INFANT MORTALITY IN ZAMBIA

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Abstract

The importance attached to the study and understanding of infant mortality for any country cannot be overestimated. Infant mortality rate is a sensitive index of socio-economic conditions of a population. It is an excellent indicator of the level and quality of the health delivery system and other infrastructure available to a population; in addition, it gives insights about the country's general development.

In the past decade, Zambia's infant mortality rate was/has been one of the highest not just in the Eastern Region of Africa but Sub-Saharan Africa as well. To this effect, the objective of this study was to measure factors that gave rise to this experience. The cardinal question that needed answers was why had Zambia experienced one of the highest infant mortality rates in the world?

It has been observed in this thesis that infant mortality is influenced by a combination of factors. Amongst these, socio-economic, demographic and environmental factors stood as major contributors to the rise of infant mortality in the past decade.

It was the view in this study that effecting measures that would see the eventual fall of infant mortality rate needed a holistic approach. Improving one aspect of all the visible variables affecting infant mortality would not effectively reduce infant mortality in Zambia. Improvement of one variable should aim at improving others as well, and for this reason, the general improvement of the economy may have a multiplier effect, meaning, it may warrant, but not necessarily guarantee the reduction in the occurrence of infant mortality.

Key words; IMR, Socio-economic, Demography and Environment

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DEDICATION

TO MY LUBUTO

GOD BLESS YOU AND LET HIM GIVE YOU HIS LOVE WISDOM, INTELLIGENCE, HEALTH AND LONG LIFE.
LET HIM SHINE HIS LIGHT IN YOU JUST THE WAY YOU HAVE BROUGHT LIGHT IN OUR LIVES. YOU ARE THE LIGHT THAT SHINES.

CONTENTS *Page number*

Thesis abstract 1

Acknowledgements 2

Dedication 3

1. Introduction 7

1.1 Background information of Zambia 7

1.1.1 History, Geography and the economy 7

1.1.2 Zambia's Population and Population Policy 9

1.1.3 Health programs and priorities 12

1.2 Infant mortality: The Problem in Zambia 13

1.3 Significance of the study 14

1.4 Organization of the thesis 15

2. Literature review 17

2.1 Concepts of Two Kinds of infant mortality 17

2.2 Causes of infant mortality and their regional differences 17

2.3 Social Determinants of Infant Mortality 19

2.3.1 Education 19

2.3.2 Cultural Influences 23

2.3.3 Primary Health Care 25

2.3.4 Health Facilities 26

3. Study design and sources of data 27

3.1 Goals and objectives 27

3.2 Conceptual framework 28

3.3 Study questions and hypothesis 29

3.4 Sources of data 30

4. Infant Mortality Rates and Trends 31

4.1 National Infant Mortality levels 31

4.1.1 Urban and Rural differences in infant mortality 32

4.2 Regional differences of infant mortality 32

4.3 Infant mortality and reproductive factors 37

4.3.1 Infant mortality and maternal age 37

4.3.2 Infant mortality and parity 39
4.3.3 Infant mortality and birth interval 41
4.4 Infant mortality and maternal education 43
4.5 Infant mortality and antenatal care 45
4.6 Prevalence of common infections in infant population 47
5. Socio-economic and demographic situation and their impacts on infant mortality 48
5.1 Demographic information 48
5.2 Economic situation 52
5.3 Education information 55
5.4 Nutrient deficiency factors in infants 58
5.5 Health care resources 59
6. Final Discussions 63
6.1 Answers to Study Questions 67
6.2 Limitations of the Study 68
6.3 Recommendations 68
6.4 Conclusion 71

Appendix

References 73

LIST OF TABLES AND FIGURES

Tables

Table 1 Demographic characteristics 10
Table 2 IMR for Zambia, rural/urban and provinces 34
Table 3 Average IMR for the provinces 35
Table 4 Relationship between IMR and maternal age 37
Table 4.1 IMR and parity 39
Table 4.2 Relationship between IMR and birth interval 42
Table 5 IMR and number of years in school of the mother 43
Table 6 IMR and antenatal care 46

Table 7 Infectious disease presence in infant population 47
Table 8 MMR, CDR and life expectancy 51
Table 8.1Population information 52
Table 9 Summary of economic indicators for Zambia (1992,1996, 2002) 55
Table 10 Nutrient conditions 59
Table 11 Summary of health care resources in Zambia 62

FIGURES

Figure 1 Map of Zambia 8
Figure 2 IMR trends/differentials for 1992, 1996 and 2002 ZDHS 34
Figure 3 Average IMR for the provinces 35
Figure 4 Line graph, IMR and age of the mother 38
Figure 4.1 Line graph, IMR and parity 40
Figure 4.2 IMR and birth interval 42
Figure 5 Column chart, IMR and maternal education 44
Figure 6 IMR and antenatal care 46
Figure 7 Percentage of the official primary school population-age 7 to 13 attending school by sex, 1990 and 2000 57
Figure 7.1 Net secondary school attendance rate by sex, 1990 and 2000 57

INTRODUCTION *1*

Background information of Zambia 1.1

History, Geography and the Economy 1.1.1

Historical and archaeological evidence indicates that by the year 1500, Bantu-Speaking Horticulturalists, farming people who were ancestors of the present inhabitants, occupied much of modern Zambia. In the late 19th century, the British South Africa Company administered various parts of what was to become Northern Rhodesia. In 1924, the British Colonial Office assumed responsibility for administering the territory, and in 1953, Northern Rhodesia (Zambia) and Southern Rhodesia (Zimbabwe) joined Nyasaland (Malawi) to form the Central African Federation of Rhodesia and Nyasaland (ZDHS, 2001/2002). In 1963, the federation was however dissolved and by October 24, 1964, Zambia gained independence and became a multiparty state. In 1972, Zambia became a one party state. However, 19 years down the line, Zambia again re-introduced and re-implemented a multiparty political system.

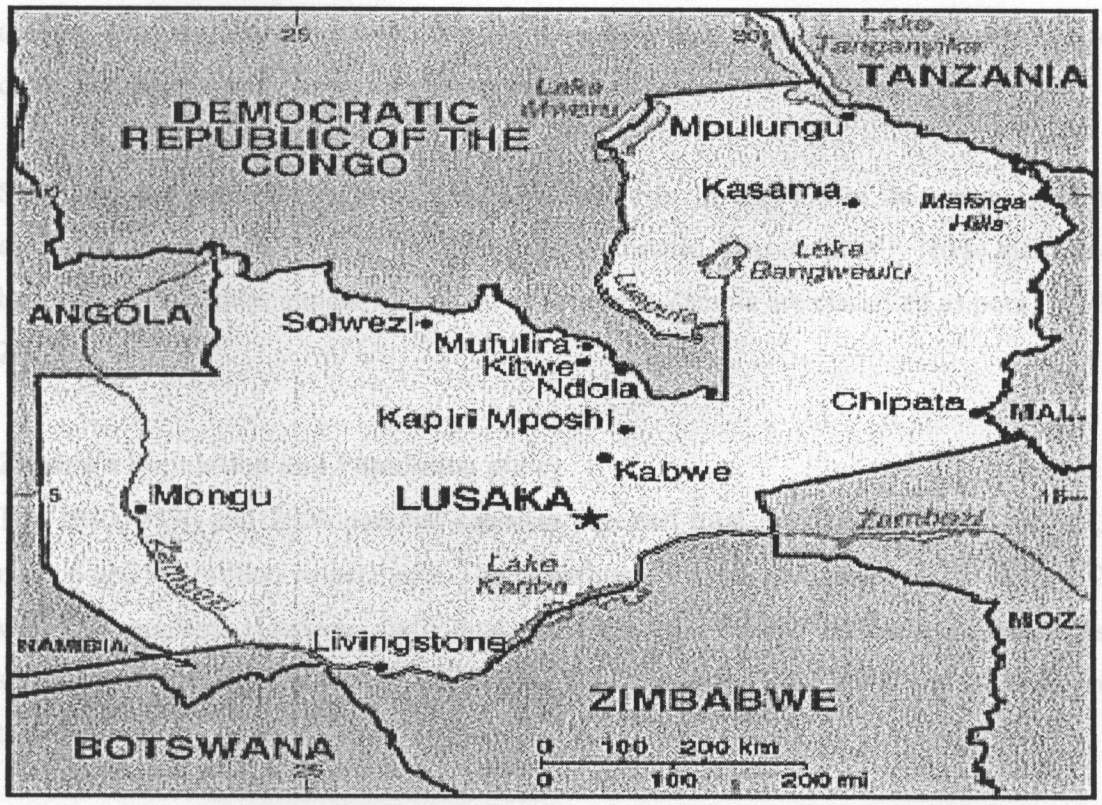
Geography

Zambia lies between 8 and 18 degrees south latitude and between 20 and 35 degrees east longitude. It is a landlocked country covering an area of 752,612 square kilometers. It shares borders with eight other countries namely; the Democratic Republic of Congo and Tanzania in the north; Malawi and Mozambique in the east; Zimbabwe and Botswana in the south; Namibia in the southwest and Angola in the west. Zambia has 9 provinces and 72 districts. Predominantly, there are two or three provinces described as urban and the other seven are rural like. The nine provinces are Central, Copperbelt, Eastern, Luapula, Lusaka, Northern, Northwestern, Western and Southern provinces.

Zambia's climate and vegetation are tropical. There are 3 distinct seasons namely; the cool to cold winter from May to August, a warm to hot dry season from September to October and a wet and warm summer in the months November down to April. The northern part of the country receives more rainfall than the south and the east.

Zambia lies in a watershed and as such is a home to numerous river sources. The major river sources in Zambia are the Zambezi River, which is the longest in the country, the Kafue River, the Luangwa River and the Luapula River. There are four big water bodies namely, Lake Tanganyika, Lake Mweru and Lake Bangweulu, all in the north. Lake Kariba, a man made lake is in the southern part of the country.

Figure 1: MAP OF ZAMBIA



Source: www.zamstats.gov.zm

Economy

Zambia has a mixed economy consisting of a modern urban sector and a rural agricultural sector. For a long time, parastatal organizations have been dominant in running the modern sector economic arrangement, while private enterprises have been concentrating in construction and agricultural industries. From 1991 onwards, the pattern changed in that most

government owned companies were sold off to private entities. Unfortunately, most of these companies have gone under and no longer in operation.

Copper mining is the country's main economic activity accounting for 95 percent of export earnings and contributing 45 percent of government's revenue. From the 1970s, low copper prices plus high oil prices culminated in the country's sluggish economic performance. The government attempted to overrule this poor performance of the economy by introducing policies that would enable the country less dependent on copper as the major economic activity. Diversification became the main stem by which dependency on copper was to be dealt. The desired goals however proved futile to achieve.

Structural Adjustment Programs (SAP) became rife in the 1990s, but even with these economic alternatives, Zambia' economy remained static. This eventually led to many people being poor. Currently, almost 72 percent of people in Zambia are classified as poor (MOFNP, 2002).

Zambia's Population and Population policy 1.1.2

The 1980, 1990 and 2000 national censuses reported total populations of 5.7 million, 7.8 million and 9.3 million respectively. The growth rate for the intercensal period 1990 to 2000 was 1.77 percent. However, individual provinces experienced different growth rates. A summary of selected demographic indicators for Zambia for 1980, 1990 and 2000 are in the table below:

Table 1: Demographic characteristics Selected indicators, Zambia, 1980, 1990 and 2000			
Census year			
	1980	1990	2000
Population (millions)	5.7	7.8	9.3
Density (pop./sq.km.)	7.5	10.4	12.4
Percent of pop. in urban	39.9	38	36
Total fertility rate	7.2	6.7	6.0
Completed family size (women aged 45-49)	6.6	7.1	6.8
Infant mortality rate (0/00)	97	123	110
Life expectancy at birth			
Male	50.4	46.1	51.7
Female	52.5	47.6	51.7

Source: Zambia Demographic and Health Survey, 2001-2002

The density of the population in Zambia has been increasing. From 1980, the population density increased from 7.5 to 10.4 people per square kilometer in 1990 and 12.4 people per sq/km in 2000. Lusaka and the Copperbelt are the most densely populated provinces in Zambia.

The proportion of the urban population to the total population has been reducing. This has been due to the hostile economic conditions Zambia has been experiencing. It has been estimated that the percentage of the population in urban areas now stands at 36 percent, quite different from the 38 percent of 1990 and the 40 percent of 1980.

Total fertility rates estimated from the 1969 and 1980 censuses are all in the range of 7.0 births per women. This rate declined to 6.7 births per woman in 1990 and to 6.0 births per woman in 2000. Life expectancy at birth was estimated at 50 years for males in 1980 but

declined to 46 years by 1990. There has been a gain of about 5.6 years and 4.1 years for females and males respectively in life expectancy according to the year 2000 census. In general, women in Zambia outlive men, on average by at least 2.1 years. Mortality levels differ by area of residence, that is, rural or urban. Provinces like Luapula, Western and Eastern have high mortality levels, where as Lusaka, Copperbelt and Northwestern provinces experience quite low mortality prevalence. Infant mortality rate declined from 141 deaths per 1000 births in the mid 1960s to 99 in the late 1970s. This decline was temporal as infant mortality rose again to 123 in the late 1980s. At present, infant mortality has reduced to 110, note that this rate is still higher than that of the 1970s and by comparison, higher than what obtains in most developing countries that have similar economic conditions as those of Zambia (ZDHS, 2001-2002).

Population policy

From independence to the 1980s, Zambia never incorporated population issues in her development programs. Results of the 1980 Population and Housing census indicated to the government then the need to reappraise the role of population in national development. As a result, the government initiated the drafting of the first National Population Policy, which aimed at grafting population problems into all programs of national development. The population policy was adopted in May 1989 and later revised in December 1996. Some of the objectives of the 1996 population policy were:

1. To ensure that population issues and other development concerns are mutually integrated in planning and implementation processes so as to attain development;
2. To ensure that all couples and individuals have the basic right to decide freely and responsibly the number and spacing of their children and to have the information, education and the means to do so in order to enhance the health of families;
3. To contribute to the reduction of maternal, infant and child mortality so as to increase life expectancy;
4. To contribute to the reduction of HIV/AIDS and other sexually transmitted infections so as to improve the general health status of the population;

5. To improve the population's access to appropriate, affordable and high-quality reproductive health services including family planning and sexual health in order to have a healthy nation;
6. To promote and maintain equal access to education for both sexes at all levels to raise literacy levels.

Objectives of the Zambian Population Policy were to be achieved through related policies and strategic frameworks such as the Reproductive Health Policy and the Gender Policy. To date, only a few of these objectives have been achieved and this stood out as one of the questions this study endeavored to answer.

1.1.3 Health Programs and Priorities

In 1991, the government of Zambia articulated radical health reforms characterized by a move from a strongly centralized health system in which the central structures provided support and national guidance to the peripheral structures. An important component of health policy reforms is the restructured Primary Health Care (PHC) program.

The reformulated PHC program aims, among others, to deal with the main health problems in the community. The reforms focus on the needs of the underserved, high-risk, and vulnerable groups. Thus, attention is paid to the rural and peri-urban areas where health needs of the people are greatest. PHC aims at targeting health questions such as maternal and child health, family planning, nutrition, control of communicable diseases (e.g. diarrhea, cholera, dysentery, sexually transmitted infections, HIV/AIDS, malaria etc), immunization and environmental sanitation in order to secure adequate health care for all people in Zambia (ZDHS, 2001/2002)

Health reforms established were aimed at achieving the following targets by the year 2000:

- To reduce the percentage of underweight children (0-5 years) from 23 to 18 percent;
- To reduce and control tuberculosis prevalence
- To increase accessibility and acceptability of family planning services;

- To improve the quality and utilization of maternal and child health care delivery so as to reduce incidences of maternal deaths and related complications;
- To reduce the incidence of sexually transmitted infections (STI's), AIDS and reproductive tract infections (RTI's);
- To reduce incidences of induced abortions so as to bring to lower levels maternal complications and maternal deaths;
- To increase the percentage of the population having adequate sanitation facilities from 66 to 75 percent in urban areas and from 37 to 57 percent in rural areas by 1996 (MOH, 1992)

Health care services are the means by which these targets were to be achieved. These targets, like most population policy objectives, have been hard to fulfill and the situation in the health delivery system has to some extent, been deteriorating rapidly.

Infant Mortality: The problem in Zambia 1.2

INFANT MORTALITY is under lied by a set of biological, socio-economic, demographic and cultural factors that are too complex to understand especially on the actual causes. The importance of studying Infant Mortality cannot be overestimated- Infant Mortality Rate is a sensitive index of social-economic conditions of a Population. It is an excellent indicator of the level and quality of health care and other social infrastructure available to a Population.

From the inception and discovery of modern technology in medicine, Infant Mortality has been declining the world over especially in More Developed Regions. However, the situation in Less Developed Regions leaves much to be desired. Despite drastic changes in the political, economic and social settings of most countries in the developing world, Infant Mortality has remained significantly high. Research institutions have also been releasing data qualifying the existence of high infant mortality in some developing countries and in this regard, about 10 countries out of 193 countries with populations over 1 million have so far shown remarkable increase in Infant Mortality Rates (IMR) and more, in Under 5 Mortality Rate (U5MR). These countries are Bulgaria, Iraq, Rwanda, Zambia, South Africa, Botswana,

Tanzania, Malawi, Afghanistan and Burundi (www.ined.fr/englishversion). Out of the 10 countries, seven are all in Africa, and going by regional demographic partitions, they are in the Eastern Region. Since Zambia is one of the countries experiencing high infant mortality, the researcher attached particular interest to study and determine prevailing conditions resulting in this experience.

The main aim was to determine the level and time trends in Infant Mortality in Zambia for the past 10 years, thereby establishing whether there were increases in infant deaths. The study aimed at contributing to knowledge in academic applications, more also, results of this research may enable the Zambian Government find appropriate ways of reducing infant mortality thereby reducing high costs incurred through the health care system.

Significance of the study 1.3

For most parts of the world, infant mortality has been reducing, but unfortunately, countries such as Zambia have been experiencing the exact opposite. The situation prevailing currently needs concerted efforts aimed at reducing infant deaths and thereby contribute to the development of Zambia. The importance attached to the need to understand and identify the actual cause of high infant mortality cannot be over emphasized. High or low infant mortality rate is one of the basic indicators of a country's development, further, knowing the causes and finding solutions to problems have other benefits for any country in the world. According to the data given by the World health Organization (WHO), Zambia's infant mortality rate started declining in the early 1960s. Specifically, in 1960 the IMR was more than 126 per 1000 births. This however was common to almost all African countries. The decrease continued until 1980 when it reached 99 infant deaths per 1000 births. This improvement was short lived as IMR started rising again and by 1990 to the year 2000, IMR has been ranging between 110 and 120 per 1000 births making it one of the highest both in the region and also in the World. Further, the 1992 Zambia Demographic and Health Survey (ZDHS) indicated that infant deaths had gone up by a considerable margin and that Neo-natal and Post-natal mortality had particularly risen to about 35 percent more than what was experienced in the past 15 years before the conduct of the survey. Questions needing answers are reasons explaining this up-ward swing. By discretion, Zambia, a country that has not suffered any major civil strife from independence to date is expected to show remarkable

improvements in development and thereby affecting IMR positively. Alternatively, the IMR in Zambia is expected to be low and by the start of this century, a trend following other developing countries pattern with relatively lower IMR should have been prevailing. On the contrary, the opposite is true and an inquiry into why IMR has remained high was the purpose this study tried to achieve.

The Government has been initiating several programs to provide facilities in order to curb this problem despite economic hardships the whole country is going through. Some of the programs already tried include, the introduction of compulsory immunization for all children under the age of 15 and these include, in addition to the old vaccine program, the introduction of new vaccines aimed at reducing Maternal and Neonatal deaths. Vitamin A complementation programs aimed at boosting mother and child's vitamin A levels and thereby controlling the level of maternal and infant mortality, National Reproductive health Programs aimed at the reduction of newborn deaths and disability. Other measures introduced have been aimed at minimizing mortality due to Measles and Yellow Fever and any other complication brought about by measles especially (Vaccines and Biologicals, 2002, WHO). However, despite these efforts, the state of infant mortality in Zambia has remained wanting and for this reason, it was imperative to probe further and find reasons for such experiences. In addition to what the Government has been doing so far, several international organizations such as WHO and UNICEF have also been making frantic efforts in trying to come up with solutions on how to improve the general health of children. Results of these efforts have been disappointing. Because of these disappointing results, it was therefore justifiable to carry out this study.

1.4 Organization of the thesis

This paper has been prepared to answer and give solutions to questions and problems relating to Infant Mortality in Zambia. Currently, many developing countries are increasingly experiencing high incidences of Infant Mortality and Zambia has not been spared. This thesis has six chapters and each chapter is divided into various sections and sub-sections.

Chapter 1 introduces Zambia as a country. This introduction runs through history, geography and the economy. It also gives an insight of infant mortality problem in Zambia and how this thesis has been organized.

Chapter 2 deals with the Theoretical understanding of Infant Mortality. This includes the conceptual definition of infant mortality and the two major sub-definitions surrounding this phenomenon. The literature in this chapter unveils how infant mortality is socially and economically determined.

Chapter 3 is a description of the study design and sources of data. It brings into effect the main objectives and goals this study attempted to achieve. Within the design, this chapter also has information on the conceptual framework, study questions and hypothesis; it also gives sources of the data used in this study.

Chapter 4 gives details of information as related to differentials in the advent of infant mortality amongst different regions in Zambia. Attention is paid on rural and urban differences in the occurrence of infant mortality, also differences existing in different provinces. In addition, this chapter introduces factors that directly influence IMR, and they include reproductive factors, education, antenatal care etc.

Chapter 5 looks at the socio-economic and demographic factors and how they have affected infant mortality in Zambia. It deals with what has been the situation in terms of economic performance and how this could be linked to reasons affecting IMR in Zambia.

Chapter 6 makes some detailed discussions of the findings of this study. This chapter also includes limitations of the study, recommendations and a conclusion.

LITERATURE REVIEW 2

Concepts of Two Kinds of infant mortality 2.1

Many studies have been done on infant mortality both in the past and current times. As indicated above, results from various researches have one common aspect and that is, Infant Mortality has been on the decrease in developed countries but developing countries on the other hand have so far experienced different results. The situation is even worse in the so-called Least Developed Regions where almost all countries are comparatively very poor. Simply defined, Infant Mortality refers to the death of children under the age of one (www.ined.fr/englishversion).

Due to the complexity of infant mortality, most researchers make a distinction between Neonatal and Post-neonatal (Endogenous and Exogenous) infant mortality. Endogenous mortality is a notion used to distinguish between mortality due to conditions during birth or congenital malformations, hereditary diseases, perinatal conditions, and exogenous mortality results from external causes such as infectious diseases, malnutrition, accidents etc (www.ined.fr/englishversion). However, distinguishing with certainty between the two types of deaths is difficult and largely depends on the degree of medical knowledge. On this assertion therefore, the focus of this research was on the post-neonatal/exogenous infant mortality. The reason for this focus was simple, that post-neonatal deaths do have quite simple explanations compared to neonatal deaths. In social science research, causes of neonatal deaths have attracted very little attention, but exhaustive research on post-neonatal causes of deaths has been made and this is because issues of the environment have a lot to play in the actual cause of infant mortality.

Causes Infant Mortality and their regional differences 2.2

The actual causes of death at infantry can be categorized according to their different groupings. They include Respiratory Infections, for example, Influenza, Pneumonia, Whooping Cough etc, Diarrhea diseases e.g., Cholera and Dysentery, Malaria. Other infectious diseases include Measles, Tetanus etc. Recently, HIV/AIDS has been added to the list of diseases causing deaths in children. However, rural and urban areas of most developing countries share different experiences as regards to the actual causes of deaths. In

rural India for example, causes of infant deaths reveal that respiratory infection of the newborn causes peculiar to infancy (www.ined.fr/englishversion) pre-maturity, congenital malfunction, diarrhea of the newborn and birth injury are broad based categories that account for more than 80 percent of all the infant deaths. The India National Paper goes on to point out that accidents and injuries, fevers, digestive disorders, disorders of the respiratory system etc are also amongst the major causes of deaths at infant stage.

In urban areas on the other hand, causes like slow foetal growth, malnutrition, immaturity and other conditions account for about 75 percent of infant deaths. Infectious and Parasitic diseases like intestinal infectious diseases, TB, other bacterial diseases, viral diseases contribute about 7 percent. Congenital anomalies and other causes bring up the rest. The suggestion from the observed trend in infant deaths is to tighten up the health care system by countries in the most affected regions.

The link as explained by the literature above is that the Environment and particularly biological factors interact to cause most deaths of infants in developing countries. Other researchers however have expanded the causes of infant deaths to include other socially, economically and demographic aspects playing a very cardinal role in the escalation of infant mortality. The list is endless and includes among others, infanticide, literacy, medical facilities and attention, age of mother, birth order and spacing, birth weight etc (www.ined.fr/englishversion).

Household settings act as important parameters influencing the survivorship of children in general and infant mortality in particular. More also, many researchers have laid emphasis on the importance of the influence of the mother on the survivorship of infants. In this sense, Caldwell (1979) claimed that the mother is of prime importance in this situation and it is her knowledge, autonomy in the household, decision making and ability to interact with outside agencies, that define the level of household child mortality even if the outer limits are set by the economic resources of the household and the medical facilities in its area. The interactions between household influences and child survival can be viewed from two perspectives. The first one being that of developing countries and the other is that of developed countries. Developed countries have so far passed through many stages in combating and eventual reduction of infant mortality, and therefore act as yardsticks for

developing countries. Since the focus of this study is based on experiences of developing countries, it is probable to take a leaf from developed countries and hence make points of comparison.

Social Determinants of Infant Mortality 2.3

Education 2.3.1

Infant and Child Mortality in developed countries used to be relatively high also but at some point in time reduced due to a combination of factors. One factor that played an important role in this period was Education. An example sighted in this case was that of London in the 1900s when schools of mothers were opened within a short period of time, 1904 and 1907 respectively. Accordingly, the health education these schools imparted became readily acceptable and applied, and the compulsory education act of 1870 worked to the advantage of the entire population (Benjamin, 1965). During this period, urban infant welfare centers also rapidly multiplied and from 1907, an even more personal approach to education was adopted, particularly in London where health visitors contacted mothers to impart basic information on such cases as asepsis, nutrition and child physical development.

Studies done in certain European countries during the period 1876-85 to 1946-55 indicate that the reduction of infant mortality in developed countries was mainly due to improvements in nutrition and standards of living, and public sanitary reforms. This however does indicate to a larger extent that general improvements in the socio-economic status of individual societies may lead to quantifiable reductions in mortality generally and infant mortality particularly. It also means that countries still lagging behind in development need a lot more effort in handling mortality issues than those that are more developed. The developed countries' experiences lead to some focused conclusion, that the steady and more rapid decline in childhood mortality is compatible with the suggestion that it is heavily influenced by social changes at the individual and family behavioral level (Alaka M. Basu, 1987). Such changes tend to generate their own momentum, which soon get divorced from changes in other economic or technological factors as is demonstrated more vividly with evidence from developing countries (A.M. Basu, 1987).

Experiences in developing countries on this subject still need a lot of attention. According to Basu (1987), only a few African countries began a sustained mortality reduction before the 1940s. However, the real take off for mortality decline in developing countries as a whole occurred after the Second World War. The first couple of decades of this period saw remarkable gains in life expectancy in nearly every developing country and, Africa was no exception as it saw the expectation of life at birth rise from below 30 years in the 1930s to about 43 years by the 1960s (Preston, 1980). The improvements that occurred in this period in developing countries were however imbalanced in the sense that mortality mainly reduced at older ages and not necessarily at infant or childhood stages. According to the United Nations data on mortality decline by age of 1973 for selected developing countries, it was found that in the immediate post-war decades which recorded the most dramatic falls in Crude Death Rates, the gains by young adults have been at least as great as, and often higher than, those by young children. The overall impression therefore from whatever data sources are available is that gains in mortality at the young childhood ages in developing countries have tended to lag behind improvements at older ages (Dyson, 1977; United Nations, 1982).

Disparities as indicated by experiences in developed and developing countries on the imbalances exhibited by differentials in adult and child mortality are lamped with one general explanation, that the medical advances which became significant contributors to the falling death rates in the developed countries only after two centuries of economic and social change were of the kind which could be transferred easily to areas which had reached very differing levels of social and economic development, as long as political will existed to implement these new technologies. This means that the chronological order of the influences on declining mortality was completely reversed in these countries; first came the effects of the wide spread adoption of developments in medicine and public health, followed after by varying intervals of time by the economic and/ or social changes needed to sustain these falls in mortality (Basu, 1987). In other words, these reductions in infant, childhood or even adult mortality were not independent of attachments from the developed countries or, they were not initiated by developing countries but rather came as gifts that later became too complicated to understand and more also to sustain. The general agreement on this however is that the effect of medical measures on the falling death rates tends to toper off unless it is

backed by equivalent rises in personal living standards (Basu, 1987). A new approach in this respect is that of the emphasis laid on individual or personal living standards. This does show that the survivorship of infants and children in general will mostly depend not only on the overall development taking place in any society but more also on micro-level experiences, at individual and/or personal level.

What is clear from the information above is that whatever the case, childhood mortality declines are greatest when the primary influence on mortality is social change (Basu, 1987). This change can be measured from two ways, personal and societal perspectives.

Following the arguments above, one pragmatic indicators of social change is literacy or education. According to John G. Cleland and Jerome K. Ginneken, there is nothing new about the belief that the spread of education and its impact on knowledge and outlook is a central force behind the Demographic Transition; and in 1934, Penrose wrote:
"It would seem that when a community has gained the knowledge and acquired the habits necessary to reduce the death rate, it will sooner or later gain the knowledge and acquire the habits necessary to reduce the birth rate. There maybe a time lag between the two processes but both of them in a large share are outcomes of education (Penrose, 1934)".

Until recently, education was mainly associated with being an indicator of socio-economic status and not having any specific influence on the mortality of children as such. However, the turning point was an analysis of survey data from Ibadan, Nigeria, which demonstrated that the mother's education was a more decisive determinant of child survivorship than more economic family characteristics such as husband's occupation (Caldwell, 1979). Following this influential investigation, there has been a deluge of researches on the topic and surprisingly, most of these studies have confirmed the fact that parental education, more especially maternal education, does indeed have a large influence on the survivorship of children.
Education has tended to play a very positive role in the reduction of childhood mortality, particularly in developing countries. Cochrane *et al* (1980) and the United Nations (1985) conducted comparative analyses of the association between maternal education and mortality

at different times and using data from different countries. The results of these studies were remarkably consistent; both found an essentially linear relationship between maternal education and childhood mortality, with an average of 7-9 percent declines in mortality ratios with each one-year increment in mother's education. Several other studies conducted with the view of linking childhood survivorship to maternal education have more or less shown quiet consistent results with very few or less intervening variables. One such case has been the introduction of mother's health as an indicator or factor influencing childhood survivorship. However, there is no plausible explanation to adduce childhood survivorship to that of a mother's health status. Further, it has been claimed that it is not correct to make a claim that the mother's general health status is a factor intervening between her education and the fate of her children. As Ware (1984) pointed out, it is likely that educated mothers are better nourished, more willing to flout harmful food taboos during pregnancy and less subjective to heavy manual work during pregnancy than their less educated counterparts. Overall, the claim is that there is plenty of evidence that these represent serious risk factors for infant survival.

The number of years that a mother spends in school also marks quiet remarkable differentials when looking at education as a factor influencing child survival. In other words, the more years a mother spends in school, the higher the chances that her children will survive to adulthood. According to major analyses of World Fertility Survey by Hobcraft *et al,* (1984), a few years of primary schooling is associated with a 20 percent drop in the probability of dying between age one and five; a few more years of primary schooling brings about another 10 percent fall, while a further 20 percent drop comes with secondary schooling. From Hobcraft's analysis, the claim that children born from mothers who at least reached secondary school level education are likely to survive childhood should be held in high esteem.

In the same vein, there is a high correlation between education and the use of health facilities or rather services. This means that educated mothers are more likely to use health services available for both curative and preventive purposes than the un-educated ones. Most studies have shown a positive correlation between maternal education and the use of modern

preventive health services. In a survey in Latin America by Fernandez (1984), it was found even after adjustment for maternal age, parity, rural-urban residence and husband's education, that, differences according to maternal education in utilization of maternal and child health services remained high. In addition to the increased propensity of educated mothers to seek medical attention for themselves and their children, it is likely that they do so with greater timeliness, extract high quality care and adhere to advice with greater persistence (John G. Cleland *et al,* 1988).

Cultural Influences 2.3.2

In any societal setting, especially in developing countries, adherence and observance of certain cultural norms and traditions is highly prevalent. Culture plays a fundamental role in births and eventual upbringing of children. This means also that child survival is directly influenced by cultural and traditional beliefs. Two dimensions of cultural considerations could be looked at; the first one being the extent to which a mother observes cultural and traditional norms, and the second being perceptions that society has towards children with particular emphasis to their sex.

Characteristics of individual mothers are normally representative of the culture, worldviews of the status group within which she functions or options to function, and possession of such characteristics is among the criteria used by the mother herself and other members of the group to evaluate her performance as a member or a prospective member (John Simons, 1989). As such, a mother's reward of success may include avoidance of negative sanctions imposed by other members of the status group. These members may include fathers who are as committed as their wives are to the survival of children, and to share their belief in the efficiency of parental intervention though they may not share their wives' knowledge and skills. The question that remains un-answered is what are the possible dimensions for a mother to intervene in the survivorship of her child? At extremes, certain societal settings believe that the survival of children depends on God, fate or luck, and therefore not subject to control by actions of the mother (John Simons, 1989). The following are some of the ways a mother is hampered by culture and traditions on her effective intervention on child survival:

Power relations within the household – while in most traditional societies the mother has full responsibility for childcare, she may have little control over allocation of resources to herself or to her child or over critical childcare practices (Safilios-Rothschild, 1980). According to Mosley and Chen (1984), it's expected that decisions in this area should be the prerogative of elders, particularly the mother in law or the husband, and the latter may rigidly adhere to useless or harmful traditional practices.

Sex preferences – in many developing countries, the most striking evidence of variations in commitment to child survival is the data on sex differentials in mortality. There are many countries especially in Asia where the survival of girl children is critically hampered due to the strict observance of certain traditions and cultural norms. Ware (1981) writes that there were at least five countries in Asia in the early 1970s where discrimination against females was sufficiently strong to ensure that expectation of life at birth was shorter for females than males. The visible factor in these traditions lies within the notion that girl children are economic liabilities rather than values. In line with this notion are many reasons given to explain the general value of children, male or female. Mosley and Chen (1984) report that in economic terms, a family's investment in childcare maybe conditional on expected returns. An example is that of Kenya in Africa where female child survival rates are a little higher than males due to bridal prices charged when female children are getting married, and Bangladesh, where survival rates for males is also slightly higher than females, mostly, due to heavy bridal prices families from the girl's side have to pay (Mott, 1979; Poffenberger, 1981).

Beliefs about disease causation- a child's survival may also depend on this one important factor. In many traditional societies, certain diseases are myths and can only be cured by means of supernatural intervention, as such; notions of this kind do have significant results on the proximate determinants of child survival. These ideas range from ritualistic disease prevention practices, to choice of therapies and practitioners for sickness care, to sexual taboos and abstinence to prevent illness in the suckling child (Fabrega, 1972; Kleinman *et al*, 1975). Prominent also in ideas about beliefs on disease causation is the influence of food preferences on child survival. Because maternal diet during pregnancy and lactation and patterns of breastfeeding and supplementation are potent determinants of child survival, food

preferences do assume importance in many developing countries, particularly where food taboos and restrictions are commonly practiced during pregnancy, lactation, weaning and illness (Mosley and Chen, 1984). A common deleterious dietary practice of concern is the withholding of food and fluids during diarrhea illness, a situation now being addressed through the World Wide Promotion of Oral Re-hydration Therapy (Grant, 1982).

Primary Health Care 2.3.3

Among the intrinsic factors unfolded in research is the promotion of Primary Health Care (PHC) as a methodology to enhance child survival. Within this assumption or method is the introduction of effective, preventive and curative techniques to ensure high incidence of child survival, which would be combined with the existing methods prevailing in many developing countries. The general picture of many countries especially in Africa is that the support and sustenance of medical technologies based purely on western understanding and development is almost an impossible adventure to achieve. As Mosley (1985) notes, most countries in Africa have an extreme shortage of highly qualified medical work force, with average population to physician ratios ranging from 10,000 to over 40,000. For rural areas, the ratios are often at least ten times higher. Even where large numbers of nursing personnel, mid-wives and medical assistants have been trained, the health centers and dispensers from which they operate cover only a small proportion of the rural population.

In developing countries and especially those in Africa, PHC can work by means of 5 major components suggested and defined at Alma Ata Conference in 1978 (WHO and UNICEF, 1978):

1) Active participation by the community in which they exist and operate
2) Be socially relevant to the local context; western medicine should augment rather than replace traditional health systems
3) Involvement of other sectors such as education, housing, water, sanitation and agriculture
4) Health services and health promotion should be largely operated by paramedical personnel, and
5) Use of simple but effective technologies.

The core of this study was identifying variables, social-economic, environmental, as well as biological affecting infant mortality in developing countries. In terms of literature, a lot has been written and almost all observations and revelations have in a way or another pointed to one formidable conclusion; that infant mortality is a function of social and economic determinants and these operate through some basic biological mechanisms, or intermediate variables that influence risks of morbidity and outcomes of morbidity processes. Further, mortality in infancy and childhood is generally the ultimate consequence of cumulative episodes of morbidity (including their biological and social synergies) and only infrequently is it a result of a single episode of disease (Mosley, 1985).

Health Facilities 2.3.4

On the other hand, an important aspect in child survivorship is the availability of adequate health services. John G. Cleland *et al* (1988) makes a claim that there is abundant anthropological evidence that belief in and practice of entirely different systems of disease classification and therapy can co-exist, but the correlation between exposure to formal schooling and propensity to resort to western medicine is clear-cut. It is thus reasonable to expect that the advantage conferred by education maybe greater in settings where modern health facilities are available. The readily available and easily accessible health facilities do play a very important role in the general survivorship of the society in question and more also the survival of children. Orubuloye and Caldwell (1975) found that educational differentials in childhood mortality were indeed larger in a Nigerian village with a hospital than a village without such a facility. In a subsequent re-analysis, a huge interaction was found; the presence of health services improved child survival by 20 percent; maternal education in the absence of health services was associated with 33 percent improvements; but the joint effect of services and maternal education resulted in an 87 percent improvement (Caldwell and Caldwell, 1985). The presence of health facilities such as hospitals, clinics and health centers do help reduce infant and child mortality especially in cases as indicated above where a combination with education does produce remarkable results. However, most developing countries are lagging behind in either maternal education levels or health facilities availability or both, hence high incidence rate of infant and child mortality.

Cementing the above claim is the assertion that the interrelationship between maternal education, health service provision and childhood mortality is complex and variable. This actually reflects the complexity of the real world. The most obvious of these complexities lies in the knowledge of disease causation, prevention and cure and of the nutritional requirements of infants and children. Either as a direct consequence of school curricula or as an indirect consequence of schooling on subsequent exposure to and comprehension of health facilities, educated mothers may have a better knowledge of health requirements than uneducated mothers.

STUDY DESIGN AND SOURCES OF DATA 3

Goals and objectives of the study 3.1

This study aimed at achieving the following goals:

1. The formulation of Theories or a Theory to the understanding of infant mortality and its causes in Zambia, thereby giving more information for research and academic purposes,
2. Help change policy decisions, service delivery programs and individual and family health behavior in relation to Infant Mortality in Zambia.

The study focused on attempting to achieve the following objectives:

Conducting a descriptive study by using all possible data bases in understanding infant mortality in Zambia and probe further to understand and explain the causes. Specifically, the study aimed at obtaining information in the following contexts:

(a) Identifying regional differences and socio-economic differences in IMR levels and causes of infant deaths, such as urban-rural differences, differences among different provinces, and differences by some socioeconomic and demographic indicators (income, education, and fertility).

(b) Exploring causes or factors underlying the rise of IMR in Zambia and causes or factors influencing the regional variations of IMR. The study therefore focused on socioeconomic, demographic, environmental, cultural and health care factors and,

(c) Finding populations at high risk of infant deaths, in other words, in what kinds of mothers, households or communities are infant deaths more likely to occur and find specific ways that can reduce this difference effectively.

3.2 Conceptual Framework

From historical perspectives, it has been noted and documented that in the period 1950s to 1960s, there was a rapid decline in infant mortality in the world and especially in developing countries. Reasons attributed to this decline include among others, increased economic development and technology in the developed nations which later on spilled over to the less developed countries. In the 1970s and 1980s however, the sustenance of low infant mortality in developing countries could not be upheld for long and this resulted in the slow decline of infant mortality. One of the major reasons for this decline was lack of self-propagated development by countries in the developing world. In addition, reduced funding to public institutions due to structural adjustments also brought about the slow decline in infant mortality. Apart from economic reasons, it has also been pointed that emphasis on disease focused programs and drug resistance due to mutations has contributed to the slow decline of infant mortality in developing countries.

Basing their arguments on this decline or slow down of infant mortality, **Mosley and Chen (1984) postulated five categories of proximate determinants of Child survival in their Analytical Framework of Child Survival in Developing Countries** and these determinants include;

a) Maternal Fertility Factors,

These factors include maternal age, and birth interval, which have independent effects on the risk of infant mortality (Federici and Terranato, 1983). Child bearing at very young (under 18) and older (over 35) ages, at high parity (over four) and with short birth intervals (under one year) increase the risk of infant deaths, especially in the presence of two or more factors, for instance high parity among young women.

b) Environmental Contamination with Infectious Agents, accordingly, with a few significant exceptions such as tetanus and plague, almost all infectious agents have their reservoir in human hosts and thus the transmission of these diseases depends largely on patterns of human behavior (Mosley, 1983). Three intermediate variables

can be identified through which infectious agents most often enter human host to produce disease. These routes and major diseases are:

1) Contamination of Air
2) Contamination of food and water
3) Vector transmission

c) Nutrient Deficiency or Availability of Nutrients, each of the four classes of nutrient – calories, protein, vitamins, and minerals – may show isolated deficiencies in different ecological settings, but for brevity, primary attention is focused on protein-calorie malnutrition.

d) Injury, accidents and injuries account for only a relatively small fraction of deaths in developing countries compared with malnutrition and infections, and

e) Personal Disease Control Factors, the extent to which an individual mother is able to identify and eventually apply means by which they can control or cure a disease or an infection. Notably, western trained physicians commonly distinguish between preventive measures for the healthy and therapeutic measures for the sick, which means there must be a clear distinction between the way an infection is treated and preventive measures to be taken in case of a healthy infant.

This framework tallied with research questions and objectives of this study as the aim was to establish an understanding of infant mortality in Zambia, which is a developing country, and to determine the causes. Since this study focused on infant mortality as determined by social/economic, demographic and environmental factors, it can further be claimed that it was in line or in agreement with the Mosley-Chen Analytical Framework, which also explains child survival by similar factors. The synergy by the Mosley-Chen Framework and the objectives of the study made it probable therefore to adopt the Mosley-Chen Analytical Framework as a conceptual framework.

3.3 Study Questions and Hypothesis

A decade ago, Zambia's IMR had been declining and had almost equaled that prevalent within the region. However, in the past ten years, an unexpected scenario of high rates of infant mortality is being experienced and the unanswered question is "what has caused this

shift?" What are the main factors causing this high prevalence in infant mortality? Are there some risky factors recently introduced in the past ten years? Compared to other countries with relatively the same economic conditions, it is also postulated that Zambia's IMR is still one of the highest and a probe of what has been the cause was an important and beneficial research inquiry.

One of the targets of the 1990 population policy was to reduce infant mortality rate from 97 per 1000 births to less than 65 per 1000 births. Ten years along the line, this target was never realized. Why have these policies produced no meaningful results? These questions were amongst the many that this research tried to answer.

The major hypothesis this study tried to prove is that;

Socio-Economic, Demographic and Environmental factors are the major cause of the increase in (post-neonatal) Infant Mortality in Zambia.

Other explanations for high infant mortality in Zambia may boarder on immunity and biomedical problems, however; on the other hand, factors outside immunity and biological causes may give more understanding to this problem than would the limited approach and explanations of medical science. This however does not mean to rule out the influence of genetic and biological factors on infant mortality, and frankly, medical personnel would do detailed research in looking at genetic or biological causes.

Sources of data 3.4

Much of the data used in this study was obtained from the three national health surveys (Zambia Demographic and Health Survey, ZDHS) the Zambian Government and the International Community have been carrying out to monitor the health situation in the country. The first set of data is from the 1992 ZDHS, the second is from the 1996 ZDHS and the third is from the 2001/2002 ZDHS.

The period to observe change in Infant mortality was tagged at ten years. This means that the period 1990 to 2000 was exclusively covered by the three surveys and any change therefore was easily captured.

In addition to the three ZDHS databases, census information for 1990 and 2000 was also used. Critical data such as the total population for both census years made it possible to make complete and unbiased comparisons relating to observed changes in the population. Other sources of data were the 1992, 1996 and 2000 social and economic indicators that gave insights on problems such as poverty levels, literacy levels, and girls' education etc. Different publications and internet websites were used as sources of data in this study. One observation however is that these sources of data were authentic and representative since they were national wide surveys.

INFANT MORTALITY RATES AND TRENDS 4

National infant mortality levels 4.1

For the past decade, infant mortality has been very high in Zambia. Though IMR has also been high in other developing countries, the case in Zambia can be said to be out of proportion. The reason for this assertion is that, unlike most African countries, Zambia has not suffered any major disturbance by means of a civil strife or war. Because of this, Zambia has had some due advantage to develop much faster than countries that experienced or are experiencing civil strife or war. Taking some neighboring countries as examples, child mortality for Zimbabwe stood at 115 deaths per 1000 births for males and 107 deaths for females. In Angola, child mortality in the year 2000 was 279 deaths per 1000 births for males and 247 for females (www.who.org). The case of Angola and Zimbabwe can be clearly explained in that for Zimbabwe, independence took place only some twenty years ago and before that time, the country was very unstable. Angola on the other hand has had a running civil war since 1975, and to some extent, this scenario sheds light on why the two neighboring countries have had high child hood mortality. WHO statistics state that child mortality in Zambia by the year 2002 was 191 deaths per 1000 population for males and 176 for females. These statistics are much higher than what has been obtaining in Zimbabwe and slightly lower than the case of Angola. Simple comparisons and observations as these were among the leading causes to carry out this study.

In the data sets at hand, IMR for Zambia by 2002 went down but still very high by international standards. In 1992, IMR for the whole of Zambia was 107. In the 1996 survey year, IMR went up to 109. By the year 2002, IMR went down to 95 infant deaths per 1000 births.

Urban and Rural differences in infant mortality 4.1.1

Infant mortality experiences are different by region and residence. For example, urban and rural areas of Zambia have different levels of infant mortality. Interestingly, for the 1992, 1996 and 2002 ZDHS, IMR was higher in rural areas than urban areas. For 1992, IMR in rural Zambia was 115.8/1000 births whereas in urban areas, it was as low as 78/1000 births. Analyses for the year 1996 have so far indicated that social and economic conditions were not very conducive for guaranteed child survival. This is further compounded by observations that IMR for both urban and rural areas went up; 117.9/1000 births for rural areas and 91.9/1000 births for urban areas respectively. In 2002, IMR went down in urban and rural areas; 103/1000 births in rural areas and 77/1000 births in urban Zambia. This regional difference in infant mortality experience does point to the claim that poorer social/economic conditions prevailing in rural areas seem to be the best fit in explaining why urban areas have been experiencing lower IMR than rural areas.

Regional differences of infant mortality (provincial) 4.2

Different provinces have had different rates of infant mortality in the past decade. Earlier, it was stated that many provinces in Zambia except for two or three are classified as rural. This statement is also reflected in the advent of infant mortality in that the 2 or 3 provinces considered urban have had low infant mortality experiences than those that have more rural characteristics.

For 1992, the lowest IMR was on the Copperbelt province with about 68.9 deaths per 1000 births followed by Southern province, 70/1000 births and Lusaka, 76/1000 births. The rest of the provinces had IMR above 100. More particularly, Luapula and the Northern Province had the highest IMR of about 148.5/1000 births each. Northwestern and Western provinces had an IMR of 132/1000 births, Central and Eastern had 114.1/1000 births respectively.

In 1996, the pattern of infant mortality changed a little, with Southern province having the lowest IMR of 66.2/1000 births. The Copperbelt was second with an IMR of 81.9 and Northwestern was third with 91.1 deaths per 1000 births. Of the nine provinces, five had an IMR of a 100 and over. In the case of Luapula the IMR was even higher than that of 1992 as it went up to 157.8/1000 births. Eastern province followed with a 131.1 IMR, 129.1 for Western province, 125.3 for Northern Province and 100.3 for Lusaka province.

Except for Luapula and Western provinces, IMR in other provinces for the 2002 ZDHS went down. Luapula province had an IMR of 154/1000 births, about 3.8 less than that of 1996. Western province's IMR went up to 139/1000 births, whereas Northern province had an IMR of 113/1000 births. The Copperbelt province had the lowest IMR of 68/1000 births, seconded by Lusaka, 70/1000 births and Northwestern province, 74/1000 births. Southern province had an IMR of 76/1000 births, Eastern province, 84/1000 births and Central province, 92/1000 births.

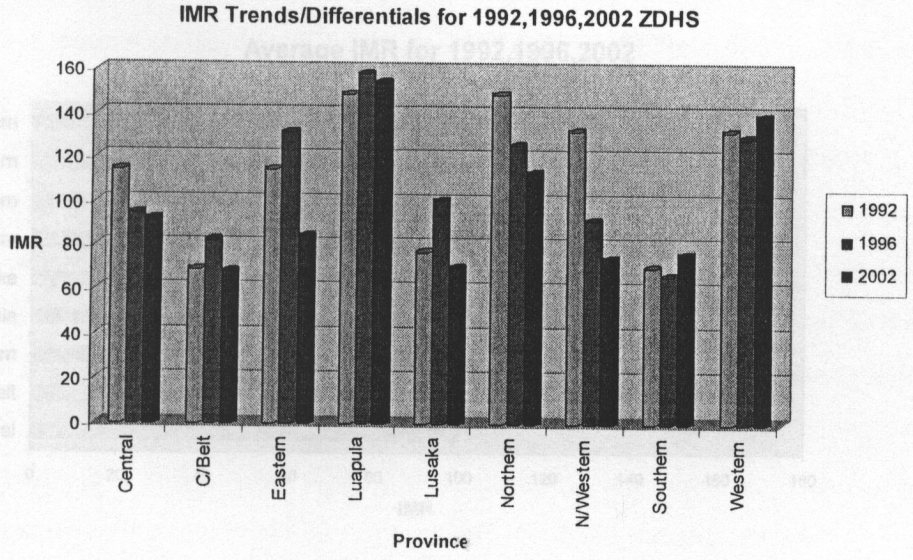
Generally, IMR seemed to have been higher in 1996 for all the provinces in the three ZDHS. Although Southern province had quite low IMR in all the three surveys, most of the provinces experienced high infant mortality rates.

The table and figure below are summaries of IMR in Zambia, for both urban and rural areas and the 9 provinces.

Table 2: IMR for Zambia, rural and urban, and the Provinces

Region/Province, Zambia	Survey Year/IMR 1992	1996	2002
Total Zambia	107	109	95
Urban	78	91.9	77
Rural	115.8	117.9	103
Province			
Central	114.1	94.6	92
Copperbelt	68.9	81.9	68
Eastern	114.1	131.1	84
Luapula	148.5	157.8	154
Lusaka	78.8	100.3	70
Northern	148.5	25.3	113
North-Western	132	91.1	74
Southern	70	66.2	76
Western	132	129.1	139

Figure 2: IMR Trends/Differentials for the Provinces

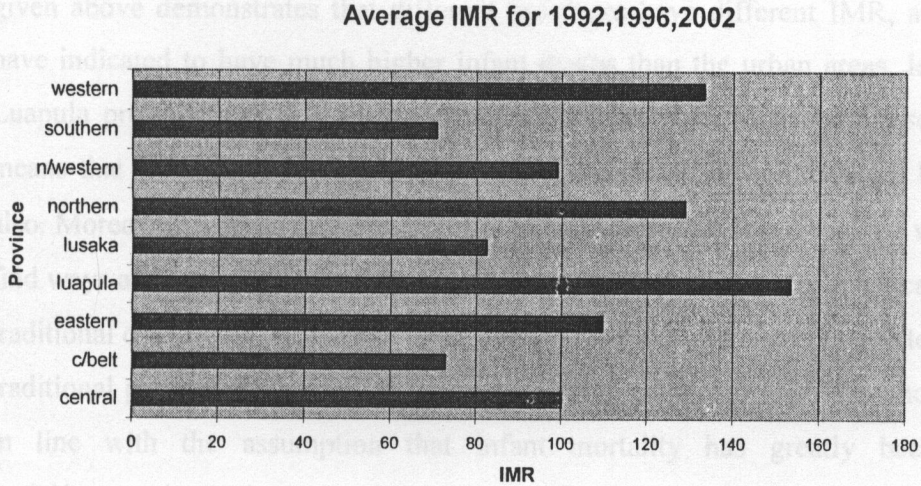


On average, Southern province exhibited the lowest IMR for the three ZDHS years looked at in this study. There were 71 deaths per 1000 births on average in Southern province, making it the lowest for all the survey years. The Copperbelt was next with an IMR of 73/1000 births for all the three survey years and Lusaka had about 82 deaths for every 1000 births. As could be expected, Luapula had on average the highest experience of infant mortality for the three survey years, about 153/1000 births, Western province followed with an IMR of 133/1000 births and Northern province, 129 deaths per 1000 births respectively. The remaining provinces had varying averages. Eastern province had an IMR of 110/1000 births, Central province, 100/1000 births and Northwestern had an IMR of 99/1000 births. The table below indicates the average IMR experiences for the nine provinces. (Note, this average was arrived at by summing all IMR for each province and for each survey year and then dividing the sums by 3, the number of years for the surveys)

Table 3: Average IMR for the Provinces

central	c/belt	eastern	luapula	lusaka	northern	n/western	southern	western
100.2	72.9	109.7	153.4	82.4	128.9	99.0	70.7	133.4

Figure 3: Average IMR for all the Provinces



It has been demonstrated that different provinces had different levels of infant mortality. Many factors combine to give reasons as to why Southern province seems to have on average considerably lower IMR, and amongst these, health facilities and care could have played a very important role. Most of the towns in Southern province are along the line of rail and are adequately equipped with health infrastructure. This also means that many people in this part of the country have quick access to most health facilities and this contributed to the low IMR.

The current information points to some cardinal considerations in analyzing differentials in the experience of infant mortality in the nine provinces. Amongst the causes of high infant mortality, area of residence comes out as one fundamental aspect, and the unfolded fact is that urban provinces or areas are much less likely to experience high IMR in comparison to rural provinces or areas. The case of Luapula province comes out as an all-important example. For Zambia as a whole, Luapula province seems to be the most under-developed of all the provinces. This applies to both economic and infrastructural development. The province is defined to be more rural than any other province of Zambia. This description means also that availability of and access to institutions such as hospitals and schools is greatly impaired. Because of these conditions, it becomes practically difficult for any meaningful program, health or other wise to be effected and implemented to benefit people in this area. Though the data does not point with precision that there exists a relationship between area/region of residence (urban or rural) and infant mortality, observing the trends as given above demonstrates that different provinces have different IMR, and the rural areas have indicated to have much higher infant deaths than the urban areas. In this sense, since Luapula province has few important infrastructures such as hospitals, schools etc, it also means that chances of having higher IMR compared to other provinces become very high also. Moreover, lack of cardinal facilities such as hospitals leaves people with no choice but find ways and means of how they can curb infant illnesses, and for most cases, they resort to traditional or cultural methods. If these cultural methods are what may be termed as "harmful traditional practices", then child survival is highly compromised. This understanding is/was in line with the assumption that infant mortality has greatly been influenced by social/economic, environmental and demographic factors in the past decade.

Infant mortality and Reproductive factors 4.3

Infant mortality and Maternal age 4.3.1

The three survey years have information or data that directly provides an insight on how demographic variables affect IMR in Zambia. In this section, a look at the influence of Maternal Age on infant mortality was described by means of figures and tables and the trends they indicated.

The demographic surveys of 1992, 1996 and 2002 measured how maternal age affects IMR. For all the surveys, IMR was high or low depending on the age of the mother. The ages looked at in all the surveys were: i) less than 20 years, ii) 20-29 years, iii) 30-39 years, and iv) 40-49 years. These years had different levels of IMR. In 1992 for example, IMR for a maternal age of less than 20 years was 123.2 deaths/1000 births, between 20 and 29 years, 92.4/1000 births, 30 to 39 years, 87.1, 40 to 49 years, 101.5. For the1996 ZDHS, IMR for a maternal age of less than 20 years was 141.3/1000 births, 20-29 years, 101.9/1000 births, 30-39 years, 83.6/1000 births and 40-49 years, 110/1000 births.

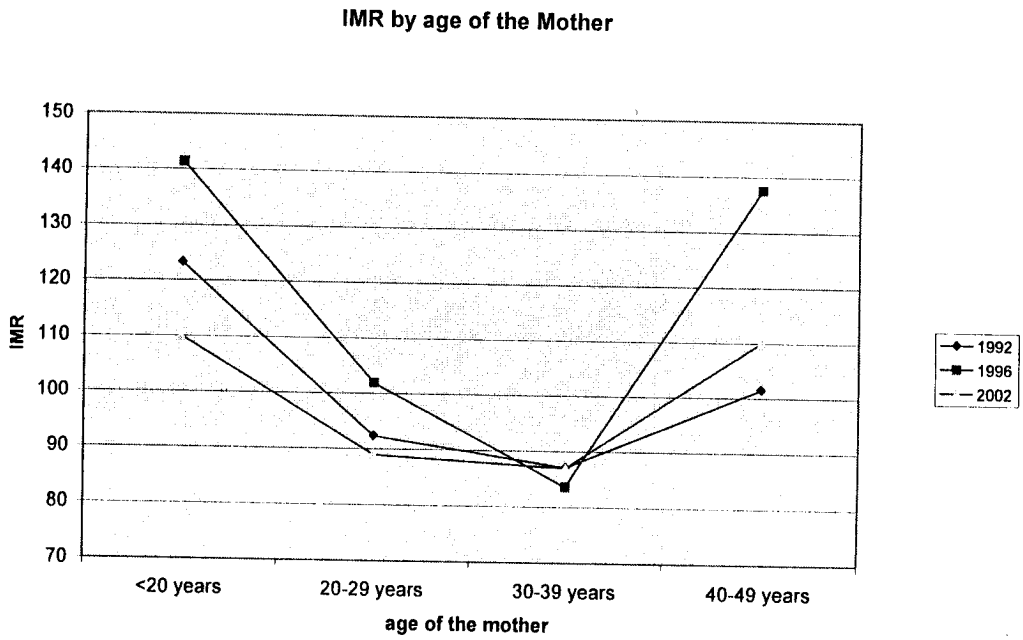
The pattern of IMR according to the age of the mother does show a certain trend, and it is clear that in the less than 20 years and the 40 plus categories, IMR is higher when compared to that of 20-29 years and 30-39 years age groups. This assumption determines that at very young and very old ages, IMR is certainly high. It also shows that the rate of infant deaths is greatly affected by the age of the mother. The following table summarizes the relationship between IMR and age of the mother (maternal age)

Table 4: Relationship between IMR and Maternal age

age	Year	1992	1996	2002
Less than 20 years		123.2	141.3	110
Between 20-29 years		92.4	101.9	89
Between 30-39 years		87.1	83.6	87
Between 40-49 years		101.5	137.5	110

The relationship between IMR and Maternal Age is established merely by observing directly how IMR changes as age increases or decreases. To solidify this assumption, the line graph below gives a pattern in understanding the effects of the mother's age on IMR.

Figure 4: Line graph, Age of the mother and IMR



Apparently, there seems to be a particular pattern in this plot. All the lines (blue, green and red) have a concave like or U-shape appearance, showing that at ages less than 20 years for all the three years, IMR is high. IMR reduces as age increases, and in age groups 20-29 and 30-39 years, IMR is very low. The lowest IMR is associated with age group 30-39 years, 85.9/1000 births. As age increases further to the 40-49 age category, IMR goes up too. By these observations, it is true that age of the mother does indeed affect IMR. Note that this pattern seems to be different in that under normal circumstances, ages 30 to 39 should show a higher infant mortality rate than ages 20 to 29 years. The most probable explanation for this trend is intertwined with birth intervals. It is possible that at ages 20 to 29, many couples or mothers do not have strict measures regarding the number of years between births. This may mean that on average, many mothers in this age group are in a hurry to have as many children as possible and hence do not really take into account the necessity of longer birth intervals. Eventually, as the desired number of children is achieved by the end of age 29 , the possibility is that mothers begin to delay the intervals of their births and this reduces IMR in the age group 30 to 39 years.

For the survey years looked at in this study, it has been discovered that generally, the age at which women enter marital unions (or indeed have their first births) is very low. This is one of the factors that enhanced high IMR in Zambia in the past decade.

Infant mortality and Parity 4.3.2

Parity refers to the number of children a woman has at a particular time. In this study, the parity in question is the total number of children a woman had when the surveys were conducted. By simply analyzing data in its raw form, an observation was made relating parity to IMR.

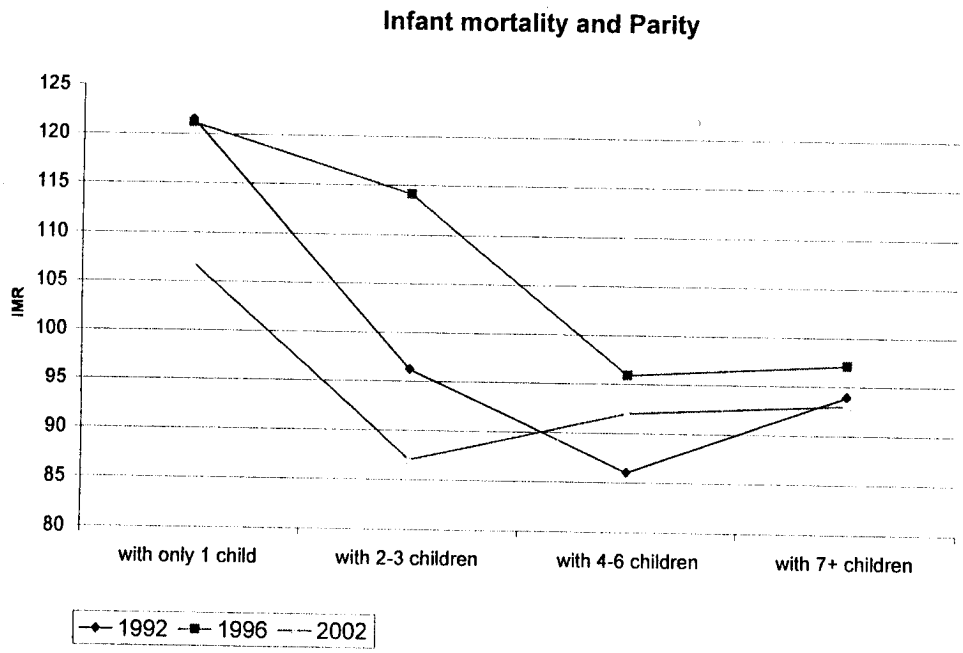
The survey years in question do provide information leading to the understanding that at the beginning of motherhood, IMR is rather high. In 1992, 1996 and 2002, IMR in mothers who had one child at the time of the survey was higher than in mothers with two or more children. For 1992 ZDHS, IMR in mothers with one child was about 121.5/1000 births; 1996, 121.2/1000 births and the year 2002, it was 107/1000 births. As parity increased, IMR reduced. In the 2 to 3 and 4 to 6 children categories, all, except 1996 (2 to 3), IMRs were less than a 100/1000 births. By comparing all the 4 parity categories, the lowest IMR was experienced by the 4 to 6 parity, about 91.3/1000 births. The highest IMR experience was in the one child category, 116.6/1000 births followed by the 2 to 3 category, 99.1/1000 births and by the seven plus category, 94.7/1000 births. This trend explains that parity plays a cardinal role in shaping IMR. The table indicates the relationship between infant mortality and the number of children a woman bore at the time of the surveys.

Table 4.1: IMR and Parity

	1992	1996	2002
with only 1 child	121.5	121.2	107
with 2-3 children	96.2	114.1	87
with 4-6 children	86	95.9	92
with 7+ children	93.9	97.1	93

In the same vein, a plot between IMR and parity gave some interesting pattern as it also justified the fact that as the number of children went up to a certain level, the rate of infant mortality went down and rose up again when the number of children exceeded a parity of 6. This plot is shown below.

Figure 4.1: Line graph, IMR and Parity



The lines in the graph for all the survey years do show that when the number of children is 1, IMR is very high, between 2 and 3 children, there is a sharp drop in the value of IMR for 1992 and 2002 but not for 1996. The lines do indicate further that IMR is lowest when the number of children is between 4 and 6 for all the years. An observation in this regard is that in the year 2002, IMR was lowest when the number of children went to the 2 and 3 category, and started rising after the number of children went beyond 3. In 1992, the pattern was more clearer in that IMR reduced significantly down to about 85.5/1000 births when the number of children went to the 4 to 6 category , after which it started rising when the number of children increased. For all the years under study, the moment the number of children went beyond 6, the graph shows rises in IMR.

This graph and the figures given are remarkable in that they gave a visual demonstration that IMR is highly influenced by the number of children a woman may have. In the case of 1 child stage, IMR seemed to be higher because of the age of the mother and not necessarily because of high parity. As stated earlier and according to the ZDHS of all the 3 survey years, age 18 and 19 are the average ages at which most women in Zambia enter marital unions or

experience their first births. In the subsection preceding the current one, it was observed that IMR is higher in mothers that were less than 20 years at the time of the survey, and since mothers in this age group are likely to have only one child, the effects of parity and age take their course. In the same line, IMR reduced when the number of children went to 2 and 3, and 4 and 6 categories respectively because of the increase in maternal age. This is reflected in the large IMR figure for both the parity (1 child) and the age of the mother (less than 20 years). Observing the Total fertility rate in Zambia gives an impression that for as long as it remains at 6.0 children per woman or more, infant mortality as influenced by parity will continue to be high and will continue affecting future strategies aimed at minimizing IMR in general.

Infant mortality and Birth interval **4.3.3**

The number of years between births (birth interval) is one of the most important demographic variables affecting infant mortality. Medically, a woman who has given birth to a baby needs at least two years before going through another pregnancy. There are many risks associated with birth intervals that are less than two years, and one of the risks is that a woman conceiving in less than two years after the previous birth is likely to lose her life and that of her baby.

In this study, data from the 3 survey years show that there is a marginal difference between IMR in mothers with a less than two years birth interval and those with at least 2 to 3 years birth intervals.

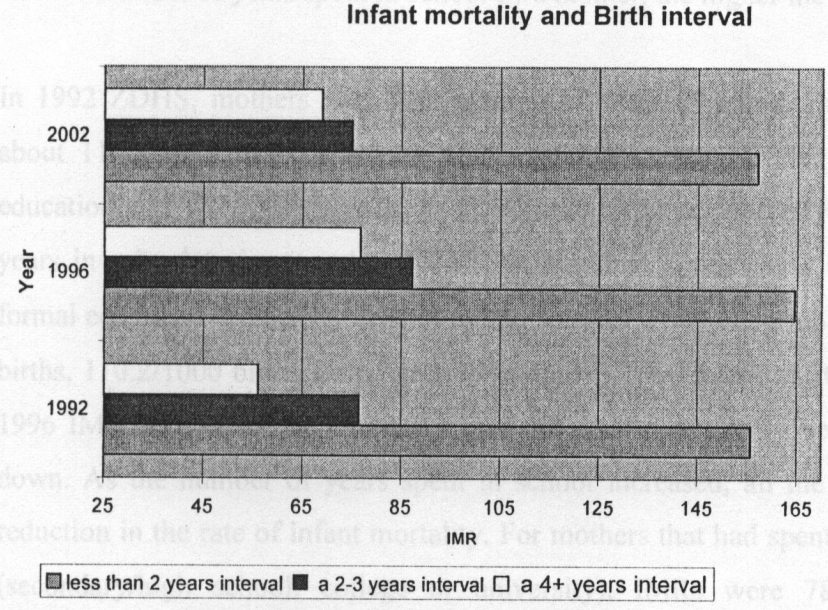
For all the 3 survey years, IMR for births with less than 2 years birth interval is much higher than other intervals. In 1992, IMR for less than 2 years birth interval was about 155.8/1000 births, 1996, 164.5/1000 births and 2002, 157/1000 births. In the 2 to 3 years birth interval, IMR reduced; and for 1992, it was about 76.5/1000 births, 1996, 87.2/1000 births and the year 2002, 75/1000 births. For the 4 years plus birth interval, IMR went down in all the survey years. It was as low as 56.1/1000 births in 1992, 76.7/1000 in 1996 and 69/1000 births in 2002. 1996 had the highest IMR in all intervals, meaning also that so many factors, especially economic ones, were at play. The table below is a relationship between infant mortality and birth interval.

Table 4.2: Relationship between IMR and Birth Interval

	1992	1996	2002
less than 2 years interval	155.8	164.5	157
a 2-3 years interval	76.5	87.2	75
a 4+ years interval	56.1	76.7	69

Subjecting these simple analyzes to simple graphs produced clear evidence that birth interval has an effect on the rate of infant mortality. The bar chart shows differences in regard to the different birth intervals and IMR.

Figure: 4.2, IMR and Birth Interval



The bar chart gives information to the effect that with a birth interval of less than 2 years, IMR was very high for all the survey years. The blue bar for 1996 is the longest in the graph. The graph does also show that IMR is low and continues to be low as the number of years between births increases. This is a proof to the claim that the number of years between births influences the occurrence of infant deaths. Therefore, it is safe to state that birth intervals that are less than two years have a higher probability of "producing" high infant mortality. As the gap between births widens, the rate of infant mortality goes down and IMR eventually reduces. This assertion was true for all the survey years.

Infant mortality and Maternal education **4.4**

The second chapter in this paper demonstrates in detail how that education of the mother does have effects on the survivorship of a child. Many studies show (and as revealed in the literature) that even where health facilities are readily available and easily accessible, lack of education in mothers does rise the probability of infant deaths.

Data in the 3 surveys show exactly the same picture. Like any other demographic or economic pattern, education affects infant mortality disproportionately in that the more years a mother spent in school, the lower the rate of infant deaths. The opposite is also true, that the less the number of years spent in school by a mother, the higher the rate of infant deaths.

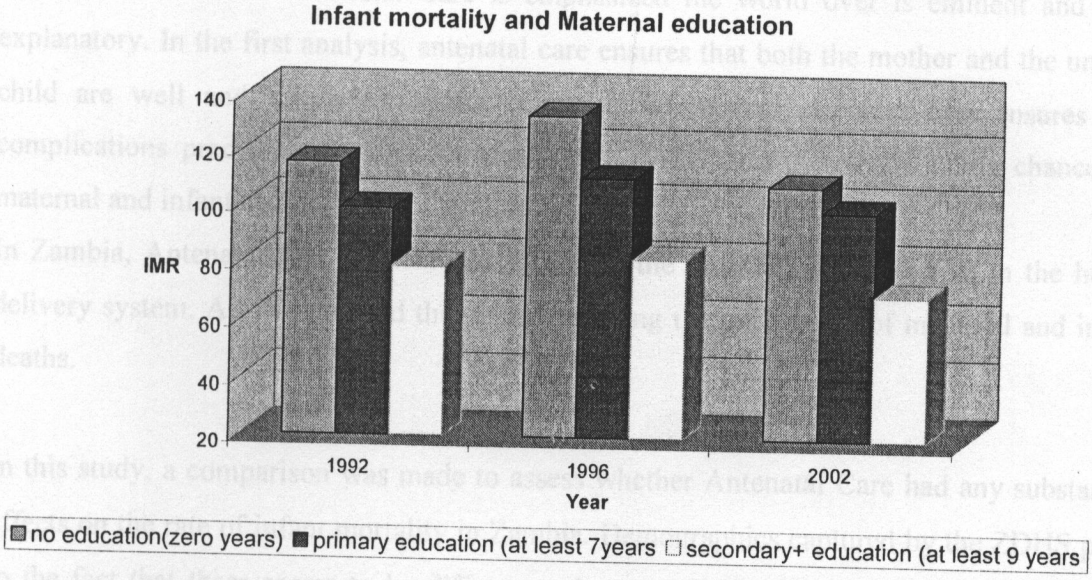
In 1992 ZDHS, mothers with zero-number of years in school (no schooling) experienced about 114.9/1000 births IMR. In 1996 and 2002, the IMR for mothers with no formal education was 132.9/1000 births, and 108/1000 births respectively. For mothers that spent 7 years in school (primary school), IMR in the survey years was lower than those with no formal education. For 1992, IMR in mothers with 7 years of formal education was 98.7/1000 births, 110.2/1000 births in the year 1996 and 99/1000 births in 2002. However, though the 1996 IMR was higher in mothers with 7 years of education, overall infant mortality went down. As the number of years spent in school increased, all the survey years show some reduction in the rate of infant mortality. For mothers that had spent at least 9 years in school (secondary/high school, college or university), IMRs were 78.4/1000 births in 1992, 81.7/1000 births in 1996 and 70/1000 births in 2002. Following the trends of these figures, it was or rather is very hard to rule out the overwhelming influence of education on IMR in Zambia. The claim of an existing relationship between maternal education and IMR is indicated in the table below.

Table 5: IMR and Number of years in school of the mother

	1992	1996	2002
no education(zero years)	114.9	132.9	108
primary education (at least 7years	98.7	110.2	99
secondary+ education (at least 9 years)	78.4	81.7	70

By means of a column chart, the data revealed a pattern that concurred with the assertion that education of the mother greatly affects the occurrence of infant mortality.

Figure 5: Column chart, IMR and Maternal education



The figure above is a confirmation of what has already been alluded to earlier in that for all the survey years, infant mortality is very high in mothers with no education. Primary education contributes to the reduction of infant mortality, but not at the same rate as does secondary education. The number of years spent in school makes it possible for mothers to delay entry into childhood bearing and thereby contribute greatly to the general reduction of infant mortality. Simply observing these trends it can be deduced that one method by which high infant mortality could be curbed is by emphasizing the importance of education of the mother, and this education has to be formal, and not necessarily informal. Mothers with secondary education seem to have lower experiences of infant mortality because they spent more years in school and thereby making it possible for them to delay entry into motherhood. The years spent in school also made it possible to reach ages (20-29 years) that pose little danger to the survivorship of their children. However, infant mortality is higher in mothers with little or no education due to a combination of many variables such as age, parity, birth

interval etc. These factors together with low education can result in high infant mortality rates.

Infant mortality and Antenatal care **4.5**

The cause for which Antenatal Care is emphasized the world over is eminent and self-explanatory. In the first analysis, antenatal care ensures that both the mother and the unborn child are well and in perfect health condition. Moreover, antenatal care ensures that complications preceding delivery are dealt with swiftly and thereby reducing chances of maternal and infant deaths.

In Zambia, Antenatal care is enshrined as one of the most important factors in the health delivery system. All this has had the aim of reducing the probability of maternal and infant deaths.

In this study, a comparison was made to assess whether Antenatal Care had any substantial effects on the rate of infant mortality in Zambia. Demographics captured by the ZDHS point to the fact that there seems to be differences between IMR occurring in mothers that had exposure to antenatal care and those that were not.

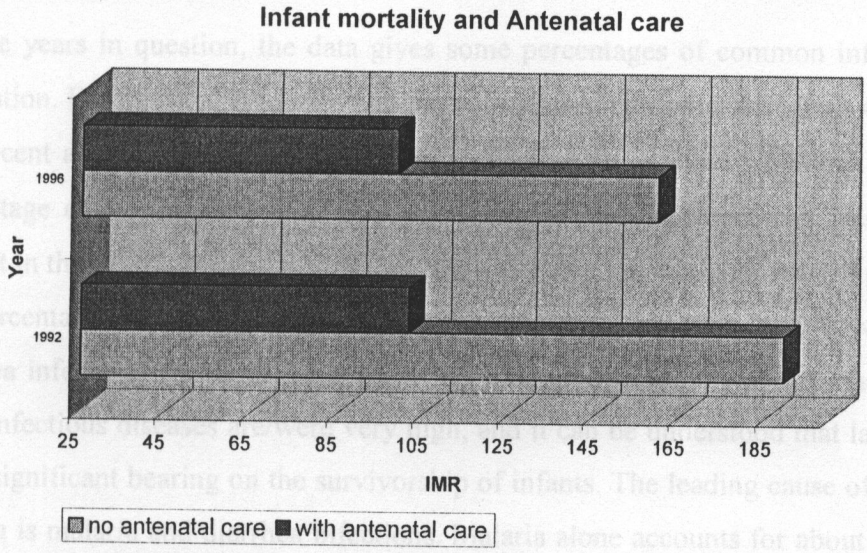
The ZDHS of 2002 did not have records of antenatal care as a variable influencing IMR; however, the 1992 and 1996 ZDHS had information to this effect. From these data, it is clear that there exist fundamental differences between IMR in mothers that were attending antenatal care clinics during pregnancy and those that were not. In 1992 for example, IMR was 188.8/1000 births in mothers with no antenatal care, while in mothers with antenatal care IMR was 101.3/1000 births. This was almost similar to that of 1996; IMR in mothers with no antenatal care was 159.5/1000 births while those that had, it was about 98.4/1000 births. Without any form of computational analysis, it is possible to argue that attendance and non-attendance of antenatal care by mothers during their pregnancy stage posses some influence on infant mortality. The table below indicates a relationship between infant mortality and antenatal care.

Table 6: IMR and Antenatal Care

	1992	1996
no antenatal care	188.8	159.5
with antenatal care	101.3	98.4

Graphical representation of the relationship between infant mortality and antenatal confirms the effects of antenatal care on IMR.

Figure 6: IMR and Antenatal care



The table and the figure above are clear to assume that IMR is affected by Antenatal care. From here, it was established that one of the effective healthy policy tools to cop with increasing IMR is the emphasis on antenatal care.

On other considerations, antenatal care is also influenced by other equally important factors. Amongst these factors, availability of health services comes out as the most crucial and the second one is knowledge. Availability of good health services in any country ensures easy access to good health and gives people, especially health personnel the ability to deal with complications that come because of pregnancy. Health services, however good they may be

are not sufficient to effect substantial change in reducing infant mortality, and as such, education comes into play as one of the best co-factors.

Prevalence of common infections in infant population **4.6**

Most of the factors mentioned above do affect infant mortality indirectly. This means that by themselves, these factors cannot be seen to cause infant deaths; they are only a means to an end. The presence of infectious diseases in Zambia in the past decade points to the effects that the environment may have on the overall outcome of IMR.

For the years in question, the data gives some percentages of common infections in infant population. For the year 1992, the presence of malaria in infants was about 44 percent, 1996, 40 percent and in the year 2002, it went to 43 percent. Acute respiratory infections had a percentage of 13 for 1992 and 1996. It increased by 1.6 percent and went to about 14.6 percent in the year 2002. As for diarrhea, the 1992 data shows that it was 23 percent; in 1996, the percentage was similar to that of 1992, however, the year 2002 saw a reduction of diarrhea infections by about 1.8 percent. By international comparability, the percentages of these infectious diseases are/were very high, and it can be understood that largely, they have had a significant bearing on the survivorship of infants. The leading cause of infant deaths in Zambia is malaria and diarrhea infections. Malaria alone accounts for about two-fifths of all infant deaths in Zambia (www.allafrica.com/zambia). By looking at the high presence of these diseases in infant population, it means that in the past decade, infant deaths have largely been caused by these infections. The table below is a summary of the presence of common infections in infant populations in the past decade.

Table 7: Infectious Disease Presence in Infant population

	1992	1996	2002
percentage of malaria in infants 2 weeks before the survey	44 percent	40 percent	43 percent
percentage of acute respiratory infection in infants 2 weeks before the survey	13 percent	13 percent	14.6 percent
percentage of diarrhea in infants 2 weeks before survey	23 percent	23 percent	21.2 percent

Note should be taken however that these infections are not necessarily the result of a polluted environment. The issue of pollution has not reached a stage to cause serious variations in disease patterns in Zambia. This however does not mean that contamination of the environment by pollution could be ruled out completely, it means that pollution and causing infections that affect infant deaths can only be considerable at the very minimum. On the other hand, the major causes of these infections are the presence of mosquitoes and the contamination of drinking water. Little infrastructual development has provided a conducive environment for mosquito breeding and this has over the years been the main cause of malaria. Most of the rural areas are faced with problems of clean water supply. Even where water is readily available, much of it is untreated and unsafe to be used for consumption. The use of this untreated water has been a major reason for the high presence of diarrhea related infections in infants.

SOCIO-ECONOMIC AND DEMOGRAPHIC SITUATIONS AND THEIR IMPACTS ON INFANT MORTALITY 5

Demographic information 5.1

From the first official census in 1969, Zambia's population has been on the increase. The period in question in this paper is 1992 to 2002 and 1996 as an inter-survey year. In 1992, Zambia's population was approximately 7.8 to 8 million with a Natural Rate of Increase (NRI) of 3.2 percent per annum (ZDHS, 1992). This NRI is a backdrop of the 1980 to 1990 inter-census period. From 1990 to 1996, Zambia's population increased by about 1.4 million with an annual NRI of 2.7 percent. The 2.7 NRI was a reduction from the previous 3.2 percent. The latest census results of 2000 show that Zambia's population has increased but in comparison to the 1996 figure, this gain is not extremely big. Overall, the NRI has reduced by a 0.9 percentage in the past 20 years (1980 to 2000)

One of the reasons Zambia's population has been changing so rapidly is the experience of relatively high Total Fertility Rate (TFR). Admittedly, though TFR has been reducing over

the past number of years, it has remained one of the highest in the region and the world at large. The 1992 ZDHS indicates that Zambia's TFR was 7.0 children per woman (complete fertility). This reduced to about 6.1 children per woman in 1996 and 6.0 children per woman in the 2001/2002 ZDHS. In the same line of thought, other observations indicate that not only is TFR high compared to other parts of the world but also that women in Zambia enter into marriage unions or rather experience their first births at quite tender ages. ZDHS data does show that on average, women in Zambia experience their first birth by age 18 and this greatly affects IMR. Though there was an increase of one year in the 2002 ZDHS, age 19 is also a very young age to experience a birth or a marriage, especially not withstanding priorities such as education completion at anylevel.

The complexity of high TFR is not just coupled with measures such as the mother's age at first birth but also knowledge and use of family planning (FP) methods. It was observed in all the three ZDHS that FP use amongst married women has steadily been increasing. In 1992, only about 15 percent of married women were using one of the FP methods (contraceptives). There have been dramatic changes between the two survey years. In 1996, about 26 percent of married women were using some method of FP, a difference of almost 10 percent with that of 1992. In the third survey (2001/2002), the percentage of married women using contraceptives or indeed any form of FP method went up to about 70 percent. Going by the survey results of 2002, this means that currently, almost three quarters (3/4) of married women in Zambia are using one or more of the available family planning methods. To some degree, much of the changes in the total number of births or TFR are functions of campaigns on FP use, gender sensitization activities, reproductive health and rights campaigns etc. The point of note however is that the increase in the number of women using contraceptives has had very little impact on the overall TFR. The time it has taken for the TFR to reduce to about 6, is too long for a population with about 70 percent use of contraceptives. The most probable explanation for this anomaly is that in as much as the number of contraceptive use has increased over the years, correct use of these methods may be wanting. Women could have reported that they were using some FP method of some kind, but it is possible that they were using or are using these contraceptives wrongly and therefore their impact on TFR has been minimal. The other reason could be that respondents give or gave wrong information to

the ZDHS researchers, so that the figure of women using contraceptive methods swelled, but no corresponding reduction in the TFR. To some degree, the high TFR as alluded to earlier is one of the factors that have had effects on infant mortality in Zambia for the past ten years.

Data in the Three ZDH Surveys does show some interesting patterns as regards to life expectancy, crude death rate (CDR) and maternal mortality ratio (MMR).

The three data sets indicate that generally, life expectancy in Zambia has been fluctuating between ages 40 and 55. For the year1992, life expectancy seemed to have been the highest of the three survey years, 54 years. This age is an average for both males and females. Note that except in situations where females are more at risk of experiencing death, they in most cases outlive males by an average of two or more years. In the 1996 ZDHS, life expectancy in Zambia reduced drastically. In a period of about four years, from 1992 to 1996, approximately 9 years of life were lost and life expectancy went down from 54 years in 1992 to 45 years in 1996. The major reasons for this were economic shocks that saw the government reduce funding to health institutions and more also, loss of the means of subsistence such as jobs due to the non-performance of companies under SAP. However, in the year 2002, life expectancy went up by 5 years and in the year 2000 census, life expectancy in the whole of Zambia was approximated to be around age 50 for both males and females.

Apart from life expectancy as a measure of mortality, the crude death rate (CDR) for the whole country has also been increasing. This to some degree is some additional information in support of the assertion that Zambia's life expectancy has been very low in the past decade. For 1992, the CDR in Zambia was 13.2 deaths per 1000 population. By way of regional comparisons, this rate was not at variant with what had been obtaining in other neighboring countries. In the same way that life expectancy dropped, so did the CDR increase with a significant margin taking into account the number of years that had passed from 1992 to 1996. CDR increased by about five more deaths per 1000 population in 1996 and went up to 18.3 deaths per 1000 population. From 1996 to 2002, an increase of about 1.2 from 18.3 to 19.5 deaths per 1000 population had been observed. CDR is as the name states, a crude way

of measuring mortality, but by looking at how it has increased over the past decade, it is clear that mortality has been rising in Zambia; this could shade some light on understanding why infant mortality has also been high.

Maternal mortality on the other hand has also been quite high. The 1990 census and the 1992 ZDHS never captured the maternal mortality ratio (MMR), however, in 1996 and the year 2002, maternal mortality was quite high. In 1996, the MMR was 649 maternal deaths for every 10,000 births. In the year 2002, MMR went up to 729 maternal deaths per 10,000 births. In general, although the level of maternal mortality is considered one of the most important indicators of Zambia's health conditions, no reliable data are available to measure it accurately. A study conducted in 1982-83 at the University Teaching Hospital in Lusaka estimated a MMR of 118 deaths per 10,000 births, while a study in Mongu (Western Province Capital) in 1991-92 produced a MMR of 889 (Nsemukila, 1994:10). National level estimates for MMR vary from 202 (Unicef, 1995) to 940 (WHO, 1996:15) deaths per 10,000 births. It is more likely that rural areas of Zambia experience higher maternal mortality levels than urban areas. This disparity is attributed to the fact that there are no adequate and reliable health resources to go round in most parts of rural Zambia. The table indicates a summary of maternal mortality ratio, crude death rate and life expectancy for 1992, 1996 and 2002. The increase in the ratio of maternal mortality and crude death in the past years has also been influencing IMR.

Table 8: MMR, CDR and Life Expectancy for the 3 survey years

Year	MMR	CDR	Life Expectancy
1992	.	13.2	54
1996	649	18.3	45.5
2002	729	19.5	50

Population distribution in Zambia is uneven. Much of the population is concentrated in rural areas. As stated earlier, only about two or three out of the nine provinces in Zambia are classified totally urban; the Copperbelt and Lusaka provinces. The rest are mostly rural with provincial capitals and other developed towns within provinces as exceptions. In 1992, about

58 percent of people in Zambia lived in rural settings. This figure has continued increasing with 60 percent of the total population of Zambia living in rural areas by 1996 and 64 percent in the year 2000 (ZDHS, 1992, 1996, 2001/2002). The increase of people in rural areas could be attributed to strings of reasons but prominent amongst these reasons are losses of jobs, liquidation of companies, and lack of employment opportunities in urban areas and more generally, people prefer staying in rural agricultural productive zones where security of formal or informal employment is guaranteed (CSO, 2002b).

The table below shows selected demographic characteristics as captured in the three survey years 1992, 1996 and 2001/2002.

Table 8.1: Demographic Information

Selected Demographic Characteristics	Survey Years		
	1992	1996	2001/2002
Total Population of Zambia	7,820,000	*	9,337,425
Total Rural Population	-	5,598,941	5,990,356
Total Urban Population	-	3,682,954	3,347,069
Percentage of Rural Population (%)	58	60.3	64
Natural Rate of Increase (%)	3.2	2.7	2.3
Total Fertility Rate	7.0	6.1	6.0
Average Age of Mother at first birth	-	18	19.1
Family Planning use by married women (%)	15	26	70

* Actual population number was missing

Source: ZDHS 1992, 1996, 2001/2002

Economic Situation 5.2

Zambia's economy consists of an urban-based sector and a rural agricultural sector. This set up has existed since colonial times. Prior to the 1991 multiparty elections, the economy was more socialist/communist type, where the central government controlled almost all sectors.

This arrangement changed and this shift saw the government introduce drastic measures with the aim of implementing a charismatic economic recovery. Structural Adjustment Program (SAP) was introduced and many parastatal companies either were privatized or simply went under (liquidated). Stability of the country's economy was never guaranteed and consequently performed more poorly than was expected. This has led to a generally low Gross Domestic Product (GDP) growth and a relatively low GDP per capita.

Generally, although the GDP has been increasing, the change in real terms has remained low. In the years under study, and taking the 1992 social and economic indicators as examples, Zambia's GDP was approximately 203.92 million kwacha (Zambian currency). The corresponding GDP per capita was about K25,426. By default, this means that in the year 1992, every Zambian was exposed only to about K69 a day. By simple analysis, K69 was not very sufficient; however, inflation and the cost of living then were low.

In 1996, Zambia's GDP went up to about 3951 billion kwacha. However, taking into account high inflation and rapid population growth, this growth was insignificant. This was compounded by a GDP per capita of about K42,945 about K17,519 more than that of 1992. This increase was however not sufficient. Many factors, inflation included, influenced this slow growth but the most obvious reason is alluded to the failure of SAP and many other programs sponsored or propagated by The International Monetary Fund (IMF) and the World Bank (MoFED, 1996c).

The 2002 GDP was almost three times as much as the 1992 GDP and almost twice as much as that of 1996. This made the GDP per capita gain and it went up to K108,311. Much of the growth in the GDP was not necessitated by good economic performance but rather by the need to finance services. Many analysts do claim that Zambia's GDP in the past decades has been directed not at the needed and urgent sound economic recovery programs but rather on debt servicing and financing government expenditure. This claim is evidenced by many challenges currently obtaining such as stagnant economic growth, employment creation inabilities and by the level of poverty prevailing in the country.

Looking at areas of residence, economic indicators of 1996 state that both rural and urban unemployment has been going up. Data on both urban and rural unemployment for 1992 was not captured; however, in 1996 rural unemployment by percentage was about 40.2 percent while urban unemployment was 59.8 percent. The major reason for this difference is that (refer to chapter 1) the agriculture sector in Zambia is so far the largest industry and employs (formal and informal) more than 50 percent of people in rural areas. People in urban areas rely more on other industries such as mining, manufacturing and services. Due to poor performances of these industries, the rate of unemployment in urban areas seems to be higher than in rural areas. In the same way, the pattern of unemployment for the 2002 economic indicators exhibited quite similar results. In 2002, rural unemployment reduced by about 7.2 percent (33%) meaning that more people were engaged in agricultural activities than in 1992 and 1996 survey years. On the other hand, the exact opposite happened to urban unemployment where there was a loss of almost 7.2 percent. These results show that where rural unemployment reduced by 7.2 percent, urban unemployment grew by the same margin. It can be deduced therefore that many people that become displaced by the hostile economic conditions in urban areas found solace in rural areas.

Another aspect that gives insight on Zambia's economic progress is the level of poverty. The survey years 1992, 1996 and 2002 indicate that people living below what is called the "poverty datum line" has always been above 50 percent in the recent past. This level of poverty is referred to as 'abject poverty', meaning people are unable to afford three standard meals per day. For 1992, about 78 percent of people in Zambia were living in abject poverty. This reduced to 69 percent in 1996 but went up again in 2002 (72.9%). The level of poverty of this magnitude does not only affect accessibility to food but also influences the provision of education, access to and availability of health delivery systems, engendering crime etc. Table 9 below is a summary of economic indicators as captured by the 1992, 1996 and 2002 ZDHS and by the social/economic indicators of 1992 and 1996 produced by the CSO.
As the topic at hand is infant mortality, it is without doubt that its increase over the past years has been influenced by many factors and the information above gives some insights. For the past ten years, the economy of Zambia has not been performing well, and thereby affecting many areas. It is true that this economic situation is not sufficient to uphold and support a

good health delivery system. This being the case means simply that IMR may continue rising if the economy does not improve.

By similar comparisons, it has been unveiled that the poverty situation in Zambia has been out of proportion. For a long time now, almost three/quarters (or 70-75%) of people in Zambia have been living beyond the poverty datum line. Due to the long time this situation has been prevailing, it has also in the end affected important amenities such as health, education, employment etc. The poverty situation enhanced by poor economic performance has necessitated and given the right conditions for infant mortality to remain high in Zambia in the past decade.

Table 9: Summary of Economic indicators for 1992, 1996 and 2001/2002 (CSO)

Economic Indicators	Survey Years		
	1992	1996	2001/2002
GDP (Current Prices in Zambian Kwacha)	203.92million	3951 billion	10073 billion
GDP Per Capita (in Zambian Kwacha)	25,426	42,945	108,311
Rural Unemployment (%)	-	40.2	33
Urban Unemployment (%)	-	59.8	67
Poverty Status (%) below "Datum Line"	78	69.2	72.9

*In 1992 the exchange rate between Zambian Kwacha and US dollar was: $1US= K1500. In 1996, $1US= K1900, and in 2002, it was about $1US= K4800

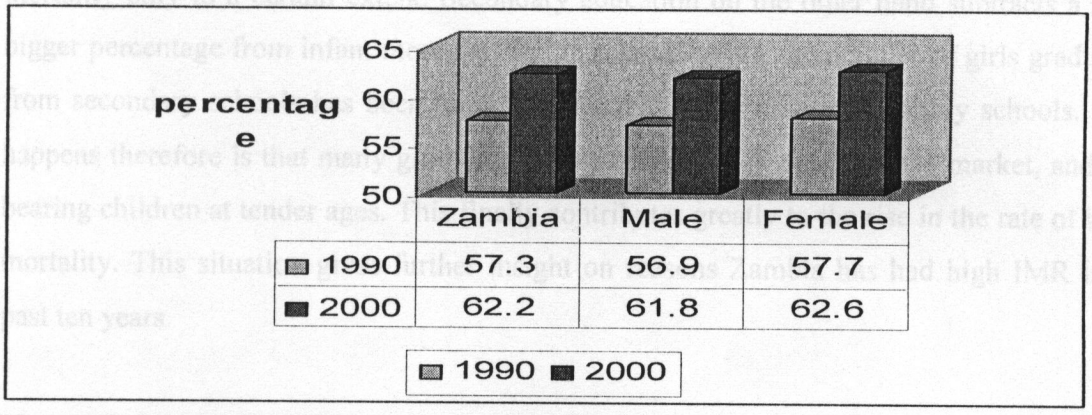
Education information 5.3

The focus on education in the three Zambia Demographic and Health Surveys in relation to infant mortality was on the education of women. Much has been said about the influence of education on child survival in the second chapter of this study; however, this section aims to look at education in three ways: literacy levels among women of reproductive ages (15 to 49 years), percentage of girls in primary schools and the percentage of girls in secondary school.

According to the data as captured by the 2001/2002 Demographic Health Survey (DHS), Education Data Survey, literacy was defined as the ability to read some or all of a sentence. This definition however does not provide information about functional literacy such as whether someone can read and understand instructions on a bottle or packet of medicine or make use of a bus timetable (DHS, 2001/2002). Literacy measured by the ability to read has been relatively high amongst women in their reproductive ages. For the 1992 ZDHS, approximately 65.3 percent of women aged 15 to 49 years were literate. In 1996, the percentage of literacy went up by about 1.2 percent. The upward gain in literacy had not been sustained as is seen by the results of the 2002 ZDHS where the level of literacy dropped to about 58.3 percent. The reason for this downward shift is not immediately clear, however, this could have been enhanced by changes in the definition of what literacy is. This means that instead of defining literacy simply as the ability to read part of or the whole sentence, other aspects such as the ability to write and understanding what is read could have been introduced as measures of literacy and this eventually led to a lower experience of literacy amongst women. This assertion however is speculative, as there was/is no data to this effect.

Literacy levels can also be captured by analyzing the intake and percentage of girls in both primary and secondary schools. In the years looked at in this study, the percentage of girls in primary schools remained at 47 percent with a 0.9, 0.7 and 0.8 percent variation respectively. Comparatively, it also means that there were more boys in primary schools than were girls. This disparity between girls and boys is further aggravated by early (girls) dropouts from schools due to problems such as pregnancies. In secondary schools, the situation was almost similar to the primary schools except that the number of girls at this level was even much lower. For the years under study, only about 38 percent of girls in Zambia were in secondary schools, with only a 0.3 and 0.4 percentage variation. This level is quite low considering the fact that females form a larger percentage of the Zambian population. The figures below indicate differences between girls and boys education (primary and secondary) in Zambia as captured by the 2000 census of population. Note however that these graphs are indicating official attendance rates and not percentage of girls or boys in schools.

Figure 7: Percentage of the Official Primary School Population- age 7 to 13 attending school by sex, 1990-2000



Source: CSO 2000 Census of Population and Housing

School attendance rates by Population, aged 7-13 have increased since 1990.The rates are higher among Female than male population.

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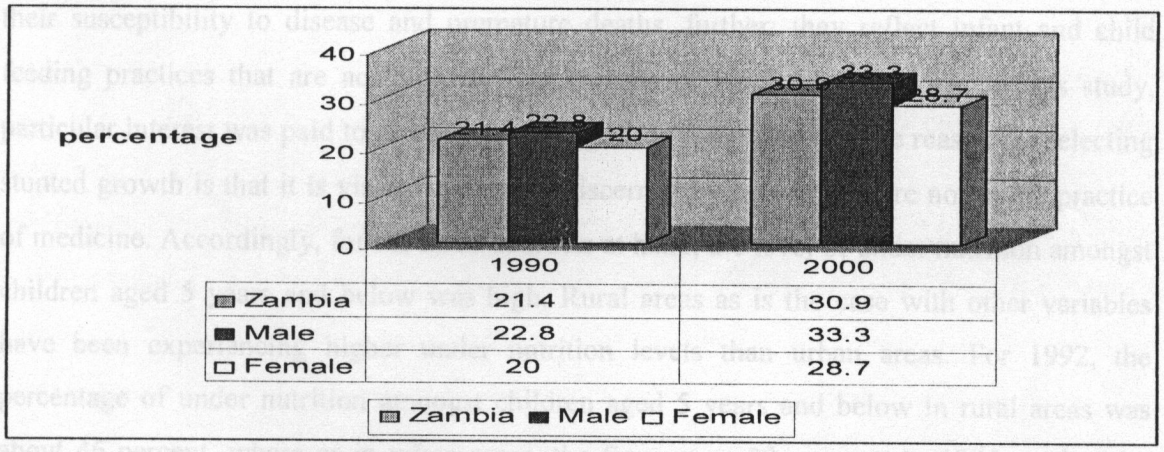
Figure 7.1: Net Secondary School attendance rate by sex, 1990-2000



Source: CSO, Census of Population and Housing

Proportion of the population aged 14-18 years attending secondary school has gone up from 21.3% to 30.9% between 1990 and 2000.

Net attendance is higher amongst males than females.

Like stated above, education has been an influential factor on IMR. The information given has shed some light on why infant mortality has been high in the past decade. The data states

that there are more girls attending primary schools than boys, however, as they reach secondary school level, the number of boys increases. Primary education influences infant mortality only to a certain extent. Secondary education on the other hand subtracts a much bigger percentage from infant mortality. In the past ten years, the number of girls graduating from secondary schools has been much smaller than those entering primary schools. What happens therefore is that many girls drop out of school, enter the marriage market, and start bearing children at tender ages. This finally contributes greatly to the rise in the rate of infant mortality. This situation gives further insight on reasons Zambia has had high IMR in the past ten years.

Nutrient Deficiency Factors in infants 5.4

Due to the nature of this study, one factor that directly influences child survival and infant mortality in particular is the level of under nutrition. Under Nutrition is measured by many variables such as Height for age (stunted), Weight for height (wasting) and Weight for age (under-weight). These measures are important because children's nutrition status influences their susceptibility to disease and premature deaths, further; they reflect infant and child feeding practices that are acute as well as chronic or recurrent infections. In this study, particular interest was paid to one measure, height for age (stunted). The reason for selecting stunted growth is that it is visible and easily discerned by people that are not in the practice of medicine. Accordingly, for the three data sets at hand, the level of under nutrition amongst children aged 5 years and below was high. Rural areas as is the case with other variables have been experiencing higher under nutrition levels than urban areas. For 1992, the percentage of under nutrition amongst children aged 5 years and below in rural areas was about 46 percent, where as in urban areas, the figure was 33 percent. In 1996 rural under nutrition went up by 2.7 percent. On the contrary, urban under nutrition reduced by about 0.3 percent. For the year 2002, under nutrition in both the urban and the rural areas went up, that is 51 percent for the rural areas and 36.8 in the urban areas. This increase was mainly attributed to crop failure due to the drought that Zambia and several other Southern African Countries experienced during the 2001/2002 farming season.

It is a fact that the increase in under nutrition is also reflected in experiences of both child and infant mortality, moreover, they (under nutrition on one hand and child/infant mortality

on the other) affect one and the other in that an increase in under nutrition literally causes an increase in the advent of both infant and child mortality and this is another of the reasons on why there has been high IMR in the past decade in Zambia. The table below is a summary of nutrient deficiency conditions for the years 1992, 1996 and 2002

Table 10: Nutrient Conditions, 1992, 1996, 2002 ZDHS

Year	Under nutrition, rural*	Under nutrition, urban*
1992	46	33
1996	48.7	32.7
2002	51.3	36.8

* Under nutrition: Percentage (%)

Health Care Resources 5.5

Much of the data in this section was obtained mainly from the social/economic indicators of the years 1992 and 2000 produced by the Zambia Central Statistical Office.

The provision of good health facilities is made easier and possible if health care resources such as hospitals, clinics, health centers etc are available and easily accessible. By analyzing these indictors, it is probable to indicate the extent to which Zambia's health care resources are impaired and most unlikely to meet all health care needs as demanded by the population and by the health policy. Moreover, much of the needed infrastructure to absorb the demand created by the ever-increasing population has been stretched to limits over the years. In other ways, infrastructural development in the health sector has not been matching population expansion. This unfortunately permeates even to medical staff such as doctors, nurses and clinical officers.

For a long time, hospital infrastructure in Zambia has remained unchanged. The 1992 social/economic indicators show that there were about 82 hospitals in the whole of Zambia in the same year. By 1996 and 2002, the total number of hospitals went up to 84. However, note that most of the major hospitals with up-to-date medical technology equipment are found in major cities and provincial capitals.

In rural areas, health care resources are mostly clinics or rural health centers manned either by clinical officers or by nurses. In 1992, there were about 942 clinics in rural Zambia. Between 1992 and 1996, an additional 140 clinics were built making a total of 1082 clinics. Due to some unknown reasons, the number of clinics in rural Zambia reduced to 1069 by the year 2002. At face value, these figures indicate that in this period the number of clinics in Zambia was adequate enough to carter for the rural population. This assertion is based on the understanding that there are 72 districts in Zambia and this means that in the year 2002, each district had approximately 14 clinics. Depending on factors such as accessibility and affordability, the rural population has had good exposure to health facilities; however, one consideration in this respect is whether these health facilities had or have enough health personnel and reliable health equipment adequate to deal with complicated health conditions.

Looking at accessibility as a factor of health care resources, the 1992 social/economic indicators state that about 75 percent of the people in rural Zambia had access to some health center within 0-5 kilometers distance. Surprisingly, in the year 1996, only about 50 percent of people in rural areas had access to a health center within a 0-5 kilometers distance. This situation was also reflected in 2002. To some degree, this is a contrast in that since the number of clinics in rural Zambia increased in 1996 and the year 2002, the situation should have seen 'accessibility' increase by a certain percentage. An explanation to this anomaly could be that in as much as rural health centers increased, the corresponding number of needed health personnel has not been provided by the government there by leaving many health centers empty/closed.

Accessibility to health facilities in urban areas within a distance of 0-5 kilometers for 1996 and 2002 was 99 percent. Comparatively, people in urban areas enjoy an upper advantage in terms of access to health facilities than those in rural areas. This like stated earlier explains why rural areas have had high infant mortality rates than urban areas.

Having a good number of hospitals and clinics in both urban and rural areas is one side of the challenge in health care resources. The other side demands that health personnel be available to run these health institutions. This is one area where the Zambian Government has performed inadequately.

In 1990 and 1992, the population of Zambia was approximately 7.8 million and over. At that time, the number of doctors per 100,000 population was about 15, nurses were about 138 for a similar number of people. Unfortunately, the number of doctors, nurses and health/clinical officers has been decreasing over the years. In 1996, there were only 7 doctors and 123.1 nurses per 100,000 population, and about 1.5 health/clinical officers for every 1000 population. In the year 2002, there were 6.5 doctors and 79.1 nurses per 100,000 population, and only 1 health/clinical officer for every 1000 population. As stated, this scenario is in conflict with the delivery of good health by the government. Where as the population and health institutions have been increasing over the years, supply of qualified personnel to run these health facilities has not been adequate. This means that achieving health policy goals set by the government has highly been compromised. Over the years, Zambia has been loosing well-trained medical personnel especially doctors and nurses to neighboring countries and other developed countries. The major cause for this "brain drain" is the search for better economic conditions where one's work is commensurate with one's pay. To a larger degree, results of these "brain drains" have culminated into poor health delivery systems that have seen health conditions deteriorate rapidly within a relatively short period. And as this study demands, this has been a leading explanation for the high infant mortality rate in Zambia in the past decade.

The information unfolded so far is definite and explains the relationship between the topic at hand, which is infant mortality, and the various social/economic settings. Largely, it can be claimed that from the early 1990s to the year 2002, social/economic indicators have given reasons for the high infant mortality obtaining in Zambia. This assertion does point to a number of conclusions:

In the first place, the data and descriptions above do give evidence, statistical and other wise, that there has been remarkable influence of social, economic, demographic or environmental conditions on infant mortality. In other words, what has come out so vividly is that in the past decade, Zambia's economy has not been performing adequately enough to support and sustain any meaningful development on the education system, health delivery system, employment creation etc.

From the economic point of view, per capita income is losing its real value and by international standards, many people in Zambia live on less than a dollar every day.

Creation of employment in the past decade was not an easy task to fulfill. The evidence is seen by the low level of employment opportunities that prevailed all over the country in the period under study.

Education for women is also quite low even in the 21st centaury, and over the past ten years, illiteracy (functional) has increased among women in the reproductive ages.

Health delivery systems for the past years have remained wanting. This is also seen in the ever-decreasing number of medical personnel.

The assertion at this stage is that due to the poor economy, which eventually affects social settings, health conditions, educational systems etc, infant mortality has remained high and has continued rising. As stated, this conclusion is precise because so far the data is clear and has related infant mortality on one hand to social, economic, or even demographic variables on the other hand. Similarly, it is evident that these variables have had some profound influences on mortality for the past years in Zambia and infant mortality is not an exception.

Table 11: Summary of Health Care Resources-Zambia

Year	Number of Hospitals	Number of Clinics in rural areas	Number of Doctors/100,000 population	Number of nurses/100,000 population	Number of clinical/health officers/1000 population	Access to health facility(0-5kilometers) in rural Zambia	Access to health facility (0-5kilometers) urban Zambia
1992	82	942	15	138	2.3	75*	-
1996	84	1082	7	123.1	1.5	50*	99*
2002	84	1069	6.5	79.1	1	50*	99*

Percentage (%)

DISCUSSIONS, RECOMMENDATIONS AND CONCLUSIONS

6

In its inception, this study aimed at making available answers to questions on infant mortality in Zambia. More particularly, the study focused on wanting to give reasons for the high incidence and prevalence of infant mortality in the past decade in Zambia. The channels followed in this quest were numerous. Some gave un-doubtable explanations and yet others still deduce suspicion, leaving room for further research.

In the original framework, and as it is portrayed in the Mosley-Chen Framework, infant mortality is influenced by various factors ranging from the environment, economy, society and demographics. A recap of the framework gives the following information:

Social/Economic, Environmental and Demographic variables were subdivided as shown below,

1. Maternal factors (reproductive factors), which include

a) age of the mother at first birth/marriage

b) birth interval

c) parity

2. Environmental factors include

a) air and water contamination

b) vector transmission

3. Nutrient deficiency factors

a) lack of protein intake (under nutrition)

4. Injury

5. Disease control factors

a) preventive and therapeutic factors

b) availability of health infrastructure and health personnel such as hospitals, clinics, doctors, nurses etc.

6. Economic related factors
a) GDP
b) GDP per capita
c) Employment

7. Social factors
a) educational level for women in the reproductive age
b) cultural and traditional practices

The factors listed above were all classified as intermediate. They are the means by which infant mortality causing elements operate through and in the end cause the actual mortality or death.

The main assumption that this study tried to justify was that in the past ten years, Zambia's high infant mortality has been caused by unstable social/economic, environmental and demographic factors. In part, the study justified the assumption, however, some factors within this assumption could not be explained precisely as directly linked to causing infant mortality.

Overall, it is without exception that in the past decade, Zambia's social/economic performance has particularly been at variance with the achievement of low and sustained IMR. Almost all economic indicators have had some negative growth. The study pinpointed that important economic variables such as employment and income (GDP per capita) were inadequate to support and achieve acceptable and internationally recognized standards in many sectors. The percentage of people in employment is low and companies to offer employment opportunities are performing lamentably. Though the data used could not point directly the link between employment and infant mortality, it was clear that few or no employment opportunities made it extremely hard for the country in general and unemployed

people in particular to command an upper hand in determining their health and that of their children. To some degree, this was the only fair and objective manner to deduce how economic factors affected infant mortality.

On the effects of social factors on infant mortality, the study established that as a social variable, Education plays a pertinent row in determining infant mortality. The data provided proof that education of the mother highly influences IMR. Further, it was also proved that the higher the level of education of the mother, the lower the IMR. Similarly, traditional and cultural factors had no data to link them to the cause of infant mortality. By deduction, the study brought to light that where health infrastructure and personnel were unavailable, it is highly likely that people would resort to traditional/cultural methods of preventing or even curing illnesses. If it so happens that they improvise some health delivery system that involve "harmful traditional practices", it were very probable that infant mortality would be high. This assumption is speculative since the data did not indicate the interaction between cultural/traditional practices and IMR.

The relationship between disease control factors and IMR proved valid in this study. This meant that these factors do affect infant mortality greatly. The study postulated that the means to prevent, control and even cure diseases have not performed adequately. The study pointed out that the number of health infrastructure is impressive. However, the number of health personnel such as doctors and nurses has been going down. This has left high demands for doctors and health personnel. Lack of health personnel is one of the most influential factors affecting IMR. In the past years, many doctors in Zambia have been going out in search of "green pastures". As a result, it was professional to rule with certainty the influence that disease-control factors have on infant mortality even though the data was not very accurate in capturing this relationship.

The study found that all demographic (especially reproductive factors) variables observed proved to be related directly or indirectly to infant mortality. To begin with, it was found that age of the mother affects the occurrence of infant mortality. At very young ages and at very old ages, IMR was/is higher than intermediate ages (20 to 39 years). On the other hand, parity also plays an important role in determining IMR. It is without doubt that mothers who

have or had more children had/have high infant mortality experience than those that had/have few children. Birth interval seems to affect IMR depending on the number of years between births. The longer the time between births, the lower the IMR. In the analyses, it was proved by providing statistics that demographic factors influence infant mortality greatly. Therefore, the assertion that demographic factors have been influencing infant mortality in Zambia in the past decade holds.

A variable related to social/economic and disease control factors in this study is Antenatal care. Antenatal care is related to the social/economic factors through education. Educated mothers make use of antenatal clinics more than their un-educated counterparts do. On the other hand, antenatal care is related to disease control factors by institutions such as hospitals or clinics. There can only be antenatal care if there are hospitals or other health institutions and if there are health personnel like doctors and nurses. The study found that antenatal care affects IMR greatly. The data and the analyses proved that IMR is or were lower in mothers that attended antenatal care clinics during their pregnancies than those that did not. This means that the assumption that social/economic conditions have been contributing to the high infant mortality Zambia has experienced over the past decade holds.

In the hypothesis, the assertion that environmental factors have had influences on infant mortality in Zambia in the past decade was valid. The data used in this study established a link between environmental conditions as independent factors and infant mortality as a dependent variable by means of 3 important environmental factors. These factors are represented by the percentage of malaria, respiratory infections and diarrhea infections. The data proved or otherwise provided a meaningful relationship between the environment and infant mortality. The presence of vector-transmitted diseases such as Malaria and water borne diseases such as Diarrhea, Dysentery etc in many parts of the country indicated the potential that environmental factors pose on influencing infant mortality. Infant deaths resulting from causes that are environmental in nature have always been high in Zambia and this proves also that the assertion that factors that are linked to the environment have been exerting considerable pressure on the advent of infant mortality in the past decade in Zambia.

The data analyzed in this study has given or gave an overall stance on how to perceive IMR and what has been contributing to its escalation in Zambia. The findings according to the data used were that social/economic, environmental and demographic variables have been the biggest reason behind high IMR in Zambia in the last ten years. This points also to the fact that infant mortality is affected by many variables and not necessarily by one or two. In tackling problems related to the control of infant mortality, it is probable that all factors are taken into account. Improving one factor and thereby ignoring others amounts to little or zero reduction of high infant mortality rate.

6.1 Answers to study questions

In answering the main study questions, the research established that crude death rate for Zambia has been on the increase, and the only reason attributed to the difference between adult mortality and infant mortality is immunity related. Infants seem to have lower resistance to infections than adults, and hence the difference. The second study question stated why IMR went up from 97/1000 births in 1989 to more than a 100/1000 births in the past ten years. Accordingly, the reason for this rise has been attributed to the poor social and economic performance of the country. Many of the answers to this question are given in previous chapters.

Some of the new risk factors introduced in the past ten years are but economic in nature. Like stated already, for 27 years, Zambia's economy was set to function in communist style. Education and health were free. In 1991, the sudden change of government and subsequently change of policies, made education and health payable amenities. Many people were caught unaware and since most of them could not afford these new paying schemes, the means by which they could apply high health standards became affected. This presumably was a new risk factor introduced at the beginning of this decade. Another risk factor was mass unemployment due to liquidations and privatization of parastatal companies.

Most of the health programs set by the government have not borne results due to the poor economic structure currently in function. Less or non-commitment to the effectual implementation of these programs by the government has in many ways been a major contributing variable to the non-achievement of these health goals and targets.

Limitations of the Study 6.2

There were a number of limitations in achieving objectives of this study. However, almost all of these limitations were/are represented by two main ones:

1) This study received merger or no resources in terms of financing from The Chinese and The Zambian Governments. More specifically, only about RMB 500 was given by The Scholarship Council through the institute to complete the whole project. By conversion, RMB 500 only adds up to about $50 (USA Dollar), which is too little to carry out a study of this magnitude.
2) Due to the non-availability of funds, the data used in this paper was all secondary data. This brought many complications, as modalities had to be employed to "doctor" the data so that it could be used in achieving objectives of this study. Though results concurred with the main assumption of this study, they could have achieved more academic and policy application had the data been primary sourced. More specifically, much of the data used in this study came from the ZDHS reports. This meant that variables outside demographic diasporas that equally have a bearing on IMR, like the economy and the environment were left to play a very minimal role in the final findings. It is no wonder that almost all demographic variables adhered to the original assumption.

Recommendations 6.3

The Government of Zambia and the International Community need to up date their commitments towards strategizing and implementation of policies that would draw Zambia out of the Social and Economic malaise currently prevailing. Frankly, not all problems Zambia is facing were bred locally; the international community and especially multilateral institutions like the IMF and World Bank have their own share. The following points need to be considered by bilateral and multilateral institutions:

1) It is true that there are benefits if a country subscribes to conditonalities set by multilateral organizations. Prominent forms of these conditions are the delinking of government from overall running of "businesses", therefore

c) Due to the significant impact of demographic factors on infant mortality, much attention needs to be paid in order to reduce their effects on IMR. More particularly, the minimum age at which a woman/girl gets married and have children must be raised to at least 20 years. This policy will help reduce high infant deaths that occur in mothers that may be less than 20 years at the time of experiencing their first births. Though people can have as many children as they want, there has to be a policy restricting the number of children to a maximum of four children per woman. The selection of four as the maximum number is brought about by the results of this study where IMR goes up when mothers have 4-6 children. Similarly, people have to be educated to understand that birth intervals that are less than 2 years are dangerous to both the mother and the infant, and in order to reduce infant mortality resulting from too short birth intervals, advocations through law or otherwise have to be imposed;

d) There has to be comprehensive provisions of Antenatal care clinics for all pregnant women in urban and rural areas. In addition, a compulsory policy that would enable (or even force) pregnant women attend antenatal clinics has to be framed. This would greatly contribute to the reduction of IMR. These efforts, it must be noted would be complimented by retaining medical personnel and improving health resources facilities and;

e) The data has indicated that infant mortality is not affected by one or two variables only; it has a number of factors that combine to eventually cause the actual deaths. In handling this problem, the Government of Zambia must take a holistic approach. This means that all conditions/problems or factors that contribute to the increase of infant mortality should be looked at as a group and not isolating and improving one or two as a way or modality by which infant deaths would be reduced.

The above propositions need concerted efforts from both the Government of Zambia and the international community. This would set in motion sustained economic recovery. Now, Zambia needs functional economic policies and serious commitments if targets in most of her policies (health and population policies in particular) are to be achieved.

6.4 Conclusion

Infant mortality is a prominent indicator of social and economic development. By simply following infant mortality trends in any country, it is possible to measure the extent of that country's development (social and economic). This brings to light an understanding that high IMR is associated with low-level development. This is evidenced by differences between infant mortality as obtaining in developed countries and developing countries. Developed countries and some fast developing countries in the third world are currently experiencing low levels of IMR. Least developed countries on the other hand have in general high infant mortality experience.

Many factors influence infant mortality. This study pointed to factors such as education, income (employment), cultural/traditional practices, demographic variables (parity, interval, maternal age etc) as major elements affecting infant mortality in Zambia. However, the study established that economic and demographic variables seem to exert more pressure on IMR. In addition, in dealing with IMR, it was the view of this study for would be readers or policy makers to pay attention on how economic and demographic factors could be improved and in the end reduce high infant deaths. It is hoped and expected that development should not only be focused on lowering inflation, pleasing donors and manipulating the Consumer Price Index (CPI), but rather improving employment prospects and implementing a good health delivery system.

Development in Zambia has for a long time been externally determined and it seems that bilateral and multilateral organizations have had an upper hand in controlling how it is achieved. Many people have been caught in the wrangles of conditionalities set to achieve this development and the unfortunate thing is that these policies have bred vice and suffering for the majority of Zambians. In the final analysis, poor economic performance has affected many other viable sectors such as health and education, which stand as pillars influencing infant mortality.

The way forward therefore requires commitment on the part of the Zambian government and honesty and fairness on the part of international communities. Economic conditions should not be dictated to poor countries even where it is clear they cannot work. Application of

double standards by multilateral institutions when dealing with northern and southern countries must be stopped or checked in order to create equality and fairness in the quest for development. Developing countries need investment (Foreign Direct Investment or FDI), and this investment should not have conditions that disadvantage these countries due to their weak economic standing. As long as issues of both social and economic development are not dealt with firmly and fairly by both the Zambian government and the international community, it is highly unlikely that Zambia' infant mortality would ever fluctuate downwards.

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