A study done in Limuru by Kinyingi (1988) in the tea estates compared the nutritional status of children of tea estate workers and those of small scale farmers who live adjacent to the tea estates. The tea estates are owned by Brooke Bond and the resident workers have abandoned their own farms, grow no food and the women have generally little or no time for child care. The small scale farmers are generally of low socio-economic status. Thirty five percent of the children from the estates had a low weight-for-age (< 80% of standard), while 18% of the children of small scale farmers had a low weight for age. The height-for-age was also significantly different between the two groups, 41% and 21% respectively, using less than 90% as cut off.

Studies done in rice irrigation schemes have found a similar picture. Irrigation schemes have been mainly established land into productive use. Mwadime (1992) did a study in the Mwea Tebere irrigation scheme and compared families living in the scheme with those of farmers living in the periphery of the irrigation scheme. Off-scheme families consumed more calories and proteins than the scheme households. Scheme children were also nutritionally worse off. Fifty three percent of preschoolers in the scheme as opposed to 35% of those off-scheme had a low Height-for-age index (< 2 S.D). Wasting level was 4.5% and 2.6% respectively. A high prevalence of wasting (8%) and stunting (40%) was also observed in the Ahero Irrigation Scheme in Nyanza among resident rice farmers (Niemejer, Genns, Kilest, Ogonda and Hoorweg, 1988).

A student in a sugar growing area in south Nyanza however, found no significant differences in the nutritional status of preschoolers in the sugarcane outgrowers' scheme and those of non sugar cane farmers. This is despite the fact that the sugarcane producers had significantly higher income, accrued from sugar cane outgrowers scheme had positive effects on the household energy consumption of the new entrants to the scheme although this did not have an influence on preschooler growth. There is therefore a need to address the impact of commercial projects on the health of the population affected, right at the planning stage.

It can be hypothesized that because arid and semiarid lands produce limited amounts of food, caloric intakes are likely to be low and the population is at risk of malnutrition.

A study by Walingo (1991) in Kamnarok Mosop, Baringo District found that out of 310 children in the survey, 18.4% were undernourished (W/A 2 S.D.), and 28.1% were stunted. An earlier evaluation in the Baringo Arid and semi Arid project covering the lower areas of the District also showed a high prevalence of malnutrition with 21-29% of children having a low high-for-age (Kwofie, 1984).

Difference in child mortality by mother's education are apparent in almost every analysis of mortality differentials in Kenya. For example, in both the 1979 and 1989 census the more educated women in every age group reported a lower proportion deceased among their children. Despite the clear relationship between education and mortality, it is not clear why education is not related to child survival. It is not clear how much of the relationship is a direct of education and how much is due to factors correlated with education but not held constant in the comparisons. This problem is apparent in the inconsistencies that appear when we examine the results of different studies of the relationship between mother's education and child mortality.

Some evidence of the way in which maternal education affects child survival comes from Maina Ahlberg's (1979) study of the treatment of measles and diarrhoea in Machakos District. She found that education had little effect on the likelihood that a child with measles or acute diarrhoea would be treated using modern medicine. There was no difference in the use of modern medicine unless the mother had more than eight years of education. However she did find that education decreases the traditional practices of withholding water and milk from children with maternal age is strongly associated with infant and maternal survival. In Mott's analysis of Kenya fertility survey maternity history data (1982) he ran a regression on infant survival of the children born 1 to 10 years before the survey and the results showed that births of order two to four have the lowest infant mortality rate children of birth order five to nine and first born children suffer a rate of about 16% higher than for those of birth orders two to four. When maternal age is included in the same regression, it indicates that the children of older women have lower risks of infant death. A separate analysis of the same data carried out at the United Nation's population division shows that this result is due largely to the higher infant death rate suffered by children born to mothers under 20 years.

CHAPTER 2

METHODOLOGY

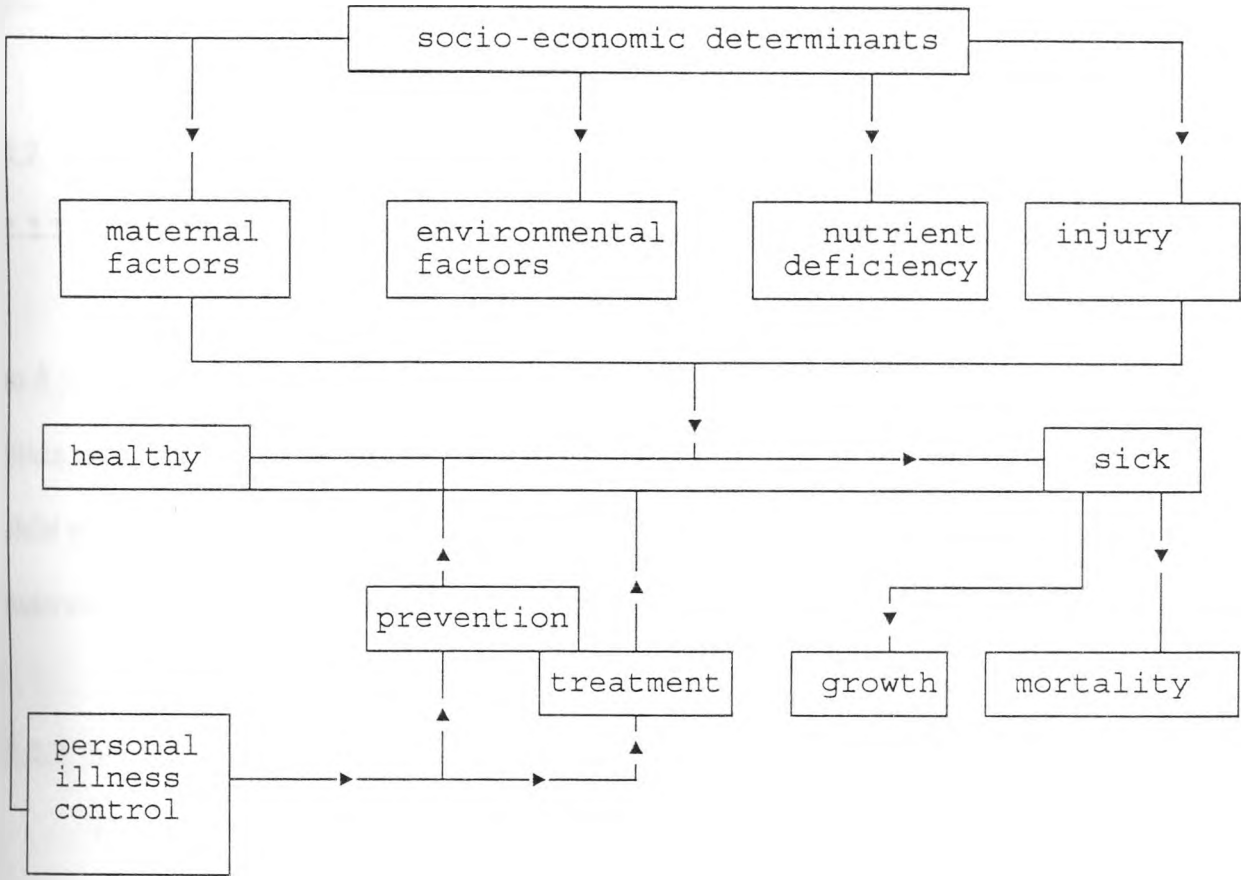
2.1 THEORETICAL FRAMEWORK

This study borrows greatly from what was been developed and proposed by Mosley (1982) and Chen (1983). Mosley and Chen's conceptual framework is based on the premise that the social conditions of life are major determinants of child survival, these determinants make their impact through a set of intermediate mechanisms that can be decomposed analytically and within this multi-layed framework, disease and death are direct consequences of a set of factors originating in the social conditions of life and behaviour of families. The framework proposed and developed by Mosley and Chen from the study of determinants of child survival incorporates both social and biological variables and integrates research employed by social and medical scientists. The framework is also based on the premise that all social and economic determinants of child mortality necessarily operate through a common set of biological mechanisms, to exert an impact on mortality.

Mosley model on child survival was based on several premises. They argue that a set of proximate determinants or intermediate variables directly influence the risk of mortality. All social and economic determinants must operate through these variables to affect child and infant survival. Some of these proximate determinants include: maternal factors, environmental contamination, nutrient deficiency, injury and personal illness control. Each of these factors is assumed to exert an independent outcome on child and infant survival.

Fig: 1 CONCEPTUAL MODEL

OPERATION OF THE FIVE GROUPS OF PROXIMATE DETERMINANTS OF THE HEALTH DYNAMICS OF A POPULATION.



Source: Population Review Vol. 10 1984

As can be seen from figure 1 mortality analysis is complex because death is the ultimate consequence of a cumulative series of biological insults rather than the outcome of a single biological events.

Socio-economic determinants like education of the mother, income, occupation, housing, all act together to affect nutritional intake, Maternal factors, environmental contamination, the kind of diet taken and also the kind of injuries that the child might get,all these factors interact

to either produce a healthy child or a sick child. The kind of preventive medicine used and treatment given either traditional medicine or modern medicine all affect the health of the child which will either accumulate finally into death of the child or into a healthy child. In this study I will concentrate mainly on the effect of nutrient deficiency on infant and child mortality.

2.2 OPERATIONAL DEFINITION OF VARIABLES

2.2.1 DEPENDENT VARIABLE

This study considered child mortality as that involving children aged between one month to 5 years as at the time of death.

Since the study is using secondary data and owing to the limitation of data and time for the study child mortality will refer to the propotion children who die before attaining age 60 months per individual mother.

2.2.2 MATERNAL FACTORS

The maternal characteristics that are involved in this study include the level of education of the mother, marital status,age of mother at first birth, proportion: of women with given education levels and proportion of women of certain marital status.

The educational level of the mother was categorized into : none, primary, secondary, college and university education.

This study considers four marital statuses: single or never married, widowed, and divorced or separated.

2.2.3 HOUSEHOLD AMENITIES

These include cases of environmental conditions under which a child grows. The environmental conditions used in this study. include sewerage disposal which determines spread of germs in the child's environment.

2.2.4 FEEDING PATTERNS

Feeding patterns was defined as the average length of breastfeeding and age for introduction of solid or mushy food to the baby. Average length of breastfeeding is considered because of it's role in determining the child's immunity against infection and level of prevalence of stunting. Mean age of supplementation determine the child's nutritional status.

2.2.5 SEX DIFFERENTIALS

Although this study did not analyse in detail differentials in infant and child mortality by sex, it did attempt to analyse whether they are any major differences in age at introduction of supplementary foods and duration of breastfeeding for the children by sex.

2.2.6 MATERNAL AGE FIRST BIRTH

Maternal age at first birth was categorized into: 15-19, 25-24, 25-29, 30-34, 35-39, 40-44 and 45-49 years. It is believed that relatively young mothers are likely to introduce solid foods to the baby at an early age.

2.3 SOURCE OF DATA

The study will utilized data collected in the Kenya Demographic and health survey of 1993. The survey included data on mothers socio-economic status and information on the environment of the child (household amenities) among others. The information in the survey was ideally obtained from the mother of the child.

2.4 METHODS OF DATA ANALYSIS

Since the study is using secondary data, the methods of data analysis had to be chosen to fit the nature of data while at the same time allow for the objectives to be realised. Basically this study utilised statistical techniques to analyse the data. The cross tabulation was used to determine association between chosen independent variables and duration of breastfeeding and age for introduction of solid or mushy food to the baby. Correlation analysis gives the relationship between duration of breastfeeding, age for introduction of supplementary foods and number of children dead per mother.

2.4.1 CROSS TABULATION

In using cross tabulation to study association between two or more variables and the significance of the association is measured by a Chi-square statistic.

The Chi-Square X^2

The Chi-square is used to measured the significance of the cross tabulated variables. This is based on observed cell frequencies of a cross tabulation (joint contingency table) with the

frequencies that would be expected if the null hypothesis of no relationship were infact true.

The chi-square is calculated using the following steps:

1. Find the frequencies for each variable i.e. observed frequencies.
2. Find the expected frequencies by multiplying the number of row by the number of columns, then divide the expected result by the grand total or the sample size.

   $F_{expected} = (RxC)/N$

3. Find the difference between the observed and expected frequencies in each cell, then square it, then divide it by the expected frequencies for each cell, then sum all results for all cells of the table.

   The equation is written as follows:

$$E^r E^c = (F_{expected} - F_{observed})^2 / F_{expected}$$

note E represents summation sign, c represents columns,r represents rows and F represents frequencies. In this analysis the results of the chi-square will be obtained by the use of computer because of the large data set. If the observed significance printed out for a cross tabulation is less than 0.05 then the variables in the cross tabulation have a relationship that is significant at 95 percent confidence interval.

2.4.2 Correlation analysis

The correlation coefficient is defined as the ratio of the covariation to the square root of the product of the independent variable say x and the variation in dependent variable say y (Hubert Blalock 1979, pp 398).

The steps followed in calculating the correlation coefficient between two variables is as follows:

1. Calculate the means of the variables i.e. mean of X and mean of Y.
2. Second calculate the deviations of the each variable from its mean.
3. Square the deviations of each of the variables in step two and sum them up.
4. Multiply each of the variables and sum them up.

The final formula would thus look like this

$$r = E(X*Y)/Sqrt[(Ex^2)(Ey^2)]$$

Note: E represents the summation sign, X and Y are the variables while x and y are the deviations from the mean.

CHAPTER THREE

DEMOGRAPHIC, SOCIO-ECONOMIC, NUTRTIONAL STATUS AND INFANT/CHILD MORTALITY

Cross tabulation shows the association between variables and the significance of that association. In this section the association between duration of breastfeeding, age at introduction of solid of mushy foods(supplementary foods) and selected variables will be outlined. The data represented throughout this analysis represents that for the second child as information was likely to be complete.

3.1 Age of mother

The relationship between age of mother, duration of breastfeeding and age for introduction of mushy or solid foods is reported in table 3.1. The results of the analysis shows that the proportion of women in the different age groups were as follows: 15-19 years, 23.7 percent;20-24 years, 21.3 percent; 25-29 years, 15.9 percent; 30-34 year, 14.7 percent; 35-39 years, 9.9 percent; 40-44 years, 8.7 percent and 45-49 years, 5.8 percent.The majority were in the age group 25-29 while the minority were in the age group 45-49 years. The results further showed that duration of breastfeeding varied among women. However, 6 percent reported that they breasted for 0-6 months, 28.2 percent reported that they breasted for 7-12 months and 32 percent reported that the breasted for 13-18 months. The majority

breastfed for 13-18 months. The proportion that reported that they breasted for 19-24 months was 26.8 percent while only 6.9 percent breasted for 25 months or more.

The proportion of women who introduced solid or mushy foods to their second born babies at the age of 0-6 months were 69.7 percent and those who introduced at age 7-12 months were 27.5 percent. Only 2.8 percent introduced solid foods at age 13 months or above.

Table 3.1: Age of mother, duration of breastfeeding and age for introduction of solid, mushy foods.

Age	Duration of breastfeeding in months											
	0-6		7-12		13-18		19-24		25+		Total*	
	N	%	N	%	N	%	N	%	N	%	N	%
15-19	6	14.3	15	3.5	17	40.5	3	7.1	1	2.4	42	2.5
20-24	29	6.4	148	32.6	146	32.2	94	20.7	37	8.1	454	27.1
25-29	28	5.4	141	27.4	165	32.1	145	28.2	35	6.8	514	30.7
30-34	27	7	88	23	120	31.3	122	31.9	26	6.8	383	22.9
35-39	6	3.4	49	28.2	54	31	55	31.6	10	5.7	174	10.4
40-44	2	2.4	23	28	28	34.1	24	29.3	5	6.1	82	4.9
45-49	3	11.1	8	29.6	7	25.9	7	25.9	2	7.4	27	1.6
X^2=40.64864 N=1676 Significance=0.0182												

** Footnote: Proportion in the total column are based on the total number of children and this applies to all the tables in the this section.*

Among the mothers who were aged 15-19 years, the highest proportion, 40.5 percent, breasted their babies for 13-18 months, 35.7 percent for 7-12 months, 14.3 percent for 0-6 months. Further for women in this age group, 77.5 percent introduced solid foods to their babies at age 0-6 months while only 20 percent introduced solid foods at age 7-12 months. For women in this age it is noted that over 80 percent breastfeed their babies for more than 6 months and 77.5 percent introduced solid foods to their babies in the first six months. However, less than 10 percent of the women in this age group breasted their babies for more than 18 months.

Table 3.2: Age of mother, and age for introduction of solid, mushy foods.

Age	Age for introduction of solid foods in months							
	0-6		7-12		13+		Total	
	N	%	N	%	N	%	N	%
15-19	31	77.5	8	20	1	2.5	40	2.5
20-24	295	66.5	132	29.7	17	3.8	444	27.5
25-29	356	72.2	122	24.7	15	3	493	30.5
30-34	260	71.6	100	27.5	3	0.8	363	22.5
35-39	112	67.9	48	29.1	5	3	165	10.2
40-44	59	68.6	24	27.9	3	3.5	86	5.3
45-49	14	56	10	40	1	4	25	1.5
$X^2=14.17883$, N=1616 Significance=0.2894								

In the age group 20-24 years, over 90 percent of the women breasted their babies for more than six months and 20.7 percent of women in this age group breasted for more than 18 months. In the same age group, 66.5 percent of the women introduced solid foods to their babies in the first six months while 29.7 introduced solid foods to their babies in the 7-12 months.

In the age groups 25-29, 30-34, 35-39 and 40-44 years, over 90 percent o the women breasted their babies for more than six months while at the same time about one third of them breasted their babies for more than 18 months. For the same age groups, over 55 percent introduced solid foods to their babies in the first six months of age and about one third introduced solid foods to their babies in 7-12 months.

Among the women who were aged 45-49 years, 11.1 percent breasted their babies for 0-6 months while 14 percent introduced solid foods to their babies in the first 6 months. The overall trend emerging shows that women who were less than 30 years breasted for relatively shorter periods compared to those who were thirty and above. Although over 55 percent of women in each age group introduced solid or mushy foods to the baby in the first six months, the highest proportion is found among those aged 15-19 years.

Further analysis show that the relationship between age and duration of breastfeeding is significant at 95 percent significance level (observed significance was 0.0182) while the relationship between age of mother and age for introduction of solid foods to the baby was not significant at the same significance level (the observed significance level was 0.2894).

3.2 Current marital status

The proportion of women who were reported to be in different marital status categories were as follows:-

never married, 30.8 percent; married, 57.4 percent; living together, 3.4 percent; widowed 3.1 percent; divorced 2.6 percent and not living together,2.7 percent. The relationship between

current marital status, duration of breastfeeding and age at introduction of solid or mushy foods is reported in table 3.2.

Table 3.3: Current marital status and duration of breastfeeding

Marital status	Duration of breastfeeding											
	0-6		7-12		13-18		19-24		25+		Total	
	N	%	N	%	N	%	N	%	N	%	N	%
Never married	5	11.4	15	34.1	15	34.1	5	11.4	4	9.1	44	2.6
Married	78	5.4	415	28.9	458	31.9	385	26.8	100	7	1436	85.7
Living together	6	7.1	22	26.2	27	32.1	25	29.8	4	4.8	84	5
Widowed	5	18.5	2	7.4	8	29.6	10	37	2	7.4	27	1.6
Divorced	2	5.4	8	21.6	14	37.8	10	27	3	8.1	37	2.2
Not living together	5	10.4	10	20.8	15	31.3	15	31.3	3	6.3	40	2.9
X^2=25.28191 N=1676 Significance=0.1909												

Among the women who have never ben married, 11.4 percent breasted for 0-6 months, 34.1 percent breasted for 7-12 months, 34.1 percent breasted 19-24 months while 20.5 percent breasted for more than 18 months. In the same age group 72.3 percent introduced solid or mushy foods to their babies after six months (7+ months).

For the women who were married, over 90 percent breasted their babies for more than six months with 26.8 percent breastfeeding for 19-24 months. Further for women in this category of marital status, about 70 percent (69.6%) introduced solid foods at age 0-6 months, 27.6 percent introduced at 7-12 months.

In the category of women living together with their partners, over 90 percent breasted for more than six months while 65 percent introduced solid foods to the baby at age 0-6 months. Though the widowed women were few in the study they had the highest proportion, 37 percent of women who breasted for more than six months. Further for the widowed women, 73.1 percent introduced solid foods to the baby at age 0-6 months.

Table 3.4: Current marital status and age for introduction of solid or mushy foods

Marital status	Age for introduction of solid foods in months							
	0-6		7-12		13+		Total	
	N	%	N	%	N	%	N	%
Never married	34	72.3	11	23.4	2	4.3	47	2.9
Married	963	69.6	382	27.6	39	2.8	1384	85.6
Living together	52	65	27	33.8	1	1.3	80	5
Widowed	19	73.1	7	26.9	-	-	26	1.6
Divorced	27	75	8	22.2	1	2.8	36	2.2
Not living together	32	74.4	9	20.9	2	4.7	43	2.7
$X^2=5.40954$, N=1616 Significance=0.8622t								

Among the divorced women, over 94 percent breasted their babies for more than six months while 75 percent introduced solid foods at age 0-6 months. For women who were not living together with their partners, 10.4 percent breasted their babies for 0-6 months, 20.8 percent for 7-12 months, 31.3 percent for 13-18 months and 37.6 percent for over 18 months. In the same category of women, 74.4 percent introduced solid or mushy foods to the baby at age 0-6 months and 20.9 percent introduced solid or mushy foods at age 7-12 months. The data show that the never married and widowed women have the highest proportions of women who breasted their babies for 0-6 months while divorced women have the highest proportion of women who introduced solid or mushy foods at age 0-6 months.

Further analysis show that the relationship between current marital status and duration of breastfeeding is not significant at 95 percent significance level. The same result was found between current marital status and age for introduction of solid or mushy foods. In both cases the observed significance was greater than 0.05.

3.3 Number of household members, duration of Breastfeeding and age for solid or mushy food.

Although the number of household member is unlikely to have an effect on the duration of breastfeeding of a mother it may have an effect on the age of introduction of solid or mushy foods to the baby in that household. The KDHS showed that household with 1-5 members were 40.7 percent, 6-10 members, 46.5 percent and 11 members were 9.8 percent. The result of the crosstabulation between number of household members , duration of breastfeeding and age of introduction of solid or mushy foods is reported in table 3.5 and 3.6.

Table 3.5: Number of household members and duration of breastfeeding

Number of Household members	Duration of breastfeeding in months											
	0-6		7-12		13-18		19-24		25+		Total	
	N	%	N	%	N	%	N	%	N	%	N	%
1-5	35	6.1	174	30.5	179	31.4	146	25.6	36	6.3	570	34
6-10	51	5.4	257	27.4	301	32.1	262	28	66	7	937	55.9
11+	15	8.9	41	24.3	57	33.7	42	24.9	14	8.3	169	10.1
X^2=7.04949 N=1676 Significance=0.5313												

In the households which had 1-5 members, 6.1 percent of the women breasted for 0-6 months, 30.5 percent breasted for 7-12 months and 31.4 percent breasted for 13-18 months. About 31 percent breasted for more than 18 months. The proportion of women in this type of households who introduced solid or mushy food at age 0-6 months were 70.1 percent.

Table 3.6: Number of household members and age for introduction of solid, mushy foods.

Number of Household members	Age for introduction of solid foods in months							
	0-6		7-12		13+		Total	
	N	%	N	%	N	%	N	%
1-5	34	72.3	11	23.4	2	4.3	47	2.9
6-10	632	70.8	241	27	20	2.2	893	55.3
11+	103	62.8	52	31.7	9	5.5	164	10.1
$X^2=7.73743$, N=1616 Significance=0.1017								

The highest proportion of women in the households with 6-10 members breasted their babies for 13-18 months. In this category, 70.8 percent of the women introduced solid food at age 0-6 months. For women in household with 11 or more members, over 90 percent breasted their babies for more than 6 months. In the same category of women 62.8 percent introduced solid food to their babies at the age of 0-6 months.

Generally a higher proportion of women in households with few members introduced solid foods to their babies at age 0-6 months compared to those women from households with many members say 11 or more.

The analysis showed that there is no significant association between number of household members and age for introduction of solid foods to the baby and duration of breastfeeding. In each case, the observed significance was more than 0.05 (95% significance level).

3.4 Age of respondent at first birth.

The result of the analysis showed that 7.4 percent of the women had given their first birth at the age of below 14 years, 60.4 percent at age 15-19 years, 27.3 percent at the age of 20-24 years, 4.3 percent at age 25-29 years and 0.6 percent at age 30+ years. The crosstabulation between

age at first birth, duration of breastfeeding and age for introduction of solid or mushy foods is reported in table 3.4.

Table 3.7: Age of respondent at first birth and duration of breastfeeding.

Age of respondent at first birth(years)	Duration of breastfeeding in months											
	0-6		7-12		13-18		19-24		25+		Total	
	N	%	N	%	N	%	N	%	N	%	N	%
Below 14	7	6.7	20	19	32	30.5	38	36.2	8	7.6	105	6.3
15-19	59	5.6	302	28.5	345	32.6	275	26	77	7.3	1058	63.1
20-24	28	6.4	126	28.6	135	30.7	125	28.4	26	5.9	440	26.3
25-29	5	7.4	24	35.3	22	32.4	12	17.6	5	7.4	68	4.1
30+	2	4.0	-	-	3	60	-	-	-	-	5	0.3
X^2=26.64213 N=1676 Significance=0.0456												

Among the women who had their first birth at age of below 14 years, less than 10 percent breasted for 0-6 months while 75.2 percent introduced solid foods at age 0-6 months. For women who first gave birth at age 15-19 years, 5.6 breasted for 0-6 months, 28.5 percent breasted for 7-12 months, 32.6 percent breasted for 13-18 months while over 30 percent breasted for over 18 months. Further for women who first gave birth in the age group 15-19 years, 67 percent introduced solid foods at the age of 0-6 months, 29.8 percent at the age 7-12 months and 3.3 percent at age of over 12 months (13+).

In the category of women who first gave birth in the age groups-20-24 and 25-29 years, less than 10 percent breasted their babies for 0-6 months and over 70 percent of them introduced solid food to their babies at age 0-6 months. The highest proportion of women who introduced solid food at age 0-6 months is found among those aged 25-29 years.

Table 3.8: Age of respondent at first birth and age for introduction of solid, mushy foods.

Age of respondent at first birth(years)	Age for introduction of solid foods							
	0-6		7-12		13+		Total	
	N	%	N	%	N	%	N	%
Below 14	76	75.2	22	21.8	3	3	101	6.3
15-19	677	67	301	29.8	33	3.3	1011	62.6
20-24	320	73.2	109	24.9	8	1.8	437	27
25-29	52	83.9	9	14.5	1	1.6	62	3.8
30+	2	40	3	60	-	-	5	0.3
X^2=17.31635, N=1616 Significance=0.0270								

The relationship between age at first birth and duration of breastfeeding is significant at 9.5 percent significance level (the observed significance was 0.0456). However, the association between age at first birth and age for introduction of solid or mushy food was not significant at 95 percent significance level because the observed significance was 0.0270.

3.5 Level of Education.

Women with higher level of education are likely to be engaged in formal employment and thus they breastfeed for short period and at the same time introduce solid foods to the baby at an early age. The results of the analysis show that for women with no education, 7.4 percent breasted for 0-6 months, 28 percent breasted for 7-12 months, 26.8 percent breasted for 13-18 months and 38.6 percent breasted for over 18 months. For this women, 65.8 percent introduced solid foods at age 0-6 months, while 34.2 percent introduced solid foods at age of over 6 months.

Table 3.9: Level of education and duration of breastfeeding.

Level of education	Duration of breastfeeding in months											
	0-6		7-12		13-18		19-24		25+		Total	
	N	%	N	%	N	%	N	%	N	%	N	%
No education	23	7.4	87	28	81	26.8	96	30.9	24	7.7	311	18.6
Primary	52	4.9	294	27.9	354	33.6	279	26.5	74	7	1053	62.8
Secondary	26	8.4	88	28.5	102	33	75	24.3	18	3.8	309	18.4
X^2=21.56937 N=1676 Significance=0.0426												

Among the women with primary level of education, 4.9 percent breasted for 0-6 months, 27.9 percent for 7-12 months, 33.6 percent for 13-18 months, 26.5 percent for 19-24 months and 7 percent for more than 24 months. In the same category of education, 67.9 percent of the women introduced solid foods at age 0-6 months.

The women who had secondary education had the lowest proportion of women, 30.1 percent, who breasted for more than 18 months and they had the highest proportion of women, 79.6 percent, who introduced solid foods at age 0-6 months.

Table 3.10: Level of education and age for introduction of solid, mushy foods.

Level of education	Age for introduction of solid foods							
	0-6		7-12		13+		Total	
	N	%	N	%	N	%	N	%
No education	200	65.8	87	28.6	17	5.6	304	18.8
Primary	686	67.9	300	29.7	24	2.4	1010	62.5
Secondary	238	79.6	57	19.1	4	1.3	299	18.5
$X^2=27.75464$, N=1616 Significance=0.00001								

Further analysis show that the relationship between level of education, age for introduction of solid foods and duration of breastfeeding are all significant at 95 percent significance level. The observed significance in each case was less than 0.05.

3.6 Place of Residence.

The relationship between place of residence and duration of breastfeeding, age of introduction of supplementary foods is shown in table 3.6 below. For women staying in the urban areas, 14.5 percent breasted for 0-6 months, 30.3 percent for 7-12 months, 28.9 percent for 13-18 months while 17.8 percent breasted for 19-24 months. Only 8.6 percent breasted for more than 2 years. The proportion of women who introduced solid or mushy food to the baby at age 0-6 months were 80.9 percent, 15.3 percent introduced at age 7-12 months and 3.8 percent introduced at age 13+ months.

Table 3.11: Place of residence and duration of breastfeeding.

Place of residence	Duration of breastfeeding											
	0-6		7-12		13-18		19-24		25+		Total	
	N	%	N	%	N	%	N	%	N	%	N	%
Urban	22	14.5	46	30.3	44	28.9	27	17.8	13	8.6	152	9.1
Rural	79	5.2	426	28	493	32.3	423	27.8	103	6.8	1524	90.9
X^2=26.33825 N=1676 Significance=0.0000												

For women staying in the rural areas, 5.2 percent breasted their babies for 0-6 months, 28 percent breasted for 7-12 months, 32.3 percent breasted for 13-18 months and 27.8 percent breasted for 19-24 months while 6.8 percent breasted for more than 2 years. In the same category, 68.5 percent introduced solid or mushy foods to the baby at age 0-6 months, 28.8 percent introduced at age 7-12 months while 2.7 percent introduced solid foods after 2 years.

Table 3.12: Place of residence and age for introduction of solid, mushy foods.

Place of residence	Age for introduction of solid foods							
	0-6		7-12		13+		Total	
	N	%	N	%	N	%	N	%
Urban	127	80.9	24	15.3	6	3.8	157	9.7
Rural	1000	68.5	420	28.8	39	2.7	1459	90.9
X^2=13.17510, N=1616 Significance=0.0014								

The trend emerging shows that the women in the rural areas breastfeed their babies longer than those in the urban areas while those in the urban areas, a higher proportion introduced solid or mushy foods to the baby at age 0-6 months.

Further analysis show that the relationship between place of residence (rural/urban) and duration of breastfeeding and age for introduction of supplementary food were all significant at 95 percent significance level.

3.7 Sex of Child (2nd born).

The relation between sex of child (2nd child) and duration of breastfeeding on one hand and age for introduction of solid foods is reported in table 3.7 below. For the male children, 5.5 percent were breasted for 0-6 months, 28.7 percent were breasted for 7-12 months, 30.5 percent were breasted for 13-18 months while 35.5 percent were breasted for over 18 months. Further, for the male children, 68 percent of their mother introduced solid foods to them at age 0-6 months, 29 percent introduced at age 7-12 months.

Table 3.13: Sex of child and duration of breastfeeding.

Sex of child	Duration of breastfeeding in months											
	0-6		7-12		13-18		19-24		25+		Total	
	N	%	N	%	N	%	N	%	N	%	N	%
Male	45	5.9	23	28.7	250	30.5	218	26.6	71	8.7	819	48.9
Female	56	6.5	237	27.7	287	33.5	232	27.1	45	5.3	857	51.1
X^2=9.16212 N=1676 Significance=0.0572												

Among the mothers with female children, 6.5 percent breasted for 0-6 months, 27.7 breasted for 7-12 months, 33.3 percent breasted for 13-18 months and 32.4 percent breasted for over 18 months.

Further analysis show that the relationship between sex of child and duration of breastfeeding and age for introduction of supplementary foods is not significant at 95 percent confidence interval because the observed significance in each case was greater than 0.05.

Table 3.14: Sex of child and age for introduction of solid, mushy foods.

Sex of child	Age for introduction of solid foods months							
	0-6		7-12		13+		Total	
	N	%	N	%	N	%	N	%
Male	541	68	231	29	24	3	796	49.3
Female	586	71.5	213	26	21	2.6	820	50.7
X^2=2.37062, N=1616 Significance=0.3057								

3.8 Toilet facility

Toilet facility affects the environmental sanitation and thus influences the extent to which a baby can be infected with disease causing germs. In this study cross tabulation analysis was done to determine the extent of the relationship between type of toilet facility and duration of breastfeeding, type of toilet facility and age for introduction of supplementary foods. The results of this analysis is reported in table 3.8.

Table 3.15: Type of toilet facility an duration of breastfeeding.

Type of toilet facility	Duration of breastfeeding in months											
	0-6		7-12		13-18		19-24		25+		Total	
	N	%	N	%	N	%	N	%	N	%	N	%
Own flush	6	15	15	37.5	14	35	5	12.5	-	-	40	2.4
Shared flush	4	10.3	12	30.8	10	25.6	8	20.5	5	12.8	39	2.3
Traditional pit	73	6	333	27.4	393	32.3	333	27.4	84	6.9	1216	72.8
Ventilated improved pit	8	9.4	28	32.9	25	29.4	21	24.7	3	3.5	85	5.1
No facility bush	10	3.4	84	29	92	31.7	81	27.9	23	7.9	290	17.4
X^2=27.82650 N=1671 Significance=0.1136												

Except for women who own flush toilet or shared flush toilet, over 90 percent of women using the other types of toilets breasted for more than six months. For women who were using traditional pit lat- rines, the highest proportion, 32.3 percent breasted for 13-18 months while in the same category women, 72.7 percent introduced solid foods to the baby at age 0-6 months. The highest proportion of women using ventilated improved pit latrines, breasted their babies for 7-12 months. For the same group of women, 72.1 percent introduced solid foods to the baby at age 0-6 months.

Table 3.16: Type of toilet facility and age for introduction of solid, mushy foods.

Type of toilet facility	Age for introduction of solid foods in months							
	0-6		7-12		13+		Total	
	N	%	N	%	N	%	N	%
Own flush	34	81	7	10.7	1	2.4	42	2.6
Shared flush	30	81.1	5	13.5	2	5.4	37	2.3
Traditional pit	841	72.7	286	24.7	30	2.6	1157	71.9
Ventilated improved pit	62	72.1	23	26.7	1	1.2	86	3.5
No facility bush	153	53.5	122	42.7	11	3.8	286	17.8
$X^2=48.81325$, N=1609 Significance=0.0000								

Women who had no toilet facility and were using the bush had the highest proportion, 35.8 percent, of those who breasted their babies for more than 18 months. These women, however, had the lowest proportion of women, 53.5 percent, who introduced solid foods to the baby at age 0-6 months. On the contrary, the women who use flush toilets had the lowest proportion, 12.5 percent, of women who breasted for more than 18 months and they had the highest proportion, 81 percent of women who ha introduced solid foods to the baby at age 0-6 months. The trend shows that women with modern toilet facilities breasted for shorter periods compared to those with relatively poor toilet facilities. Women with modern toilet facilities also tend to introduce slid foods to the baby at a relatively early age.

The results further show that the association between toilet facility and duration of breastfeeding was not significant at 95 percent significance level. However, the relationship between type of toilet facility and age for introduction of solid foods to the baby was significant at 95 percent significance level.

3.9 Source of drinking water

Source of drinking water has an effect on the level of infection that the baby can be exposed to unless other measure are taken like boiling water before use. In this study the analysis was undertaken to show the association between source of water and duration of breastfeeding and source of water and age for introduction of solid foods to the baby.

Table 3.17: Source of drinking water and duration of breastfeeding.

Source of water	Duration of breastfeeding in months											
	0-6		7-12		13-18		19-24		25+		Total	
	N	%	N	%	N	%	N	%	N	%	N	%
Piped into residence	25	12.1	69	33.3	62	30	44	21.3	7	3.4	207	12.4
Public tap	20	9.7	46	22.2	62	30	60	29	19	9.2	207	12.4
Well with tap	4	2.5	39	24.8	56	35.7	45	28.7	13	8.3	157	9.4
Well without pump	5	1.8	89	32.7	86	32.6	74	27.2	18	6.6	272	16.3
Lake, pond	8	5.8	53	38.4	31	22.5	37	26.8	9	6.5	138	8.3
River, stream	35	5.6	162	25.8	214	34	174	27.7	44	7	629	37.7
Rain water	2	9.5	4	19	6	28.6	6	28.6	3	14.3	21	1.3
Other	1	2.7	7	18.9	18	48.6	9	24.3	2		37	2.2
X^2=65.03958 N=1668 Significance=0.1668												

The results show that among the women whose drinking water is piped into the house, less than 90 Percent breasted their babies for more than six months (87.9%). In this group, 80.3 percent introduced solid foods to the baby at age 0-6 months. Only 19.7 percent introduced solid foods to the baby after six months. Less than 10 percent of the women who use public taps as their source of water breasted their babies for 0-6 months while 72.6 percent of them introduced solid foods to their babies at age 0-6 months.

Table 3.18: Source of drinking water and age for introduction of solid, mushy foods.

Source of water	Age for introduction of solid foods in months							
	0-6		7-12		13+		Total	
	N	%	N	%	N	%	N	%
Piped into residence	171	80.3	36	16.9	6	2.8	213	13.3
Public tap	146	72.6	50	24.9	5	2.5	201	12.5
Well with tap	106	63.1	55	32.7	7	4.2	168	10.5
Well without pump	185	68.3	78	28.8	8	3	271	16.9
Lake,pond	81	66.9	30	24.8	10	8.3	121	7.5
River,stream	397	67.7	180	30.7	9	1.5	586	36.5
Rain water	16	80	4	20	-	-	20	1.2
Other	18	69.2	8	30.8	-	-	26	1.6
$X^2=38.39221$, N=1606 Significance=0.0005								

For women who get their drinking water from well with pump and well without pump over 95 percent breasted their babies for more than six months while less than 10 percent breasted their babies for more than 24 months. In the same category of women, over 60 percent introduced solid foods to their babies at age 0-6 months.

Among the women who get their water from lakes and ponds, the highest proportion 38.4 percent breasted their babies for 7-12 months while only 6.5 percent breasted for more than 24 months. In the same group, 66.9 percent introduced solid foods to their babies at age 0-6 months.

The majority of the women who get their water from rivers and streams breasted their babies for 13-18 months, 34 percent , although only 7 percent breasted for 24 months or more. For the

same women, 67.7 percent introduced solid foods to the baby at age 0-6 months and 30.7 percent introduced solid foods to the baby at age 7-12 months. Over 50 percent of the women who get their drinking water from rain water, breasted their babies for a period of between 13-24 months (i.e. between one year and two years). In the same category 80 percent of the women introduced solid foods to the baby at age 0-6 months.

For women who get their drinking water from 'other sources', 48.6 percent breasted their babies for 13-18 months and 69.2 percent introduced solid foods to the baby at age 0-6 months.

Further results of the analysis show that the relationship between water and duration of breastfeeding and between source of water and age at introduction of solid foods to the baby are both significant at 95 percent significance level. The observed significance was in each case less than 0.05.

3.10 Ethnicity

In different ethnic communities in Kenya, duration of breastfeeding varies from one community to the other as it is governed by other factors. In communities where duration of breastfeeding is short, the nutritional status of the baby is likely to be affected. This study therefore examines how duration of breastfeeding varies within and between ethnic communities in Kenya and how this can eventually influence infant and child mortality levels in this communities.

Table 3.19: Ethnicity and duration of breastfeeding.

Ethnicity	Duration of breastfeeding in months											
	0-6		7-12		13-18		19-24		25+		Total	
	N	%	N	%	N	%	N	%	N	%	N	%
Kalenjin	13	4.5	107	37.3	89	31	44	21.3	10	3.5	287	3.5
Kamba	12	5.9	43	21.3	70	34.7	68	23.7	18	8.9	202	12.1
Kikuyu	10	4.2	81	33.8	84	35	55	29.2	10	4.2	240	14.3
Kisii	13	11	33	28	38	32.2	29	24.6	5	4.2	118	7.1
Luhya	15	4.9	74	24.3	103	33.8	94	30.8	19	6.2	305	18.2
Luo	8	3.6	56	25.1	69	30.9	69	30.9	21	9.4	223	13.3
Meru/Embu	3	3.2	26	27.7	28	29.8	24	25.5	13	13.8	94	5.6
Mjikenda/Swahili	12	11.5	24	23.1	25	24	28	26.9	15	14.4	104	6.2
Somali	1	25	3	75	-	-	-	-	-	-	4	0.2
Taita/Taveta	6	15.8	12	31.6	11	28.9	7	18.4	2	5.3	38	2.3
Other	8	13.8	12	20.7	19	32.8	16	27.6	3	5.2	58	3.5
X^2=94.41756 N=1673 Significance=0.1673												

In the Kalenjin community, it was reported that 4.5 percent of the women breasted for 0-6 months, 37.3 percent for 7-12 months, 31 percent for 13-18 months and 23.7 percent breasted for 19-24 months. For the same community, 60.3 percent introduced supplementary foods to the baby at age 0-6 months. Those who introduced solid foods to the baby at age 7-12 months were 37.4 percent.

The proportion of the Kamba women who breasted for 0-6 months were 5.9 percent and 21.3 percent breasted for 7-12 months. The proportion of women who breasted for 13-18 months were 34.7 percent and 29.2 percent breasted for 19-24 months. Further, 66.7 percent of the Kamba women introduced solids to the baby at age 0-6 months and 31.3 percent introduced solid foods to the baby at age 7-12 months.

Among the Kikuyu ethnic community, 4.2 percent of the women breasted their babies for 0-6 months, 33.8 for 7-12 months, 35 percent for 13-18 months and 22.9 percent breasted their babies for 19-24 months. The proportion of the Kikuyu women who introduced solid foods to their babies at age 0-6 months were 91 percent.

For the Kisii women, 11 percent breasted their babies for 0-6 months, 28 percent for 7-12 months, 32.2 percent for 13-18 months and 24.6 percent for 19-24 months. Further among the Kisii women,92.9 percent introduced solid foods to the baby at age 0-6 months and only 7.1 percent introduced solid foods to the baby at age 7-12 months.

Table 3.20: Ethnicity and age for introduction of solid foods.

Ethnicity	Age for introduction of solid foods in months							
	0-6		7-12		13+		Total	
	N	%	N	%	N	%	N	%
Kalenjin	184	60.3	114	37.4	7	2.3	305	18.9
Kamba	132	66.7	62	31.3	4	2	198	12.3
Kikuyu	272	91	17	7	5	2	244	15.1
Kisii	26	92.9	2	7.1	-	-	28	1.7
Luhya	199	62.2	113	35.3	8	2.5	320	19.8
Luo	142	66.4	63	29.4	9	4.2	214	13.3
Meru/Embu	92	90.2	9	8.8	1	1	102	6.3
Mjikenda/Swahili	56	51.9	42	38.9	10	9.3	108	6.7
Somali	4	100	-	-	-	-	4	0.2
Taita/Taveta	33	86.8	5	13.2	-	-	38	2.4
Other	36	67.9	16	30.2	1	1.9	53	3.3
X^2=143.73377, N=1614 Significance=0.0000								

In the Luhya Ethnic community, 4.9 percent breasted their babies for 0-6 months, 24.3 percent breasted for 7-12 months and 33.8 percent breasted for 13-18 months. Also among the Luhya women, 62.2 percent introduced solid foods to the baby at age 0-6 months and 35.3 percent introduced solid foods to the baby at age 7-12 months.

Within the Luo ethnic community, 3.6 percent of the women breastfeed their babies for 0-6 months, 25.1 percent breasted their babies for 7-12 months, 30.9 percent breasted their babies for-13-18 months, 30.9 percent breasted their babies for 19-24 months and less than 10, percent breasted their babies for more than 24 months. The proportion of the Luo women who introduced solid foods to the baby at age 0-6 months was 66.4 percent and 29.4 percent introduced solid foods to the baby at age 7-12 months.

In the Meru/Embu communities, 3.2 percent of the women breasted for their babies for more than six months, 27.7 percent breasted for-7-12 months, 29.8 percent breasted for 13-18 months and 25.5 breasted for 13-18 months. Still among the women in these communities 90.2 percent introduced solid foods to the baby at age 0-6 months and 8.8 percent introduced solid foods to the baby at age 7-12 months.

Among the Mjikenda/ Swahili women, 11.5 percent breasted for 0-6 months, 23.1 percent breasted for 7-12 months, 24 percent breasted for 13-18 months and 26.9 percent breasted for 19-24 months. In the same ethnic community, 51.9 percent introduced solid foods to the baby at age 0-6 months and 38.9 percent introduced solid foods to the baby at age 7-12 months.

In the Taita/Taveta ethnic community, 15.8 percent breasted their babies for 0-6 months, 31.6 percent for 7-12 months, 28.9 percent for 13-18 months and 18.4 percent for 19-24 months. In the same ethnic community, 86.8 percent introduced solid foods to the baby at age 0-6 months and 13.2 percent introduced solid foods at age-7-12 months.

Among the other communities covered by the survey, 13.8 percent breasted their babies for 0-6 months, 20.7 percent for 7-12 months and 32.8 percent for 13-18 months. Those who breasted for 19-24 months were 27.6 percent. Further, for this other communities, 67.9 percent introduced solid foods to the baby at age 0-6 months, 30.2 percent introduced solid foods to the baby at age 30.2 percent.

The results further shows that the association between ethnicity and duration of breastfeeding and age for introduction of solid foods to the baby are both significant at 95 percent significance level.

3.11 Infant and child mortality

This study has analysed proportion infant and child mortality by proportion of children dead to those ever for a group of women as shown in tables 3.21 and 3.22.

Table 3.21: Proportion of children dead to those ever born for women who breastfeed for different periods

Duration of breastfeeding in months	Number of children dead	Number of children ever born	Proportion of children dead to ever born
0-6	5	515	0.00971
7-12	23	2226	0.01033
13-18	24	2563	0.00936
19-24	41	2302	0.01781
25+	5	511	0.00978

Among the women who breastfed for 0-6 months, 7-12 months and 13-18 months, there seem to have almost proportion of children dead to those ever born.This proportion indicates for women in this categories, about 9-10 children died for every 1000 children ever born. However for the women who breastfed their babies for 19-24 months, the proportion is slightly higher at 17 children dead per 1000 children ever born. For those who breastfed their babies for more than 24 months (25+) the proportion of children dead to those ever born again reduces to about 10 children (9.8) dead per 1000 ever born.

Table 3.22: Proportion of children dead to those ever born for women who introduce solid foods to the baby at different ages.

Age for introduction of solid foods in months	Number of children dead	Number of children ever born	Proportion of children dead to ever born
0-6	48	5313	0.009034
7-12	39	2192	0.017792
13+	4	191	0.020942

With respect to age for introduction of solid foods to the baby, women who introduced solid foods to the bay in the first six months (0-6) had about 9 children dead for every 1000 children ever born.

Among the women who introduced solid foods to the baby in at age 7-12 months, they had 18 (17.7) children dead per 1000 children ever born and for women who introduced solid foods to the baby at age of 13 months or more, they had about 20 children dead per 1000 children ever born. Although, it is widely expected that the proportion of children to those ever born should be high for women who introduce solid foods to the baby at early ages, the results shown here indicate the contrary. This can be explained by the fact that mortality is caused by many factors that cannot all be covered in this study.

CHAPTER FOUR

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

This chapter gives the summary and conclusions that can be drawn from the main findings.

(a) Summary and Conclusions

Age of mother

The results of this study have shown that women who were younger than 30 breasted for shorter periods than those who wee more than 30 years and highest proportion of women introduced solid foods to the baby at age 0-6 months was found among the mothers aged 15-19. These mothers are quite young and owing to their inexperience in child rearing, their children are likely to be exposed to infections through solid foods. The conclusion that can be drawn from this finding is that the children of younger mothers are likely to have low nutritional levels because their mothers breastfeed them shorter periods and instead introduce solid foods that may not have an equivalent nutritional value.The children of these mothers are thus likely to experience higher mortality levels.

Current marital status

Children of mothers in stable marital unions are likely to have relatively good nutrition status compared to single mothers or those who are divorced/seperated with their husbands. The results however showed that the never married women and widowed women had the highest proportion of those who breasted for 0-6 months while divorced women had the highest

proportion who introduced solid foods to the baby at age 0-6 months. Since the children of the never married and the widowed women are only breasted for a short period they are likely have low nutritional status thus they are likely to experience higher mortality

Number of household members

When there are too many people in the household the resources are likely to be scarce such that children are not well fed as they should. However, in this study it was found out that number of household member doesn't have any association with duration of breastfeeding or age for introduction of solid foods to the baby. This finding was expected because mothers cannot introduce solid foods to the baby if there is scarcity of the food itself because of many other mouths to be fed. It therefore, be concluded that number of household members does not affect the nutritional status of infants and children.

Age of respondent at first birth

As in case of age of mother, age of respondent at first birth may influence the duration of breastfeeding. As the results showed the two factors have a very strong significant relationship. However age of mother at first birth may not affect the age at introduction of solid foods to the baby. Women who have their first birth at a very early age may breastfeed for shorter periods and those and thus solid foods to the baby at an early age. This is likely to expose the baby to disease causing agents.

Level of education

The level of education of the mother has a very significant influence on the survival of the her baby. Education empowers women to make informed choices among other factors. However, with respect to breastfeeding, women with higher levels of education breastfeed for shorter periods because they have to engage in formal employment and as such have very little time to stay with the baby and breastfeed. On the other hand, these women introduce solid foods to the baby at an early age (0-6 months). Although the baby is likely to be infected and mothers breast milk is of a high nutritional status, generally these women with high levels of education also have access to areas with better sanitation and they are also likely to introduce to the baby foods of high nutritional value. Therefore, they are less likely to experience infant and child mortality. For mothers with lower levels of education, the results of the analysis showed that they breasted for longer periods. This is encouraging as their babies are likely to have very good nutrition level.

Place of residence

In Kenya like in any other developing country, the women who stay in the urban areas are the ones who most likely to have high levels of education. The ones staying in the rural areas have low levels of education generally. The trend therefore that emerged between place of residence, duration of breastfeeding and age for introduction of supplementary foods respectively was similar to the trend observed between education and these factors. Although the women in the urban areas breasted for shorter durations they also have better socio-economic status and thus they are less likely to experience high infant and child mortality. The women in the rural areas breasted for longer periods but over two thirds introduced solid foods to the baby

at age 0-6 months. This age for introduction of solid foods to the baby for the rural women, is early given the fact that they are unlikely to afford the foods of high nutritional status for the baby.

Toilet facility and source of drinking water

When solid foods are introduced to the baby at an early age environments with poor sanitation (i.e poor toilet facilities and lack of clean drinking water) the child is likely to suffer from such fatal diseases as typhoid, diarrhoea among others. This diseases contribute highly to the level of infant and child mortality in the developing countries and even in Kenya in particular.

This study has shown that women who have access to better toilet facilities and clean drinking water breastfeed for shorter durations and they also introduce solid foods to the baby at an early age. This finding is consistent with the other findings because the women who have access to better toilet facilities are likely to be staying in urban centres and also they are likely to have better levels of education.

On the contrary, women with relatively poor toilet facilities, or those who have no toilet facility at all breastfeed for longer periods but a majority of them introduce solid foods to the baby at an early age. This exposes the baby to risks of getting such diseases as diarrhoea and typhoid as already discussed above.

(b) **Recommendations**

(1) The 1981 National food policy should be reviewed to incorporate the nutrition issues, food utilization, land and income policies and infrastructures to enhance food distribution.

(2) The breastfeeding policy should be fully implemented by both public and private health facilities.

(3) The liberalization of prices should address the interest of the consumers and producers with special reference to the vulnerable groups.

(4) Food sufficiency both at National and household level.

(5) Nutrition related research findings should be represented in a manner that can help identify the vulnerable groups, their magnitude and causes of their problems so as to mount effective interventions. The government should allocate more funds for carrying out research activities similarly methodology of carrying out research should be incorporated in curricula at diploma and undergraduate levels.

(6) Nutrition curriculum should be included at all educational levels. This should be supplemented by the use of mass media in the promotion of nutrition.

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