

“ THE ROLE OF FAMILY PLANNING IN CHILD HEALTH:
THE CASE OF KIBERA LAINI SABA ”

BY

LYDIAH A. AYANGA

A THESIS SUBMITTED IN PARTIAL FULFILMENT FOR THE
DEGREE OF MASTER OF ARTS IN THE DEPARTMENT OF
SOCIOLOGY, UNIVERSITY OF NAIROBI 1992

UNIVERSITY OF NAIROBI LIBRARY

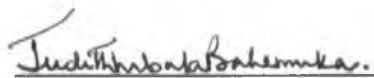


0146082 3

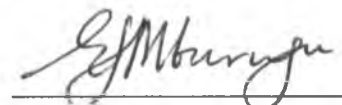
This thesis is my original work and has not been presented for a degree in any other university.

Lydia A. Ayanga
LYDIAH A. AYANGA

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



PROFESSOR J. M. BAHEMUKA



PROFESSOR E. K. MBURUGU

ACKNOWLEDGEMENTS

This work would not have been possible without the constructive and stimulating supervision of Professor J. M. Bahemuka and Professor E. K. Mburugu. I am greatly indebted to them for their invaluable advice and the enlightening discussions engaged in during the course of this study.

I am also grateful to the women who provided the information in this study. Their cooperation was highly appreciated.

Very special thanks go to members of my family for their moral support and all those friends and colleagues who helped me in one way or another during the course of the study.

Finally, I am grateful to the University of Nairobi for offering me a post-graduate scholarship.

Any mistakes in this work are my responsibility.

DEDICATION

This work is dedicated to my husband and children, my father, my brothers and sisters and to the memory of my late mother, Rev Ritah Ayanga, for their love, support and encouragement in my academic career.

TABLE OF CONTENTS

Abstract	x
Chapter 1	1
Introduction	1
Statement of the Problem*	1
Significance of the Study	5*
Objectives of the Study	7-
Expected Utility of Findings	7
Chapter 2	9
Literature Review	9
Spacing and Child Mortality	11
Spacing and Child Morbidity	17
Effects of Family Size	20
Family Size and Mortality	20
Family Size and Child Health	21
Maternal Education and Child Mortality	26
Maternal Education and Child Morbidity	27
Maternal Age and Child Health	33
Maternal Occupation and Child Health	35
Income Effects and Child Health	38
Summary	41
An Overview of the Literature	43*
Theoretical Framework	46
Hypotheses	49*
Chapter 3	53*
Methodology	53
Site Description	53
Background to Kibera: Geographical Situation	54
Historical Background	55
Operational Definitions	57*
Dependent and Independent Variables	57*
Methods of Data Collection	62
Sample Design	63
Sampling Procedure	63
Problems and Justification of the Sample	65*
Data Analyses	67
Chi-Square Test (χ^2)	68

Contingency Coefficient (C)	69
Chapter 4	71
Data Description: An Overview	71
Chapter 5	92
Data Analysis and Interpretation	92
Chapter 6	112
Conclusions	112
Recommendations	120
Bibliography	122
Appendix	132
Questionnaire	132

TABLES

- 1.1 Relationship between Birth Interval and Birth Weight in Egypt
- 1.2 Among children under 5 years of age, the percentage reported by mother to have had diarrhoea in the past 24 hours and the past two weeks, by background characteristics, Kenya, 1989.
- 1.3 Among children under 5 years of age who had diarrhoea in the past two weeks, percentage receiving different treatments as reported by the mother, and the percentage consulting a medical facility and not receiving treatment according to background characteristics, Kenya, 1989.
- 4.1 Age Distribution of Respondents in Years
- 4.2 Summary of Marital Characteristics of Respondents
- 4.3 Percentage Distribution of Respondents by Family
- 4.4 Percentage Distribution of Respondents by Family Size Preferences of the Spouses
- 4.5 Percent Distribution of Respondents by Average Spacing in Months
- 4.6 Percentage Distribution of Respondents by Ideal Birth Intervals in Years
- 4.7 Percentage Distribution of Respondents' Reasons for Perceived Ideal Birth Intervals
- 4.8 Percent Distribution of Women with 2-5 Children aged 5 and below
- 4.9 Summary of Socio-Economic Characteristics of Respondents and Spouses where applicable
- 4.10 Percent Distribution of Respondents by Levels of Education of the Spouses
- 4.11 Percent Distribution of Respondents' Perceived State of their Families' Health
- 4.12 Percent Distribution of Respondents' Perceived Causes of Disease

- 4.13 Percentage Distribution of Responents' Reasons for non-use of Family Planning Methods
- 4.14 Percentage Distribution of Respondents' Perceived Advantages of Contraceptive Use
- 4.15 Percentage Distribution of Respondents' Breastfeeding Duration in Months
- 5.1 Percent Distribution of Respondents by Maternal Levels of Education and Average Spacing
- 5.2 Distribution of Respondents by Maternal Levels of Education and Percent Morbidity
- 5.3 Distribution of Respondents by Occupational Levels and Average Spacing
- 5.4 Distribution of Respondents by Maternal Occupational Levels and Percent Morbidity
- 5.5 Distribution of Respondents by Income Levels and Average Spacing
- 5.6 Distribution of Respondents by Income Levels and Percent Morbidity
- 5.7 Distribution of Respondents by Maternal Age and Average Spacing
- 5.8 Distribution of Respondents by Maternal Age and Percent Morbidity
- 5.9 Distribution of Respondents by Family Size and Percent Morbidity
- 5.10 Distribution of Respondents by Average Spacing and Percent Morbidity

LIST OF DIAGRAMS

- 2.1 Diagramatic Presentation of Variables

ABSTRACT

High population growth rate is the most disturbing problem to a developing country such as Kenya. Policy-makers in Kenya have been prescribing various measures aimed at slowing down the population growth rate to no avail. High among the measures prescribed is the introduction of the family planning programme. The major justification for its introduction is economic development.

It is the main argument of this study that an important aspect for the introduction of family planning has been largely ignored. This aspect on which the study has placed much emphasis is health, particularly that of children. It is suspected that the continued rise in population numbers in spite of the concerted effort by various organizations, could be the result of this ignorance. Child health is a matter of great concern to parents, and they are most receptive to factors that influence their children's health. Family planning (birth spacing) has such influence. The health benefits accruing from birth spacing are thus considered important. It is the contention of this study that emphasis placed on the health aspect may go a long way in enhancing the few achievements of family planning in reducing population numbers.

The aim of the study is to show birth spacing as an important determinant of child health. It also examines the influence of other selected factors such as maternal education, age, occupation, family size and household

income on child health. These selected factors, it is noted, may influence child health indirectly by influencing the spacing habits of women, or they may have a direct influence on child health without the mediating role of birth spacing.

The sample for this study was all female. The individual women with the following characteristics was the unit of analysis: married mothers and unmarried mothers with at least two children aged between 0 and 5 years. A total of eighty respondents were interviewed.

The sample was selected using the snowball method of sampling and simple random sampling. Simple observation and child welfare cards were other methods of data collection. Data were collected using the interview schedule technique (questionnaire). The questionnaire consisted of both closed and open-ended questions.

* To assess the validity of the study's argument, up to three major hypotheses were formulated for testing. The chi-square test (χ^2) and Contingency Coefficient (C) were the statistical tools adopted to test the hypotheses.

According to the study's findings, birth spacing is related to child health. It was confirmed that the longer the spacing among siblings, the better their health status. Maternal education was found to influence the health of children directly without the mediating role of birth spacing. No significant relationship was noted between maternal education and birth spacing, thus

dismissing the indirect relationship of maternal education and child health via birth-spacing. All other selected independent variables (maternal occupation, family size, household income) were found to have the expected influence on the health of children. An exception to this was the maternal age variable which exhibited no significant relationship with child health both directly and indirectly via birth-spacing.

It was therefore concluded that in Kibera Laini Saba, birth spacing is a major determinant of child health, relative to other selected factors which were found to influence the spacing habits of women and consequently the health of their children. It is thus necessary to underscore the importance of spacing children for the sake of better health. It is also necessary to promote the factors that are conducive to better family formation patterns.

This study suggests that more emphasis be placed on the health aspect of family planning than has so far been done. Birth spacing as an aspect of family planning is suggested to be a priority aspect in ensuring better health for children.

CHAPTER ONE

INTRODUCTION

1.1. Statement of the Problem

Family planning is not a new concept in Kenya. Throughout history there have been taboos, customs and practices that have evolved because of the need to ensure an adequate but not excessive or harmful rate of birth. However, due to rapid social change, child bearing is taking place without the natural constraints that used to apply. This has necessitated the application of modern technologies to ensure fertility control and the stabilization of population numbers.

Family planning is thus seen as the equivalent of population control and both are thought of as a response to the population explosion. However, even if there was no such thing as a world population problem, there would still be an urgent and compelling case for family planning; and that is health.

This study is based on the premise that the health effect is one of the most important reasons for making modern methods of family planning available to all those who may wish to use them. This study considers this as an aspect that has largely been ignored by both the policy makers and the medical profession.

The theoretical assumptions and practical justifications which underlie the introduction of family planning programmes in developing countries have been based on the issue of economic development.

In Kenya, the National Census of 1962 revealed that the annual population growth rate was 3.3% (Kenya, Republic of, 1962). This was considered to be a serious practical problem by the government, especially when this high growth rate was related to development. In 1966, the Kenyan Government invited a Population Council advisory mission to analyze the demographic situation in Kenya and make recommendations. On the basis of the analysis, a conclusion was reached that the high rate of population growth is a factor retarding Kenya's economic growth and therefore should be curbed by introducing a National Family Planning Programme. In response to this recommendation, the Government officially launched the National Family Planning Program in 1967. This programme's main objective was to reduce the population growth rate through fertility reduction and thus enhance the economic growth of the country (Kenya, Republic of, 1967).

The National Family Planning Programme together with other non-governmental organizations engaged in Family Planning activities under the umbrella of the National Council for Population and Development, which are still on-going. However, their efforts have borne little fruit, if any. For example, between 1974 and 1978, their objective was to reduce the population

growth rate to 3.25% per annum in 1978 from 3.5% per annum in 1975. The long term targets were to reduce the population growth rate to 3% per annum by 1980 and 2.8% by the year 2000 (Kenya, Republic of, 1974). These goals have not been attained to date.

The 1979 census data indicated that instead of a decline in the population growth rate, a significant increase had occurred which raised the growth rate to 3.8% per annum in 1979 (Kenya, Republic of, 1985). From the 1989 census data, it is indicated that there is a decline in the population growth rate from 3.8% per annum in 1979 to 3.5% per annum in 1989. This, however, still remains an alarming rate of population growth (K.D.H.S., 1989).

Valuable research has been done to examine demographic trends and various aspects of family planning programmes have been studied. So far, the chief premise of these studies has been that either ignorance, inadequacy or non-availability of contraceptives, is the cause of the persistent fertility increase. Re-examination of this premise, however, suggests that in the developing countries most births would occur anyway, that parents consciously want many children. For example, the 1979 census data revealed that the total fertility rate, defined as the sum of age-specific birth rates of women over their reproductive span observed in a given time, increased from 6.2 children per woman in 1962 to 8.2 children per woman in 1977-78 (Henin, 1984). This, therefore, holds that people still have good reason to prefer a large family size.

For example, in developing countries, an average family wants at least two adult sons who are considered to provide the only effective form of social security. The premium placed on male offspring is confirmed by an Indian Study of vasectomized fathers, who had an average of more than three times as many sons as daughters (Berg. 1975). Another aspect of preferred large family size is that increased mortality and morbidity provides no physical security. Thus, families continue to have children until they are reasonably sure that some of them will survive.

Child and infant mortality in developing countries has started to decline, a fact attributed to improvement in medical technology, disease control measures and increased availability of public health facilities (U.N., 1973). The declining death rates have brought on the population explosion, yet child mortality rates remain high. For instance, it is noted that in developing countries, 20-25% of the children die before reaching their fifth birthday, resulting in an estimated 15 million deaths annually (UNICEF, 1984). High child morbidity and mortality and desire for a son are among the contributors to the population dilemma.

Until people have good assurance that live-born children will survive into adulthood, they are unlikely to be interested in family planning. This, in fact, could be part of the reasons why family planning programmes have little or no effect on fertility decline. It is noted that in Kenya, preventable diseases

such as diarrhoea, measles, malaria, respiratory infections, among others, take heavy toll on young lives. The mother whose child makes a dramatic recovery from a preventable disease is a prime prospect for further help. Her receptivity to advice from the person who has thus saved her child is dramatically enhanced; that advice can quite logically include family planning.

The health effect is thus considered in this study to be an important link in the gaps that family planning programmes need to fill in Kenya.

It is within this context that this study was considered worthwhile. Family planning should be considered a means to ensure the health of children and mothers. It eliminates the health risks associated with unplanned fertility.

Significance of the Study

This study deals with one of the key variables in development: child health. The health aspect of any nation is determined from child health indices. Children deserve special focus as they are the future of any nation. The determinants of their survival needs special attention. For this study, Family Planning is considered an important determinant.

The study area, Kibera Laini Saba, poses special risks to the children. Kibera Laini Saba is a poor urban area inhabited by people of poor socio-economic status. Coupled with this is the fact that it has no proper sewage system, sanitation is poor, lack of water and housing conditions are poor.

Numerous studies have documented the risks associated with a situation such as this (Mosley et.al 1983; Chowdhury et.al 1977; Megama 1981; Wood 1982). Given a bad situation such as this, it is imperative to discover to what extent family planning would reduce the risks to the health of the already exposed children.

As will be shown later, most of the existing literature on child survival has tended to focus on child health under distinct disciplines of biomedical and social aspects. This study hopes to explain the interplay of various factors, both social and biomedical, that influence the health status of the child, particularly in a poor urban area.

The main assumption made is that birth spacing is an intervening variable in the health status of the children. This means that for this study, the selected factors which contribute to health (e.g. maternal education, family size, household income, maternal occupation and age) do so through birth spacing. On the other hand, these independent variables could influence child health directly without the mediating role of birth spacing. Winnikoff, 1983, notes that socio-economic factors do have an independent association with child health and birth spacing. Both approaches are adopted in this study to show both the direct and indirect influence of the selected factors on child health.

It is expected that by establishing the factors that influence child health, the planners will be able to formulate policies that can bring about the desired change in health, demography and socio-economic status. This is the ultimate goal underlying this study.

Study Objectives

1. To establish the health status among children with long or short birth intervals in terms of its (health status) proximity to the biological outcomes of disease and death.
2. To determine the role of other factors such as socio-economic status, maternal age and parity, in child health, both directly and indirectly via birth-spacing.

Expected Utility of the Findings

1. The findings of this study will be useful to the Government and other propagators of family planning in the formulation of appropriate socio-economic policies.
2. The findings will provide some critical information for those concerned about the continued rise in fertility levels despite the efforts to reduce them.

3. The findings will provide good data for those interested in the biosocial interrelationship of child health, i.e. for doctors and social scientists.

CHAPTER TWO

Literature Review

An attempt is here made to discuss existing literature related to this study, with special focus on the major findings.

Spacing or interval effects on the health status of children are observable in birth mortality and morbidity indices. (It should be noted from the onset that the majority of the existing literature related to this study deals mainly with the determinants of child health as they relate to mortality). This is probably because deaths are definite events which can be counted and even measured, unlike the degree of health. It is the contention of this study, however, that mortality is but the tip of the iceberg. This is so because when excess deaths are observed among children born too close together, or among children born into large families, or among children born to teenaged mothers, it is a clear indication that infection and illness are also common among these groups. Of major interest to this study therefore is the health status of surviving children aged between 0 and 5 years; as indicated by morbidity occurrence and frequency. Morbidity is indicated by common childhood diseases such as diarrhoea, fever and respiratory infections.

Many studies give evidence of the effects of birth spacing on child health, however, one chronic problem in the interpretation and comparison of such studies is the lack of uniformity in the definition of birth spacing or interval and also what constitutes a short birth interval or a long birth interval.

Although birth spacing or interval are terms used in every day life, they tend to lack a standardized or conventional definition. Omran (1984), identifies five different definitions of birth spacing or interval among which scholars choose whichever they consider suitable for their studies. The definitions are as follows:

1. Interbirth Interval: This refers to the interval between two successive births, including live or still births. Such a definition faces criticism in that it ignores intervening pregnancies that end in abortion or fetal loss. When a second child is born prematurely, the interval is automatically shortened. A possible source of bias in such a definition is the under-reporting of stillbirths.
2. Interlive Birth Interval: It is the interval between two successive live births. This definition has an advantage over the preceding one in that it includes live births only. In surveys live births are more frequently reported than are stillbirths, and the interval is also shortened due to prematurity of the second child.
3. Interconception Interval or Onset-to-Onset Interpregnancy Interval: This is the interval between the on-set of one pregnancy and the on-set of a subsequent one. The difficulty with this definition is that it is difficult to pinpoint the onset of conception. Like in the above two definitions, this one is also subject to the automatic shortening of interval in cases of abortion, fetal loss or preterm births.

4. End to Onset Interpregnancy Interval: This interval definition refers to the spacing between the end of a pregnancy (whether the outcome was a live birth, stillbirth or fetal loss) and the onset of a subsequent pregnancy, usually measured as the date of the last menstrual period. A source of bias is the under-reporting of unsuccessful outcomes and difficulty in accurate identification of the onset of the next pregnancy.
5. End to End Interpregnancy Interval: This pregnancy interval comes between the end of one pregnancy (regardless of outcome) and the end of the subsequent pregnancy (also regardless of outcome). It is easier to count using such a definition.

This last definition is therefore adopted for this study. Information about the birthdays of the target children (under age 5) was sought and the months between the birthdays were counted. (Omran 1984:35)

SPACING AND CHILD MORTALITY

Yerushalmy et.al (1953) were among the earliest scholars to conduct a population-based study designed to look specifically at patterns of reproduction and health. The study was done on the island of Kanai in Hawaii. They took retrospective histories of approximately 27,000 pregnancies from 6,000 women whom they interviewed. Their results revealed a consistent negative relationship between the length of birth intervals and the rate of mortality,

with rates declining as intervals increased to more than three years. This study recorded mortality differentials among children born at varying birth-to-conception intervals. They reported excess mortality among children born with 4-11 months birth-to-conception intervals. Yerushalmy's study suggests that though there may be differentials in mortality at various birth to conception intervals, overall there is a deleterious effect of short intervals, in particular those in which conception took place less than a year from the birth of the previous child. This study did not control for maternal age and parity. These are potential confounding factors and may explain some of the differentials reported. This work also did not control for previous childhood deaths. When a woman loses a child, she has a strong urge to "replace" the lost child, hence short birth intervals may be over-represented by women who have lost the first child of the interval.

Another study analyzing the relationship between child mortality and birth intervals was conducted by Wolfers and Scrimshaw (1975) in Ecuador. They examined over 8,000 pregnancy intervals and their results revealed a downward trend in mortality with increasing birth intervals. This study was most carefully conducted and unlike Yerushalmy's study above, controlled for prematurity and maternal age. When controlled for maternal age, the shortest birth-to-conception intervals (0-5 months) showed a clear detrimental effect for both neonatal and post-natal mortality rates for all age groups. This

suggests that short birth intervals increase mortality risks regardless of the mother's age. Thus, short birth intervals seem to have independent effects on children other factors being constant.

De Sweemer (1981) carried out an analysis of 13,570 preceding birth intervals in over 5,000 women in India. She calculated the probabilities of survival through 36 months of age for all children studied. Chances of survival increased steadily with birth intervals ranging from 73% for the shortest interval (0-11 months) to 87.5% for the longest interval (over 36 months).

Chowdhury (1981) carried out a study in Bangladesh between 1966 and 1970. He compared mortality rates among children in neo-natal and post neonatal periods. For him short birth intervals were those less than 26 months while long birth intervals were 27 months and over. Chowdhury's study is of more interest to us since we considered any interval below two years to be short and therefore had deleterious effects on the health of children. His findings revealed a generally higher rate of mortality at shorter intervals and at all parities.

Still in an effort to ascertain the role played by birth intervals in the health status of children, Frederick and Adelstein (1973) carried out a study in Great Britain. In their study the dependent variable was the death of the second child of a pair within the first three months of life. They adopted the birth-to-conception definition of interval. The results revealed a significant

excess of mortality for conceptions that occurred within the first six months of a prior live birth. They attributed the excess mortality to prematurity and intrauterine growth retardation. One possible explanation for this finding is that lack of adequate time between pregnancies may result in maternal depletion syndrome whereby the reproductive system may not have resumed optimum biological functioning. For instance the uterine environment may not be conducive to pregnancy in that there is inadequate provision of nutrients, and the mechanical inability to carry pregnancies to full term. This may be the explanation for the pronounced effects of the shortest intervals on neonatal survival indicated by other studies cited above.

On the African scene, several studies have been conducted which confirm the findings of their counterparts in other continents. Kamel et.al (1974) conducted a study in Egypt where he examined 350 cases of married women aged between 15-45 years. The results showed an association between short inter-pregnancy intervals and high fetal wastage. The explanation for this could be the unpreparedness of the uterus to perform the biological function of nurturing pregnancy to full term either due to tender age (15 years) or maternal depletion syndrome among older women with higher parities.

El-Sherbini et.al (1981) also conducted a similar study in Alexandria area of Egypt and reported similar findings. The highest proportion of pregnancy wastage was observed when the interval was less than two years.

Addo and Goody's (1975) study of Ghana revealed that within each residential category and at each parity level, children born soon after previous birth had greater probability of dying during infancy and early childhood than those separated by longer birth intervals. The results showed 3-4 times more infant deaths among children of intervals less than one year, than at 3-4 year intervals. Their findings may suggest that short birth intervals have independent effects on child health regardless of area of residence and family size.

A demographic and health survey carried out in Kenya in 1989 also demonstrated the effects of the length of birth intervals on infant and child mortality levels. The findings showed that infant mortality rate was 76 per thousand for births occurring after intervals of less than two years; it was 48 per thousand for births after intervals of 2-3 years and 36 per thousand for births after intervals of 4 years or more. The survey also discovered substantial differentials in childhood mortality by length of preceding birth interval, in the same direction as infant mortality differentials. This is possibly because the effects of birth spacing are felt right from infancy to early childhood (K.D.H.S., 1989).

In summary, the studies reviewed regarding spacing effects on infant mortality provide evidence that infant mortality rates are generally negatively related to birth interval. However, few studies have reported contradictory

findings to the above. Though they are in the minority, an example of such studies deserves mention here.

Doyle et.al (1978) carried out a study in Western Nigeria to determine the effects of birth intervals on child health. The results indicated that short birth intervals did not adversely affect child survival and growth.

Another study was done in Machakos which aimed at determining the relationship between nutritional status of children aged 5 years and below with child spacing, family size and length of breastfeeding. The results revealed that there was no significant relationship between birth spacing and nutritional status of children (cited in Afya: Journal for Medical and Health Workers, Vol. 15:30).

Differentials in findings in themselves indicate that more research in this area is needed. This is so because distribution of intervals and the reasons for very short and very long intervals may vary from culture to culture or population to population, the health effects of birth intervals cannot be expected to be the same for all populations. Most of the studies cited above are from societies outside Kenya. This illustrates the urgency of findings based on our society. This study aims at making a contribution towards this end.

SPACING AND CHILD MORBIDITY

Many studies have been done which indicate that short birth intervals are notoriously associated with poor child health. It is indicated in malnutrition cases, low birth weight cases and in cases of poor resistance to infection.

Malnutrition poses a major threat to children. It is presented as a major cause of death in Kenya and the developing world in general (UNICEF 1984). Lack of adequate nutrition greatly increases susceptibility to infection and disease. Wray and Aguirre (1969) conducted an extensive study of childhood malnutrition in Columbia. They came up with evidence that interval effects can be demonstrated in the nutritional status of children. Rates of malnutrition increased with an increasing number of pre-school children in the family - a factor which indicates short birth intervals.

Wishik and Lichtblau (1974) examined a small number of birth intervals from Central American data in an attempt to look at interval effects on nutritional status. A total of 143 intervals were examined. The probability of good child nutrition was assessed according to birth interval. The results showed that at the highest nutritional level, there was a 90% chance of the youngest child being in better nutritional health if that child had been born at least two years after its older sibling. The probability of good nutrition fell rapidly with shortening of the interval.

There is evidence which supports the fact that breast milk is the best form of nutrition for infants from birth to six months. Scientific research shows that breast milk has the vital nutrients for healthy human development. It also gives vital immunity to the child which protects against infection. For example, breast milk has been found to play a major role in the protection of children against diarrhoea. Ketsela and Asfaw (1989) in their study meant to assess the extent of protection of breast milk against diarrhoea in Western Ethiopia concluded from their findings that the incidence of diarrhoea diminished considerably with the practice of exclusive breastfeeding. It is noted therefore that birth spacing goes a long way in ensuring that the nursing infant gets the above mentioned protection.

Rapid weaning of a nursing infant because of an early subsequent pregnancy often results in kwashiorkor. Angela Molnos (1968), writing on the hazards caused by close spacing of births, notes that frequent pregnancies and consequent abrupt weaning are the origin of the most serious health problems in East Africa. This probably means that the results of these behavioral patterns are poor nutrition and direct competition for maternal resources.

Other studies indicate that low birth weight may be attributed to short birth intervals. El-Sherbini and Attalla (1960) describe the relationship between birth weight and the period that elapsed between the previous and present pregnancy. When the interval was less than twelve months, the mean

birth weight was less than three kilogrammes. The highest mean birth weight was found with an interval of 24 to 30 months. This can be seen from the following table:

Table 1.1 Relationship between Birth Interval and Birth Weight in Egypt

Interpregnancy Period (Months)	Mean Birth Weight (Kg)
< 12	2.920
12-17	3.350
18-23	3.060
24-29	3.540
30-35	3.360
36 +	3.440

Source: El-Sherbini and Attallah (1960)

A study carried out by Azab (1977) demonstrated the fact that the negative effects of interpregnancy intervals could continue with the child into adulthood. He studied the physical fitness of physical education female students in Alexandria. He found that those born at intervals of two to three years from their siblings fared better than those born at very short or very long periods. The poorest results were associated with intervals of one year or less.

Overall, there is evidence that short birth intervals have a negative effect on the health of children.

The evidence also points to the great importance of lactation for health of children in developing countries. If this is abandoned, children are

subjected to the double risk of greater likelihood of birth in a shorter interval and the nutritional/immunological detriment of lack of mother's milk in an unfavourable environment. (However, the dearth of similar information in Kenya is markedly noticeable.)

EFFECTS OF FAMILY SIZE

A great many studies in both developed and developing countries have shown that the total number of children in the family significantly affects child survival and child health. (D. Maine, 1984; Morley et.al, 1968; Khan et.al 1979).

Family Size and Mortality

Various studies have reported findings whereby fetal mortality increased with birth order. El-Sherbini et.al (1981) studied Egypt birth order correlates of mortality and reported that the total pregnancy wastage increased with pregnancy orders. Radoric (1966) studied maternity cases in Tema General Hospital in Ghana. The results revealed that fetal mortality rate for multipara (women with 4+ children) was six times greater than for those with fewer children. These studies suggest that the biological mechanisms that allow full term pregnancies are adversely affected by frequent births hence the frequency of pregnancy wastage.

A study carried out by the Ministry of Health in Sierra Leone in collaboration with the World Health Organization (1980) indicated that there was a J-shaped relationship between infant mortality rates and parity. In Nigeria, Ayeni and Ondutan (1978) carried out a study relating infant mortality rate and birth order whose results showed that the infant mortality rate was 88.2 per thousand live births. In higher birth orders, this indicated a positive relationship between infant mortality rate and family size. This suggests that overburdening of maternal resources may predispose her children to mortality risks right from conception.

A similar result is reported by Meme (1978). He analyzed 276 cases out of 1,595 cases of live births. He reported an infant mortality rate of 53.3 per thousand live births and a positive relationship between infant mortality and birth order. This study was done in Nairobi, Kenya.

Family Size and Child Health

Many studies provide proof that there exists a relationship between total family size and the health of the children in the family. The effects of large family size may manifest themselves right from birth in high birth order children in the form of prematurity and low birth weight. It is noted that compared to normal children, premature children are more prone to various health problems and exhibit poor survival chances (Arkutu, 1978).

Data from diverse studies have pointed to a decrease in nutritional status with increasing birth order and family size. For example, Wray and Aguirre (1969) in their study in Columbia found that the more the children there were in the family, the larger the proportion of the family resources that were spent on food, but the smaller the amount of food available for each person, and the higher the proportion of children diagnosed as malnourished. This finding may be explained by the fact that good nutrition is impossible in large families, particularly those with limited resources. Quantity rather than quality food is the main issue. In a similar study in St Vincent, Greiner and Latham (1981) found that the number of siblings was negatively associated with the nutritional status of the children. Other scholars with similar findings include Drake et.al (1976), Reynes et.al (1979), Wishik et.al (1974).

There are various studies conducted in Africa which indicate an association between family size and malnutrition. Such evidence is provided by Khan et.al (1979). They studied 200 children admitted to hospital and who had been diagnosed as malnourished. They discovered a relationship between malnutrition and large family size which was compounded by poor socio-economic status.

El-Behairy et.al (1976) in Cairo studied 208 children under paediatric care. Their statistics revealed higher cases of fatality among malnourished children (27.4%) than normal. Their findings also indicated that malnutrition

was more frequent from 3rd birth order onwards. This may suggest that the younger children who may not adequately compete for food are adversely affected.

In Nigeria, Morley et. al (1968) discovered that underweight children were more frequently those above birth order seven, especially if the mother was also underweight. Maternal depletion syndrome is detrimental to both mother and children born to her.

Many children in a family are susceptible to cross-infection of childhood diseases. This situation might be attributed to over-crowding. Several studies have found a relationship between crowding and childhood diseases. For example, Wasfy (1976) showed that the prevalence of anemia among Egyptian children increased as the crowding index rose. Similarly, Aly (1979) showed that among 238 asthmatic school children in Alexandria, the majority came from crowded households, as did Sherif (1980) for 176 cases of acute poliomyelitis. Dingle et.al (1964) carried out a long term study of illness in families. The results showed that the number of episodes of diarrhoea per person increased with family size.

Thus, it is noted that family size (large) has both pathophysiological and endocrinal and metabolic effects. This fact is supported by El-Sherbini (1984) who notes that "The pathophysiological reactions of children living in severe

crowding may minimize their immunity causing them to be more vulnerable to infections and parasitic diseases". Omran 1984:83).

Increased family size may also show its effects on children through less satisfactory growth and development. In a National Survey carried out in Great Britain by Douglas et. al (1958), results were obtained which showed that children from larger families were shorter than their peers from small families by the time they were four and a half years old. The difference persisted at ages seven, eleven and fifteen. Zajonc (1976) confirmed the persistence into adulthood through his study of 19-year-old males in the Netherlands, which showed a clear-cut decrease in height with increasing family size.

On the question of family size and mental development, several studies have revealed an association. Studies of huge populations in Europe and the United States have shown that the larger the number of siblings the lower the intelligence quotient test score regardless of the test used. Belmont et.al (1973) carried out a study of 19-year olds. They reported a negative relationship between intelligence and family size. Among families of a given size, test scores fell with each birth order. This study also supported the fact that caution must be exercised in generalizing the findings to individuals. Just because a particular child is from a large family does not mean that he or she will automatically be intellectually less able than children from smaller

families. The study revealed that whatever the factors associated with family size that reduce a person's IQ, they seem to operate regardless of social classes. Furthermore, not all children in large families are affected equally.

A similar study was carried out by Hammam et.al (1981) in Alexandria, Egypt. They reported that I.Q. scores decreased gradually with increase in family size; higher I.Q. scores were associated with lower birth orders.

These findings may be explained by the fact that the intellectual development of a child depends to a large extent on a nurturing environment and the amount of stimulation received from the parents early in life. It is noted that parents with too many children cannot provide the stimulation needed for optimum development. This explanation is also consistent with the changes associated with birth order, i.e., with each succeeding child, the mother has a little less time and energy. This also confirms the observation by Zajonc (1976) that the youngest children in a family do well if born after an interval of five or more years. This observation may be explained by the fact that as the other children grow older, they demand less of the parents' attention and, being more mature, can even teach their younger siblings. This also points to the importance of birth intervals which may be a key factor in intellectual as well as physical development.

So far our focus has been on the review of literature whose main aim is to show the epidemiological and clinical risks associated with unplanned

fertility. However, it is important to note that certain socio-economic conditions have been identified as favouring birth spacing and hence reducing the mentioned health risks of unplanned fertility. For this study, maternal education, maternal age and occupation, and household income are of particular interest.

Maternal Education and Child Mortality

Massive literature shows clear evidence of differentials in child survival rates associated with education of mothers. Data from developing countries such as Latin America (Behm, 1976-78; Haines and Avery, 1978), Africa (Caldwell, 1979; Farah and Preston, 1982) and Asia (Cochrane, 1980, Caldwell and McDonald, 1981) all show a negative relationship between the extent of maternal education and the level of child mortality. The amount of education required, however, to produce significant reduction in mortality varies from culture to culture.

Education empowers women and gives them confidence to take decision-making into their own hands. Caldwell (1979) argues that there are several factors which are important in this regard. These include a reduction in fatalism in the face of children's ill-health; a greater capability in exploring and manipulating the world (e.g. in knowing where facilities are, and in securing the attention of medical staff); it ensures a change in the traditional

balance of family relationships and ensures that a greater share of resources is devoted to children. Ware (1983) notes that educated parents rarely plan to have illiterate children, and the food and medical investment in a child destined to go to school may well be greater than that in a child who is expected to join parents in working in the fields. Higher mortality would thus be expected among these children than those whose parents are educated. Education differential in mortality is expected to be much more significant in terms of nutrition practices. With respect to perinatal mortality, birth weight is an important intermediate variable. Educated women achieve higher average birthweights because they eat well, they seek ante-natal care, and avoid heavy manual labour in the third trimester (Chowdhury, 1982).

In a recent survey carried out in Kenya, it was revealed that mortality differentials by mothers' level of formal education showed that mortality is highest in children whose mothers had no education, declined for children whose mothers had some primary education and was lowest for children whose mothers had attained secondary education (K.D.H.S., 1989). In a similar study carried out in Nigeria, Caldwell (1979) noted that maternal education is indeed a factor in mortality decline. Belgin (1983) reported similar findings in Jordan. W.H.O. (1986) notes that some years of schooling provide a woman with the capacity for continued learning, particularly in the area of health.

Maternal Education and Morbidity

Low levels of education have repeatedly been found in mothers of malnourished children (Richardson 1974; Grantham et.al, 1981; Aguilon 1982). A mother is the principal provider of the primary care that her child needs during the first six years of life. The type of care she provides depends largely on her awareness of certain aspects of health care and nutrition. It is therefore understandable that a mother's education has been reported to be positively related to child health (Gopaldos et.al 1988; Christian et.al 1988).

During the past decade, evidence has accumulated from several studies which indicate that maternal education is an important determinant of child health. Several reasons have been advanced as to why this is so. Children born of educated mothers are at an advantage in terms of health because educated women tend to marry and have children at a later age. This is so because teenage pregnancies have serious risks (health) both to the mother and child (Omran 1984). Education empowers women with knowledge and skills which enables them to obtain gainful employment, thus enhancing the effectiveness of the health inputs used in the production of child health (Schultz 1982).

During the Kenya Demographic and Health survey (1989) the following results were obtained regarding maternal education and child morbidity:

Table 1.2: Among children under 5 years of age, the percentage reported by mother to have had diarrhoea in the past 24 hours and the past two weeks, b Background * Characteristics, Kenya 1989.

Maternal Education	Diarrhoea in Past 24 hours	Diarrhoea in Past 2 weeks	Total No. of Children
No education	7.5	13.2	1725
Some primary	6.9	12.9	2040
Primary completed	6.7	12.7	1546
Secondary +	5.0	11.9	1194

Source: K.D.H.S. 1989

* Maternal education was extracted as a background characteristic for the purpose of this study.

These findings are in line with the others reported above. These findings, however, depended on mothers' recall capability, therefore they could have been affected by failure to report occurrence of diarrhoea during the specified time.

Effective use of medical facilities by maternal education level was also examined during the survey. The following are the results:

Table 1.3: Among Children under 5 years of age who had diarrhoea in the past two weeks, the percentage consulting a medical facility, the percentage receiving different treatments as reported by the mother, and the percentage not consulting a medical facility and not receiving treatment, according to Background Characteristics, Kenya, 1989

Maternal Education	Percentage to hospital	Oral Dehydration Packets Used	No Treatment Given	No. of Children with Diarrhoea
No education	42.3	16.3	16.3	228
Some primary	49.2	21.3	7.6	264
Primary completed	49.2	21.2	8.0	196
Secondary +	46.3	24.3	8.1	142

Source: K.D.H.S. 1989

Maternal education background variable extracted for its relevance to this study.

The effective use of medical facilities by educated women is further confirmed by these findings. This supports Caldwell's (1979) contention that education arouses the explorative and manipulative capability in women, enabling them to seek and obtain information regarding health issues and utilize it effectively.

Christian et.al (1988), however, note that generalization of such findings must be exercised with caution. They note that it cannot be assumed that

mothers of unhealthy children are necessarily ignorant or that all illiterate mothers whether their children are healthy or malnourished are ignorant.

A similar caution is sounded by Schultz (1982). He notes that as education levels increase, there is a sharp change in taste preferences, such that instead of utilizing their increased income in purchasing healthful foodstuffs, their eating habits may pre-dispose them to poor health. This, therefore, shows that although the impact of maternal education on child survival has been demonstrated, extravagant generalizations of findings should be avoided.

Evidence has been documented whereby maternal education has a positive impact on fertility regulation. In other words, women with some schooling have a tendency to plan their families thus reducing the health risks associated with unplanned fertility (Cochrane 1979; Graff 1979).

Education accelerates the rate at which new values are learned and assimilated. Among the new values, especially those accruing to the process of modernization in general, is the acquisition of modern demographic norms, i.e. small family size (Caldwell 1981).

A view close to Caldwell's is held by Janowitz (1976). She argues that education can affect fertility by widening a woman's horizon, and thus affecting her preference for children. She further contends that education, by increasing the woman's productivity in the market, increases incentives to spend more

time in the labour force than in bearing children. It is pointed out in her study that education can increase the efficiency of fertility control by increasing a woman's knowledge about contraception.

Cochrane (1980) argues that education can affect fertility through literacy by allowing one to get access to birth regulation information. Like Caldwell (1981), Cochrane sees education as a strong socializing factor, inculcating values in women about ideal family size. These views are supported by numerous scientific studies. Bivariate studies that confirm the strong inverse relationship between maternal education and fertility have been reported by, among others, Kasarda (1971); Anker (1978). Certain cross-cultural studies have reported similar findings. Caldwell (1969), Schultz (1982); and Cochrane (1979).

All these considerations point to the fact that female educational attainment and fertility are negatively related. However, there is evidence in literature which documents unusual relationships between education and fertility. Some scholars believe that education showed tend to increase fertility since higher income should result in couples being able to afford more children (Schultz 1982). Hicks (1974) reported that in Mexico the relationship between fertility and education was negative between 1960 and 1970 and positive afterwards.

Another dimension to the relationship between education and fertility is documented by Ominde (eds)(1988) who notes that fertility differentials by education reveal that women with primary education have higher fertility than those with no education. This is explained by the fact that primary education makes it possible for women to be more conscious of the importance of hygiene and all other basic health requirements which help prevent pregnancy of foetal wastage. Women with at least secondary education have the lowest level of fertility. He concludes therefore that secondary education is probably a pre-requisite for change of a woman's attitude to family size. This points to the fact that levels of education play a determining role in the direction of influence on fertility.

In summary, it is shown that maternal education is a mighty instrument for child health and survival, both in terms of awareness and effective use of health inputs.

Maternal Age and Child Health

Many studies have documented a consistent association between maternal age and both morbidity and mortality among children and their mothers. The studies suggest that there is an age level in the fertility span of a woman during which the reproductive risks are at a minimum. These age levels extend from 18-34 or more conservatively from 20-30. On either side

of this age range, the risk increases (Omrah 1981; Becker et.al 1981; Puffer et.al 1975).

Voorhoeve, Muller and O'igo (1979) carried out a study in Machakos District of Kenya, with the aim of investigating the factors associated with maternal and child health. The study covered 3,700 households with 2,246 births. The results showed that infant mortality was higher for maternal ages under 25 and over 34. This supports the age range theory.

Similarly in another study carried out at three hospitals in Nigeria, of 12,809 births Nylander (1971) also found that outside the safe age range (18-30 or 20-34), the rate was 61 per 1,000 births for mothers aged 15 to 19, falling to 47 per 1000 live births in the 20 to 24 group, and rising steeply to 89 per 1,000 live births at 40 and over. A possible interpretation of these results is that at a young age the uterine environment is not fully prepared to nurture a pregnancy while older women may have maternal depletion syndrome whereby for a multiparous woman at that age has had many children and ny subsequent pregnancies lack adequate nutrients and the outcome may be prematurity and/or intrauterine growth retardation (low birth weight), thus resulting in excess infant and child mortality among women within these age groups.

Omran (1981) is in accord with these findings when he states that "In regard to birthweight and prematurity, teenage girls and older mothers have

been found to be more likely to bear a low birth weight baby. Maternal age has been found to be the family formation variable most strongly correlated with congenital malformation and handicapping conditions in children. These conditions, especially Down's Syndrome, have been shown to increase in incidence with increasing maternal age, especially after age 30 (Omran 1981:36).

Birth weight data is available at virtually all hospitals and they are frequently used as proxy for a new born infant's health and maturity. Most studies based on this information support the general relationship of increasing birth weight as maternal age increases. They also reveal that prematurity (usually associated with high morbidity and mortality) is more frequent in teenage pregnancy.

Maternal Occupation and Child Health

Women are involved in economic activities within the home, in the informal sector outside the home in such occupations as farm labourer, petty trader, or domestic worker in other households; or in the formal sector in factories and offices.

Ware (1983) notes that women's economic activities have a negative impact on child care. This is particularly so in cases where the activity is incompatible with simultaneous child rearing. Women's work outside the

home has been associated with child neglect and child malnutrition due to abandonment of breastfeeding.

Bowley (1951) notes that a motherless child suffers the keenest and most acute loss of love, feels emotionally rejected and insecure. Stephens (1963) echoes similar sentiments when he observes that separation from the mother is the major source of anxiety for the child during the first two years of life. Prolonged separation may lead to serious developmental abnormalities.

Child health may be affected especially if the mother has to stay away from home working in order to contribute to the financial welfare of the family. Women with little education in urban areas have limited opportunities for employment. The necessity of such women to be at home and caring for their children further impedes opportunities for employment. These women participate in what is broadly termed as the informal sector ranging from selling food items to large retail goods (The World Bank, 1989). Many mothers may prefer this kind of occupation since it interferes relatively little with child care. Mwanamwamba (1979) notes that in a number of societies childcare is treated as a secondary activity that can be accomplished by alternate monitoring while engaged in more extensive work. He notes that in neighbourhood markets or large city markets women in Zambia bring those who need care and those above the age of five who can assist effectively.

Elite working mothers stand to lose most by entrusting the care of their children to poorly educated servants. An alternative to this is to avoid paid employment while the children are young. Such an arrangement was observed in Java by Rahardjo and Hull (1982).

A study carried out in Sudan by Farah and Prestone (1982) revealed that the mother's participation in the labour force raised infant mortality by 27% in the capital as compared with 10% for the country as a whole. This may be due to the fact that educated women employed in the capital are more seriously disadvantaged by entrusting childcare to illiterate maids or relatives.

On the other hand, women's economic activities may enhance child health in the sense that they have increased income which enables them to purchase health through market inputs such as food and other household amenities. As is noted by Mburugu et.al (1986) the higher the income of a woman, the more she can afford to buy food supplements. She may also be able to hire experienced nannies to take care of her children while she is away on duty.

These are two dimensions regarding maternal occupation and child health. It would be interesting to discover which view applies most to Kibera Laini Saba.

Income Effects and Child Health

Income is a basic household requirement for the sustenance of a reasonable standard of living. Poverty is lack of income and resources and Taylor (1978) argues that it is associated with poor physical growth. Income determines the family's capacity to purchase health through market inputs such as food, medical services and household amenities. There exists evidence in literature which confirms the relationship between income and child health. For instance, Belgin et.al (1983) reported a negative relationship between income and child mortality. Similarly Agullon et.al (1982) reported a significant association between income and the nutritional status of pre-school children.

Still on the relationship between child health and income, Kennedy (1973) notes that the effect of income on caloric intake indicates that in general as income increases caloric consumption also increases. In support of this idea, Musgrove (1988) portrays the notion that income is a mirror image of a household's resources and provides an index of its purchasing capacity. He notes that food that cannot be purchased is never consumed. He concludes therefore that the economic situation of the household is a potent factor in determining how much and what kind of food will be available. It is therefore expected that with improvement of household income, absolute expenditure on food is likely to go up.

Mosley et.al (1983) enumerates a number of factors through which income effects operate on child health. They note that income effects are felt at the household level in terms of its capacity to purchase consumer goods which include the following:

1. Food: They note that the stable availability of a basic minimum food supply, of sufficient variety to ensure adequate amounts of all nutrients, is critical.
2. Water: The quality and quantity of water supply is an important determinant of child health. Lack of it enhances exposure to disease.
3. Clothing/Bedding: These are important for protection from climatic conditions. Sufficient clothing also ensures a change for washing which reduces the incidence of skin infections and parasitic infestation.
4. Housing: The size and quality are important. This ensures that there is proper ventilation and overcrowding which is detrimental to health is reduced.
5. Fuel/Energy: This is seen as an essential commodity for cooking, boiling water, sterilization of food and utensils, warmth to reduce respiratory infections in cold weather.
6. Hygiene/Preventive Care: This requires the means to purchase soap and disinfectants.

7. Sickness Care: Means to purchase services by doctors, hospitalization is essential.
8. Transport: Ensures access to all health inputs.
9. Information: Income ensures that people have access to information through purchase of radios, television sets, newspapers, magazines and books. Through this media people get informed about immunizations, nutrition, hygiene and contraceptives.

Thus it is clearly shown why income is considered a powerful determinant of child health. Other scholars with similar sentiments are (Chowdhury & Chen, 1977; Meegama 1981, Wood 1982).

That income is a determinant of unplanned fertility is a contention held by various scholars (Becker 1966; and 1965; Blake 1968; Simon 1974). These views are based on the premise that the higher a household's income, the more children it is able to afford.

Higher levels of income may lead to polygamy, especially in some parts of western Kenya. This means that in such cases more potential mothers are activated, thus having a positive effect on fertility.

On the other hand, some scholars argue that with the increase in the levels of income, there is a possibility of alternative lifestyles, where children and a large family play a less important role (Freedman 1975). This view is further supported by Rich (1973) who claims that factors such as better health

and increased access to education lead to reductions in family size. Berelson (1966) conducted a study in the United States of America to determine the relationship between income and family size. His findings revealed that as levels of income increased, the desired family size declined.

In summary, it is noted that income is an important element in child health. With income good health and information are accessible. This in turn leads to less pre-occupation with quantity but quality in children. This may be explained by the fact that if people are assured that the few live children will survive to adulthood, then they made decide to curb family size in favour of quality rather than quantity (Berg 1975).

SUMMARY

From the foregoing literature review it has been demonstrated that child health is indeed threatened by unplanned fertility and that it stands to benefit significantly from family planning (birth spacing). This is based on the fact that longer birth intervals reduce the risks of maternal depletion (low birth weight), and between child competition for care.

It is also evident from the literature that maternal education contributes significantly to child survival. This is achieved by the mother's ability to exercise her acquired skills and knowledge about appropriate measures for prevention and treatment of disease.

A large family has been shown to be detrimental to child health. Morbidity cases of malnutrition are increasingly found in large families, particularly those with poor socio-economic status.

Maternal age contributes to child health in the sense that younger women are ill prepared both physically and psychologically for parenthood. Younger women have been shown to give birth to low birth weight children and also premature babies, factors which make the children prone to infections. The reproductive potential of younger women indicates shorter birth intervals. This predisposes the children to the health risks associated with short birth intervals.

There is also evidence in literature which shows that maternal occupation affects child health. Women who go out to work have to abandon breastfeeding their babies. This affects the nutritional status of the children, since breast milk is best for the baby for the first six months of his life.

Another effect is noted in the quality of child care since the working woman may have to leave the baby with a nursemaid who may not be good at child care. Children left thus are prone to poor feeding and also accidents. These risks may, however, be offset by increased income whereby experienced nursemaids are engaged and nutritious food supplements purchased.

Household income has been shown to be a determinant of child health. Income determines the family's capacity to purchase health through market

inputs such as food, medical services and other household amenities. Lack of income denotes poverty and consequently poor health.

An Overview of the Literature

Following is an overview of the literature in terms of its characteristics and weaknesses in the light of the present study.

This study aims at determining the specific influence of birth spacing on child health relative to other socio-economic factors such as household income, maternal education, age and occupation, and family size. Most studies have demonstrated that short birth intervals are associated with increased child morbidity and mortality. However, they have not been clear whether it is due to birth spacing per se or there are other related factors. For instance, the study by Yerushalmy et.al (1956) did not control for age and parity. Similarly the study by De Sweemer (1981) had no control for age, parity and socio-economic status. This study may go a long way in filling these gaps. This also points to the fact that the issue of child health in the light of family planning (birth spacing) needs further exploration since its many dimensions cannot be exhaustively investigated by a single study.

Many studies utilize macro-data which yield little insight when tested on a small scale. This study employs micro-data at the individual level and thus deals directly on the objects of the study: the individual households.

Only a few studies have been done within the confines of Kibera Laini Saba, and with family planning and child health as the major theme, this study may go a long way in providing more information on this topic.

Many of the studies done are based within distinct disciplines of biomedical and social aspects of child health. This study attempts a biosocial approach.

The dependent variable for this study is child health measured in terms of occurrence and frequency of selected diseases (morbidity). This is a unique approach since emphasis is placed on the health of surviving children, a factor ignored by social scientists (Chen et.al 1984).

More often than not, studies of this kind examine mortality as the dependent variable. This is advantageous since deaths are definite events which can be counted and even measured unlike the degree of health. However, as is noted by Mosley et.al (1983), "An exclusive focus on mortality handicaps research because death is a rare event, the measurement of which necessitates the study of large populations or the cummulation of the mortality experience of smaller populations over long periods" (Mosley et.al, 1983, pg.29). On the other hand, focusing on diseases or nutritional status of survivors permits intensive study of smaller populations. Its disadvantage is that it ignores past occurrences of death. However, strategies geared to

improving health status of survivors and preventing occurrence of mortality are more central to this study.

The studies carried out, however, are important in that they provide a basis for our study. They generate information upon which we focus our theoretical analysis and develop the hypotheses to be tested in this study.

THEORETICAL FRAMEWORK

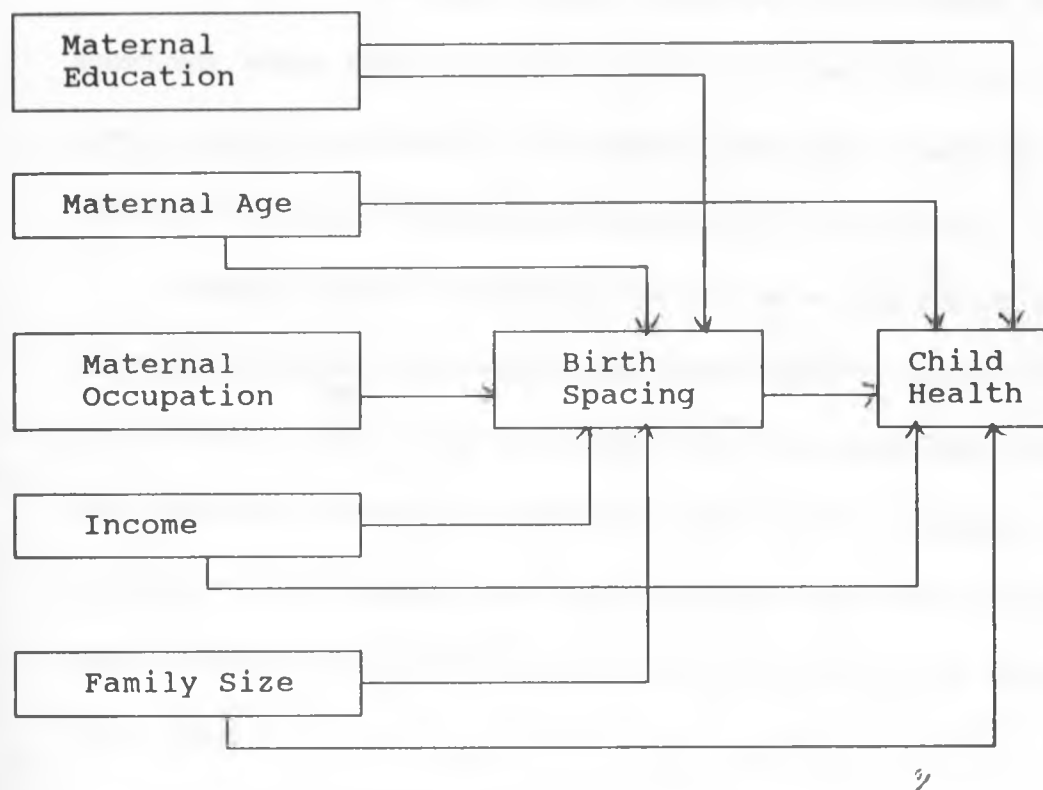
"A theory is a set of interrelated constructs (concepts), definitions and propositions that present a systematic view of phenomena by specifying relations among variables with the purpose of explaining and predicting the phenomena" (Kerlinger, 1964:11)

In this section we wish to show the specific relations through which the independent variables: spacing, family size, maternal age, education and occupation; and household income influence the health of children.

For this study birth spacing is taken to be an intervening variable in the health status of children. This means that the selected factors that contribute to child health do so via birth spacing. As such the socio-economic factors that influence birth spacing will also indirectly affect child health. On the other hand, however, child health could be enhanced directly through these socio-economic factors without the mediating role of birth spacing. As is noted by Winnikoff (1983) socio-economic factors have independent relationships with both birth spacing and health, indicating a direct and indirect influence.

Following is an illustration of the relationships between variables for this study.

DIAGRAMMATIC PRESENTATION OF VARIABLES



⑤ This study is based on the premise that family planning, whose major aim has been to reduce population numbers in order to facilitate economic development has another dimension to it; that of child survival (health).

The basic assumption made is that child health is a function of social conditions of life and behaviour of families. There is evidence in literature which shows that short birth intervals contribute to higher health risks among children. This is due to both biological disadvantages of maternal depletion

(low birth weight) and to between child competition for care (Mata 1978; World Fertility Survey 1983; Kenya Health and Demographic Survey 1989). Studies in nutrition have also indicated a decline in the nutritional status in households where there are more pre-school children (Wray et.al 1983). Abrupt weaning is detrimental to child health. One of the reasons for abrupt weaning is a subsequent pregnancy indicating short birth interval.

Maternal education has been documented to be instrumental in enhancing child health both directly and indirectly via birth spacing (Caldwell and McDonald, 1981). A more educated woman has skills and knowledge about appropriate measures for prevention and treatment of disease among her children. Her education also reflects a change in her status in the family and community, that permits her to act more effectively on the knowledge (Ware 1983).

There exists literature with evidence that links maternal education and birth spacing. Educated women are more receptive to contraceptives which in turn increase the length of birth intervals among their children, thus enhancing their health status (Caldwell 1981; Janowitz 1976).

Maternal age plays a role in child health both directly and indirectly via birth spacing. Older women are better prepared both biologically and socially to take care of children. Low birth weight has been associated with teenaged mothers, a factor that predisposes the infant to numerous health risks. The

reproductive potential of younger women is very high, a factor which indicates short birth intervals among their children and the associated risks of short birth intervals (K.D.H.S. 1989, Winnikoff 1983).

Maternal occupation has a negative impact on child care. Women's work outside the home has been associated with child neglect and malnutrition due to abandonment of breastfeeding (Ware 1983). On the other hand, however, it is noted that occupation means increased income. This means the mother is able to purchase food supplements for her infant, thereby reducing the risk of malnutrition (Safilios-Rothschild and Mburugu, 1986).

Household income entails the family's capacity to purchase health through market inputs such as food, medical services and household amenities (Belgin 1984). The risks associated with a large family size are numerous. They include malnutrition, congestion and cross-infection among others. These are views held by Latham et.al, 1981; and El-Sherbini, 1984.

The foregoing is thus the framework within which our study is based.

HYPOTHESES

From the literature, the hypotheses of this study have been mentioned. In this section we endeavour to state them precisely.

It is noted that the ultimate dependent variable is child health. The factors that are the main determinants of child health are: family planning, i.e.

spacing of births and family size; maternal education, age and occupation; and household income.

The selected determinants, it is hypothesized, have both direct and intervening effects on child health which are mainly mediated through the respondents' family planning practices. The selected determinants form a cluster of variables hypothesized to impact upon child health.

In stating the hypotheses other variables are held constant.

Hypothesis 1

Some maternal factors are related to child health both directly and indirectly via birth spacing. These are:

(a) Maternal Education

It is expected that women with higher levels of education space their children longer than do those with lower education. It is also expected that women with higher levels of education have healthier children as a result of their spacing habits and also as a result of the knowledge acquired with regard to the direct management of their children's welfare.

(b) Maternal Occupation

It is expected that maternal occupation should encourage longer spacing among a woman's children. Women engaged in economic activities may consider frequent births an impediment to the attainment of their economic goals. Women who are economically active are expected to have healthier

children due to their spacing habits as well as due to the income attained which enables them to purchase health inputs for their children.

(c) Maternal Age

It is expected that maternal age influences the spacing habits of women. Younger women are expected to have shorter birth intervals than do older women. The woman who is married at a younger age is exposed to the risk of pregnancy for a longer period than an older woman. A younger woman's fertility rate is higher than an older woman's, which indicates frequent births and shorter birth intervals. It is therefore expected that older women have healthier children due to the biological readiness for successful pregnancy outcomes. It is noted that younger women are prone to have low birth weight as well as premature babies. These factors predispose the children to poor health.

Hypothesis 2

Some household factors influence the health of children both directly and indirectly via birth spacing. These include:

(a) Household Income

The higher the household income the better the health status of the children. Both parents who are economically occupied bring in higher income. Considering the incentive of higher income, women may not pre-occupy

themselves with frequent births but rather may consider fewer well-spaced and healthy children more viable. It is expected that households with higher levels of income have healthier children due to the spacing practices adopted by the members of the household as well as due to the ability to purchase healthy consumer products.

(b) Family Size

It is expected that the smaller the family size, the better the health status of the children in the family. Large family size implies short birth intervals among siblings. Family size influences the health status of children in that large family sizes encourage cross-infection among members and also malnutrition where there is not enough nourishment for all members. Thus, children born in households where there are many family members are expected to exhibit poor health.

2

Hypothesis 3

Birth spacing influences the health of children

It is expected that the longer the spacing among siblings the better their health. Closely spaced children may suffer poor health due to cross-infection, malnutrition and lack of individual attention.

CHAPTER 3

METHODOLOGY

Site Description

In determining the study area, several factors were taken into consideration, the most important of these being: the contributions made by other scholars with regard to the same problem of the study, i.e. the factors which impact upon the health of children. This study is a part of a large project covering some other parts of Kenya.

The Thirtieth World Health Assembly decided in 1977 that by the year 2000 all people of all countries should have a level of health that would permit them to lead socially and economically productive lives. To achieve this, the factors that play the most important role in the high infant mortality rates need to be identified, and resources committed to interventions that will have a positive impact on these factors.

UNICEF has a mandate to reduce infant mortality and therefore it has a special interest in collecting and developing knowledge and expertise in this area. It has been at the forefront in the global promotion of a "Child Survival Revolution" based on what is referred to as the GOBI-FFF Strategy, an acronym for Growth Monitoring, Oral Rehydration therapy for diarrhea, Breastfeeding, Immunization, Food Supplements, Family Planning and Female Education (UNICEF 1984).

To achieve a reduction in infant mortality such measures (GOBI-FFF) must be implemented on a massive scale throughout a country, in order to have a measurable national impact (UNICEF 1984).

This study is a part of UNICEF's efforts in Kenya to implement the GOBI-FFF strategy. It is a countrywide project. However, participants from the University of Nairobi were given two areas of study. These were Kibera in Nairobi and any other area in Baringo District. There were two groups to carry out the research: One for Kibera to which we belonged and the other for Baringo District.

It was with this background that we drew a sample to represent Kibera. Kibera is comprised of several villages, the biggest of which is Laini Saba. Therefore because of its size, a sample was drawn from Laini Saba which exhibited all the characteristics that we wished to study.

Background to Kibera: Geographical Situation

Kibera is a peri-urban area situated 7km south-west of Nairobi city centre. It is bordered to the south by the rather steep valley of Mutuini River, to the east by Nyayo National Stadium, to the north by Golf Course and Woodley Estates, and to the west by Ngong Road. The Uganda railway traverses the area from west to east. Kibera, which is in Nairobi Municipality, has the same altitude as the city centre (1680m). Climatically, Nairobi lies in

the highland zone and has annual rainfall of 855mm distributed over the year in two rainy seasons. Much of the vegetation has disappeared due to long history of habitation.

Historical Background

Kibera is a Sudanese word for forest. Before 1904 when the area was originally assigned to the King's African Rifles to settle Sudanese ex-soldiers (The Kenya Land Commission Report, 1984), it was part of the present Ngong Forest.

Around 1897 Sudanese soldiers had joined the British Army and were free to move wherever the British Empire had extended. These soldiers came to Kenya this way and were used to suppress rebellion or uprising whenever the British were establishing authority in East Africa. The Sudanese and the Kenyan recruited soldiers were in the contingents that suppressed the Somalis at Kismau in 1910 (Okoth G., "The Old Soldiers of Kibera", Drum Magazine, March 1975). But they suffered heavy casualties and many of them died in battle or of disease leaving many descendants at Buller Camp in Nairobi. These descendants were eventually settled at Kibera, Kibos, Eldama Ravine, Mombasa and in a few other towns in Kenya. Kibera was a special settlement area with no other tribal group being allowed to settle there. Hence the Nubians (descendants of the Sudanese ex-soldiers), lived secluded from the

local people, keeping to themselves their cultural heritage. However, through the gradual expansion of the Nairobi City, some Nubians integrated with the local people and intermarriages occurred. This meant that Kibera was no longer the Nubian Enclave it was before the 1930s. Although Kibera remained outside the municipal boundary of Nairobi, it housed people working in the municipality. Thus Kibera and other estates (e.g. Karen, Spring Valley and Ruaraka) developed as peri-urban settlements. The proximity of Kibera to the city centre and the Nairobi industrial area made it an attractive place for African migrants into the city. Soon after the Second World War, and particularly after the Mau Mau Emergency, non-Nubian peoples began to infiltrate the area commonly as tenants to the Nubians and occasionally as squatters on vacant land. Kibera was included within the city boundary in 1962 by the Kenya Boundary Commission of that year.

Kibera is nearly the largest slum area in Nairobi. It comprises nine 'slum villages', namely: Makina, Lindi, Mashimoni, Soweto, Kisumu-Ndogo, Katwikira, Kianda, Silanga and Laini-Saba. It has been inhabited since 1912 (Amunga, 1976). Kibera comprises of small and numerous housing units most of which appear temporary and makeshift. These housing units have no orderly lay out plan for they are scattered randomly. The majority of the structures have roofs of iron-sheets and straightened tins. The walls are predominantly earthen, however, some units have cemented walls, the cement

is cast upon the earth and it is poorly done such that the original earth can be seen in the corners, on the sides and where the wall meets the roof. Most of the housing units are one-roomed and have earthen floors. The main tracks are circuitous and most buildings are inaccessible by motor-vehicles. During the hot and dry season the area is overly dusty and when it rains people move by wading through the mud.

Kibera has no proper sewage system. There are few pit latrines scattered in each village. Water is scarce, there are water kiosks unevenly distributed in the area and residents buy water from communal standby water taps. There are many small kiosks and open air stalls which serve the residents. The relative proximity of the city centre and the industrial area makes Kibera an attractive residential area for lower income groups and even the unemployed.

2

OPERATIONAL DEFINITIONS

Dependent and Independent Variables

The dependent (or outcome) variable is child health. Child health is incorporated in the definition of health advanced by the World Health Organization. They define health as "the complete state of physical, social and mental well being and not merely the absence of disease or infirmity. It is the

enjoyment of the highest attainable standard of health: (WHO, cited in Scrimshaw et.al 1988).

Health status is reflected through morbidity and mortality indices. For this study the presence and frequency of the following diseases are used as proxy for morbidity:

- (a) Diarrhoea
- (b) Respiratory Infections
- (c) Malaria (fever)

These morbidity indicators were selected due to the following reasons:

(a) Diarrhoea: Diarrhoea is a major killer of infants and young children. W.H.O. (1987) notes that countries list diarrhoea as one of the most serious problems affecting child health and one of the main reasons for contact with the health system. Diarrhoea is recorded as the third leading cause of morbidity among children in Nairobi (City Commission Health Reports, 1986). It mostly affects children below five years of age because their immature bodies have low resistance. Factors that promote a high incidence of diarrhoea include poor sanitation and poor water supply among others. Our study area exhibits such characteristics, thus making it a high risk area.

(b) Respiratory Infection: Respiratory infection is indicated in statistics as a major cause of child morbidity and mortality. It is noted by W.H.O. (1987)

that acute respiratory infections are the leading reason for people consulting a health institution, both in the developed and developing countries.

(c) Fever: Fever (Malaria) remains a major problem in tropical Africa. It is the most prevalent disease and has serious socio-economic influence. It is noted that at least one million children die each year from malaria (W.H.O. 1981).

The respondents were asked to indicate the occurrence and frequency of diarrhoea, fever and respiratory infections in the month preceding the interview, and the treatment in case of these illnesses.

Questions regarding morbidity generate information that is influenced by various factors. For instance, occurrence of an illness depends on mother's subjective evaluation of whether her child/children experienced that particular disease. The response is also influenced by the respondents' understanding of particular terms or names of diseases. This may therefore lead to underreporting or overreporting of an illness which may affect the accuracy of the occurrence estimate. The information is also subject to mother's recall reliability. In other words, whether she could remember the occurrence of a disease during the reference period (preceding month).

Childhood Mortality: This is the respondents' report of the death of a child aged between 0-5 years.

The selected independent or explanatory variables for this study include: Birth spacing, Family size, Maternal education, and Household income.

Birth Spacing: This is an aspect of family planning which refers to the length of the interval between births.

This variable poses a definition problem. It is often used in literature without a clear definition. There is no consensus among scholars of what a uniform definition should be (Winikoff 1983; Omran 1984). For this study, birth spacing is taken to mean end to end interpregnancy interval. This definition is adopted since it is much more definite to count events this way.

Family Size: This refers to the number of living children per household.

Maternal Education: This is the highest level of education that the respondent had completed. This variable is coded from none to secondary education. This variable, however, does not include any non-formal education that these people may have had. For this study this variable is measured as a categorical (or dummy) variable, in which case three categories constitute this variable:

- (1) No schooling
- (2) Primary School level
- (3) Secondary School level

Income: This variable refers to the total family income accruing to the household per month. The variable was rated in Kenyan standards of high, medium and low (Kenya Fact Book 1985-86).

1. High Category
2,500 +
2. Medium Category
800-2499
3. Low Category
100-799

A source of bias is that since most of the respondents and their spouses (where applicable) were mainly casual workers (labourers) and petty traders, it was difficult to ascertain the total income at the end of the month. This meant that an estimation had to be made.

Maternal Age: The number of years a woman has lived since birth.

Maternal Occupation: The kind of work a woman is involved in categorized as professional, non-professional. And if not involved in any income-generating activity then unemployed.

METHODS OF DATA COLLECTION

The major technique of data collection for this study was the interview schedule (questionnaire). The questionnaire was designed for women both married and unmarried who had children aged between 0 and 5 years. The women had to have at least 2 children within that age range in order to determine the birth intervals.

The interview schedule as a data collecting technique was selected for this study on the grounds that it provides room for more probing and clarification of unclear points. It also offers a chance for simple observation (though to a lesser extent) which otherwise would have been impossible. The home environment, the respondent's general manner of answering questions, for example, facial expressions and hesitation in answering questions all went a long way to add some weight to the information obtained. The appearance of the target children was also observed.

The interviews lasted 30-45 minutes and were held within the houses of the respondents. The questionnaire contained both closed and open-ended questions. Open ended questions were mainly on issues related to opinions and those matters which required elucidation. Closed questions were on matters which required specific answers. For example, marital status, number of children, age and level of education.

Sample Design

In the process of data collection, several factors of relevance to the process were considered. These include the representativeness of the sample drawn. The reduction of both the sampling and non-sampling errors was also a key concern of the study. This is achieved through the limitation of the sample to manageable proportions given the resources available to the undertaking. The study also aimed at balancing the non-sampling and the sampling errors, while at the same time minimizing the total survey errors. This was achieved through accurate numbering of the sampling units, i.e. the households.

Sampling Procedure

At the beginning of the study, the researcher employed 'mudball' or 'snowball' sampling technique in a bid to identify the possible target respondents. This study required information from a specialized group of people; in particular it required the respondents to be women both married and unmarried who had at least two children aged 0-5 years. Therefore it was necessary to single out the dwellings with the correct characteristics to be included in our sample. For this study women were chosen as the respondents since our interest is child health, a factor considered the domain of mothers. They are better placed to give information regarding their children in terms

of their health and general well-being. The age group 0-5 years was chosen because it is by far the most vulnerable age group to adverse health risks within the immediate family and community. It also constitutes a majority in any high fertility population. Therefore, differentials and changes over time in the health status of this age group represents the overall morbidity conditions and mortality rates of populations as a whole.

'Mudball' or 'snowball' sampling technique is a chaining process whereby the researcher purposefully identifies a person or persons with the required characteristics and requests the person/people to identify other possible respondents with similar characteristics as their own. After these are identified, they too are asked to identify others. This chaining process goes on until the area under study is adequately covered. The dwellings where possible respondents for this study could be found were given numbers. From these simple random sampling was applied whereby every marked dwelling had an equal chance of being included in our sample. This method has a limit in that the identified possible respondents may wish to show you only those people they know such as personal friends and/or relatives, or people of same tribe, thus leaving out other eligible possible respondents. However, the researcher believes that every possible respondent had an equal chance of inclusion in the sample.

This method proved to be both convenient and time saving. Kibera Laini Saba is an area with numerous housing units and it would have been an arduous task in view of available funds and time to visit each and every housing unit. It was therefore found necessary to visit households which the research was sure had the characteristics covered in the study.

Problems and Justification of the Sample

Eighty (80) cases formed the total sample size of this study. The main concern of any sample is representativeness. To achieve this, all cases picked in a given sample must have equal chance of being selected. Various forms of random sampling help in assuring that this is achieved. If a random sample is achieved not only is representativeness assured, but also the sampling error is minimized (Leslie and Kish 1965).

To reduce the sampling error, the absolute size of the sample, rather than its proportion to the entire population is the critical factor (Warwick and Lininger 1975). Evidence in literature reveals that a sampling fraction of up to .50 can reduce standard error to within 70% of the sample variance, but better still, an absolute sample of 100 cases will reduce the error to within 10% of the sample variance (Warwick and Lininger 1975).

Despite the fact that the researcher went to great lengths to assure representativeness, a shortcoming related to the difficulty of data collection

was that not all housing units pointed out using 'snowballing method' yielded fruitful results. Some eligible respondents were not willing to be interviewed, despite the researcher's assurance that all information given would be confidential; and that the exercise was purely for academic purposes. Some demanded to know what they would gain by being interviewed.

The age of the children is a crucial factor in this study for determining spacing or birth interval. There was a problem in trying to ascertain the actual dates of birth. The researcher noted some hesitation from some respondents when asked about age. This could be a point to misreporting. However, as in many other survey studies, the misreporting of age is a critical problem that affects the quality of the data collected. For example, a comparison done by the Central Bureau of Statistics (1980) reveals that in the Kenya National Demographic Survey there were less children aged under five than those found by the Kenya Fertility Survey. This points to the fact that in any survey there may be understatement and overstatement of age. Thus data smoothing with regard to age may be necessary to assure better results from analysis using age data.

Income data also poses similar problems as does age data. A source of bias lies in misreporting, i.e. underreporting or over-reporting. For this study information regarding this variable was sought by asking the respondents how much money they earned at the end of the month and how much their

spouses earned (where applicable). Since they kept no records of accounts regarding their income, we had to rely on respondents' subjective evaluation of what the total income per month was.

As indicated elsewhere in this study, the morbidity indicators were also subject to bias. This is so because it was at the respondents' discretion to report or not to report the occurrence and frequency of a particular illness in her child/children.

Data Analysis

For this study both descriptive and inferential statistics are adopted for data analysis.

Descriptive statistics are measures of central tendency and dispersion. They include modes, median, percentages and kurtosis. For this study ³ percentage distribution and/or mean distribution is done for the relevant variables. Relevant tables and cross-tabulations which help to make the analysis easier and comprehensible are presented.

Inferential statistics are used for hypothesis testing. They indicate whether a hypothesis should be accepted or rejected. Among the inferential statistics there are those which show that an association exists between the variables and go no further. For example the chi-square (X^2) test. There are others which after an association has been established, show the strength and

direction of the association. For example the multiple regression analysis (Bailey 1978).

For this study the above mentioned inferential statistics (i.e. X^2 and Contingency Coefficient) are used in testing our hypotheses.

Chi-Square (X^2) Test

The chi-square (X^2) test is applied to the cross-tabulated variables in an attempt to establish the existence of an association between the selected independent variables and the dependent variable. The chi-square is calculated thus:

$$X^2 = \frac{(O-E)^2}{E}$$

E

where O = Observed frequency

E = Expected frequency

This formula represents the sample frequencies compared with the frequencies which would be expected if the Null-hypothesis was true. This is achieved by calculating the chi-square. The null-hypothesis may be rejected or accepted depending on where the chi-square calculated falls, i.e. within or out of the chi-square sampling distribution rejection region. (Given the level of significance at which the chi-square is observed or the percentage of risk taken.) For this study the significant level is 0.05 (5%) and the level of confidence is therefore 95%.

As indicated earlier, the chi-square (X^2) test has a limitation in that it does not indicate the strength of the relationship (strong or weak), neither does it show the direction of the association (- or +). This therefore means that the X^2 test should be used together with another statistical tool with the missing attributes. For this study, the Contingency Coefficient (C) is adopted to summarize the direction and power of the identified relationship.

Contingency Coefficient

This statistical tool measures the degree of association between two sets of attributes. It is directly connected with X^2 test. The calculation of C assumes a knowledge of the value of X^2 obtained from the sample. The formula for calculating C is as follows:

$$C = \sqrt{\frac{X^2}{X^2 + N}}$$

Where X^2 = Chi-square obtained

N = Grand total of observations

When there is no relationship between the variables being studied C is always equal to 0.

Contingency Coefficient (C) was adopted for use on the data in this study due to its generality. It has no assumptions about the populations from which the samples are taken nor about the continuity of the variables involved

(Yeoman's 1968). Thus, the Contingency Coefficient (C) may be applied to Classificatory or Ordinal scale data as well as to interval scale measurements.

CHAPTER FOUR

Data Description: An Overview

We begin the description by examining the results of the questionnaire administered to a total of 80 respondents who constitute our sample. The questionnaire was designed to obtain factual information about the sampled households together with attitudes towards the relationship between birth intervals and child health. The results are presented using frequencies and their respective percentages.

Beginning with some background characteristics of the respondents themselves, Table 4.1 gives their age distribution.

Table 4.1: Age Distribution of Respondents in Years

Age in Years	Total	Percentage
20-24	9	11.3
25-29	38	47.5
30-34	24	30.0
35+	9	11.
Total	80	100

Overall most (47.5%) respondents belonged to the (25-29) age cohort. Table 4.1 suggests that our sample is characterized by young people whose fertility patterns may be at the peak. This would suggest that the high fertility

Table 4.2: Summary of Marital Characteristics of the Respondents

Marital Status:	Total	Percentage
Single	23	28.8
Married	57	71.3
Type of Marriage:		
Monogamous	50	62.5
Polygamous	7	8.8
Duration of Marriage: (in years)		
Not applicable	23	28.8
1-6	36	45.0
7-12	15	18.8
13-18	6	7.5

Table 4.2 suggests that majority (62.5%) of our respondents were married and in monogamous unions. A factor which may suggest a decline in polygamous unions which were represented by 8.8% of the married group. An explanation for this trend could be the socio-economic transition from traditional to modern social systems. It may not be possible to maintain polygamous institutions both economically and socially. Overall most (45%) of the marriages had lasted between 1 and 6 years.

With regard to family formation patterns the respondents were asked about the actual number of children they had. Table 4.3 below presents the findings:

Table 4.3: Percentage Distribution of Respondents by Family

No. of children	Total	Percentage
2	5	6.3
3-4	36	45.0
5-6	31	38.8
7+	8	10.0
Total	80	100.1*

* Percentages do not add up to 100.0 due to rounding.

It is noted from Table 4.3 that most (45%) respondents had between 3 and 4 children. When this finding is related to the age structure of respondents (see Table 4.1), it would seem to point to the tendency to large families in this area. To verify the allegation that this area of study (Kibera Laini Saba) has a tendency to large family sizes, the respondents were asked to indicate their family size preferences by spouse. The results are as shown in Table 4.4 below.

Table 4.4: Percentage Distribution of Respondents by Family Size Preferences of the Spouses

No. of children	Wife		Husband	
	N	%	N	%
2	10	12.5	1	1.8
3	12	15.0	5	6.3
4	40	50.0	19	23.8
5	4	5.0	5	6.3
6+	5	6.3	17	21.3
Unknown	9	11.3	10	12.5
Total	80	100.1*	57**	100

* Percentages do not add to 100.0 due to rounding

** 23 of the respondents were unmarried at the time of the survey.

Table 4.4 suggests that the popular number of children preferred by both males and females is 4. It is noted that half of the females (50%) gave 4 children as preferred family size while 23.8% of their husbands preferred a similar number. This may indicate a reduction in the large family size norm where more and more people would prefer to have fewer children. Among the respondents there were those who gave the non-numerical answer "unknown". These may comprise those people with beliefs that prohibit such predictions. They view such concepts as family size in a fatalist manner whereby whatever fact has decided for them is what they will have. Another explanation may be that some of the respondents already have too many children, they would therefore feel guilty if they said they preferred a smaller number than what they already have. Very little variation was noted regarding sex preference among children with majority responding that they did not prefer a particular sex and neither did the husbands where applicable.

Of major interest to this study is the spacing habits of the respondents, the major contention being that birth intervals play an important role in the health of children. In particular, the longer the birth interval among siblings

the better their health. Table 4.5 below reveals the findings regarding the spacing practices of the respondents.

Table 4.5: Percent Distribution of Respondents by Average Spacing in Months

Months	Total	Percentage
10-19	59	73.8
20-29	11	13.8
30-39	1	1.3
40-49	9	11.3
Total	80	100.2*

* Percentages do not add to 100.0 due to rounding.

The recommended safe birth interval in terms of both child and maternal health is 2 to 3 years. This recommendation has been given by W.H.O., 1984, and other scholars who have studied interval effects on child health, who include Mosley et.al, 1984; D. Maine, 1984; de Sweemer, 1981, to name but a few. Table 4.5 therefore would seem to suggest that the spacing habits of our respondents may be detrimental to their health as well as their children's health. Further analysis to determine the relationship between child health and birth spacing will be done in the next chapter.

The respondents were also asked to indicate what their ideal birth interval is and the reasons for choosing a particular interval. The results appear in Table 4.6 and 4.7 respectively.

Table 4.6: Percentage Distribution of Respondents by Ideal Birth Intervals in Years

Preferred Spacing in Years	Total	Percentage
1	5	6.3
2	26	32.5
3	27	33.8
4	8	10.0
5	5	6.3
6	2	2.5
7	1	1.3
Unknown	6	7.5
Total	80	100.2*

* Percentages do not add to 100.0 due to rounding

Table 4.7: Percent Distribution of Respondents' Reasons for Perceived Ideal Birth Intervals

Reasons	Total	Percentage
Economic	12	15.0
Health	52	65.0
Social	10	12.5
* Not applicable	6	7.5
Total	80	100

*Not applicable because 6 respondents gave "unknown" answer and had no reason for preferred spacing.

From Table 4.6, it is noted that most respondents gave 3 years as the ideal spacing interval. This is contrary to the earlier finding in Table 4.5

where the actual average spacing was found to be between 10-19 months in the majority of the respondents. This points to the fact that though people may be aware of the health benefits accruing from longer birth intervals, they do not space their births adequately.

In Table 4.7, the highly cited reason for preferred spacing is health which was given by 65% of the respondents.

Some respondents gave "unknown" answer when the question regarding preferred spacing was put to them. They mostly explained such an answer by saying that children were a gift from God and they would accept them any time. Others claimed that conception was a natural process where timing was impossible to pinpoint. Such answers perhaps suggest ignorance of family planning methods.

The ages of children was considered an important variable for this study and the respondents were asked to clearly indicate the ages of their children. This was meant to elicit information regarding birth intervals. The number of children aged 5 and below was also noted with the aim of determining the health status with regard to nutrition, crowding and competition for maternal care. There is evidence in literature to suggest that the more the children in this age group, the poorer their health. Such findings have been reported by Arkutu, 1978; Wrya et.al, 1969; Lathan, 1981; Sherif, 1980; El-Sherbini, 1984,

to mention but a few. In Table 4.8 is presented the distribution of women who had at least 2 and at most 5 children aged 5 years and below.

Table 4.8 Percent Distribution of Women with 2-5 children aged 5 and below

No. of children (5 yrs and below)	Total	Percentage
2	36	45.0
3	21	26.3
4	21	26.3
5	2	2.5
Total	80	100.1*

* Percentages do not add to 100.0 due to rounding.

Overall most (45%) respondents had 2 children below the age of 5. However, the proportion that had more than 2 children were in the majority. They constitute 55.1% of the sample. This could be a pointer to the fact that all the risks associated with the number of children in this age group in a particular household are commonly found in this study area. This factor will be verified when we examine the health status of the children at a later stage.

Still on background characteristics of the respondents, they were asked to indicate their occupations and that of their husbands where applicable, their income at the end of the month and whether they had an other source of income. Table 4.9 presents the findings with regard to these questions.

It is clear from Table 4.9 that most (35%) of our respondents were engaged in petty trading while most of their husbands (where applicable) were businessmen. The constituted 35% of the husbands. When we consider income levels, it is clear from Table 4.9 that most of the respondents belonged to the medium level represented by those whose income falls between K.Shs.1,000-1,999). The constituted 48.8% of the respondents. The least represented was the high income category (2,000+) which constituted 26.3%. When asked about other sources of income, majority of respondents replied in the negative, they comprised 87.5% of the sample. As for those who replied positively, their main response was that they got support from relatives and working children. The results in Table 4.9 are not at all surprising, since Kibera Laini Saba is an urban slum area which is mostly inhabited by poor people.

Table 4.9: Summary of Socio-Economic Characteristics of Respondents and Spouses where applicable

Occupations:	Total	Percentage
(Female)		
Housewife	13	16.3
Petty trader	28	35.0
Domestic servant	17	21.3
Cleaner	3	3.8
Teacher	5	6.3
Secretary	12	15.0
Receptionist	2	2.5
(Male)		
Businessman	28	35.0
Civil servant	18	22.5
Labourer	11	13.8
Not applicable	23	28.8
Total household income		
Less than 500	4	5.0
500-800	20	25.0
801-1200	15	18.8
1201-1600	20	25.0
1601-2000	21	26.3

* 23 of the respondents were unmarried at the time of the survey.

Education plays a major role in determining the health status of children and the fertility practices of individuals. The World Health Organization (1986) documents the fact that even a few years of schooling, particularly for women, have far-reaching effects in terms of health practices. The respondents were asked to indicate their levels of education and that of their spouses (where applicable). The results appear in Table 4.10.

Table 4.10: Percent Distribution of Respondents by Levels of Education of the Spouses

Levels of Education	Female		Male	
	N	%	N	%
Secondary	32	40.0	42	73
Primary	36	45.0	10	17.3
None	12	15.0	5	8.8
Total	80	100.0	57*	100.0

* 23 of the respondents were single.

It is evident from Table 4.10 that the males were more highly educated than their female counterparts. While majority (73.3%) of the males were secondary school leavers, most females (45%) were primary school leavers. This is not an unusual finding since it is commonly known that more males finish secondary school than do females. This could be explained by girl drop-outs due to pregnancy, or due to lack of school fees whereupon the male is preferred to continue with education while his sister drops out in cases where a choice has to be made.

There are certain characteristics of a house which are relevant to health. These characteristics include materials which the house is made of (walls, floor, and roof), the number of rooms, existence of a separate kitchen, sources of water and the presence of sanitary facilities. For this study,

observation was made with regard to these household conditions and a description is given elsewhere (see Chapter 3). Questions were, however, posed to the respondents regarding the ownership of the house (rental or personal) and the results showed that only 15% of the respondents owned the houses they were living in, the rest rented them. Ownership of a house would mean that these people did not spend their meager income on rent, this suggests that they would have more to spend on food and have better nourished children. All the houses in the sample were semi-permanent. The common source of energy was kerosene and charcoal. None of the respondents gave wood and electricity as their source of energy. This finding is in line with the expected inhabitants of the study area. They are people who are not expected to use expensive sources of energy.

Several questions were asked which were aimed at eliciting information regarding the health conditions of the households in our sample. The respondents were asked to describe the health of their families. The responses are shown in Table 4:11.

Table 4.11 Percent Distribution of Respondents' Perceived State of
their Families' Health

State of Health	Total	Percentage
Healthy	50	62.5
Medium	26	32.5
Sickly	4	5.0
Total	80	100.0

Majority of the respondents (62.5%) considered their families to be in healthy condition while only 5% considered their families to be sickly. When asked about the most common and frequent illness in their families, the most common response was diarrhea, fever and colds. This goes to explain why these three diseases were selected to represent morbidity states in this study.

An open question was asked of the respondents on what they perceived to be the causes of the mentioned illnesses. A total of 5 separately identifiable causes were suggested. Up to three responses were recorded. The most commonly mentioned causes appear in Table 4.12.

Table 4.12: Percentage Distribution of Respondents' Perceived Causes of Disease

Cause	Total	Percentage
Weather changes	29	36.3
Nature of surroundings	21	26.3
Natural to fall sick	16	20.0
Lack of proper day care	2	2.5
Dietary habits	12	15.0
Total	80	100.1*

*Percentages do not add to 100.0 due to rounding.

Table 4.12 shows that the respondents blame the changing weather conditions as causing disease. The nature of the surroundings in Kibera Laini Saba was a cause mentioned by 26.3% of the respondents. As described elsewhere, Kibera Laini Saba is characterized by open sewage, lack of proper sanitation and lack of easily accessible clean water resources. These respondents considered this phenomena to be detrimental to their families' health. 20% of the respondents gave fatalist answers that "it is natural to fall sick" as a reason for occurrence of disease. The remaining 17.5% suggested dietary habits and lack of proper day care for the children as the major causes. These responses would seem to suggest clear reasoning in the perceptions that these people have about causes of disease.

Nutrition is a major concern of everyone, for nutrition goes a long way in determining the health status of children. The respondents were asked to

indicate what they served at meal time (breakfast, lunch and supper). The majority of the respondents (55%) gave all the nutrients required for a complete meal (i.e. vitamins, carbohydrates and proteins). The remaining 45% gave either one or two of the nutrients as constituting their meals. In terms of food preferences, 21.3% gave types of grain or starch or meat as being unfavourable either due to health reasons, religion or just personal dislike. The remaining 78.7% majority had no preferences.

When asked whether they made special food for young children, 78.8% answered in the affirmative, citing all the nutrients and giving tender age and easy feeding as the main reasons for making the special food.

There are certain religious sects which prohibit the use of medical facilities for one reason or another. The respondents were asked what their religion was and whether it was against the use of modern medicine or facilities. Two major religions were mentioned (Islam and Christianity). The majority (93.8%) of the respondents were Christians while 3.8% said they were Moslems. The remaining 2.5% did not profess any religion. As to whether their faith was biased against modern medical facilities, the majority (87.5%) answered "No" while 5% answered "Yes". The remaining 7.5% comprised those with no religious affiliation and those who stated that they were not aware whether their faiths were averse to modern medicine. Among the 5% who answered in the affirmative could be those who belong to the Roman

Catholic faith which prohibits the unnatural family planning methods. Also among them could be those belonging to "Legio Maria" faith who do not go to hospital when sick, they only pray.

Further, the respondents were asked to indicate what happens when a child falls sick. The majority (87.%%) stated that they take the child to hospital, 4% said that they only prayed, while the remaining 8.5% mentioned all the suggested answers (hospital, prayer, homemade remedies except for suggestion 'c':go to the medicineman).

When asked whether they used any family planning methods, 57.5% stated that they did. The 42.5% who said 'No' gave numerous reasons for non-use. Those commonly mentioned appear in Table 4.13 below.

4.13: Percentage Distribution of Respondents' Reasons for Non-Use of Family Planning Methods

Reason	Total	Percentage
Health	17	21.3
Rumours of side effects	8	10.0
Religious reasons	5	6.3
Husband opposition	4	5.0
Not applicable (no barriers)	46	57.5
Total	80	100.1*

* Percentages do not add to 100.0 due to rounding.

It is evident from Table 4.13 that most respondents (21.3%) gave health as the reason why they do not use any contraceptive method. A similar result

was reported by the Kenya Contraceptive Prevalence Survey of 1984. This suggests that male participation in family planning matters is highly relevant. There is little variation in the other reasons given. Of those who use contraceptives, 32.5% mentioned the pill as the most commonly used method; followed by 17.5% who used the coil. Other methods were equally distributed among the remaining 7.6% of the users. The duration of use varied from one to seven years.

In response to an open question regarding the perceived advantages of contraceptive use, various answers were given. The most frequently given reasons appear in Table 4.14.

Table 4.14 Percent Distribution of Respondents' Perceived Advantages of Contraceptive Use

Advantage	Total	Percentage
Prevents unwanted pregnancy	28	35.0
Allows mother to rest	13	16.3
Allows spacing for health	15	18.8
Limits family size	16	20.0
None	8	10.0
Total	80	100.1*

* Percentages do not add to 100.0 due to rounding

Table 4.14 suggests that most respondents place emphasis on the prevention of unwanted pregnancy. There was little variation among respondents who gave maternal rest, spacing for health and family size

limitation as advantages. 10% of the respondents did not see any advantage accruing from contraceptive use. Among these could be those whose religion prohibits contraceptive use.

Matters regarding breastfeeding duration and the kind of food given on weaning are considered important in this study since studies have indicated a linkage between breastfeeding and birth spacing as well as child health. Breastfeeding delays postpartum ammenoriah (Mosley et.al, 1983). This means that in such a case a nursing mother is not likely to conceive, thereby ensuring spacing. Evidence also exists which shows the importance of breast milk as protecting children against infection. In a tudy carried out by Ketsela et.al (1989), diarrhoea was shown to diminish considerably with the practice of exclusive breastfeeding. This may be explained by the unhygienic tendencies which result in dirty utensils being used to feed the child thereby resulting in dirt-related diseases among the children. The kind of food administered to these children may predispose them to malnutrition.

In Table 4.15, the results regarding breastfeeding duration are presented.

Table 4.15: Percentage Distribution of Respondents' Breastfeeding Duration in Months

Duration (in months)	Total	Percentage
0-5	4	8.8
6-11	18	22.5
12-17	38	47.5
18-23	13	16.3
24-29	4	5.0
Total	80	100.1*

*Percentages do not add to 100.0 due to rounding.

Table 4.15 suggests that most (47.5%) of the respondents breastfeed their children for a period of 12-17 months. This would seem to indicate that breastfeeding is still widely practiced in this area, though with varying durations. With regard to when weaning is commenced, most (41.3%) respondents gave six months followed by (20%) who said weaning started at four months. The remaining (38.8%) had answers varying from two months to eight months. Foods given by most respondents contained all the nutrients that make a balanced diet (vitamins, proteins and carbohydrates).

Questions were asked about the prevalence of selected child diseases, i.e. diarrhoea, fever and respiratory infections one month prior to the survey. This was asked of each child and the percentage occurrence per household was calculated. Elaboration on the issue of morbidity will be done in the next chapter.

Immunization of children goes a long way in preventing child deaths caused by preventable childhood diseases. Our respondents were asked to indicate whether they took their children to well-baby clinics and the majority (95%) answered in the affirmative. Those who answered in the negative may consist of those whose beliefs (religious) do not allow visits to health facilities. When cards were perused, most children showed normal weight and growth curves.

Only 11.3% of the respondents had experienced child mortality with causes attributed to disease and accidents.

The foregoing is thus the analysis of the questionnaire administered to our respondents. In the following chapter, statistical tests will be applied to the stated hypotheses in order to determine the existence or non-existence of significant relationships between variables.

CHAPTER 5

Data Analysis and Interpretation

This study is based on the premise that birth spacing is one of the major factors influencing the health status of children. Birth spacing, it is noted, is dependent on a number of factors. The selected factors to be studied here as influencing birth spacing are: maternal education, age, occupation, family size, and household income. Since it is the contention of this study that birth spacing influences child health, the factors that influence birth spacing have an indirect influence on child health as well. It is, however, noted that although they have an indirect influence via birth spacing, they may have a direct influence on child health without the mediating role of birth spacing. Hypotheses for both the direct and indirect influence of these factors have been stated and are to be tested in this section. Finally, the relationship between birth spacing and child health will be examined.

In this chapter we present an interpretation of the findings with regard to the hypothesized relationships. Variables are cross-tabulated and the chi-square test applied in order to infer the existence or non-existence of a relationship between them. It was felt that since child health could be due to a variety of factors, a standard 95% level of confidence be adopted. Any relationship falling below this level of confidence is assumed to have occurred by chance and is discarded. Contingency coefficient was also applied to show the power of the identified relationship.

The following are the findings of this study: The importance of maternal education has been underscored in so far as it enhances child health as well as its role in attitude toward family formation patterns. However, the level at which education begins to show a marked influence still remains a question of debate among scholars. For example, the World Health Organization maintains that a few years of schooling are all that is needed in order to have changes for the better in terms of health and fertility practices. It had been hypothesized that maternal education influences her spacing practices. In other words, the higher the maternal level of education, the longer the spacing between her children. Table 5.1 below illustrates the findings.

Table 5.1: Percent Distribution of Respondents by Maternal Levels of Education and Average Spacing

	Average Spacing In Months				
Level of Education	10-19	20-29	30-39	40-49	Total
None	12(100%)	0(0)	0(0)	0(0)	12(100%)
Primary	28(77.8)	4(11.1)	1(2.8)	3(8.3)	36(100%)
Secondary	19(59.4)	7(2.9)	0(0)	6(18.8)	32(100%)
Total	59(13.8)	11(13.8)	1(1.3)	9(11.3)	80(100%)

DF	=	6	X ²	=	9.91012
p	=	0.1282	C	=	.33200

The relationship between maternal levels of education and their spacing practices was found to be significant below this study's 95% significance level. Consequently, it leads to the conclusion for this study that maternal education does not significantly influence birth intervals among a woman's children in Kibera Laini Saba.

This finding is rather surprising and is not supportive to those of other scholars such as Cochrane, 1980; Caldwell et.al., 1981; Farah et.al., 1982. The contradictory results of this study may be explained by the fact that most respondents (43.8%) were primary school leavers who may have dropped out of school without the proper knowledge of spacing techniques, though the majority (57.5%) as indicated in (Table 4.13) claimed knowledge and use of contraceptives. However, as indicated earlier, primary school leavers have been noted to have higher fertility levels. This is perhaps, as Ominde (1988) notes, due to the knowledge acquired regarding basic health requirements that help prevent foetal and pregnancy wastage. Another explanation may be the sample size. Significant results may be achieved in larger samples.

It is, of course, appreciated that there is some statistical relationship between maternal education and average spacing in Kibera Laini Saba but the level at which the relationship is significant is not acceptable in this study.

It had been hypothesized that maternal education influences child health. The results after the chi-square test and contingency coefficient are contained in Table 5.2.

Table 5.2: Distribution of Respondents by Maternal Levels of Education and Percent Morbidity

Level of Education	Percent Morbidity					
	0-20	21-40	41-60	61-80	81-100	Total
None	0 (0)	0 (0)	0 (0)	4 (33.3)	8 (33.3)	12 (100)
Primary	3 (8.3)	4 (11.1)	3 (8.3)	14 (38.9)	12 (33.3)	36 (100)
Secondary	8 (25)	4 (12.5)	7 (21.9)	10 (31.3)	3 (9.4)	32 (100)
Total	11 (13.8)	8 (10)	10 (12.5)	28 (35)	23 (28.8)	80 (100)

$$DF = 8 \qquad X^2 = 21.794$$

$$P = 0.0053 \qquad C = .46271$$

When we examined the relationship between maternal education and child morbidity, the chi-square test revealed a significant relationship at our

95% confidence level. This finding is consistent with those of Caldwell (1975); K.D.H.S.(1989), Gopaldos et.al. (1988), W.H.O. (1986). In effect the higher the level of maternal education, the lower the percentage of child morbidity. This implies, in other words, that women should be encouraged to have more years in school, be it literacy classes, as this would enable them to enormously improve their children's health. This finding therefore supports our hypothesis that the higher the maternal level of education, the better the health status of their children.

Evidence from Table 5.2 shows that the relationship between birth spacing and percent morbidity was significant at $P=0.0053$. This it was found significant at well beyond the standard level of significance of 95% for this study. This therefore confirms the hypothesis that there is a positive relationship between birth intervals and improved child health.

The finding conforms to those of Ketsela et.al (1989), Wray et.al (1983); Maine (1984), W.H.O. (1987). In effect, it is of paramount importance to encourage birth spacing in order to attain optimal health among children. Birth spacing in its own right, other factors not withstanding, is a major determinant of child health. This factor is emphasized by Maine (1984) who points out that while socio-economic factors play an important role, the risk associated with short birth intervals is not just another manifestation of poverty

but rather it is a factor that is important in its own right in so far as it affects child health.

Ominde (1988) on the other hand notes that secondary education and above must be attained by women in order for fertility rates to decline. Another argument is propounded by Schultz (1982) who notes that high education leads to change in taste preferences which may be detrimental both in terms of health and fertility practices.

Closely linked to maternal education is maternal occupation. Maternal education enables women to have access to employment opportunities which in effect means access to income and power. There is on-going debate as to whether maternal participation in the labour force is good or bad for their children, particularly in terms of the children's nutritional status. For instance, in a study carried out by Lipton (1982) in India, differentials were noted between increased income from women's work and nutrition deficiencies among children. He noted that a mother's absence from home endangered child care more than the income she earned helped it. He therefore recommended that a mother's work should be compatible with child care. A similar recommendation was voiced by Ware (1983) who argues that "it is not the occupation that is of importance, but the circumstances in which it is carried out. Women's economic activities will have a negative impact on child care only where the activity is incompatible with simultaneous child rearing or

whether a mother lacks access to another person able to care for the child" (Ware 1984:203-204 cited by Morsley and Chen, 1983). This therefore suggests that for women in the informal sector, e.g. farm labourers, petty traders and domestic workers, who are able to take their children along to work, stand to benefit in terms of child care, unlike their counterparts in the formal sector where children are clearly not allowed.

Many studies show a negative relationship between maternal occupation and short birth intervals (K.C.P.S., 1984; Barnabas, 1984). There are other scholars who argue that maternal occupation elevates the economic status of a household which means that they can be able to care for a large family size (Becker, 1960; Blake, 1968; Simon, 1974). The arguments by these scholars may not hold water in present society since there has been a lot of change both socially and economically from the time they gave their arguments. Amidst the on-going debate this study endeavoured to discover what the situation is in Kibera Laini Saba. It had been hypothesized that maternal occupation influences her spacing practices. The results are as presented in Table 5.3.

Table 5.3: Distribution of Respondents by Occupational Levels and Average Spacing

Occupational Levels	Average Spacing in Months				
	10-29	20-29	30-39	40-49	Total
Unemployed	(100) 13	(0) 0	(0) 0	(0) 0	(100) 13
Non-Professional	(79.2) 38	(14.6) 7	(2.1) 1	(4.2) 2	(100) 48
Professional	8 (42.1)	4 (21.1)	0 (0)	7 (36.8)	19 (100)
Total	59 (73.8)	11 (13.8)	1 (1.3)	9 (11.3)	80 (100)

$$DF = 6 \quad X^2 = 22.33$$

$$p = 0.0086 \quad C = .42053$$

In Table 5.3 it was found that a significant statistical relationship exists between maternal occupation and average spacing. Accordingly, our hypothesis that maternal occupation has an influence on birth spacing was confirmed. It was therefore recommended that women should strive to be economically active, thereby preoccupation with frequent births would not be viable. As indicated earlier (see literature review), long birth intervals enhance child health.

The relationship between maternal occupation and child health was also examined and Table 5.4 below contains the findings.

Table 5.4: Distribution of Respondents by Maternal Occupational Levels and Percent Morbidity

Occupational Levels	Percent Morbidity					
	0-20	21-40	41-60	61-80	81-100	Total
Unemployed	1 (7.7)	0 (0)	0 (0)	4 (30.8)	8 (61.5)	13 (100)
Non-Professional	1 (2.1)	5 (10.4)	5 (10.4)	22 (45.8)	15 (31.3)	48 (100)
Professional	9 (47.3)	3 (15.9)	5 (26.3)	2 (10.5)	0 (0)	19 (100)
Total	11 (13.8)	8 (10)	10 (12.5)	28 (28.8)	23 (28.8)	80 (100)

$$X^2 = 22.33 \quad \text{DF} = 6$$

$$p = 0.0086 \quad C = .42053$$

From Table 5.4 it is evident that the relationship between maternal occupation and child health was highly significant, well above the 95% confidence level. This implies that women in professional occupations tended to have healthier children than the rest, a factor which suggests that maternal occupation has positive correlation with child health. This finding may seem not to support Ware's (1983) argument regarding the informal and formal sectors in terms of women's economic activity. A possible explanation for this could be that higher incomes for the professional women influences their children's well-being, particularly in terms of nutritional practices thus avoiding

occurrence and severity of other infections such as diarrhoea, fever and respiratory infections. Access to a person suitable to care for the child while the mother is away may also play a major role. On this fact, this study agrees with Ware's contention that a suitable nanny or relative makes a difference.

Considering the incentive of occupations and higher income, a question is posed regarding the relationship between the women's spacing habits and income levels. As noted elsewhere (see Literature Review), many scholars argue that higher income enables families to have access to better health and education which in turn lead to reduction in family size. It is noted that a large family size implies short birth intervals (Berelson, 1966; Rich, 1975; Freedman, 1975).

An examination regarding the issue of the relationship between average spacing and income levels was carried out and the results are as shown in Table 5.5.

Table 5.5: Distribution of Respondents by Income Levels and Average Spacing

Income Levels	Average Spacing in Months				
	10-19	20-29	30-39	40-49	Total
Low	24 (100)	0 (0)	0 (0)	0 (0)	24 (100)
Medium	25 (71.4)	7 (20.0)	1 (2.9)	2 (5.7)	35 (100)
High	10 (47.6)	4 (19.0)	0 (0)	7 (33.3)	21 (100)
Total	59 (73.8)	11 (13.8)	1 (1.3)	9 (11.3)	80 (100)

$$DF = 6 \qquad X^2 = 22.978$$

$$p = 0.0008 \qquad C = 42053$$

The results reveal a highly significant statistical association between average spacing and levels of income. This therefore leads to the conclusion that the higher the income levels, the longer the birth intervals. The finding implies that women who are in higher income brackets tend to space their births, probably due to their educational levels, which makes them comprehend the risks associated with unplanned births. Among these women, alternative lifestyles play a more important role than do large family sizes.

Access to income and power for women boosts the family's well-being. This is an argument held by many scholars (W.H.O., 1986, Mburugu et.al.,

1986; Ware, 1983). However, the debate between extra income brought in by women and the health of children still applies here. A study carried out by Baltimore et.al (1976) in India revealed that extra female income promoted better infant birth weights. This suggests that with more income, women are able to eat nutritious foods which in turn determines the health of infants born to them. Children born with normal birth weight stand a better chance of survival than do those with low birth weights.

It had also been noted earlier that Farah et.al. (1982) carried out a study to show the relationship between maternal occupation (income-generating) and child mortality and reported significant differentials in child mortality among urban women as compared to the Sudan nation as a whole (see Literature Review). This suggested that women in urban centres who were economically active were at a disadvantage regarding the health of their children, probably due to poor care while they are away.

Amidst the on-going debate, this study attempted to determine the relationship between household income and the levels of morbidity occurrence among our respondents. The results are contained in Table 5.6 below.

Table 5.6: Distribution of Respondents by Income Levels and Percent Morbidity

	Percent Morbidity					
Income Levels	0-20	21-40	41-60	61-80	81-100	Total
	0-20	21-40	41-60	61-80	81-100	Total
Low	0 (0)	0 (0)	1 (4.2)	10 (41.7)	13 (54.2)	24 (100)
Medium	2 (5.7)	5 (14.3)	4 (11.4)	16 (45.7)	8 (22.9)	35 (100)
High	9 (42.9)	3 (14.3)	5 (23.8)	2 (9.5)	2 (9.5)	21 (100)
Total	11 (13.8)	8 (10.0)	10 (12.5)	28 (35.0)	23 (28.8)	80 (100)

$$DF = 8 \qquad X^2 = 38.688$$

$$p = 0.0000 \qquad C = .57093$$

After the chi-square (X^2) test it is observed that a highly significant statistical relationship exists between income and percent morbidity. We therefore conclude that the higher the levels of income the lower the morbidity occurrence among children. In effect this suggests that women should be encouraged to be economically active in an attempt to boost the well-being of their children. Women should be encouraged to join occupations that yield higher incomes. Higher incomes outweigh the risks of malnutrition and poor care for the children.

The study also examined whether there was any statistical relationship between maternal age and both average spacing and morbidity occurrence.

In Table 5.7 the findings regarding maternal age and average spacing are presented.

Table 5.7: Distribution of Respondents by Maternal Age and Average Spacing

Maternal Age (In Years)	Average Spacing in Months				
	10-19	20-29	30-39	40-49	Total
20-24	3 (33.3)	3 (33.3)	0 (0)	3 (33.3)	9 (100)
25-29	27 (71.1)	7 (18.4)	1 (2.6)	3 (7.9)	38 (100)
30-34	22 (91.7)	0 (0)	0 (0)	2 (8.3)	24 (100)
35+	7 (77.8)	1 (11.1)	0 (0)	1 (11.1)	9 (100)
Total	59 (73.8)	11 (13.8)	1 (1.3)	9 (11.3)	80 (100)

$$DF = 9 \qquad X^2 = 15.125$$

$$p = 0.0876 \qquad C = .39872$$

It was found and concluded that maternal age does not influence the woman's spacing practices. This is because the relationship between maternal age and average spacing was not statistically related at the 95% confidence

level. We therefore conclude that age does not determine birth intervals, probably because of the use of contraceptives which are available to every fecund woman.

Studies have reported a negative correlation between maternal age and child health. For instance, the 1989 Kenya Demographic and Health Survey reported that infant mortality rate was higher (108.3) for children born to mothers aged below 20 and declined to 72.5 percent as the age of the mother increased. This may be due to the problem of low birth weights among children born to teenaged mothers. This condition of low-birth weight predisposes the children to mortality and morbidity. Other studies with similar findings include Omran, 1981; and W.H.O., 1981.

To analyse the situation in Kibera Laini Saba, the relationship between maternal age and morbidity occurrence was examined. Table 5.8 contains the results.

Table 5.8: Distribution of Respondents by Maternal Age and Percent Morbidity

Maternal Age (Years)	Percent Morbidity					
	0-20	21-40	41-60	61-80	81-100	Total
20-24	1 (11.1)	2 (22.2)	2 (22.2)	2 (22.2)	2 (22.2)	9 (100)
25-29	7 (18.4)	2 (5.3)	5 (13.2)	17 (44.7)	7 (18.4)	38 (100)
30-34	3 (12.5)	2 (8.3)	1 (4.2)	7 (29.2)	11 (45.8)	24 (100)
35+	0 (0)	2 (22.2)	2 (22.2)	2 (22.2)	3 (33.3)	9 (100)
Total	11 (13.8)	8 (10.0)	10 (12.5)	28 (35.0)	23 (28.8)	80 (100)

$$DF = 12 \qquad X^2 = 14.377$$

$$p = 0.2773 \qquad C = .39030$$

From Table 5.8 it is evident that the relationship between maternal age and percent morbidity was not statistically significant at 95% confidence level. The inference drawn is that in Kibera Laini Saba, maternal age does not influence the health status of the children. Although there are studies which show a negative correlation between maternal age and child age, it should be noted that the majority of these studies base their findings on birth weights, a fact which is well beyond the scope of this study (see Literature Review, Omran, 191).

It had been hypothesized that large family size influences the health of children. This hypothesis was based on the premise that more mouths to feed may result in each individual child receiving less nourishment. This would result in malnutrition, a factor that has been known to be a preamble to other morbidity conditions. Large family sizes encourage cross-infection among its members, thereby resulting in poor health for all in the family. The relationship between these variables was examined and the results are as contained in Table 5.9 below.

Table 5.9: Distribution of Respondents by Family Size and Percent Morbidity

Family Size	Percent Morbidity					
	0-20	21-40	41-60	61-80	81-100	Total
2	4 (80)	0 (0)	1 (20)	0 (0)	0 (0)	5 (100)
3-4	5 (13.9)	6 (16.7)	9 (25.0)	10 (27.8)	6 (16.7)	36 (100)
5-6	2 (6.5)	1 (3.2)	0 (0)	17 (54.8)	11 (35.5)	31 (100)
7+	0 (0)	1 (12.5)	0 (0)	1 (12.5)	6 (75.0)	8 (100)
Total	11 (13.8)	8 (10.0)	10 (12.5)	28 (35.0)	23 (28.8)	80 (100)

$$DF = 12$$

$$X^2 = 48.07070$$

$$p = 0.0000$$

$$C = .61265$$

The findings reveal a highly significant association between large families and poor child health. The results suggest that large families, especially those with low incomes, exhibit poor health. The findings accord well with those of other scholars such as Wray et.al., 1983; Latham et.al., 1981, Morley et.al, 1968; and El-Sherbini, 1984, to name but a few. The poor health may be a result of the crowding index. As noted earlier, large families are likely to suffer from malnutrition and also from cross-infection of other ailments. Thus, small family size is considered viable.

Finally, having examined the factors that determine birth spacing and consequently child health, it is of paramount importance to examine the relationship between birth spacing and child health. It had been hypothesized that 'the longer the spacing between siblings, the better their health status'. The findings are as shown in Table 5.10.

Table 5.10: Distribution of Respondents by Average Spacing and Percent Morbidity

Average Spacing	Percent Morbidity					
	0-20	21-40	41-60	61-80	81-100	Total
10-19	4 (6.8)	3 (5.1)	5 (8.5)	24 (40.7)	23 (38.9)	59 (100)
20-29	3 (27.3)	5 (45.4)	1 (9.1)	2 (18.2)	0 (0)	11 (100)
30-39	0 (0)	0 (0)	0 (0)	1 (100)	0 (0)	1 (100)
40-49	4 (44.4)	0 (0)	4 (44.4)	1 (11.1)	0 (0)	9 (100)
Total	11 (13.8)	11 (13.8)	10 (12.5)	28 (35.0)	23 (28.8)	80 (100)

$$DF = 12 \quad X^2 = 46.73767$$

$$p = 0.0000 \quad C = .60727$$

Evidence from Table 5.10 shows that the relationship between birth spacing and percent morbidity was significant at $P > .05$. Thus it was found significant at well beyond the standard level of significance of 95% for this study. This therefore confirms the hypothesis that there is a positive relationship between birth intervals and improved child health. The finding conforms to those of Ketsela et.al. (1989), Wray et.al. (1983); Maine (1984), and W.H.O. (1987).

In effect, it is of paramount importance to encourage birth spacing in order to attain optimal health among children. Birth spacing in its own right, other factors not withstanding, is a major determinant of child health. This factor is emphasized by Maine (1984) who points out that while socio-economic factors play an important role, the risk associated with short birth intervals is not just another manifestation of poverty but rather, it is a factor that is important in its own right in so far as it affects child health.

CHAPTER SIX

CONCLUSIONS

In this chapter, a summary of the major findings is given in relation to both the objectives and hypotheses of the study.

The main objective of the study was to determine the influence of birth spacing on the health status of children aged 0-5 years in Kibera Laini Saba. The study also examined other factors which influence the spacing habits of women and consequently the health of their children. These factors included maternal education, occupation, age, household income and family size. It was noted that these factors could influence the health of children in two ways: first by influencing a woman's spacing habits, they would indirectly influence the health of the children. Secondly, these factors could influence the health of children directly without the mediating role of birth spacing. The following are the study's major findings:

The study had three major hypotheses. The first hypothesis stated that "Some maternal factors are related to child health both directly and indirectly via birth spacing". The first maternal factor to be examined was maternal education. The study found that among the women involved in the study (15%) had not had any schooling while (45%) had attained primary level of education. The remaining (40%) were secondary school graduates. The influence of maternal education on the spacing habits of the respondents was examined. The findings revealed that all the respondents (12) who had

CHAPTER SIX

CONCLUSIONS

In this chapter, a summary of the major findings is given in relation to both the objectives and hypotheses of the study.

The main objective of the study was to determine the influence of birth spacing on the health status of children aged 0-5 years in Kibera Laini Saba. The study also examined other factors which influence the spacing habits of women and consequently the health of their children. These factors included maternal education, occupation, age, household income and family size. It was noted that these factors could influence the health of children in two ways: first by influencing a woman's spacing habits, they would indirectly influence the health of the children. Secondly, these factors could influence the health of children directly without the mediating role of birth spacing. The following are the study's major findings:

The study had three major hypotheses. The first hypothesis stated that "Some maternal factors are related to child health both directly and indirectly via birth spacing". The first maternal factor to be examined was maternal education. The study found that among the women involved in the study (15%) had not had any schooling while (45%) had attained primary level of education. The remaining (40%) were secondary school graduates. The influence of maternal education on the spacing habits of the respondents was examined. The findings revealed that all the respondents (12) who had

received no formal schooling had an average spacing of between 10-19 months. This means that they had (100%) representation in the 10-19 months average spacing. Similarly, out of the 36 respondents who had attained primary level education, majority (77.8%) had an average spacing of 10-19 months. The remaining (22.2%) were almost evenly distributed in the other average spacing categories. A similar trend was also observed among the secondary school leavers with the majority (59.4%) in the 19-19 months average spacing category. However, compared to the other educational levels, secondary school leavers had higher representation in the other categories of average spacing months. For example, they had (21.9%) representation in the 20-29 months average spacing category and (18.8%) in the 0-49 months average spacing category. The association between maternal education and birth spacing was found significant at 0.1282. The two variables were found to have a weak relationship with a Contingency Coefficient (C) of 33200. What this weak relationship implies is that maternal education does not encourage longer birth intervals among the respondents' children. This is contrary to what had been expected and the study consequently concluded that no significant association exists between maternal education and birth spacing in Kibera Laini Saba. As noted earlier on, all the educational levels were highly represented in the shortest category of birth intervals. It is also noted that those who had attained secondary level of education were much fewer (32)

compared to the (48) who had either no education or had primary level education. This probably explains the result.

The direct relationship between maternal education and child health was examined and the study found that out of the (12) respondents who had not received formal schooling (33.3%) reported 61-80 percent morbidity occurrence among their children while the majority (66.7%) reported 80-100 percent morbidity. This is a very high level of morbidity occurrence. Among the primary school leavers, most (38.9%) reported morbidity occurrence of 61-80 percent. These were followed by 25% who reported morbidity occurrence of between 0-20 percent. The other categories were almost equally represented. The highest level of education was least represented in the highest percentage morbidity category (81-100) and had higher representation in the lowest morbidity category (0-20).

It was found that maternal education and child health are significantly related at 0.0053 and a Contingency Coefficient of .46271 indicated a strong association. Educational attainment influences the way a woman manages the welfare of her children, both at the preventive and treatment level of morbidity.

The second maternal factor to be examined for its direct and indirect influence on the health of the child is maternal occupation. The indirect relationship of maternal occupation and child health, the influence of maternal

occupation on birth spacing, was examined. The study found that all the respondents who were unemployed (13) spaced their children between 10-19 months on average. They had the shortest birth intervals of all. Similarly, those who were in non-professional occupations were highly (79.2) represented in the 10-19 months average spacing category. (14.6%) of the non-professional respondents had an average spacing of between 20-29 months with the remaining (6.3%) showing little variation with the 30-39 and 40-49 months average spacing. Among those in the professional category (42.1%) had an average of 10-19 months. In the 20-29 months average spacing category (21.1%) of the professional respondents were represented. The remaining 36.8% had an average spacing of between 40-49 months. It is evident from these findings that all respondents had short birth intervals (10-19 months) on average. However, differentials were noted. The respondents in the professional category showed higher representation the longer average spacing categories than did the non-professionals and the unemployed. Also, when the unemployed were compared to those in non-professional occupations, the unemployed showed the highest representation in the shortest average spacing intervals (10-19 months).

The relationship between maternal occupation and birth spacing was found significant at 0.0086. The two variables were found to have a strong relationship with a contingency coefficient of .42052. The implication derived

from these findings is that maternal occupation influences birth spacing. This means that women who go out to work, be it in the formal or informal sector, tend to space their births, unlike their counterparts who are housewives. The incentive of higher income gained from these economic activities plus peer group pressure may explain these findings.

The maternal occupation variable was also analysed for its direct influence on child health. The study found that out of the 13 respondents who were unemployed (61.5%) reported 81-100 percent morbidity occurrence. The non-professionals were represented by 31.5% in the highest category (81-100) of morbidity occurrence. The professionals had no representation in this category. Maternal occupation and child health were found to be highly related with the significance level of 0.0000. It was also found to be a very strong relationship with a contingency coefficient of .60565. The strong relationship implies that maternal occupation enhances the health status of the children. This may be explained by the fact that women who are economically active have extra income which is used for the welfare of the children.

The third maternal factor hypothesized to have an influence on the health of children was maternal age. The study found that maternal age had little statistical association with birth spacing. The relationship was found significant at 0.0876, with a contingency coefficient of .39872, implying a weak relationship. Observation shows that the respondents tended to have short

birth intervals regardless of age. Regarding the direct relationship between maternal age and child health, the study found that it was significant at 0.2773. The relationship was also found to be weak (contingency coefficient .39030). It was therefore concluded that age, though a crucial factor in any demographic study, had no correlation with the dependent variable (child health).

The second hypothesis stated that "Some household factors influence the health of children both directly and indirectly via birth spacing". The first household factor to be examined is household income. The study found a significant correlation between income and birth spacing. The relationship was found significant at 0.0008 with a strength of .47237 as determined by the contingency coefficient. In this connection, higher income was found to be instrumental in promoting longer birth intervals. While all (100%) the respondents in the low level of income category had an average spacing of between 10-19 months, the medium and high levels of income were represented by (71.4%) and (47.6%) respectively. The findings imply that income is an incentive promoting longer birth intervals. Frequent births may impede the progress of income generating activities.

The direct relationship between household income and child health was examined. The study found the two variables are significantly related at 0.0000. It was found to be a strong relationship with a contingency coefficient

of .57093. The findings revealed that respondents in the low income level had the highest (54.2%) representation in the 81-100 percent morbidity occurrence. This is as compared to (22.9%) and (9.5%) in the medium and high income categories respectively. These groups reported a similar morbidity occurrence (81-100) among their children. It was therefore concluded that higher incomes promote child health through its promotion of longer birth intervals as well as through its capacity to give the purchasing power by which health inputs are availed.

The next household factor to be determined as influencing child health is family size. It was found that large family size has detrimental effect on child health. These two variables (family size and child health) were found significant at 0.0000 with a contingency coefficient of .61265, implying a very strong relationship. The level of morbidity was highest (81-100) in families where there were seven or more children. Of such families (75%) reported 81-100 percent morbidity occurrence. This level of morbidity occurrence (81-100) was reported by (35.5%) of families with 5-6 children. Families with 3-4 children were represented by (16.7%) reporting (81-100) percent morbidity. Families with two children had no representation in this morbidity category.

The finding simply that large families predispose children to poor health. This could be explained by factors such as crowding index, malnutrition and cross-infection, which are commonly found in such families.

The third hypothesis stated that "Birth spacing influences the health of children". It was found that birth spacing and child health were significantly related at 0.0000. The relationship was found to be very strong with a contingency coefficient of .60727. In this study most respondents (38.9%) who had an average spacing of between 10-19 months reported the highest morbidity occurrence (81-100) among their children. The longer average birth intervals (40-49 months) had no representation in the 81-100 percent morbidity category. This finding confirms the relationship that exists between birth spacing and health. Birth spacing is thus considered to be a good promoter of child health.

It is concluded that child health is dependent upon maternal education and occupation, household income, family size and birth spacing. These factors influence the health of children by first influencing the family planning practices of women, as a consequence of this influence, the health of children is promoted. In addition to this indirect influence, each variable influences child health directly in its own right. These factors are therefore considered to be important determinants of child health.

RECOMMENDATIONS

The paradoxical relationship between high rates of population growth and poor health (high morbidity and mortality levels) poses the most disturbing problem in developing countries such as Kenya. With a problem such as this, concerted effort must be made to reach equilibrium in which both the population growth rate and high morbidity and mortality indices can be reduced. On the basis of the study findings, several suggestions have been made:

1. The acquiring of higher levels of education among women must be emphasized. Higher levels of education for women must be encouraged to ensure that women have the knowledge regarding fertility and child care practices. High levels of education for women should receive greater emphasis in order to encourage education and employment as alternatives to early parenthood.
2. Women should be encouraged to get into income generating occupations in order to cater better for the welfare of their children. The study revealed that women who were dependants had higher levels of fertility and higher incidence of morbidity. The study showed differentials among women with income generating occupations. This implies that women thus occupied have less preoccupation with frequent births, thus enhancing the health of the children, with long birth intervals among them.

3. It is recommended that further research in the bio-social inter-relationships of family planning and child health be carried out. This is so because there is an urgent need for more information regarding this issue, particularly in Kenya, where the dearth of similar information is markedly noticeable.

4. The small family 'size norm' must take root as a major factor in family formation patterns. Large family sizes, the study found, had detrimental effects on the health of children. Morbidity occurrence was most frequently reported in households with many children. Several factors contribute to the large family size phenomenon. Parents want many children due to uncertainty of survival into adulthood. They also prefer to have several male offspring because, culturally, males carry on the family name. Although efforts have been made by the Government to provide health facilities to ensure child survival into adulthood, and equal opportunities for males and females, more emphasis must be put on these aspects than has so far been done.

5. The study revealed that overall the spacing habits of women are poor. This may imply that there is a lack of knowledge on their part, with regard to the health benefits accruing from spacing of births. Women must be sensitized to the fact that birth spacing is a major determinant of child health.

BIBLIOGRAPHY

- Add, N. O. and J. R. Goody. (1975) Siblings in Ghana. University of Ghana Population Studies No. 7, Legon, Ghana: The Population Dynamics Programme and the Institute of Statistical, Social and Economic Research, University of Ghana.
- Agullon, B. D., Ma.Mivda Caedo, Jesse Arnold, and R. W. Engel (1982). "The Relationship of family characteristics to the nutritional status of pre-school children", In Food and Nutrition Bulletin, Vol. 4, No. 4 (October 1982):5-11.
- Aly, K. M. K. (1979). "Effects of Bronchial Asthma on School Children in Alexandria". Dr. P. H. dissertation, High Institute of Public Health, University of Alexandria, Egypt.
- Amunga, William E. U. A study of the housing policy in Kibera, with specific reference to low-income communities, Nairobi,
- Anker, R. (1978). "An Analysis of Differential Fertility in Developing Countries", in Susan Cochrane ed. Fertility and Education: What do we really know? Johns Hopkins Press, Baltimore.
- Arkutu, A. R. A. (1978). "A Clinical Study of Maternal Age and Parturition in 2791 Tanzanian Primiparae". International Journal of Gynaecology and Obstetrics 16(1): 20-23. Research Triangle Park, North Carolina, U.S.A., Medinform International.
- Ayeni, O. and S. O. Ondutan (1978). "The Effects of Sex, Birthweight, Birth Order and Maternal Age on Infant Mortality In a Nigerian Community". Annals of Human Biology 5(4):353-58. London, England: Taylor and Francis.
- Azab, F. A. S. (1977). "Physical Fitness Among Girl Students and Its Relation to Maternal Age". Ph.D. Dissertation, Helwan University, Alexandria, Egypt.
- Bailey, K. D. (1978). "Methods in Social Research". New York: The Free Press.

- Barnabas, B., A. Klinger, K. Miltenyi and G. Vukorich (1984). "Fertility, Female Employment and Policy Measures in Hungary": I.L.O.
- Becker, G. S., (1966). "An Economic Analysis of Fertility". In *Demographic and Economic Change in Developed Countries*. Princeton: Princeton University Press, pp 209-240.
- Behm, H. (1979). "Socio-economic Determinants of Mortality in Latin America". *Proceedings of the Meeting on Socio-Economic Determinants and Consequences of Mortality, Mexico City, 19-25 Une*. New York and Geneva: UN.N. and W.H.O.
- Belgin, Tekce, F. C. Shorter (1983). *Determinants of Child Mortality: A Study of Squatter Settlements in Jordan*. In *Child Survival Strategies for Research* edited by Moseley W.H., and L.C.Chen. Population Council, U.S.A., pp 257.
- Belmont, L. and Marolla, F. A. (1973). "Birth Order, Family Size and Intelligence", *Science*, 182: 1096-1101.
- Berelson, B. (eds)(1966). *Family Planning and Population Programmes: A Review of World Developments*. University of Toronto Press, pp 848.
- Berg, A. (1975). "The Nutrition Factor: Its Role in National Development". Washington, D.C.
- Blake, J. (1968). "Are Babies Consumer Durables?" *Population Studies*, 1968. 22(1):5-25.
- Bogue, D. J. (1969). "Principles of Demography". Wiley Publishing Company, New York.
- Bowley, A. H. (1951). "Child Care: A handbook on the care of the child deprived of normal home life". Edinburgh, E & S Livingston.
- Caldwell, J. (1979). "Education as a factor in mortality decline". *Population Studies*, 33 No. 3:395-413.

- _____, and P. McDonald (1981). "Influence of Maternal Education on Infant and Child Mortality". International Population Conference, Manila, Vol. 2. Liege: International Union for the Scientific Study of Population.
- Chen, C. L.; Mosley W.H.; (1983) (eds). "Child Survival: Strategies for Research". Population Council, U.S.A.
- Chowdhury, A. and L. Chen (1977). "The Interaction of Nutrition, Infection and Mortality during recent food crises in Bangladesh". Food Research Institute Studies 16.2.
- Chowdhury, A. (1981). "Infant Deaths, Determinants and Dilemmas". Deccat ICDDR, Scientific Report No. 46.
- _____(1982). "Factors Influencing Infant Survival in Rural Bangladesh". Glances 4(9-10).
- Christian, P., R. Abbi, S. Gujral and T. Gopaldas (1988). "The Role of Maternal Literary and Nutrition Knowledge in Determining Children's Nutritional Status". In Food and Nutrition Bulletin Vol. 10 No. 4.12 (1988): 29-40.
- Cochrane, C. H. (1979). "Fertility and Education: What do we really know?" International Bank for Reconstruction and Development. Washington, D.C.
- _____(1980). "The Effects of Education on Health". Washington, D.C.: World Bank, Staff Working Paper 405.
- De Sweemer, C. (1981). "The Influence of Child Spacing on Child Survival", unpublished manuscript.
- Dingle, J. H., G. F. Bader, and W. S. Jordan (1964). "Illness in the Home: Study of 25,000 Illnesses In a Group of Cleveland Families". Western Reserve University, Cleveland.
- Douglas, J. W. B. and J. M. Blomfield (1958). "Children Under Five". Alen and Unwin, London.

- Doyle, P., D. Morley, M. Woodland and J. Cole (1978). "Birth Intervals, Survival and Growth in a Nigerian Village". *Journal for Biosocial Science* 10(1): 81-94. Cambridge, England: The Caton Foundation.
- Drake, W. D. and L. F. Fajardo (1976). "The Promotor Program in Candelacia: A Colombian Attempt to Control Malnutrition and Disease, 1968-1974". Community Systems Foundation, Cali-Colombia.
- El-Behairy F., M. El-Mougi, N. H. Osman, and S. Mustafa (1976). "The Nutritionally at Risk Child. Part 2. Study of Factors Pertinent to the Child, Siblings or Mother". *Gazette of the Egyptian Paediatric Association* 24(1-2):31-41. Cairo.
- El-Geneidy, M. M. (1974). "A Study of Factors Predisposing to Low Birth Weight and the Role of the Nurse in their Control". Ph.D. dissertation, High Institute of Public health, University of Alexandria, Egypt.
- El-Sherbini, A. F. and B. F. Attalla (1960). "Some Determinants of Birth Weight". *Gazette of Egyptian Paediatric Association* 8(4):868-85.
- _____, Hammam, H. M., A. R. Omran, M. A. El-Torky, and S. I. Fahmy (1981). "Family Formation and Pregnancy Outcome. B. Egypt". In *Family Formation Patterns in Health. Further Studies*, edited by Abdel R. Omran and C. C. Standley. Geneva, Switzerland: World Health Organization, pp 154-64.
- Farah, A. and S. Prestone (1982). "Child Mortality Differentials in Sudan". In *Demographic Transition in Metropolitan Sudan*. Canberra: Australian National University Press.
- Fredrick, J. and P. Adelstein (1973). "Influence of Pregnancy Spacing on Outcome of Pregnancy", *British Medical Journal* 4 (December 1973):753-756.
- Fredman, R. (1975). "The Sociology of Human Fertility". New York, Irrington Publishers Inc.
- Gatara, T. H. (1982). "The Influence of Religion and Education on Current Family Size and Fertility Preference in Kenya". Dr. P.H. Dissertation, Florida State University, College of Social Sciences.

- Graff, A. S. (1979). "Literacy and Education. Past and Present. A Critical Review". *Population and Development Review*. 1979, 5(1):105-140.
- Greiner, T. and M. C. Latham (1981). "Factors Associated with Nutritional Status Among Young Children in St. Vincent". *Ecology of Food and Nutrition* 10(1981):135-141.
- Gopaldos, T., P. Patel and M. Bakshi (1988). "Selected Socio-Economic, Environmental, Maternal and Child Factors Associated with Nutritional Status of Infants and Toddlers". In *Food and Nutrition Bulletin* Vol. 10 No. 4, 12(1988): 29.
- Haines, M., and R. Avery (1978). "Patterns of Differential Mortality during Infancy and Early Childhood in Developing Nations". Paper prepared for the American Population Association Meeting, Atlanta, Georgia.
- Hammam, H. M., A. H. Guinena, A. H. Zarzour, and M. Elarkan (1981). "Family Formation and Child Development. 2. Intelligence Quotient. B. Egypt". In *Family Formation Patterns and Health. Further Studies* edited by Abdel R. Omran and C. C. Standley. Geneva, Switzerland; World Health Organization, pp 260-63.
- Henin, R. (1979). "Effects of Development on Fertility and Mortality Trends in Eastern Africa. Evidence from Kenya and Tanzania". *Population Studies and Research Institute, University of Nairobi*.
- Hicks, W. W. (1974). "A Reproduction Function for Young Women in Mexico". *Social and Economic Studies (Jamaica)* 15(2), June 1974: pp 121-125
- Kamel, W. H., N. A. Risk, M. K. Topozada, and M. H. Wahdai (1974). "Pregnancy Wastage in a Rural Community in Egypt". *Egyptian Population and Family Planning Review*. 7(1):11-20. Cairo, Egypt: Egyptian Society for Population Research and Institute of Statistical Studies and Research.
- Kasarda, J. D. (1971). "Economic Structure and Fertility: A Comparative Analysis. *Demography* 8(3):307-318.
- Kennedy, R. E. Jr. 1973. "Minority Group Status and Fertility. The Irish American". *American Sociological Review*, 1973, 38(1):85-97.

Kenya Contraceptive Prevalence Survey (1984). Provincial Report (Central Bureau of Statistics. Ministry of Planning and National Development.

Kenya Demographic and Health Survey (1989). National Council for Population and Development (Ministry of Home Affairs and National Heritage).

Kenya Fact Book 1985-86.

Kenya, Republic of (1962), Development Plan 1962-1967. Government Printer, Nairobi, Kenya.

_____ (1974)

_____ (1979)

_____ (1985)

Khan, A. A., and B. M. Gupta (1979). "A Study of Malnourished Children in Children's Hospital, Lusaka (Zambia)". *Journals of Tropical Paediatrics and Environmental Child Health* 25(2-3):42-45. London, England: Division of Population, Family and International Health, School of Public Health, University of California, Los Angeles, and Tropical Child Health Unit, Institute of Child Health, University of London.

Kerlinger, F. N. "Foundations of Behavioral Research". Education and Psychological Inquiry, New York.

Ketsela, T., and M. Asfaw, "Trends of Breastfeeding in Western Ethiopia and their relationship to acute diarrhoea in infants", KEMRI Publication, April 1989.

Leslie, K., Survey Sampling. John Wiley and Sons, 1965, New York.

Lipton, M. (1982). "Post-harvest Technology and the Reduction of Hunger". *IDS Bulletin*, 13(3):4-11(1982). (2) Reutlinger, S. & Selowsky, M. Nutrition and Poverty: Magnitude and Policy Options. Baltimore and London, Johns Hopkins University Press, 1976 (World Bank Staff: Occasional Papers, No. 23).

- Maine, D. and J. Way, 1984. "Family Spacing", in *The State of the World's Children*, 1984. New York: UNICEF.
- Mata, L. (1978). "The Children of Santa Maria Cauque: A Prospective Filed Study of Health and Growth". Cambridge, Mass: M.I.T. Press.
- Mburugu, E. K. and C. Safilios-Rothschild (1987). "Women's Status, Breastfeeding Patterns and Contraceptive Use in Rural Kenya", in *The Cultural Roots of African Fertility Regimes*, Proceedings of the IFE Conference. Department of Demography and Social Statistics, Obafemi Awolowo University, Ile-Ife, Nigeria: Population Studies Centre, University of Pennsylvania, Philadelphia, Pa. USA, pp 177-180.
- Meegama, S. A. (1981). "The Decline in Morality in Sri Lanka in Historical Perspective". In *International Union for the Scientific Study of Population*.
- Meme, J. S. (1978). "A Prospective Stud of Neonatal Deaths in Nairobi, Kenya". *East African Medical Journal* 55(6):262-67. Nairobi, Kenya: Kenya Medical Association.
- Molnos, Angela (1968). "Attitudes Towards Family Planning in East Africa. An Investigation in Schools around Lake Victoria and in Nairobi". Atlantic Highlands, New Jersey, USA: Humanities.
- Morley, D., J. Bicknell, and M. Woodland (1968). "Factors Influencing the Growth and Nutritional Status of Infants and Young Children in a Nigeria Village". *Transactions of the Royal Society of Tropical Medicine and Hygiene* 62(2):164-95. London, England: Royal Society of Tropical Medicine and Hygiene.
- Mosley, W. H. and L. C. Chen (eds)(1983). "Child Survival: Strategies for Research". Population Council, U.S.A.
- Musyoki, R. (1982). "Education and Desired Family Size: A Study of Kenyan Youth". Dr. P. H. Dissertation, Florida State University.
- Mwanamwamba, C. and Zenebewoke Tadesse (1979). "The Situation of Children in Zambia". SIDA Information Division.

- Nylander, P. P. S. (1971). "Perinatal Mortality in Ibadan". *African Journal of Medicine and Medical Sciences* 2:173-78. Oxford, England: Blackwell Scientific Publication.
- Omran, R. A. eds., with the assistance of Alan G. Johnston, "Family Planning for Health in Africa", Carolina Centre, University of North Carolina at Chapel Hill, 1984.
- _____. eds. (1981). *Family Formation Patterns and Health. Further Studies. An International Collaborative Study in Colombia, Egypt, Pakistan and the Syrian Arab Republic*. Geneva, Switzerland: World Health Organization.
- Odera, M. (1979). *Socio-Economic Conditions and Fertility Level and Trend of Families in Rural Nyanza (Kenya)*. M.A. Thesis.
- Ominde, S. H. eds. (1988). *Kenya's Population Growth and Development to the Year 2000 A.D.* Heinemann Kenya. Nairobi. James Currey. London. Ohio University Press. Athens.
- Puffer, R. R. and C. B. Serrano (1975). "Birthweight, Maternal Age, and Birth Order: Three Important Determinants of Infant Mortality", Scientific Publication No. 294, Pan American Health Organization, Washington, D.C.
- Radovic, Peter (1966). "Frequent and High Parity as a Medical and Social Problem". *American Journal of Obstetrics and Gynecology* 94(4):583-85. St. Louis, Missouri, USA: G. V. Mosby.
- Rahardjo, Y. and V. Hull. 1982. "Employment Patterns of Educated Women in Indonesian Cities", Conference on Women in the Labour Force in Asia, Development Studies Centre, Australian National University, Canberra.
- Reynes, J. and S. Davies (1979). "Trends in Child Malnutrition in the Bohol Project Area: 1976-1979", Research notes no. 57, Bohol Province Maternal Child Health/Family Project, Department of Health, Republic of the Philippines.
- Rich, E., 1975 (eds). "The Economy of Expanding Europe in the Sixteenth and Seventeenth Centuries". Cambridge University Press, pp 642.

- Schultz, T. (1982). "Women's Work and their Status: Rural Indian Evidence of Labour Market and Environmental Effects on Sex Differentials in Childhood Mortality", in *Women's Roles and Population Trends in the Third World*, ed. R. Ander. London: Croom Helm.
- Simon, J. L. (1974). "Family Planning Prospects in Less Developed Countries and a Cost-Benefit Analysis of Various Alternatives". *Economic Journal* 80(317), Mar. pp 58-71.
- Stephens, A. A. R. (1980). "Poliomyelitis Surveillance in Alexandria". Dr. P. H. Dissertation, High Institute of Public Health, University of Alexandria, Egypt.
- Taylor, C. A.; Emmanuel, I.; Morris L. N.; and Prosterman, R. I. (1978). "Child Nutrition and Mortality in the Rural Philippines". In *J. Trop. Paed. Env. Hth.* Vol. 24 No. 2, April. pp 80-86
- UNICEF (1984). "The State of the World's Children, 1984". New York: UNICEF.
- Voorhoeve, Andre M., A. S. Muller, H. Ojigo (1979). "Agents Affecting Health of Mother and Child in a Rural Area of Kenya. 16. The Outcome of Pregnancy". *Tropical and Geographical Medicine* 31(4):607-27. Amsterdam, The Netherlands: Royal Tropical Institute.
- Ware, H. (1983). "Effects of Maternal Education, Women's Roles, and Child Care on Child Mortality", in *Child Survival: Strategies for Research*, eds. Mosley, W. H. and Lincoln C. Chen. The Population Council, U.S.A.
- Wasfy, A. S. M. (1976). "Anaemia, A Health Hazard Among Alexandria School Children". Dr. P. H. Dissertation, High Institute of Public Health, University of Alexandria, Egypt.
- Winnikoff, B. (1983). "The Effects of Birth Spacing on Child and Maternal Health", in *Studies in Family Planning* Vol. 14 No. 10, October (1983):231-44.

- Wishik, S. M. and N. W. Lichtblau (1974). "The Physical Development of Breastfeeding on Young Children as Related to Close Birth Spacing, High Parity and Maternal Undernutrition", paper prepared for presentation at the annual meeting of the Child Development Section, American Academy of Pediatrics, San Francisco, Ca. 20(10). 1974.
- Wood, C. H. (1982). "The Political Economy of Infant Mortality in Sao Paulo, Brazil", *International Journal of Health Services*, 12:215-229.
- World Fertility Survey, 1970.
- World Health Organization, 1981. "Global Strategies for Health for All by the Year 2000". W. H. O., Geneva.
- _____(1986). "Intersectoral Action for Health". The Role of Intersectoral Cooperation in National Strategies for Health for All. W. H. O., Geneva.
- _____(1987). "Evaluation of the Strategy for Health for All by the Year 2000". Seventh Report on the World Health Situation. Global Review Vol. 1.
- Warwick, B. P. and L. A. Lininger (1975). "The Sample Survey: Theory and Practice". McGraw Hill Book Company, New York.
- Wray, J. O. and A. Aguirre (1969). "Protein Calorie Malnutrition in Candelaria, Columbia: 1. Prevalence: Social and Demographic Causal Factors". *Journal of Tropical Paediatrics*. 9. (1969):76-98.
- Wolfers, D. and S. Scrimshaw, (1975). "Child Survival and Intervals Between Pregnancies in Guayaquil, Ecuador", *Population Studies* 29, No. 3 (1975) 477-496.
- Yerushalmy, J., J. M. Bierman, D. H. Kemp, A. Connor, and F. E. French (1956). "Longitudinal Studies of Pregnancy on the Island of Kanai, Territory of Hawaii. 1. Analysis of Previous Reproductive History", *American Journal of Obstetrics and Gynecology*, 71, No. 1 (1956):80-96.
- Zanjoc, R. B. (1976). "Family Configuration and Intelligence", *Science* 192:227-235.

APPENDIX

QUESTIONNAIRE

The questions are structured along the following lines: socio-economic variables, biomedical variables, attitudes toward health and health practices and children's health.

INTRODUCTION

Hello, my name is _____ and I am from the University of Nairobi. We are carrying out a research on the role of family planning in child health. We wish to ask you some questions. We assure you that any information you give will be confidential and will not be used against you in any way.

A: Socio-economic variables

1. Respondent's name: _____
Age: _____
Marital Status: _____
2. What is your occupation?
Teacher _____
Housewife _____
Secretary _____
Clerk _____
Nurse _____
Student _____
Domestic Servant _____
Petty Trader _____
Cleaner _____

3. What is your husband's occupation (if applicable)?

Businessman _____
 Civil Servant _____
 Labourer _____
 Student _____
 Not known _____

4. What is your income?

Less than 500 Shillings _____
 500-800 Shillings _____
 801-1200 Shillings _____
 1201-1600 Shillings _____
 1601-2000 Shillings _____
 2,000 + Shillings _____

5. What is your husband's income?

Less than 500 Shillings _____
 500-800 Shillings _____
 801-1200 Shillings _____
 1201-1600 Shillings _____
 1601-2000 Shillings _____
 2,000 + Shillings _____
 Unknown _____

6. Do you have any other source of income? Yes

Working Children _____
 Relatives _____
 Religious Bodies _____
 Government _____
 Other (specify) _____

7. What is your level of education?

Primary School _____
 Secondary School _____
 Graduate _____
 None _____

8. What is your husband's level of education?

Primary School _____
 Secondary School _____
 Graduate _____
 None _____
 Unknown _____

9. How long have you been married?

10. How many children do you have?

Males: _____ Females: _____
 Ages: _____ Ages: _____

11. Is your husband a polygamist?

If yes, how many other wives and children?

12. The interviewer shall describe the state of the house viz:

Permanent _____
 Semi-permanent _____
 Concrete floor _____

13. Do you own this house or rent it? _____

14. What is your source of energy?

Kerosene _____
 Electricity _____
 Wood _____
 Charcoal _____

B. Biomedical Variables

1. How would you describe the health of your family?
2. What are the most common illnesses in the family and how frequent are they?
3. What would you say is the cause of the illnesses (if applicable)?

4. What kind of food is eaten in the household, e.g. for

Breakfast _____
 Lunch _____
 Supper _____

5. Are there any particular foods not preferred? If yes, which ones and why? 2

6. Do you make special food for infants and children? If yes, which ones and why?

7. How old is your youngest child? _____

8. How many children would you prefer to have? _____

9. What do you consider to be the best interval between siblings and why?

10. Do you prefer one sex to the other? If yes, which?

11. What about your spouse, how many children does he want?

_____ Does he prefer a particular sex? _____

C. Attitudes towards health and health practices

1. What is your religion? _____

2. Is it opposed to modern medicine? _____

3. What actually happens when a child falls sick?

- a) Take him/her to hospital
- b) Pray for him/her
- c) Take him/her to the medicine-man
- d) Use homemade remedies

4. Do you use any family planning method? _____

If yes, which? _____

If no, why not? _____

5. When did you first adopt the family planning method? /

6. How long have you used it? _____

7. What would you say are the advantages of contraceptive use?

D. Children's Health

1. Do you take your child/children to clinic (well baby)?
Yes _____ No _____
2. If yes, interviewer to peruse the card to examine height, weight and growth curve.
3. After how long do you wean your children? _____
4. What foods are given on weaning?

5. How long do you breast-feed your children? _____
6. How many children do you have aged between 0-5 years?

7. Now I have some questions about the occurrence of diarrhea, fever and respiratory infections in the past one month.

Has Child A had any of the following infections in the past one month?

Child A:

Diarrhea	1.	Yes	2.	No
Fever	1.	Yes	2.	No
R.I.	1.	Yes	2.	No

Has Child B had any of the following infections in the past one month?

Child B:

Diarrhea	1.	Yes	2.	No
Fever	1.	Yes	2.	No
R.I.	1.	Yes	2.	No

Child C: (where applicable)

Diarrhea	1.	Yes	2.	No
Fever	1.	Yes	2.	No
R.I.	1.	Yes	2.	No

Child D: (where applicable)

Diarrhea	1.	Yes	2.	No
Fever	1.	Yes	2.	No
R.I.	1.	Yes	2.	No

8. Have you lost any of your children through death?

9. If yes, what was the cause?
