

AN ANALYSIS OF CAUSES OF CHILD
MORTALITY IN SOUTH AFRICA: 1997-2006

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2010-2011

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Mini-dissertation submitted as part of fulfillment for the
requirement of

Masters Degree in Population Studies

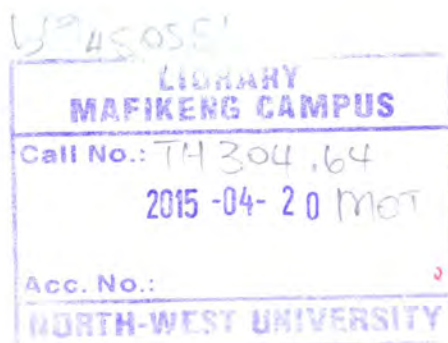
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2010-2011

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ABSTRACT

The main objective of this study was to investigate the causes of child deaths in South Africa. The study analysed trends in the cause of death for the children aged 1-4 years, examined sex differentials and variation in the causes of child death by province, and month of death.

When a country has a high child mortality, it usually signals high prevalence of infectious, parasitic, communicable, and other diseases associated with poor sanitary conditions and malnourishment. The research indicates that the leading underlying causes of death for children aged 1-4 years in South Africa are diarrhoea and gastroenteritis of presumed infectious origin, and pneumonia causes of child death vary by province and month of death. The leading immediate causes of child mortality include pneumonia organism unspecified, diarrhoea and gastroenteritis of presumed infectious origin.

Whereas Microsoft excel was instrumental for cross tabulation, Super Cross (the Microsoft Windows-based tabulation system providing rapid access to very large database) was used for data analysis.. Super-Cross was also used to run all variables for each specific objective. It summarizes data in table presentation using Windows features.

A propos these enabling tabulation seystems, the study highlighted the need for continued improvement in causes of child death data to facilitate monitoring of MDG no 4.

ACKNOWLEDGEMENT

- I would like to thank God my Saviour for having plans of prosperity for me, for giving me the courage, faith, wisdom to complete this task.
- I extend my sincere gratitude to my beloved supervisor, Dr Tapiwa Jhamba for guiding, encouraging and supporting me to ensure the completion of this mini-dissertation.
- To Dr Maletela Tuane-Nkosi, Dr Christine Khoza for their constant motivation and support.
- To my colleagues (Statistics South Africa staff members) Mr. Mathews Phirwa, Mr. Norman Mabena, the late Mr. Meshack Ramoenyana and Mrs. Linkie Mabitsela, for helping me with data availability and teaching me how to run statistical software used in this mini dissertation. Words of thanks are insufficient.
- To my class mate, my colleagues at Corporate Data Processing Centre both LFSR and COD team (Statistics South Africa): I thank you all. You are too many to be individually mentioned here by name.
- To my beloved parents ("Sis Joe and Parker"), my sisters (Tsholofelo and Tshwanelo) and one and only brother (Boitumelo) who believed in me: thanks for your support.
- To Mr. B. Fenn and Mrs. E. Fenn thank you for assisting me with editing my document.
- To Billy Marope: thank you for caring, supporting and continuing to motivate me since my undergraduate studies at Tshwane University of Technology to date.

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CHAPTER 1

INTRODUCTION

1.1 BACKGROUND

For any country, the health and survival of its citizens is its main concern. Knowing the chances of dying at each age for either sex, how the risk has changed over time, and understanding the causes of death, are crucial for not only obtaining an accurate picture of mortality but also for effective policy planning to improve rates of survival. The health of children has to be a priority, a major principle that was adopted through the ratification of the 1990 United Nations Convention on the Rights of the Child.

Between 15-30% of children globally have a chronic condition (Millar, 2004). The prevalence varies between studies partly owing to the fact that variegated definitions of chronic diseases have been used. An estimated 18% of children in the United States have a chronic disease condition and require health services beyond that required by children generally (Millar, 2004).

Similarly, many South African children suffer from a chronic condition that requires ongoing care. The most prevalent of these conditions are congenital heart disease, neurological problem and HIV. In urban areas, asthma affects more than 10% of children. The sequel of poor perinatal care, poverty and poorly managed infectious disease causes disability and places a high toll on rural families in particular. In addition, a wide range of congenital conditions that affects children globally affects South African children as well (Bradshaw, 2003). South Africa faces the challenge of improving perinatal care, pediatric and child health services, controlling over and under nutrition and decreasing poverty in order to prevent chronic conditions.

HIV-related conditions, perinatal conditions, pneumonia, diarrhea and malnutrition are the leading causes of death in children under five year of age (Bradshaw, 2003). In addition to this burden of disease, about 20% of children in South Africa have a chronic condition. For the purposes of this study, a chronic condition described as a health problem that requires ongoing management over a period of a number of years. These include diseases and impairments.

One of the Millennium Development Goals (MDGs) established at the United Nations Millennium Summit in 2000 was a “reduction in the under five mortality age groups”. How to achieve a reduction in the mortality rate is less widely agreed upon and implementing policies to reduce mortality is confounded by, and within and between country variation in everything from geographic to cultural and socio-economic determinants of child survival. Child mortality is a widely accepted indicator of well-being. High rates of child mortality signal lower socio-economic development (Anderson, Romani, Phillips, and Van Zyl, 2002 Sen, 1998).

This study investigates the immediate and underlying causes of death for children aged 1 to 4 years in South Africa, using recorded data of causes of death. The study further examines the sex differentials in the causes of child mortality, examines the causes of death by province and month of death for children aged 1-4 years in South Africa, between the years of 1997-2006.

1.2 PROBLEM STATEMENT

In 2004 it was estimated that over 10.5 million children younger than five years died across the world from preventable diseases (Groenewalt, 2000). The majority of these deaths occurred in poor countries. Child survival prospects remain dismal in Africa given the HIV/AIDS pandemic, coupled with the impact of poverty, famine and war in many areas. In a sub-Saharan country like South Africa, children from poor household are four times more likely to die before their fifth birthday than a child from rich household (Bradshaw ,2003). According to the latest United Nations Children’s Fund report on The State of the World’s Children, “every minute, a child under 15 years dies of an AIDS-related illness (UNICEF, 2006). The South African Policy Review of 2002 indicated that the mortality rates for babies at birth had increased from 45.4 to 59.0% per thousand live births, while the life expectancy had decreased from 57 years in 1996 to 52.5 years in 2002. A study from the Medical Research Council, Every Death Counts, reported that about 75 000 children die in South Africa every year before they turn five. Of these, 22 000 children die within their first month (Medical Research Council, 1998). This shows that South Africa needs to put more effort into saving its future generations.

South Africa has recently faced criticism for falling behind on the Millennium Development Goal of reducing child mortality (South African Medical Research Council, 2003). Out of eight Millennium Development Goals three are directly health related: goal four on reducing child mortality, goal five on improving maternal health and goal six on combating HIV/AIDS, malaria and other diseases. The country has to achieve a yearly reduction rate of 15 percent to meet the millennium goal of reducing child mortality by 2015. Child mortality rates have actually increased since 1990, making South Africa one of 12 countries in which child mortality rates have grown. Poverty is the main underlying cause of child deaths in South Africa (Medical Research Council, 2003).

This study seeks to analyze the underlying causes of death for children aged 1-4 in South Africa from 1997-2006 and provides recommendations to reduce child mortality.

1.3 OBJECTIVES

To accomplish this, the study seeks to achieve the following objectives:

1. To identify and analyze the immediate and underlying causes of death among children aged 1-4 years in South Africa, in the period spanning 1997-2006.
2. To examine sex differentials in causes of child mortality among children aged 1-4 years in South Africa, in the 1997-2006 period.
3. To examine variations in the causes of death by province for children aged 1-4 years in South Africa, in the 1997-2006 period.
4. To examine variation in the causes of death by month of death for children aged 1-4 years in South Africa, in the 1997-2006 period.

1.4 RESEARCH QUESTIONS

In order to achieve the above objectives the study aims to answer the following research question:

1. What are the leading immediate and underlying causes of death for children aged 1-4 years?

2. Is there a sex difference in the vulnerability to causes of death among children aged 1-4 years in South Africa?
3. Do causes of child mortality vary by province?
4. Do causes of death vary by month of death among children aged 1-4 years?

1.5 SIGNIFICANCE OF THE STUDY

Whereas child mortality is one of the most significant indicators in measuring progress towards human development, it is also one of the most difficult to measure. Accurate and timely estimates of childhood mortality are needed to assist countries to set priorities, design programmes, and monitor progress in achieving the said Millennium Development Goal 4. Such estimates are challenging to make because data on child mortality are under-reported in many developing countries.

Estimates that many countries, particularly in Africa, use to track progress in meeting this goal have to be extrapolated from earlier empirical data or retrospective data from censuses and surveys. Despite great strides that have been made in improving population health statistics, South Africa is unfortunately the exception to the rule. In an ideal situation one would use vital recorded registration of deaths to estimate child mortality.

Vital registration systems entail routine collection of data on all births and deaths in a given country. Because developing countries often lack a complete vital registration system that can provide nationally representative estimates, household surveys, such as the UNICEF supported multiple indicator cluster surveys and the USAID supported demographic and health surveys, have become the primary source of data on child mortality this can be accessed on the following website: (www.childmortality.org).

It is hoped that the results from this study will provide a reliable indication of leading immediate and underlying causes of child mortality in South Africa.

1.6 CAUSES OF DEATH FRAMEWORK

In South Africa medical certification of the causes of death is part of the death notification process. It involves certification of the event and the nature of death on the Death Notification Form (DNF), which is also known as the BI-1663 FORM (*Appendix I*). Causes of death are coded using the 10th revision of the International Classification of Diseases (ICD-10) (*Appendix II*). All morbid conditions, diseases and injuries entered on the death certificate are coded. These include those involved in the morbid train of events leading to death which are classified as either the underlying cause, the immediate cause, or and intervening causes and those conditions which contribute to death, but were not related to the disease or condition causing death. For those deaths where the underlying cause is identified as an external cause (injury or poisoning) multiple causes include circumstances of injury, the nature of injury as well as any other conditions reported on the death certificate (WHO, 1992)

On the death notification, the causes of death section have four parts:

The first part refers to the final disease, which is the disease the directly precedes death, the final results of the underlying causes of death

The second part refers to the condition leading to the final disease and is part of the patho-physiological sequence that contributes to the underlying cause

The third part is the most important and concerns the underlying causes of death i.e.: the disease that initiated the ill health effects that resulted in death, in other words, in the absence of the underlying causes the patient would be alive today.

The fourth part relates to other significant conditions; it does not list all diseases presented at death, only those that contributed to the death but not as part of the main causal sequence of disease that resulted in death.

1.6.1 International Classification of Disease (ICD)

The international Classification of Disease (ICD) is the international standard classification for epidemiological purposes and is designed to promote international comparability in the collection, processing, classification, and presentation of the cause of death statistics. The classification is used to classify diseases and causes of disease or injury as recorded on many types of medical records as well as the death record. The ICD has been revised periodically to incorporate changes in the medical field. Currently the ICD 10TH revision is used in South African causes of death statistics (CSS ICD-10 Manual, 1996).

ICD-10 is a variable axis classification meaning the epidemiological data and statistical data is grouped as follows:

- *Epidemic diseases*
- *Constitutional or general diseases*
- *Local diseases arranged by site*
- *Developmental diseases injuries*

The ICD is a systematic classification of diseases whereby morbid entities are assigned to categories according to established criteria. It is used to translate disease or any injury diagnosed, into a code which facilitates the storage, retrieval and interpretation of the data. Specifically, the ICD -10 is an alphanumeric code, whereas the ICD-9 was numeric. The ICD was originally used to classify causes of mortality as recorded in the registration of death. Subsequent revisions were adjusted to meet a variety of statistical application i.e. not only for mortality and morbidity data but also for health statistics and surveys. In the updated classification, conditions are grouped in a manner suitable for general epidemiological use and the evaluation of health care (WHO, 1992).

1.6.2 Importance of death registration in South Africa

In South Africa the Death Notification Form (DNF) is a permanent record of the fact of death that allows the Department of Home Affairs to issue a death certificate. For the purpose of death registration, the DNF provides important personal information about the deceased and about the circumstances and the causes of death. The death certificate has many uses related to the settlement

of the estate and provides family members with closure, peace of mind and documentation of the cause of death. The DNF is also a source of statistical information on mortality that is needed for several purposes, including:

- *Evaluation, monitoring and improving the health of the population*
- *Information decision on health policy and strategy*
- *Comparing health across different regions.*

Because statistical data derived from death certificates cannot be more accurate than the information on the DNF, it is very important that all persons concerned with the registration of deaths strive not only for complete registration of events, but also for accuracy and promptness (WHO, 1992).

1.6.3 Process of notification of death /stillbirths in South Africa

Death registration is part of vital registration, the administrative system that maintains information on all births and deaths of the population. In South Africa, the information is gathered by the Department of Home Affairs on the BI-1663 form. In the case where it is not possible for a doctor to certify the death, it is possible for somebody designated by the Department of Home Affairs e.g. a headman, (in remote rural areas) to certify the event of death and in this case form BI-1680 is used. (See Appendix III).

Once the notification has been accepted by the Department of Home Affairs, a burial order will be issued. No corpse may be buried without this order. It is the responsibility of the next of kin/informant/funeral undertakers to ensure that a death is registered with the Regional Department of Home Affairs. It is the responsibility of the health professional to complete the forms and to ensure that confidentiality is maintained. Thus, after any death or stillbirth, the process to be as follows:

- Completion of the Notification /register of death/stillbirths Form (BI-1663) as soon as possible by the attending doctor/doctor on duty/professional nurse in case of stillbirths where the death/stillbirth occurred or completion of form BI-1680 by the headman etc.

- After completion, page 2 of form BI-1663 should be folded and sealed in an envelope to ensure confidentiality and attached to page 1.
- The document should then be handed to the informant (relative of disease or other) or person in charge of the funeral for purpose of arranging the registration of death and obtaining a burial order.
- The regional Home Affairs office will ascertain that the correct information is recorded on both pages of the form and, if necessary, fill in any missing particulars before issuing the burial order.
- After registration of the death, the form will be forwarded to Statistics South Africa collect, code, and classify the data, perform an analysis and produce reports on deaths and stillbirths occurring in the country. These statistical reports are made available to the public on the website (www.statssa.gov.za).

1.6.4 Confidentiality

In the booklet *Cause of Death Certification: A Guide for completing the Death Notification Form (DNF) – BI-1663* by Pieterse, Groenewald, Burger, Kirk & Bradshaw(2009), the maintenance of confidentiality of patients is a legal and ethical duty of medical practitioners imposed by common law, namely the Bill of Rights contained in the Constitution of the Republic of South Africa, 1996 (Act 108 of 1996), statutes (National Health Act, No 61 of 2003), ethical rules of the Health Council of South Africa (HPCSA) rules and the international medical ethical declaration, the duty to maintain patient confidentiality also applies after a patient's death. There are times when it is legally justifiable to breach patient confidentiality and these include inter alia where a patient (or deceased's next of kin) gives consent, there is a statutory duty to disclose (Births and Deaths Registration Act, No 51 of 1992) or there is a moral, legal or social duty to disclose (WHO, 1992 Tenth revision volume 2).

In principle, according to Pieterse et al (2009), the confidentiality of the cause of death stated on page 2 of the death notification form (DNF) should be maintained as this page is required to be sealed in an envelope. The level of security provided by this method is minimal and in practice the information on the second page of the form is frequently accessed by various persons who are not entitled to do so. For this reason many medical practitioners are reluctant to comply with the legal

requirement of accurately stating the cause of death on the DNF. This is particularly so in cases where HIV infection and AIDS are the underlying causes of death. Any failure to accurately state the cause of death will result in inaccuracy in the national statistics of causes of death. The Births and Deaths Registration Act, 1992, places a legal obligation on medical practitioners to state the correct cause of death on the DNF. The making of a false statement is a criminal offence and upon conviction, a practitioner would be liable to a fine or imprisonment or both.

An expert in medical law, Professor David Mc Quoid-Mason, has concluded "Whatever the shortcoming regarding confidentiality caused by the BI-1663 Form, medical practitioners are obliged to complete it properly and to indicate cause of death on the second page for statistical purposes (WHO, 1992).

1.7 STRUCTURE OF THE DISSERTATION

Chapter one contains the introduction and background to the study, the problem statement, the purpose of the study research questions and causes of death framework. Chapter two covers the socio economic demographic background of South Africa. Chapter three covers literature reviews. Chapter four presents the methods of analysis, data used and chapter five covers recommendations and conclusions.

CHAPTER 2

LITERATURE REVIEW

2.1 INTRODUCTION

"There is a helpless feeling when a child becomes sick. But this helplessness can be made even more overwhelming when the child is sick-and dying - from preventable diseases or common ailments. Every year, more than six million children die from preventable causes like tuberculosis, pneumonia and diarrhea. Many families cannot afford the medical treatment and vaccination that could easily keep children healthy (UNICEF, 2009.)"

"Child mortality is not a health problem. Child mortality is a social problem with health consequences. It is analogous to traffic accidents mortality in children: the first priority for improving traffic accidents in children is not to build more and better medical facilities, but rather to change traffic laws and better educate drivers and children. In other words, the solution is not primarily medical, but environment, social and educational improvement and support. The same is true for infant mortality: the first priority is not more obstetricians or pediatricians or hospitals, nor even more prenatal clinics or well-baby clinics, but rather to provide more social, financial and educational support to families with pregnant women and infants" (Wagner, 1988).

It is widely held that mothers are essential for the health and well being of their children. An infant's birth weight is influenced by the mothers' nutritional status. Initially, a new born child depends

completely on the mother for nourishment, and even after weaning mothers tend to control the way infant feeding practices are implemented. Mothers are instrumental in assuring adequate growth for their new born infants, shielding them from debilitating infection and nursing them back to full health and nutritional health as they recover (Loudon and Irvine, 1992). Mothers nurture and protect, are central in the early stages of the socialization of the children. The economic contribution of mothers to the living standard of the household is another form for intervention in the health and development of their progeny. Fathers share this economic role with mothers, though their direct impact on child health is probably much smaller than of their wives. When a parent is absent, for whatever reason, it is expected that the health and well being of children will suffer as well (Loudon and Irvine, 1992).

When South Africa adopted its democratic Constitution and ratified the United Nations Convention on the Rights of the Child (CRC) in the mid-term 90s, it promised to put children first. This means that children have to be treated as the Country's number one priority by ensuring that the right to survival and development is respected, protected, promoted and fulfilled (Section 28 of the Constitution of South Africa, 1996). As the country moves into a second decade of democracy, the government is reviewing its progress, with the aim of improving service delivery. Child deaths are one of many crucial indicators of a country's progress in meeting its obligation to children.

The constitution of South Africa states that;

"Everyone has the right to have access to" -

(a) Health care services, including reproductive health care

28. (1) every child has the right to, (b) Family care or

Parental care, or to appropriate alternative care when removed from family environment

(2) A child's best interest is of paramount importance in every matter concerning the child (Act 108, 1996:13-14).

2.2 LEADING UNDERLYING CAUSES OF INFANTS AND CHILDREN IN SOUTH AFRICA

According to Stats SA 2008: the leading causes of neonatal deaths in 2007 were respiratory and cardiovascular disorders specific to the perinatal period, accounting for 45,1% of all neonatal deaths. This was followed by disorders related to length of gestation and foetal growth (12,4%), and other disorder originating in the perinatal period (10,2%) and then infections specific to the perinatal period (10,0%). For the post neonatal period, the leading causes of death were intestinal infectious disease, accounting for 28, 0% of deaths, followed by influenza and pneumonia, accounting for 20,5% of deaths. Certain disorders involving the immune mechanism ranked sixth and tuberculosis seventh.

Five most common underlying causes of death in 2007 for infants and children were intestinal infectious diseases, influenza and pneumonia, malnutrition, other acute lower respiratory infection and certain disorders involving the immune mechanism. About 20,6% and almost a quarter 24,0% of deaths occurring to infants and children aged 1-4 years, respectively, were due to intestinal infectious disease. Malnutrition was the third leading causes of death for all those aged 1-4 years and the seventh leading cause for those aged less than one year. For those aged 1-4 years, certain disorders involving the immune mechanism were the fifth leading cause of death while human immunodeficiency virus (HIV) disease was the eighth (Statistics South Africa, 2007).

According to Bradshaw (2003), the top ten causes of death among children under the age of five years of age in 2000 were HIV/ADS (40%); low birth weight (11.2%) , diarrheal diseases(10.2%), lower respiratory infection(5.8%), protein energy and malnutrition(4.3%) , neonatal infection (2.8%), birth asphyxia and trauma (2.4%) ; congenital heart disease(1.2%), road traffic accidents (1.1%) and bacterial meningitis (1.1%).

2.3 CHILDHOOD MORTALITY IN SOUTH AFRICA

15 Years after liberation from apartheid, South Africans are now facing challenges for which the highest calibre of leadership, vision, and commitment is needed. The effect of the unprecedented HIV/AIDS epidemic has been immense. Substantial increase in mortality and morbidity are threatening to overwhelm the health system and undermine the potential of South Africa to attain the Millennium Development Goals (MDGs) (UNICEF, 2009).

Accurate mortality statistics are needed for policy formulation, planning monitoring and implementation of health programmes. The level of mortality is one of the indicators of the level of human development, hence its inclusion in the construction of human development indices (HDI) and the multi dimensional approach to combat high level of poverty.

(Lagerdien, 2005) argues that child survival is the most crucial element of a child's right in South Africa and internationally. Child mortality indicators are universally acceptable measures of whether a country is meeting its obligation towards children. The country's socio economic status can be derived from the level of indicators for the children under-five mortality.

The Demographic Health Survey 1998 indicates that three quarters of all deaths under-five occur in the first year of life and one third occur in the first month of life. Poor sanitation structures and the shortage of medical services also influence child survival in South Africa. The ending of apartheid in South Africa compelled government to take steps to reduce childhood mortality rate.

More than fifty four percent of childhood deaths globally are preventable (Bradshaw, 2003) reported that child mortality in South Africa was a little higher than rates worldwide before the new government in 1994.

According to UNICEF 2008, nearly two million people die from diarrhoea every year. Unclean water is the main culprits for causing diarrhoea and over a third sub-Saharan Africans do not have access to clean water and therefore are greatly at risk from infection. Although a worldwide problem; deaths from diarrhoea are mainly restricted to the developing world (a child who contracts diarrhoea in a developing country is 520 times more likely to die than their counterparts in Europe or the USA (UNICEF, 2008)

Clean running water and adequate plumbing reduce the likelihood of gastrointestinal diseases that are particularly dangerous for children living in fragile conditions. Gastrointestinal infection is a main important cause of death among children living in rural farming areas and informal settlements, areas that are most likely characterized by poor sanitation (Bachmann ,1996).

Increased access to free Primary Health Care that includes immunization for children has seen a dramatic decrease in the incidence of measles and other EPI disease in the recent years. According to the Treatment Action Campaign (TAC), HIV is frequently not stated as the underlying causes of death. Instead, an opportunistic infection associated with HIV is usually indicated as the cause. Therefore, the number of AIDS deaths cannot be determined by simply reading the report (TAC, 2005).

2.4 CAUSES OF DEATH IN DEVELOPING COUNTRIES

High rates of child deaths and disease among individuals of lower social economic status have been extensively documented in industrialized countries throughout the past century. Indeed, in South Africa, in spite of substantial increase in economic indicators such as gross domestic products (GDP) and increases in Rand spent on medical care, high rates of child mortality remain a challenge. Child mortality rates in particular have long been considered a sensitive indicator of socio- economic disparities on the health of population, due in large part to the special vulnerability of the new born to poverty and substandard living condition (Marx, 1967).

According to www.childinfo.org/areas/childmortality the following facts relating to childhood mortality exists:

Facts:

- Infectious and parasitic diseases remain the major killers of children in the developing world, partly as a result of the HIV/AIDS epidemic. Although notable success has been achieved in certain areas (for example, polio), communicable diseases still represent seven out of ten causes of child deaths, and account for about 60 % of all child deaths.
- More than ten-million children die each year in the developing world, the vast majority from causes preventable though a combination of good care, nutrition and medical treatment.

Mortality rates for children under five dropped by 15% since 1990, but the rates remain high in developing countries

- Throughout the world child mortality is higher in males than in females.
- Child mortality rates among the poor are much higher in Africa than any other region despite the same level of income used to define poverty. The probability of poor children in Africa dying is almost twice that of poor children in America.

Post neonatal deaths have historically been due to viral and bacterial processes such as gastroenteritis and pneumonia and to injuries, all of which have long been closely linked to socio economic factors like poverty and level income (Gortmaker 1979). Neonatal mortality has been more deeply shaped by processes associated with birth, including congenital anomalies, prematurity and low birth weight, and obstetrical catastrophe associated with delivery. These causes, though generally associated with social variables, tend to operate more directly through maternal and pregnancy related pathways (Wise, 1990).

2.5 "Saving mothers saving babies"

In the impoverished mountain kin of Lesotho, nearly one in the four adults is HIV positive according to a 2006 report from UNAIDS. Completely surrounded by South Africa, this little known country of 2 million people has one of the high HIV infectious rates in the world. Out of an estimated 800 000 children under the age of 15 in Lesotho at the end of 2005, about 20 000 were living with HIV. Most were infected through breast feeding. Preventing transmission of HIV from mothers to their children and getting treatment for infected mothers is crucial in the fight against AIDS. Mother to child transmission can occur during pregnancy, labour, delivery or breast feeding. One in four pregnant women is HIV in Lesotho, among the highest known infectious rates in the world, according to a reported by the U.N. Children's agency UNICEF. One in 10 children infected in Lesotho are born positive half will die by their second birthday. Globally, one in ten children infected with HIV gets treatment. With adequate treatment, mother to child transmission is almost entirely preventable. But in sub-Saharan , the lack of access to life saving anti drugs means as estimated one in three children to an infected mother will contract the virus. Breastfeeding by a mother with chronic HIV infection can increase the

odds of transmission from 10-14 percent. In countries such as Lesotho, up to a half of all infections in children are transmitted through breast feeding. The longer the baby breast-feeds, the greater the risk. However, HIV- positive mothers in poor countries often can't afford other feeding option for their infants.

CHAPTER 3

SOCIO-ECONOMIC AND DEMOGRAPHIC BACKGROUND OF SOUTH AFRICA

3.1 INTRODUCTION

South Africa is situated at the southern tip of the continent of Africa; flanked by its neighboring countries Botswana, Namibia, Zimbabwe and Mozambique. South Africa achieved independence on 31 May 1910 from the United Kingdom and was declared a Republic under old Apartheid Regime in 1960. In 1994 the first full democratic elections was held which heralded a transition to true democracy. It is known for its diversity in natural elements, culture, eleven languages and religious beliefs.

Figure 3.1: illustrate the location of South Africa, its neighboring countries and provinces.



3.2 DEMOGRAPHIC TRENDS

In the 1980s South Africa was a country of stark contrasts and social turbulence. Abject poverty existed amidst plenty for the dominant white group. Race according to official classification coincided with socio-economic privilege and virtually every part of life was influenced by the rules of apartheid or separate development. All aspects of living were carried out in separate spheres and contact between the races occurred only in the workplace and on unequal terms.

In the post apartheid period South Africans, mostly black, continued to live in poverty, although poverty among Whites previously rare, it has increased greatly (Treiman, Keever and Fodor, 1996). Child health and survival in South Africa have been deeply influenced by the system of racial discrimination imposed from the outset of white settlements in the 17th century and institutionalized, codified, and reinforced when the National Party gained power in 1948 (Treiman, Keever and Fodor, 1996).

Between 1983 and 1993 the South African population grew from approximately 31 million to 41 million. These figures include the nominally independent black homelands of the apartheid era. The proportion of the black sector of the population increased while the white sector decreased. In 1983 the population comprised of 73% blacks, 9% Coloured, 3% Indians, and 15% white. In 1993 the comparable figures were 76% blacks, 8, 5% Coloured, 2.5 % Indians and 13% white (South Africa Institute of Race Relations, 1984).

South African's fertility rate decreased from six children to an average of 4.6 children per women between 1985 and 1990 and dropped to four children in 1994 (SAIRR, 1995). By 1989 South Africa had achieved an infant mortality rate of lesser than 50, a target set by the World Health Organization. However, the black infant mortality rate was higher than the white rate in 1985, one decade later, in 1994; it was still six times higher (SAIRR, 1996:195).

3.3 POPULATION DYNAMICS

Sex ratio (number of males per 100 females) at the national level has remained relatively stable (93 in 1996; 92 in 2001 and 93 in 2007). The total fertility rate is estimated at 2, 5 births per woman. According to Anderson 2003 it was stressed that the South African fertility was the same as other sub-Saharan countries in the late 1950s, but started to decrease more rapidly in the late 1960s and became lower than any other sub-Saharan country in the late 1990s. The Demographic Health Survey conducted in 1998 showed that the total fertility rate in 1998 was estimated to at 2.9 and further studies estimated the current fertility to 2.4 in 2008 (Stats SA, 2008). Crude birth rate is estimated at 21, 7 per 1000 population. The Crude death rate is estimated at 14, 3 per 1000 population. Gauteng and Western Cape are the major recipients of migrants from other provinces.

3.4 POPULATION SIZE

South Africa had two censuses since the first general election in 1994. The first census was conducted in 1996 followed by the second one in 2001, and a Community Survey in 2007 to estimate the total population. The population of South Africa continues to grow. It has increased from 40, 5 million in 1996, to 44, 8 million in 2001 and to 48, 5 million in 2007. The provinces with the highest population are Gauteng and Kwa-Zulu Natal with a population of 10, 5 million and 10, 3 million respectively (Community Survey, 2007). The province with the least population is Northern Cape with a population of 1, 1 million. Western Cape and Gauteng recorded substantial increases since 2001 (16, 7% and 13, 9% respectively).

3.5 POPULATION PYRAMIDS

Figures 3.2 to 3.4 below show the pyramids for the two censuses and the community survey at a national level. The pyramids show a smaller percentage of the population age group 0-4 years. Those children who were aged 10-14 years in CS 2007 were aged 5-9 years in 2001 and 0-4 years in 1996. Following the cohort as shown in Appendix IV, there were 4 443 621 children aged 0-4 years in 1996; those aged 5-9 years in 2001 were 4 853 555 and those aged 10-14 in 2007 increased to 4 947 002. The shape of the pyramids depicts trends in mortality, fertility and migration.

**Figure 3.2 South Africa: percentage distribution of population by five year age group and sex-
Census 1996**

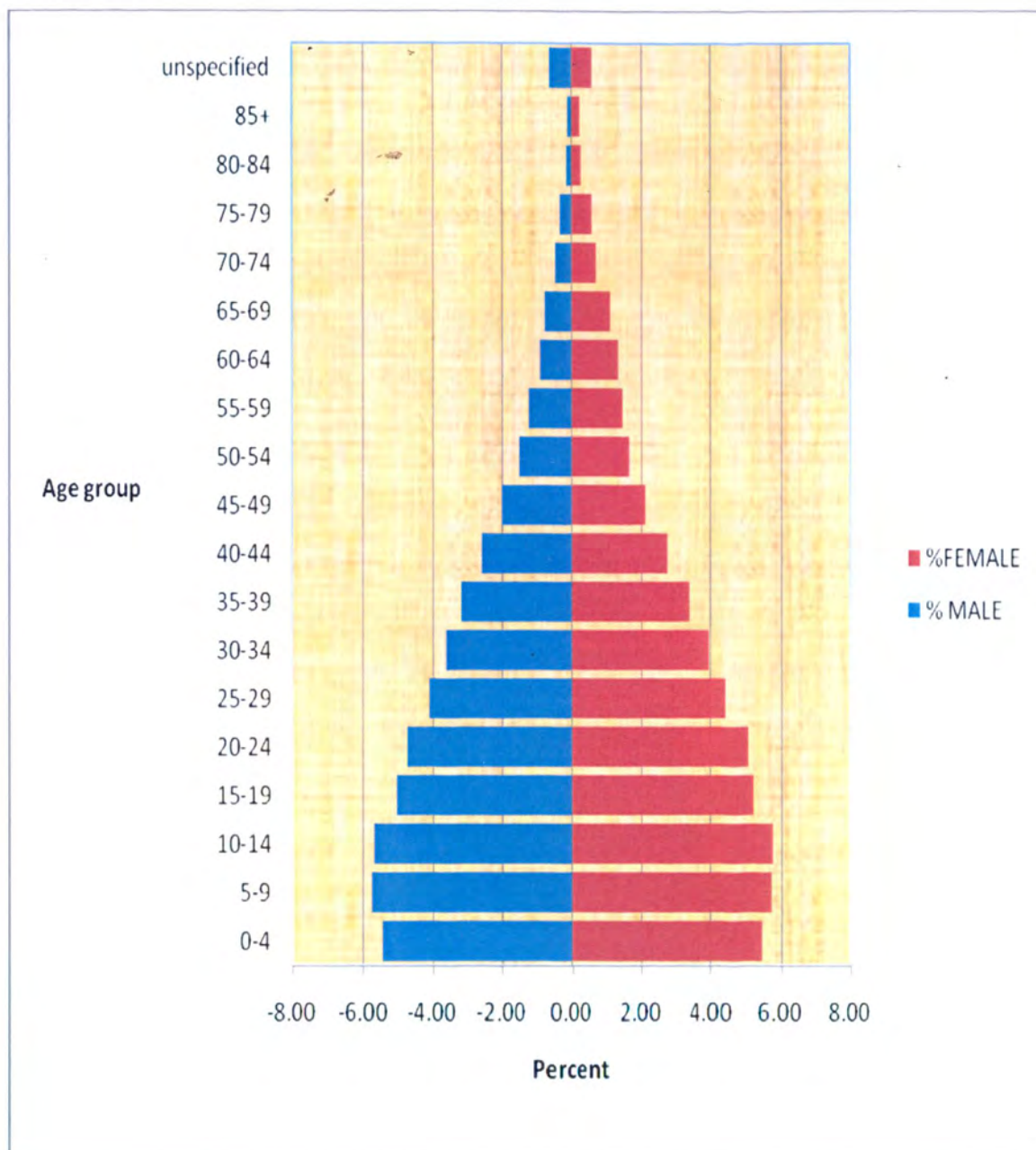


**Figure 3.3: South Africa: percentage distribution of population by five year age group and sex-
Census 2001**

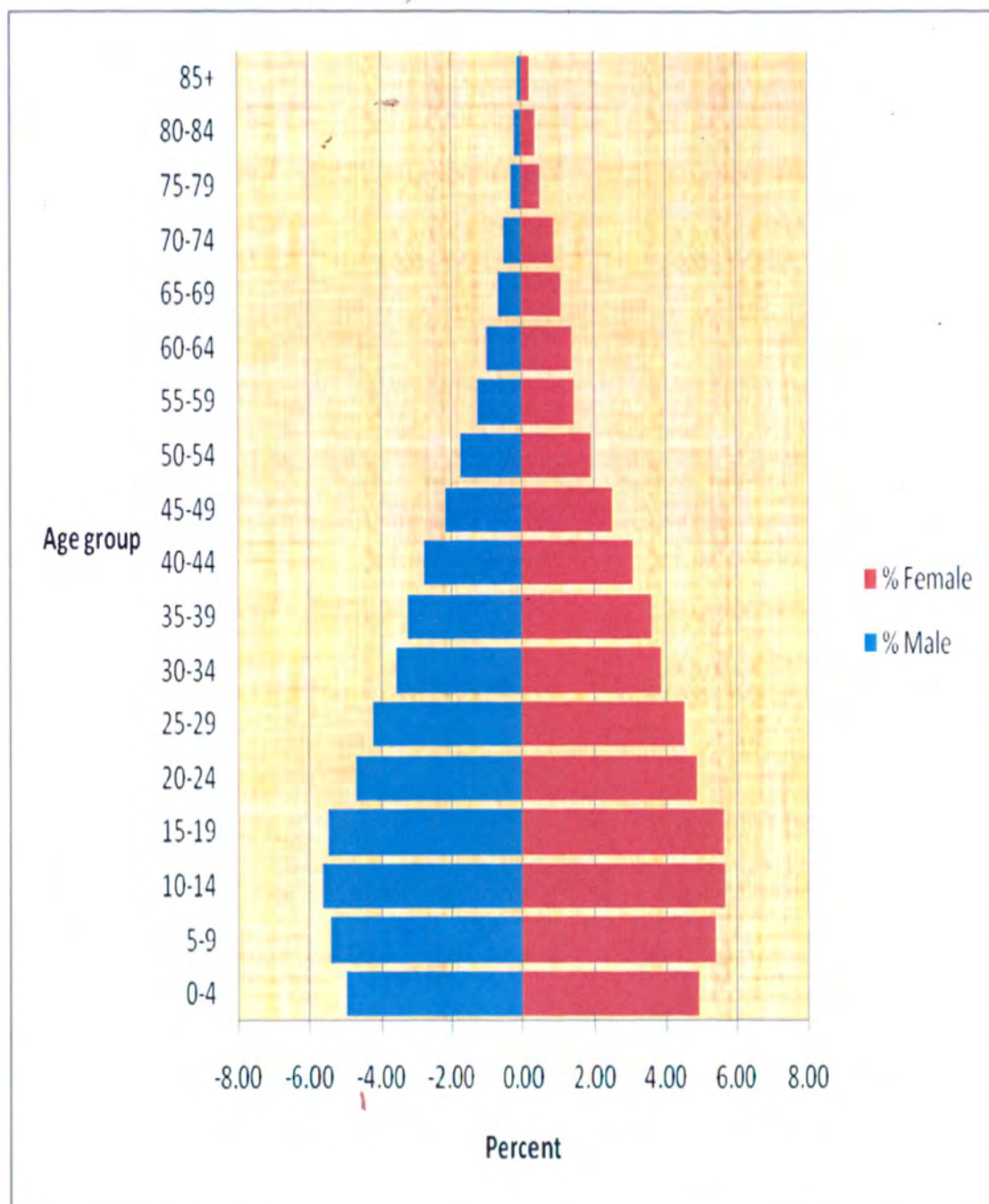
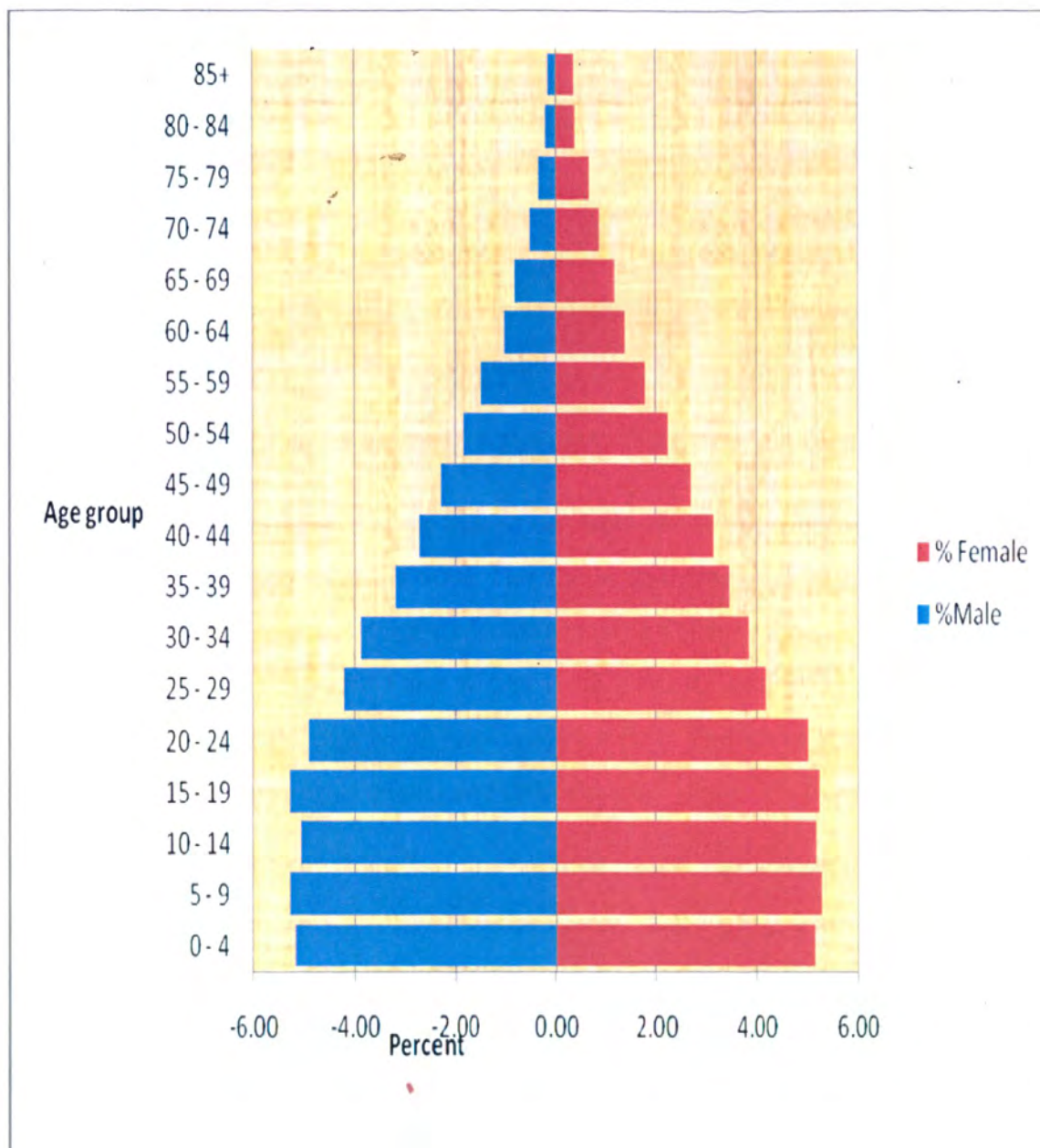


Figure 3.4 South Africa: percentage distribution of population by five year age group and sex- Community Survey 2007.



3.6 ECONOMY OF SOUTH AFRICA

By 2006, South Africa is a country of vast potential whose economy is only just beginning to crawl out of four years of recession (Stats SA, 2006). The recession capped a decade long stagnation resulting from global recession, loss of business confidence, double digit inflation, global economic sanctions, and structural inefficiencies, and irrational economic policies rooted in apartheid. South Africa's ratio of government spending to GDP doubled over the past three decades. Income taxes paid by individual increased from 3, 9% in 1960 to 10, 1 in 1994, eroding personal savings (SAIRR, 1996). A rand earned in 1980 was worth only 18 cents in 1993 (Central Statistics Services, 1994). In the period 1985-95 real GDP per head dropped by 10%, although in 1994 and 1995 it grew by 0, 6% and 1, 1 % respectively. In 1996 the South African Reserve Bank expected a growth of 1, 5 % in real GDP per head.

3.7 INFANT, CHILD AND UNDER FIVE MORTALITY RATES

The number of recorded infant deaths (based on death notification) increased from 27 044 in 1997 to 30 750 in 2001 and 48 239 in 2006. This shows an increase of 70.2 % between 1997 and 2005. Similarly, the number of deaths recorded among children aged 1 to 4 years increased from 7735 in 1997 to 11170 in 2001 and 16 058 in 2006 (Mortality and Causes of Death in South Africa, 2006). This may be due to an increase in infants and child mortality and or in the improvement in the recording of infants and child deaths.

According to the SADHS (1998) survey, the national infant mortality rate was 42, 2 with the provincial variations ranging from 61, 2 in the Eastern Cape to 8, 4 in the Western Cape. In 2003, the national infant mortality was 42,5 with provincial variation ranging from 36,9 in North West to 28,7 in the Northern Cape (SADHS, 2003). The table below indicates that the levels of infant mortality remained the same between 1998 and 2003; and that of the under-five increased slightly from 57 to 58 per 1000 live births. In the same period, infant mortality was the highest in the Eastern Cape (61, 2) and North West (36, 8). The lowest rates were reported in the Western Cape (and Northern Cape). In general the increase in the infant mortality rate could be attributed to the increase in HIV prevalence in the country. The Under-five mortality rates were much higher in non-urban areas (43, 2). There are also great

disparities between the provinces with the highest being 80, 5 in the Eastern Cape and the lowest 13, 2 in the Western Cape (SADHS, 2003). According to the UNICEF 2008, poor nutrition is the main contributing cause to under-five deaths.

Table 3.1: Child mortality rates by characteristics per 1000 live births, 1998 and 2003
SADHS

Characteristics	Infant Mortality	Infant mortality	Child mortality	Child mortality	Under- five mortality	Under- five mortality
	1998 SADHS	2003 SADHS	1998 SADHS	2003 SADHS	1998 SADHS	2003 SADHS
Residence						
Urban	32,6	41,6	11,0	10,3	43,2	51,4
Rural	52,2	44,1	20,1	12,3	71,2	55,9
Provinces						
Western Cape	8,4	43,5	4,8	13,6	13,2	56,5
Eastern Cape	61,2	6,3	20,5	11,6	80,5	79,9
Northern Cape	41,8	28,7	14,3	10,6	55,5	39,1
Free State	36,8	48,1	13,7	21,1	50,5	68,2
Kwa-Zulu Natal	52,1	30,4	23,6	3,0	74,5	33,2
North West	36,8	36,9	8,8	15,3	45,3	76,3
Gauteng	36,3	33,5	9,3	9,4	45,3	42,6
Mpumalanga	47,3	40,5	17,3	12,3	63,7	52,2
Limpopo	37,2	34,1	15,7	10,1	52,3	43,9
SEX OF CHILD						
Male	13,2	47,4		13,2		60,0
Female	8,7	37,4		8,7		45,7
Total	42,2	42,5	15,4	15,8	56,9	57,6

Sources: Department of Health, 1998 and 2003

The 2001 Census included questions with regard to all women enquiring about the number of children born to them and the number who have died, but unfortunately data quality problems make it impossible to derive reliable estimates of child mortality thereof. However, detailed analysis of the 1996 Census data together with the 1998 SADHS showed a consistent downwards trend in child mortality since the 1970s that was reversed from about 1993 (Nannan, 1997-1998).

3.8 LIFE EXPECTANCY

Life expectancy for South Africans was estimated at 62.8 years for 1991 showing an increase from 58.8 in 1980 (Population Policy for South Africa, 1998).

Table 3.2: shows a general increase in mortality between 2001 and 2007 as indicated by the decreasing life expectancy at birth.

Life expectancy	2001	2002	2003	2004	2005	2006	2007
LE male stats	52.1	51.4	50.8	50.2	50.0	49.0	48.4
LE female stats	57.2	56.3	55.3	54.4	54.0	52.5	51.6
LE combined stats	54.6	53.8	53.0	52.3	51.9	50.7	50.0
LE combined stats	54.9	53.5	52.2	51.4	51.0	50.7	

Sources: Development indicators Mid Term Review, 2007, The Presidency, Republic of South Africa.

CHAPTER 4

DATA SOURCES AND METHODOLOGY

4.1 INTRODUCTION

This chapter describes the sources of data, software and method used for the analysis. One of the priority areas that the South African Government has set out to improve is the health status of the population through effective preventive and curative programs. The causes of death data is one of the main sources of data that can inform users how various diseases including HIV/AIDS impact on the South African society.

4.2 DEATH REGISTRATION IN SOUTH AFRICA

The civil and vital statistics system are essential elements in South African population statistics. The civil registration is the source of both the population register and the vital statistics system. The existence of a civil registration and vital statistics in South Africa, in a decentralized form, predated the formation of the Union of South Africa in 1910. In fact, colonial registries, journal and diaries, as well as the "Opgaafrols and Monsterrollen van Vrieje Lieden" (Citizens Tax Rolls and Rolls of Vryliede) served as systems of enumeration and registration of colonial population from the mid-1600s until the early 1900s (Zuberi and Khalfani, 1999). The main purpose of that early system was to identify taxable and voting populations. Subsequent to the formation of the Union, Act 38 of 1914 established a national statistical office for South Africa. However, uniformity in vital registration throughout the Union was only achieved after the Births, Deaths and Marriages Registration Act 17 of 1923 came into effect in 1924. Under Act 17 of 1923, registration of vital events was made compulsory for Africans living in urban area but was voluntary for African / Blacks living in rural areas. This was in line with the Urban Areas Act of 1923.

Initially, vital statistics were published only for whites. In 1973, official vital statistics for Coloureds become available, and a year later they were published for Indians/Asians. During this period no official statistics were published for Africans.

In the 1950s, influx control, a set of laws that monitored and controlled the movements of Africans, became a compulsory policy throughout South Africa (Evans 1997). The population Registration Act of 1950 was an integral part of this control. It assigned every person an identity number that sealed his or her fate as a South African either improving or diminishing that individual's life chances. The aim of the 1950 Act was to make provision for the compilation of a register of the population of the Union, primarily for issuing identity cards. Under the said Act, anyone whose name was included in the register was assigned an identity number and population group.

Because the Department of Home Affairs is responsible for both the population register and the civil registration system, it keeps several databases that relate to different aspects of the civil registration records but that are not, strictly speaking, the population register. When the clerks at various offices of the Department of Home Affairs (DHA) capture the information about births for example, they do so directly into the database at the Nucleus Bureau, (the data processing for the DHA). These transactions are used to update the population register database as well as the birth register. The population register is cumulative and; the vital statistics system is periodic. Details of non-South African citizens or permanent residents could be obtained from the civil registration system but not from the population register.

Act no 1 of 1992, the Birth and Death Registration Act, governs the notification and registration of deaths in South Africa. There is also the Birth and Death Registration Amendment Act, (Act 67 of 1997). An abridged death certificate is issued free of charge upon the registration of a death by completion of application form (Cassim, 2001). (Mbewu, 2005) states that there has been much talk recently concerning deaths, causes of death, and rumors of deaths. Important within the subject is the differentiation of where medical research overlaps with medical practice and statistics in order to avoid confusion. By law, in South Africa, only medical doctors are permitted to certify that a person has died. A death notification form(DNF), signed by a medical practitioner is required before the body can be buried or cremated, these particular strict controls are necessary to ensure accuracy of death registration and causes of death data (Mbewu, 2005).

Mbewu, (2005:2) further states that

“ Furthermore in most countries including South Africa, medical doctors writes what is his or her opinion of the causes of death on the medical certificates , indicating what the final cause and the underlying causes of death were, and whether this diagnosis will be subsequently augmented by information from postmortem if this is to be performed later. If a medical doctor is in any doubt about what to put on a death certificate, he or she must speak to the coroner in order to determine if a postmortem is necessary to accurately ascertain the causes of death.”

4.3 DATA SOURCES

The data used in this study was obtained from Statistics South Africa (Stats SA), which represents mortality and causes of death data which is obtained from country's vital registration system. The database is created from information captured from death notification forms from the Department of Home Affairs and the Department of Health. The report covers causes of death from 1997 to 2006. The (2007/2008) processing phase included death notification forms for deaths that occurred in 2006 and additional death notification forms for the years 1997-2005 that had not been received by Stats SA in the previous processing phase. For example, in total 3538 additional death notification forms for 1997-2005 were received and processed in the 2007/2008 processing phase. The majority of these (60.0%) were deaths that occurred in 2005. Very few additional forms were received for the period of 1997-1999. This study uses the updated information for all comparative analyses between the 2006 data and data from previous years.

Following process flow is followed by Statistics South Africa after receiving the death notification forms from Department of Home Affairs (Stats SA, 2006).

- Statistics South Africa receives death notification forms from the National Department of Home Affairs.
- After receiving forms from Department of Home Affairs sorting takes place.

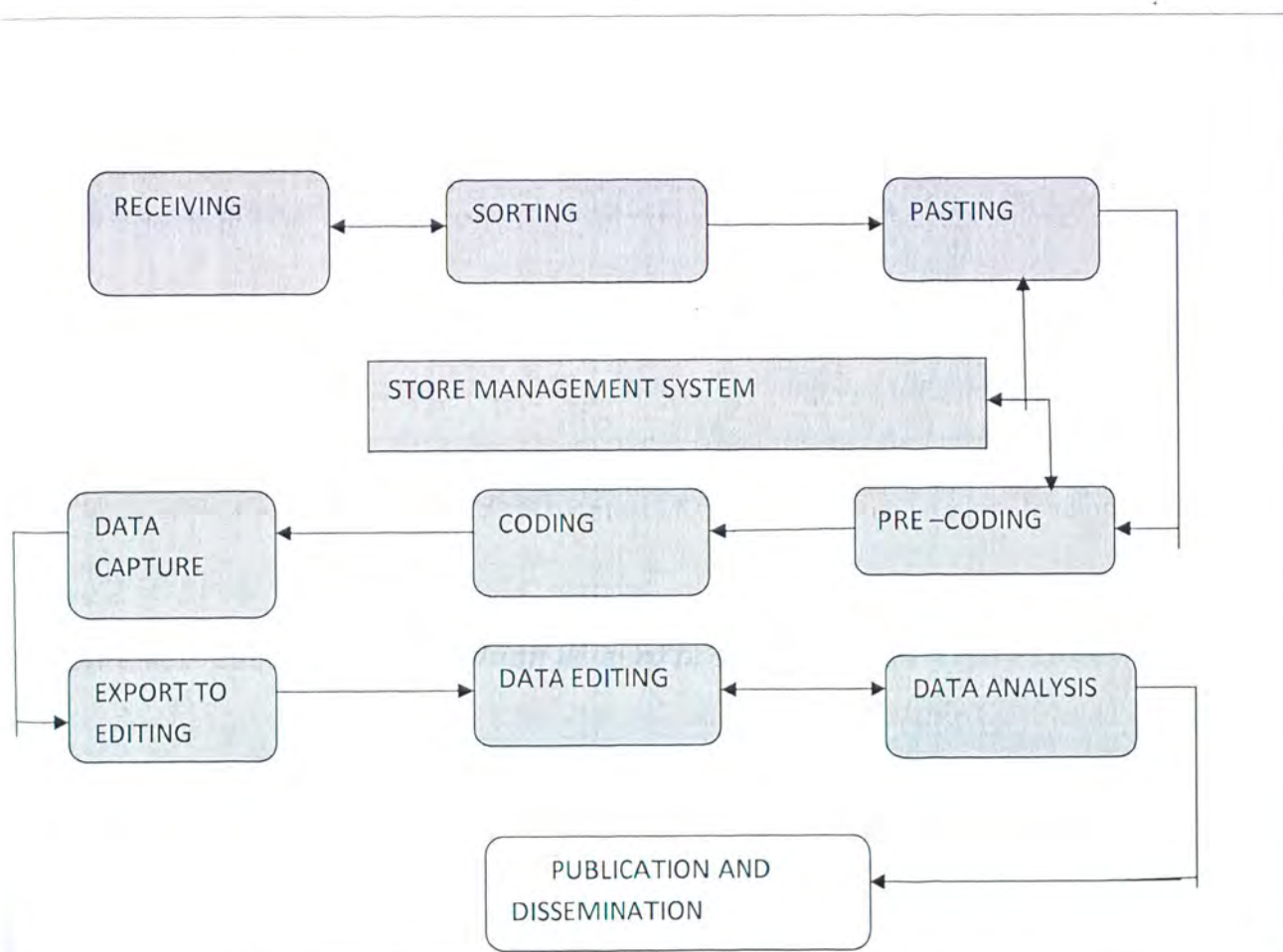
- The main purpose of sorting the death notification forms by year, month, day and the surname in alphabetic order is to remove duplicates. Most duplicates are identified during this stage.
- Death Notification forms consist of two pages, the first page containing details of the deceased and the informant information and the second page is either the death certificate issued by the Doctor and / affidavit and/ or a death report.
- Pasting of labels are done to link the form to batches. The batches in turn are then linked to boxes. This also serves to give the physical sequential numbers as created in the database.
- Data capturing is the next step that follows. Data capture is to transfer data from the Death Notification Forms to an electronic format. The process is necessary for the analysis of the data, production and release of mortality statistics.
- The causes of death are then manually coded and verified according to the International Classification of Disease (ICD 10) (attached on Appendix).

4.3.1 Certification of cause of death

The registration of deaths has changed considerably over a period of time. The old system used two individual forms, a single page death register (form BI-7) and a single page medical certificate for death and stillbirths (form BI-12). Form BI-7 contained the demographic information about the deceased. Form BI-12 was completed by a medical profession and contained more detailed causes of death information. The causes of death information on the BI-7 sometimes differed from that reported by the physician on the BI-12 form. In the new system, forms BI-7 and BI-12 have been combined into form BI-1663. When there is multiple pathology, e.g.: two major distinct disease are present and the certifier cannot identify which one led to death both should be filled in with and accompanying explanation. The person assigning the coding has a procedure for deciding which cause is the underlying one. The Automated Classification of Medical Entities (ACME) programme automates the underlying causes of death coding rules. The input of AMCE is the multiple causes-of death codes (ICD)

assigned to each entity (e.g. disease condition, accident, or injury) listed on cause of death certifications, preserving the location and order as reported by the certifier. ACME then applies the World Health Organization (WHO) rules to the ICD codes and selects an underlying cause of death. ACME has become the de facto international standard for the automated selection of the underlying cause of death. (Johansson and Westerling 2002:302). After coding, data will be edited in order to check and correct errors. Thereafter data will be analyzed and presented in more simpler and readable in the form of statistical release, way that will enable policy makers to make informed decision about the status of the population and its development in the country.

Figure 4.1: Causes of deaths high level of process flow



Source: Statistics South Africa, 2004

4.4 DATA LIMITATION

Despite the improved notification and death registration process in South Africa, particularly the introduction of a new death notification form in 1998, there is still some limitations that affect the quality of the information and the coverage of deaths (Causes of death report, 2006). One limitation to the causes of death used in this study, is the probable under registration of deaths, particularly in rural areas and in particular those of infants and children. This leads to lower estimates of the total number of deaths that have occurred in the country and may lead to an underestimation of some causes of death (Statistics South Africa, 2006).

According to Statistics South Africa, (2006) causes of death may also be misreported on the death registration form. This happens when an incorrect causes of death is given or when the cause of death is not detailed enough. The quality of the recorded information is determined largely by the diligence and integrity of the certify official –physician, professional nurse or, in some rural areas, traditional headman. For example the certifying officials sometimes write natural causes instead of stating the actual causes (Statistics South Africa, 2006)

4.4.1 Completeness of death registration

Table 4.1 shows the proportion of child deaths with missing /unspecified immediate and underlying cause of death. The table shows that missing /unspecified immediate and underlying cause of death was not a major problem.

Table 4.1: Percentage of child deaths with missing /incomplete information on immediate and underlying causes of death, South Africa 1997-2006

	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006
Immediate cause of death	0.67	1.02	0.99	0.83	0.69	0.71	0.52	0.45	0.51	0.73
Underlying cause of death	0.67	1.02	1.00	0.83	0.69	0.71	0.58	0.45	0.51	0.72

The proportion of child deaths with missing information or unspecified immediate and underlying cause of death was generally very low. The respective proportion was 1.02 % in 1998 otherwise they were generally less than 1% from 1999 to 2006 (table 4.1).

4.4.2 Late registration

The current processing phase (2007/8) included death notification forms for deaths that occurred in 2006 and additional notification forms for the years 1997-2005 that had not been received by Stats SA in the previous processing face. Table 4.2 provides information on the number of child deaths published in June 2007 for the years 1997-2005, and those obtained from additional forms received in the current processing phase for these years and the overall number of deaths for each year as of July 2008. In total 68 additional deaths notification forms for 1997-2005 were received in the 2007/8 processing phase. The majority of these were deaths that occurred in 2005. Very few additional forms were received for 1999 -2002.

Table 4.2: Number of deaths for children aged 1-4 years published in June 2007 and late registration processed in the 2007/8 processing phase by year of death: 1997-2005

Year of death	Number of deaths	Additional forms received in 2007/8 processing phase	Total number of deaths by (July 2008)
1997	7743	0	7743
1998	9436	0	9436
1999	9793	1	9794
2000	10 362	3	10 365
2001	11 234	0	11 234
2002	12 407	1	12 048
2003	13 409	11	13 420
2004	15 794	13	15 807
2005	15 435	39	15 574
2006	15 893	0	15 893

The results in table 4.2 show that late registration is not a major problem affecting the recorded child deaths.

4.5 RECORDED CHILD DEATHS IN SOUTH AFRICA, 1997-2006

Table 4.3 shows recorded deaths of children aged 1-4 years from 1997-2006 in South Africa. The recorded number of child deaths in South Africa increased from 7743 in 1997 to 15 893 in 2006 an increase of 107%. The increase in the number of deaths over time maybe a result of both the improvement in death registration as well as increasing mortality. For all the years the number of male deaths exceeds that of female.

Table 4.3: Number of recorded deaths of children aged 1-4 years, 1997-2006

<i>Sex of deceased</i>	<i>Year of death</i>									
	<i>1997</i>	<i>1998</i>	<i>1999</i>	<i>2000</i>	<i>2001</i>	<i>2002</i>	<i>2003</i>	<i>2004</i>	<i>2005</i>	<i>2006</i>
Male	4043	4858	5062	5366	5868	6303	7091	8181	8118	8299
Female	3648	4482	4633	4910	5289	5658	6240	7542	7238	7478
Unknown	29	11	4	2	-	2	5	1	-	-
Unspecified	23	85	94	84	77	84	73	70	79	116
<i>Total</i>	<i>7743</i>	<i>9436</i>	<i>9793</i>	<i>10362</i>	<i>11234</i>	<i>12047</i>	<i>13409</i>	<i>15794</i>	<i>15435</i>	<i>15893</i>

The table 4.4 shows that more than half of child deaths in age group 1-4 years occurred at age one year. The percentage of child deaths decreased from age one year to age four years. The proportion of deaths at age two years ranged from 21.89% of all deaths in 1997 to 24.41% of all death in 2002.

Table 4.4: Percentage distribution of child deaths by age of death and year of death (1997-2006)

Age of death	Year of death									
	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006
1	55.75%	54.65%	56.71%	53.45%	54.12%	51.72%	52.47%	52.39%	53.64%	59.28%
2	21.89%	23.26%	21.48%	23.41%	22.96%	24.41%	23.10%	22.26%	22.24%	19.88%
3	12.37%	12.66%	12.38%	13.14%	12.59%	14.06%	13.95%	14.02%	13.29%	11.77%
4	9.98%	9.42%	9.43%	9.99%	10.33%	9.80%	10.47%	11.33%	10.83%	9.07%
Total	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%
Total	7743	9436	9793	10362	11234	12047	13409	15794	15435	15893

4.6 METHODS OF ANALYSIS

This study is descriptive and basic descriptive analysis techniques are used where data is presented in the form of cross tabulation and percentages. Because the study is based on administrative data with no base population it is not amenable to inferential and statistical tests such as test significance.

The data covering the following variables are used in analysis,

Causes of death: immediate and underlying causes of death

Demographic characteristics:

1. Age in years
2. Death years (1997-2006)

3. *Sex of deceased (include male, female, unknown and unspecified)*
4. *Month of death*
5. *Province of death*

Software used for data analysis

Super-Cross was used to run all variables for each specific objective. Super-Cross is the Microsoft Window based tabulation system providing rapid access to very large database. It summarizes data in table presentation using Windows features. Using Super Cross one can quickly select fields, set criteria, and retrieve data using drag and drop. Tables can be changed by adding and deleting rows, columns and wafers, headers and formats. Super Cross can ask the most complex database questions to unlock the enormous amount of information your database contains. Super Cross is derived from Superstar suite of software. Superstar is the Space Time Research suite of software products. The design architecture separates core functionality into specific products. Microsoft excel is also used to extract charts and tables used in the report.

CHAPTER 5

ANALYSIS AND FINDINGS

5.1 INTRODUCTION

This chapter presents findings from the analysis of the leading immediate and underlying causes of death for children aged 1-4 years for the period 1997-2006. Underlying causes of death is defined as the disease or injury that initiated the chain of fatal events leading directly to death. In the cases of injury –related deaths the underlying cause can also be defined as the external circumstances of the accident or violence that was the cause of the fatal injury. The condition listed on the end of line of part 1 of the death certificate is usually the underlying cause of death. Immediate cause of death is defined as the disease, injury or condition directly leading to death and which was caused by the underlying cause of death.

5.2 TRENDS IN THE CAUSES OF DEATH

Table 5.1 shows the percentage distribution of child deaths by the leading immediate causes of death and year of death. The table shows that children aged 1-4 year in South Africa died mainly from pneumonia (organism unspecified) (J18) and Diarrhoea and gastroenteritis of presumed infectious origin (A09). Pneumonia and diarrhoea were the top two leading immediate cause of child mortality from 1997 to 2006. The proportion of children dying due to pneumonia (organism unspecified) as an immediate cause increased from 13.05 % in 1998 to 17.70 % in 2004. The proportion of children dying from diarrhoea and gastroenteritis of presumed infectious origin (A09) as an immediate cause increased from 16.35% in 1999 to 17.87% in 2006. Actual numbers of deaths for this table are attached in **Appendix V(a)**.

Table 5.1: Percentage distribution of child deaths (1-4 years) by leading immediate causes of death and year of death (1997-2006)

Leading immediate causes of death	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006
<i>J18 Pneumonia; organism unspecified</i>	11.62	13.05	14.36	17.87	19.03	19.35	19.29	17.70	16.68	16.91
<i>A09 Diarrhoea and gastroenteritis of presumed infectious origin (A09)</i>	14.52	13.72	16.35	15.51	14.42	15.38	16.58	17.08	17.01	17.87
<i>E86 Volume depletion</i>	3.02	3.30	4.08	4.10	3.91	4.31	3.77	3.38	4.20	4.34
<i>A16 Respiratory tuberculosis; not confirmed bacteriologically or histologically (A16)</i>	1.89	2.28	2.28	2.92	3.56	3.74	3.79	3.64	3.38	3.47
<i>A41 Other septicaemia</i>	2.75	3.01	3.53	3.28	3.18	2.99	2.67	2.65	2.87	2.68
<i>I46 Cardiac arrest</i>	6.06	5.40	3.66	2.35	1.91	2.53	2.01	2.22	1.35	1.94
<i>E40 Kwashiorkor</i>	2.97	2.99	2.79	2.75	2.74	2.62	2.10	1.85	1.73	1.88
<i>E46 Unspecified protein-energy malnutrition</i>	1.95	2.22	2.16	2.35	2.03	2.36	2.29	2.14	2.06	2.04
<i>I50 Heart failure</i>	3.23	3.02	2.19	1.64	1.48	1.34	1.48	1.66	1.41	1.36
<i>G03 Meningitis due to other and unspecified causes</i>	1.07	1.36	1.25	1.50	1.27	1.25	1.38	1.31	1.36	1.43
<i>Other non-natural causes</i>	20.09	16.68	15.76	13.82	12.53	11.10	9.73	8.22	9.49	9.63
<i>Other natural causes of</i>	30.83	32.99	31.60	31.92	33.95	33.02	34.92	38.15	38.47	36.46
Total %	100	100	100	100	100	100	100	100	100	100
Total number	7742	9434	9788	10360	11224	12045	13399	15771	15424	15893

Table 5.2 shows the leading underlying causes of death by year of death. Diarrhoea and gastroenteritis of presumed infectious origin and pneumonia (organism unspecified) were the major underlying causes of death among children aged 1-4 years in South Africa. Diarrhoea and gastroenteritis of presumed infectious origin as underlying causes of death accounted for over 20% of child death from 1997 to 2006. Pneumonia (organism unspecified) was the second leading underlying causes of child mortality in the period 2000-2003 while respiratory tuberculosis causes ranked number three from 2001 to 2006.

Five of the leading immediate causes of death in table 5.1 were also among the ten leading causes of death on table 5.2. These include diarrhoea and gastroenteritis (A09), pneumonia (organism unspecified) (J18), volume depletion (E86) and unspecified protein energy malnutrition. The proportion of child deaths attributed to HIV as an underlying causes decreased consistently from 2.74 % in 1999 to 0.69% in 2006. The proportion of child deaths due to pneumonia as an underlying cause increased from 7.7% in 1997 to 13.79 in 2003 and 12.94 in 2006. Actual numbers of deaths for this table are attached on **Appendix V(b)**

Table 5.2: Percentage distribution of child deaths (1-4 years) by leading underlying causes of death and year of death (1997-2006)

CAUSES OF DEATH	YEAR OF DEATH									
	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006
Leading underlying causes of death										
<i>A09 Diarrhoea and gastroenteritis of presumed infectious origin (A09)</i>	20.64	20.24	23.05	21.60	20.29	21.64	22.78	22.81	23.35	24.60
<i>J18 Pneumonia; organism unspecified</i>	7.80	8.45	9.16	11.68	12.60	13.33	13.79	13.26	12.46	12.94
<i>A16 Respiratory tuberculosis; not confirmed bacteriologically or histologically (A16)</i>	2.65	3.22	2.95	3.85	4.60	4.76	4.85	4.57	4.43	4.83
<i>E40 Kwashiorkor</i>	4.92	5.27	4.92	4.27	3.87	3.69	3.15	2.61	2.75	2.84
<i>D84 Other immunodeficiencies</i>	1.39	2.30	3.53	3.65	4.06	3.84	4.16	3.50	3.04	2.47
<i>E46 Unspecified protein-energy malnutrition</i>	2.47	2.96	2.37	2.75	2.26	2.78	2.48	2.36	2.09	2.11
<i>B20 Human immunodeficiency virus (HIV) disease resulting in infectious and parasitic diseases</i>	2.18	2.15	2.74	2.41	2.21	1.98	1.42	0.99	0.81	0.69
<i>B33 Other viral diseases; not elsewhere classified</i>	0.52	0.92	1.31	1.45	1.89	2.00	2.55	1.89	1.88	1.92
<i>G03 Meningitis due to other and unspecified causes</i>	0.94	0.99	1.07	1.24	1.00	1.10	1.06	1.01	1.22	1.35
<i>E86 Volume depletion</i>	0.94	0.92	0.92	1.01	0.92	1.17	0.92	0.92	1.07	0.87
<i>Other natural causes</i>	35.46	35.91	32.23	32.27	33.79	32.61	33.10	37.88	37.43	35.76
<i>Non-natural causes</i>	20.08	16.68	15.76	13.82	12.52	11.10	9.72	8.21	9.48	9.63
<i>All causes</i>	100	100	100	100	100	100	100	100	100	100
<i>Total number of death</i>	7743	9436	9793	10362	11234	12047	13409	15794	15435	15893

5.3 SEX DIFFERENTIALS

Table 5.3 shows the percentage distribution of child deaths by sex and year of death. Across all the years, the proportion of males exceeded that of females. The proportion of male deaths varied from 52.21% of child deaths in 1997 to 52.22% of child deaths in 2006. The proportion of female child deaths varied from 47.11% in 1997 to 47.05% in 2006. Actual numbers of deaths for this table are attached on **Appendix VI**

Table 5.3: Percentage distribution of child deaths by sex (1997-2006)

<i>Sex of deceased</i>	<i>Year of death</i>									
	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006
<i>Male</i>	52.21	51.48	51.69	51.79	52.23	52.32	52.88	51.80	52.59	52.22
<i>Female</i>	47.11	47.50	47.31	47.38	47.08	46.97	46.54	47.75	46.89	47.05
<i>Unknown</i>	0.37	0.12	0.04	0.02	0.00	0.02	0.04	0.01	0.00	0.00
<i>Unspecified</i>	0.30	0.90	0.96	0.81	0.69	0.70	0.54	0.44	0.51	0.73
<i>Total</i>	100	100	100	100	100	100	100	100	100	100
<i>Total number of deaths</i>	7743	9436	9793	10362	11234	12047	13409	15794	15435	15893

Table 5.4 shows the distribution of child deaths by sex and leading immediate cause of death and ranking of causes of death for the period 1997-2006. Pneumonia (organism unspecified) ranked number one as the leading immediate cause of death for both males and females. Diarrhoea and gastroenteritis of presumed infectious origin (A09) ranked number two for both sexes. Generally the ranking of the leading immediate causes of death were the same for both males and females. Actual numbers of deaths for this table are attached on **Appendix VI (A)**.

Table 5.4: Ranking of the leading immediate causes of child deaths by sex, South Africa, 1997-2006

Leading immediate causes of death	Number of deaths			Rank		
	Male	Female	Unspecified	Male	Female	Unspecified
<i>J18 Pneumonia; organism unspecified</i>	10375	9971	138	1	1	1
<i>A09 Diarrhoea and gastroenteritis of presumed infectious origin (A09)</i>	9997	9361	105	2	2	2
<i>E86 Volume depletion</i>	2433	2232	35	3	3	3
<i>A16 Respiratory tuberculosis; not confirmed bacteriologically or histologically (A16)</i>	1994	1881	17	4	4	4
<i>A41 Other septicaemia</i>	1810	1713	20	5	5	5
<i>I46 Cardiac arrest</i>	1569	1474	14	6	6	6
<i>E40 Kwashiorkor</i>	1443	1363	22	7	7	7
<i>E46 Unspecified protein-energy malnutrition</i>	1379	1216	17	8	8	8
<i>I50 Heart failure</i>	1081	1043	15	9	9	9
<i>G03 Meningitis due to other and unspecified causes</i>	867	732	10	10	10	10
All Other causes	30206	26096	391	-	-	-
Total number of deaths	63154	57082	784	-	-	-

Table 5.5 shows the distribution of child deaths by sex and leading underlying cause of death and the ranking of cause of deaths for the period 1997-2006. Diarrhoea and gastroenteritis of presumed infectious origin (A09) ranked number one as the leading underlying cause of death for both males

and females over the period 1997-2006. Pneumonia (organism unspecified) ranked number two for both sexes as the leading underlying cause of death. Human immunodeficiency virus (HIV) ranked number eight for both males and females. Generally, the ranking of the leading underlying causes of child death were the same for males and females over the period 1997 to 2006. Actual numbers of deaths for this table are shown in **Appendix vi (B)**.

Table 5.5: Ranking of the leading underlying causes of child deaths by sex, South Africa, 1997-2006

Leading underlying causes of death	Number of deaths			Rank		
	Male	Female	Unspecified	Male	Female	Unspecified
<i>A09 Diarrhoea and gastroenteritis of presumed infectious origin</i>	13923	12962	160	1	1	1
<i>J18 Pneumonia; organism unspecified</i>	7302	7042	103	2	2	2
<i>A16 Respiratory tuberculosis; not confirmed bacteriologically or histologically</i>	2668	2415	27	3	3	3
<i>E40 Kwashiorkor</i>	2218	2132	37	4	4	4
<i>D84 Other immunodeficiencies</i>	1977	1943	20	5	5	5
<i>E46 Unspecified protein-energy malnutrition</i>	1520	1399	19	6	6	6
<i>B33 Other viral diseases; not elsewhere classified</i>	1046	1035	12	7	7	7
<i>B20 Human immunodeficiency virus (HIV) disease resulting in infectious and parasitic diseases</i>	997	952	10	8	8	8
<i>G03 Meningitis due to other and unspecified causes</i>	742	600	6	9	9	9
<i>E86 Volume depletion</i>	574	589	9	10	10	10
Other causes of death	30222	26049	382	-	-	-
All causes of death	63189	57118	785	-	-	-

5.4 PROVINCIAL VARIATIONS

Table 5.6 shows the percentage distribution of deaths by province and year of death. In all the years Kwa Zulu Natal was the leading province with the highest percentage of deaths followed by Gauteng and then Eastern Cape. The province with the least percentage of death is Northern Cape and the Western Cape. Kwa Zulu Natal and Gauteng contributed more deaths as the two provinces are more populated as compared to other provinces in South Africa. Northern Cape is the least populated province that is why it is contributing the least. Actual numbers of this table are attached on *Appendix VII*.

Table 5.6: Percentage distribution of child deaths by province of death, 1997-2006

Province of death	Year of death									
	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006
<i>Western Cape</i>	6.33	6.09	5.75	5.91	5.16	5.21	4.75	4.24	3.68	3.54
<i>Eastern Cape</i>	10.58	10.27	10.63	11.19	11.43	10.77	11.16	11.95	11.83	11.10
<i>Northern Cape</i>	2.92	2.47	2.49	2.84	2.74	2.35	2.15	2.15	1.86	2.08
<i>Free State</i>	9.01	8.91	9.64	8.83	8.65	8.92	9.22	9.13	8.77	9.29
<i>KwaZulu Natal</i>	27.48	28.15	26.88	25.33	25.32	24.06	24.24	25.21	25.58	21.58
<i>North West</i>	10.55	9.82	10.70	11.53	10.74	11.48	12.27	11.44	11.29	12.55
<i>Gauteng</i>	17.07	17.77	17.45	17.07	17.65	18.78	17.87	17.12	16.02	16.92
<i>Mpumalanga</i>	7.39	7.28	7.76	7.93	8.79	8.79	8.90	8.07	9.65	9.56
<i>Limpopo</i>	8.67	9.22	8.70	9.36	9.49	9.60	9.40	10.62	11.28	13.34
<i>Outside RSA</i>	0.00	0.01	0.00	0.00	0.03	0.02	0.05	0.06	0.03	0.03
Total %	100	100	100	100	100	100	100	100	100	100
Total (numbers)	7743	9436	9793	10362	11234	12047	13409	15794	15435	15893

Table 5.7 shows the ranking of the six leading immediate causes of death for children aged 1-4 years in South Africa by province of death. Diarrhoea and gastroenteritis of presumed infectious origin ranked number one in the following provinces Eastern Cape, Northern Cape, KwaZulu Natal Mpumalanga and Limpopo. Pneumonia (organism unspecified) ranked number one in Western Cape, Free State, North West and Gauteng. Volume depletion ranked number three in Free State, North West, Mpumalanga and Limpopo. Actual numbers of deaths for this table are shown in **Appendix viia**

Table 5.7: Ranking of the six leading immediate causes of death among children aged 1-4 years by province of death, South Africa 1997-2006

Leading immediate causes of death	Province of death								
	Western Cape	Eastern Cape	Northern Cape	Free State	KwaZulu-Natal	North West	Gauteng	Mpumalanga	Limpopo
<i>J18 Pneumonia, organism unspecified</i>	1	2	2	1	2	1	1	2	2
<i>A09 Diarrhoea and gastroenteritis of presumed infectious origin</i>	2	1	1	2	1	2	2	1	1
<i>E86 Volume depletion</i>	-	-	5	3	-	3	-	3	3
<i>A16 Respiratory tuberculosis, not confirmed bacteriologically or histologically</i>	4	3	4	6	3	6	5	4	5
<i>A41 Other septicaemia</i>	3	6	-	-	4	-	4	6	6
<i>I46 Cardiac arrest</i>	5	4			5		3	-	-
<i>E40 Kwashiorkor</i>		5	6	5	6	5		-	-
<i>E46 Unspecified protein-energy malnutrition</i>	-	-	-	4	-	4		-	-
<i>I50 Heart failure</i>	6	-	-	-	-	-	-	-	4
<i>G03 Meningitis due to other and unspecified causes</i>	-	-	3	-	-	-	6	5	-

Table 5.8 shows the ranking of the leading underlying causes of death by province of death. Diarrhoea and gastroenteritis of presumed infectious origin ranked number one as the leading underlying cause of death in all provinces. Pneumonia (organism unspecified) is also ranked number two as the leading underlying causes of death in all provinces. Respiratory tuberculosis ranked number three in Kwa Zulu Natal and Eastern Cape whereas in North West and Gauteng it ranked number five. Actual number of deaths for this table are shown in **Appendix VII(B)**

Table 5.8: Ranking of the six leading underlying causes of death among children aged 1-4 years by province of death, South Africa 1997-2006

Leading underlying causes of death	Province of death								
	Western Cape	Eastern Cape	Northern Cape	Free State	KwaZulu -Natal	North West	Gauteng	Mpumalanga	Limpopo
<i>A09 Diarrhoea and gastroenteritis of presumed infectious origin (A09)</i>	1	1	1	1	1	1	1	1	1
<i>J18 Pneumonia; organism unspecified</i>	2	2	2	2	2	2	2	2	2
<i>A16 Respiratory tuberculosis; not confirmed bacteriologically or histologically (A16)</i>	4	3	4	4	3	5	5	4	4
<i>E40 Kwashiorkor</i>	6	5	3	5	4	4	6	5	3
<i>D84 Other immunodeficiencies</i>	5	4		6	5	3	4	3	6
<i>E86 Volume depletion</i>	-	-	-	-	-	-	-	-	-
<i>E46 Unspecified protein-energy malnutrition</i>		6	5	3	6	6		6	5
<i>A41 Other septicaemia</i>	-		-		-	-	-	-	-
<i>B20 Human immunodeficiency virus (HIV) disease resulting in infectious and parasitic diseases</i>	3	-	6	-	-	-	3	-	-
<i>B33 Other viral diseases; not elsewhere classified</i>	-	-	-	-	-	-	-	-	-

5.5 VARIATION BY MONTH OF DEATH

Due to climatic changes, causes of death vary by month of death. Common disease in winter is flu which at times causes pneumonia. Even in summer there are diseases associated with that season. Causes of death vary by month of death due to temperature conditions or changes.

Table 5.9 shows the percentage distribution of child deaths by month of death in South Africa, 1997-2006. Generally March and April shows relatively high percentages of deaths as compared to other months. Also the months of August to November are associated with the smallest proportion of child deaths over the period 1997-2006.

Table 5.9: Percentage distribution of child deaths by month of death, South Africa, (1997-2006)

	YEAR OF DEATHS									
<i>Month of death</i>	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006
<i>Jan</i>	7.26	8.02	11.04	8.22	9.17	11.16	7.85	8.81	9.40	8.53
<i>Feb</i>	9.39	8.36	12.01	9.70	7.52	9.13	8.29	9.04	9.82	9.97
<i>Mar</i>	10.42	9.76	12.44	10.94	7.93	9.60	9.72	9.68	10.66	12.91
<i>Apr</i>	10.87	9.16	9.33	9.32	8.32	9.30	8.72	10.12	8.74	11.33
<i>May</i>	9.74	12.08	8.19	8.93	9.49	8.73	9.34	10.04	9.23	10.00
<i>Jun</i>	8.32	9.45	7.34	7.73	8.77	8.09	8.96	9.05	9.26	8.75
<i>Jul</i>	6.91	6.44	6.40	7.97	8.57	8.09	8.45	7.54	7.74	6.86
<i>Aug</i>	6.88	6.20	5.67	7.38	8.05	6.88	7.79	7.21	7.11	6.37
<i>Sep</i>	6.73	6.48	5.55	6.93	7.40	6.62	7.20	6.34	6.17	5.59
<i>Oct</i>	7.61	6.74	6.35	7.20	7.06	7.11	6.82	6.62	7.18	6.22
<i>Nov</i>	7.57	8.18	6.94	7.56	7.28	7.04	7.27	7.05	6.96	6.43
<i>Dec</i>	8.30	9.12	8.73	8.12	10.44	8.25	9.59	8.50	7.74	7.03
Total %	100	100	100	100	100	100	100	100	100	100
Total number of deaths	7743	9436	9793	10362	11234	12047	13409	15794	15435	15893

Table 5.10 shows the ranking of the six leading immediate causes of deaths by month of death. Table 5.10 shows that diarrhoea and gastroenteritis of presumed infectious origin ranked first from January–May and ranked number two from June –November as the leading immediate causes of death. Pneumonia (organism unspecified) ranked first from May to November and ranked number two from December to April. Respiratory tuberculosis (not confirmed bacteriologically or histologically) ranked third from July to November. Actual numbers of deaths for this table are shown on **Appendix viii(a)**

Table 5.10 Ranking of the six leading immediate causes of death for children aged 1-4 years by month of death in South Africa, 1997-2006

Leading immediate causes of death	Year of death											
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
<i>A09 Diarrhoea and gastroenteritis of presumed infectious origin</i>	1	1	1	1	1	2	2	2	2	2	2	1
<i>J18 Pneumonia, organism unspecified</i>	2	2	2	2	1	1	1	1	1	1	1	2
<i>A16 Respiratory tuberculosis, not confirmed bacteriologically or histologically</i>	5	6	5	6	4	4	3	3	3	3	3	4
<i>A41 Other septicaemia</i>	4	4	4	4	3	5	5	4	4	5	5	5
<i>E40 Kwashiorkor</i>	6	4	5	5	5	-	-	-	-	-	-	-
<i>E46 Unspecified protein-energy malnutrition</i>	-	-	-	-	-	-	-	-	-	-	6	-
<i>E86 Volume depletion</i>	3	3	3	3	2	3	4	6	5	4	4	3
<i>G03 Meningitis due to other and unspecified causes</i>	-	-	-	-	-	-	-	-	-	-	-	-
<i>I46 Cardiac arrest</i>	-	5	6		6	6	6	5	6	6		6
<i>I50 Heart failure</i>	-	-	-	-	-	-	-	-	-	-	-	-

The ranking of the underlying causes of death by month of death is shown in table 5.11. The table indicates that diarrhoea and gastroenteritis of presumed infectious origin (A09) ranked number one

in all the months except August where it is ranked number two. This is followed by pneumonia (organism unspecified) which similarly ranked number two in all the months except August. Respiratory tuberculosis ranked number three from June to December whereas in January to May it ranked number four. Actual numbers of deaths for this table are shown in **Appendix viii (B)**

Table 5.11: Ranking of the six leading underlying causes of death for children aged 1-4 years by month of death, South Africa, 1997-2006

Underlying causes of death	Month of death											
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
<i>A09 Diarrhoea and gastroenteritis of presumed infectious origin</i>	1	1	1	1	1	1	1	2	1	1	1	1
<i>J18 Pneumonia; organism unspecified</i>	2	2	2	2	2	2	2	1	2	2	2	2
<i>A16 Respiratory tuberculosis; not confirmed bacteriologically or histologically</i>	4	4	4	4	4	3	3	3	3	3	3	3
<i>B20 Human immunodeficiency virus (HIV) disease resulting in infectious and parasitic diseases</i>	6	-	-	-	-	-	-	-	-	-	-	-
<i>D84 Other immunodeficiencies</i>	-	5	5	5	5	5	4	4	4	4	4	4
<i>E40 Kwashiorkor</i>	3	3	3	3	3	4	5	5	5	5	5	5
<i>E46 Unspecified protein-energy malnutrition</i>	5	6	6	6	6	6	6	6	6	6	6	6
<i>E86 Volume depletion</i>	-	-	-	-	-	-	-	-	-	-	-	-

CHAPTER 6

CONCLUSION AND RECOMMENDATION

6.1 INTRODUCTION

This chapter gives the summary and conclusion as well as recommendations of the study based on findings of this research.

6.2 CONCLUSION

The data used for analysis of the immediate and underlying causes of death presented in this report was acquired from Statistics South Africa. The analysis was presented in tables, percentage and rankings.

There is a general increase in the number of deaths reported from 1997-2006. The increase in recorded child deaths from 1997-2006 may be attributed partly to increasing population, increasing mortality and improvements in the vital registration system.

Leading immediate and underlying cause of death:

The main underlying and immediate causes of death among for children aged 1-4 years in South Africa are diarrhea and gastroenteritis of presumed infectious origin, pneumonia (organism unspecified), respiratory tuberculosis, kwashiorkor and unspecified protein energy malnutrition. These are generally diseases associated with poverty, inadequate primary health care and unhygienic living conditions. Pneumonia (organism unspecified) and diarrhoea of presumed infectious origin were the leading immediate cause of child mortality from 1997-2006. The proportion of children dying due to pneumonia (organism unspecified) as the immediate cause of death increased from 13.05 % in 1998 to 17.70% in 2004. The proportion of children dying from diarrhoea and gastroenteritis of presumed infectious origin as an immediate cause increased from 16.35% in 1999 to 17.87% in 2006. Diarrhoea and gastroenteritis of presumed infectious origin and pneumonia (organism unspecified) were the leading underlying cause of death among children aged 1-4 years in South Africa. Diarrhoea and gastroenteritis of presumed infectious origin as underlying cause of

death accounted for over 20% of child death as the leading underlying cause from 1997 to 2006. Pneumonia (organism unspecified) was the second leading underlying cause of child mortality in period 2000-2003 while respiratory tuberculosis was the third cause of death from 2001- 2006. In conclusion the five leading immediate cause of death were also among the ten leading underlying cause of death.

Sex variation:

Pneumonia (organism unspecified) ranked number one as the leading immediate cause of death for both males and females. Diarrhoea and gastroenteritis of presumed infectious origin ranked number two for both sexes. Generally the ranking of the leading immediate cause of death were the same for both sexes.

Diarrhoea and gastroenteritis of presumed infectious origin ranked number one as the leading underlying cause of death for both males and females over the period 1997-2006. Pneumonia (organism unspecified) ranked number two for both sexes as the leading underlying cause of death. Generally the ranking of the leading underlying cause of death was the same for both males and females.

Provincial variation:

Pneumonia (organism unspecified) ranked number one as the immediate cause of death in Western Cape, Free State, North West, and Gauteng. Diarrhoea and gastroenteritis of presumed infectious origin ranked number one in Eastern Cape, Northern Cape, Kwa-Zulu Natal, Mpumalanga and Limpopo as the leading immediate cause of death. Diarrhoea and gastroenteritis of presumed infectious origin ranked number one as the leading underlying cause of death in all provinces. Pneumonia (organism unspecified) ranked number two as the leading underlying cause of death in all provinces. Respiratory tuberculosis ranked number three in Kwa-Zulu Natal, Eastern Cape whereas in North West and Gauteng it ranked number five. The study shows that there is variation of cause in death by province. However, the ten leading underlying causes of death are among the leading immediate causes of death.

Variation by month:

In South Africa, there is a variation in the cause of death by month of death. Diarrhoea and gastroenteritis of presumed infectious origin ranked number one as the leading immediate cause of death among children aged 1-4 years from January to May and ranked number two from June to November. Pneumonia (organism unspecified) ranked number one from May to November and ranked number two December to April. Respiratory tuberculosis ranked number third from July to November. Diarrhoea and gastroenteritis of presumed infectious origin ranked number one in all the months except in August where it is ranked number two as the leading underlying cause of death. Pneumonia (organism unspecified) which is similarly ranked number two in all the months except number three from June to December whereas in January to May it ranked number four.

6.3 RECOMMENDATIONS

Understanding the causes of death for children aged 1-4 years in South Africa is fundamental to the development of the country. The analysis presented in this report reveals the seriousness of the need for further research on the underlying causes of death in South Africa.

In view of the findings of this study the following policy and research recommendations are made:

- Need for continued improvements of causes of death data for ongoing monitoring of progress in health, including monitoring of MDG 4.
- Audits of child deaths similar to confidential inquiry on maternal deaths to improve the quality of causes of death data.
- If South Africa wants to ensure the survival of its next generation, they must focus on providing low-cost, simple intervention to keep these young children healthy.
- Expanding access to safe water will reduce the incidence of diseases contributing to child death.
- Resources should be targeted to provinces, where child mortality is greatest, based on the severity and magnitude.

APPENDIX SECTION

Notification / register of death / still birth (BI-1663)

REPUBLIC OF SOUTH AFRICA
DEPARTMENT OF HOME AFFAIRS

BI - 1603

NOTIFICATION / REGISTER OF DEATH / STILL BIRTH

In terms of the Births and Deaths Registration Act,
1992 (Act No. 51 of 1992)

Space for Box Code

* Must be completed in black ink (please tick ☒ where applicable)

* Please refer to instructions

FILE NO

DATE

SERIAL No:

A0 1857265

A PARTICULARS OF DECEASED INDIVIDUAL ☐ / STILLBORN CHILD ☐		Date of birth 	
Identity number of deceased 	Date of death 	Age at last birthday years	Sex
Surname 	If death occurred within 24 hours after birth No. of hours alive		
Maiden Name (if female) 	Religious Law Marriage ☐ Divorced ☐ Customary Marriage ☐		
Forenames 	Left hand joint of deceased		
MARITAL STATUS OF DECEASED Single ☐ Civil Marriage ☐ Living as married ☐ Widowed ☐			
Religious Law Marriage ☐ Divorced ☐ Customary Marriage ☐			
PLACE OF BIRTH (municipal district or country if abroad) _____			
PLACE OF DEATH (city / town / village) _____			
PLACE OF REGISTRATION OF DEATH _____			
CITIZENSHIP OF DECEASED _____			
B PARTICULARS OF INFORMANT		Left hand joint of informant	
Identity number 	Initials and Surname 		
Relationship to deceased Parent ☐ Spouse ☐ Child ☐ Other (specify) ☐	Postal address 		
Postal address 	Postal Code 	Dialling Code 	Telephone No.
Was the report of loss of the deceased a "stroke" during the past five years? Yes ☐ No ☐			
Date _____ Signature _____			
C PARTICULARS OF FUNERAL UNDERTAKER		Office Stamp of Funeral Undertaker	
Initials and Surname 		Postal Address 	
Designation No. 		Place of burial / cremation _____	
Date _____ Signature _____		SAMDC / SANU Reg. No.	
INITIALS AND SURNAME _____ SIGNATURE _____		Date signed	
D CERTIFICATE BY ATTENDING MEDICAL PRACTITIONER / PROFESSIONAL NURSE			
I, the undersigned, hereby certify that the deceased named in Section A, in the best of my knowledge and belief, died solely and exclusively due to NATURAL CAUSES specified in Section G. ☐		Postal Address 	
I, the undersigned, am not in the position to certify that the deceased died exclusively due to natural causes. ☐		Postal Code 	
CERTIFICATE BY DISTRICT SURGEON / FORENSIC PATHOLOGIST		SAMDC / SANU Reg. No.	
I, the undersigned, hereby certify that a medicolegal post-mortem examination has been conducted on the body of the person whose particulars are given in Section A and that the body is no longer required for the purpose of the Inquest Act, 1959 (Act No. 58 of 1959) and that the cause of death is:		Date signed	
Unnatural ☐ Under investigation ☐		Postal Address 	
Natural (Cause of Death as indicated in Section C) ☐		Postal Code 	
Initials and Surname 		Memory Reference	
Place of post-mortem _____ Date		SAMDC Reg. No.	
Signature _____ Date signed		Other Stamp	

APPENDIX II

International Statistical Classification of Diseases and Related Health Problems

10th Revision

Version for 2007

Tabular List of inclusions and four-character subcategories

Chapter List

<i>Chapter Blocks</i>	<i>Title</i>
<u><i>I</i></u> <u><i>A00-B99</i></u>	<i>Certain infectious and parasitic diseases</i>
<u><i>II</i></u> <u><i>C00-D48</i></u>	<i>Neoplasms</i>
<u><i>III</i></u> <u><i>D50-D89</i></u>	<i>Diseases of the blood and blood-forming organs and certain disorders involving the immune mechanism</i>
<u><i>IV</i></u> <u><i>E00-E90</i></u>	<i>Endocrine, nutritional and metabolic diseases</i>
<u><i>V</i></u> <u><i>F00-F99</i></u>	<i>Mental and behavioural disorders</i>
<u><i>VI</i></u> <u><i>G00-G99</i></u>	<i>Diseases of the nervous system</i>
<u><i>VII</i></u> <u><i>H00-H59</i></u>	<i>Diseases of the eye and adnexa</i>
<u><i>VIII</i></u> <u><i>H60-H95</i></u>	<i>Diseases of the ear and mastoid process</i>
<u><i>IX</i></u> <u><i>I00-I99</i></u>	<i>Diseases of the circulatory system</i>

<u>X</u>	<u>J00-J99</u>	<i>Diseases of the respiratory system</i>
<u>XI</u>	<u>K00-K93</u>	<i>Diseases of the digestive system</i>
<u>XII</u>	<u>L00-L99</u>	<i>Diseases of the skin and subcutaneous tissue</i>
<u>XIII</u>	<u>M00-M99</u>	<i>Diseases of the musculoskeletal system and connective tissue</i>
<u>XIV</u>	<u>N00-N99</u>	<i>Diseases of the genitourinary system</i>
<u>XV</u>	<u>O00-O99</u>	<i>Pregnancy, childbirth and the puerperium</i>
<u>XVI</u>	<u>P00-P96</u>	<i>Certain conditions originating in the perinatal period</i>
<u>XVII</u>	<u>Q00-Q99</u>	<i>Congenital malformations, deformations and chromosomal abnormalities</i>
<u>XVIII</u>	<u>R00-R99</u>	<i>Symptoms, signs and abnormal clinical and laboratory findings, not elsewhere classified</i>
<u>XIX</u>	<u>S00-T98</u>	<i>Injury, poisoning and certain other consequences of external causes</i>
<u>XX</u>	<u>V01-Y98</u>	<i>External causes of morbidity and mortality</i>
<u>XXI</u>	<u>Z00-Z99</u>	<i>Factors influencing health status and contact with health services</i>
<u>XXII</u>	<u>U00-U99</u>	<i>Codes for special purposes</i>

[illegible]

D. DECLARATION BY TRADITIONAL LEADER OR WARD COUNCILOR

BARGODE

My role is: Traditional leader ☐ Ward Councilor ☐

I, the undersigned, hereby declare that:

(choose the applicable option)

- a) I was present at the above mentioned death / saw the body; ☐
- b) I did not witness the death and did not see the body. The certificate is issued in good faith. ☐
- c) The information furnished under sections A and B is to the best of my knowledge and belief true and correct ☐
- d) A medical practitioner could not certify the death for the following reasons: ☐

I, the undersigned, hereby declare under oath that the information submitted in this form and supporting documents is true and correct. I understand that a false statement is punishable under section 31 of the Births and Deaths Registration Act 51 of 1992.

Date signed

Signature

Place signed

E. PARTICULARS OF TRADITIONAL LEADER OR WARD COUNCILOR

(Completed by Traditional Leader or Ward Councilor)

I, the undersigned, hereby certify that the information provided above is to the best of my knowledge and belief true and correct

Identity number

Date of birth Designation no.

Surname

Forename

Residential address: Street

Town Postal code

Province Telephone number (office)

Cellphone no.

Date signed

Let the undersigned of Traditional Leader or Ward Councilor

Office Stamp

Signature

F. FORM DELIVERED TO HOME AFFAIRS OFFICE BY

Identity no. (passport if foreigner)

Surname

Forename

Relationship to the deceased ☐ Parent ☐ Spouse ☐ Child ☐ Other, specify

☐ Traditional leader ☐ Ward Councilor

G. FOR OFFICIAL USE ONLY

The information stated above has been checked for correctness and found to be in order

☐ Need investigation ☐

Identity number

Surname

Forename

Postal no.

Rank/Role

Form Submitted by:

Office stamp

Signature

Date signed

Documents included with this application:

☐ Original ID of Deceased

☐ Copy of ID document of the informant

DHA-1880 was submitted by:

☐ Informant

☐ Traditional leader

☐ Ward Councilor

Appendix IV: Population distribution by 5 year age groups and sex, census 1996, 2001 and community survey 2007

Census 1996				Census 2001				Community Survey 2007			
Age group	Male	Female	Total	Age group	Male	Female	Total	Age group	Male	Female	Total
0 - 4	2216763	2226858	4443621	0 - 4	223 731	2 226 085	4 449 816	0 - 4	2503035	2482142	4985176
5 - 9	2333563	2335160	4668723	5 - 9	2425804	2427751	4853555	5 - 9	2564274	2552539	5116814
10 - 14	2308759	2345341	4654100	10 - 14	2518956	2 542 961	4 853 555	10 - 14	2456503	2490499	4947002
15 - 19	2050213	2130503	4180716	15 - 19	2453079	2 528 642	5 061 917	15 - 19	2560000	2533139	5093139
20 - 24	1917918	2064435	3982353	20 - 24	2099293	2 195 230	4 981 721	20 - 24	2371767	2420041	4791808
25 - 29	1663064	1792664	3455728	25 - 29	1899124	2 035 814	4 294 523	25 - 29	2042480	2022312	4064792
30 - 34	1463499	1610702	3074201	30 - 34	1594488	1 746 412	3 934 939	30 - 34	1884867	1853621	3738488
35 - 39	1284955	1368800	2653755	35 - 39	1441507	1 630 264	3 340 901	35 - 39	1553069	1664562	3217631
40 - 44	1030597	1108028	2138625	40 - 44	1233632	1 385 832	3 071 770	40 - 44	1310880	1524420	2835300
45 - 49	813816	863710	1677526	45 - 49	967604	1 119 776	2 619 465	45 - 49	1109868	1298414	2408282
50 - 54	600477	668418	1268895	50 - 54	769499	868 521	2 087 380	50 - 54	891687	1075698	1967385
55 - 59	483678	586258	1069936	55 - 59	552 323	652 943	1 638 020	55 - 59	711156	854997	1566153
60 - 64	352053	538483	890536	60 - 64	444 510	620 784	1 205 266	60 - 64	494016	663670	1157685
65 - 69	304013	454874	758887	65 - 69	304 763	483 164	1 065 294	65 - 69	395071	567121	962193
70 - 74	195119	287044	482163	70 - 74	232 547	398 922	787 927	70 - 74	241884	423211	665095
75 - 79	141844	235583	377427	75 - 79	136 436	231 101	631 469	75 - 79	163118	316968	480086
80 - 84	62072	116831	178903	80 - 84	90 835	180 111	270 945	80 - 84	87685	176113	263798
85+	43230	94054	137284	85+	45 907	111 425	157 333	85+	70703	170533	241236
Total	19 520 886	21 062 687	40 583 5739	Grand total	21 434 040	23 385 737	44 819 778	Total	23412062	25090001	48502063

Appendix V: Trends of causes of death

Total number of death by year of death for children aged 1-4 years in South Africa

	<i>Year of death</i>									
<i>Age</i>	<i>1997</i>	<i>1998</i>	<i>1999</i>	<i>2000</i>	<i>2001</i>	<i>2002</i>	<i>2003</i>	<i>2004</i>	<i>2005</i>	<i>2006</i>
<i>1</i>	4317	5157	5554	5539	6080	6231	7036	8274	8280	9421
<i>2</i>	1695	2195	2104	2426	2579	2941	3098	3515	3432	3160
<i>3</i>	958	1195	1212	1362	1414	1694	1871	2215	2052	1870
<i>4</i>	773	889	923	1035	1161	1181	1404	1790	1671	1442
<i>Total</i>	7743	9436	9793	10362	11234	12047	13409	15794	15435	15893

Appendix v(a)

Total number of leading immediate causes of death for children aged 1-4 years in South Africa by year of death: 1997-2006

Leading immediate causes of death	Year of death									
	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006
<i>J18 Pneumonia; organism unspecified</i>	900	1231	1406	1851	2136	2331	2584	2792	2572	2687
<i>A09 Diarrhoea and gastroenteritis of presumed infectious origin (A09)</i>	1124	1294	1600	1607	1618	1853	2221	2694	2624	2840
<i>E86 Volume depletion</i>	234	311	399	425	439	519	505	533	648	690
<i>A16 Respiratory tuberculosis; not confirmed bacteriologically or histologically (A16)</i>	146	215	223	302	400	450	508	574	522	552
<i>A41 Other septicaemia</i>	213	284	346	340	357	360	358	418	442	426
<i>I46 Cardiac arrest</i>	470	509	361	245	216	243	249	240	218	309
<i>E40 Kwashiorkor</i>	230	282	273	285	307	316	281	292	267	298
<i>E46 Unspecified protein-energy malnutrition</i>	151	209	211	243	228	284	307	337	318	324
<i>I50 Heart failure</i>	250	285	214	170	166	162	198	262	217	216
<i>G03 Meningitis due to other and unspecified causes</i>	83	128	122	155	142	151	185	206	210	227
Other non-natural causes	1555	1574	1543	1432	1406	1337	1304	1296	1463	1530
Other natural causes of	2387	3112	3093	3307	3811	3977	4679	6017	5933	5794
All causes	7742	9434	9788	10360	11224	12045	13399	15771	15424	15893

Appendix V (B):

Total number of the underlying causes of death for children aged 1-4 years in South Africa by year of death, 1997-2006

Underlying causes of death	Year of death									
	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006
<i>A09 Diarrhoea and gastroenteritis of presumed infectious origin (A09)</i>	1598	1910	2257	2238	2279	2607	3055	3602	3604	3909
<i>J18 Pneumonia; organism unspecified</i>	604	797	897	1210	1416	1606	1849	2094	1923	2056
<i>A16 Respiratory tuberculosis; not confirmed bacteriologically or histologically (A16)</i>	205	304	289	399	517	574	651	721	683	767
<i>E40 Kwashiorkor</i>	381	497	482	442	435	444	422	412	424	451
<i>D84 Other immunodeficiencies</i>	108	217	346	378	456	463	558	553	469	393
<i>E46 Unspecified protein-energy malnutrition</i>	191	279	232	285	254	335	332	373	323	335
<i>B20 Human immunodeficiency virus (HIV) disease resulting in infectious and parasitic diseases</i>	169	203	268	250	248	238	191	157	125	110
<i>B33 Other viral diseases; not elsewhere classified</i>	40	87	128	150	212	241	342	299	290	305
<i>G03 Meningitis due to other and unspecified causes</i>	73	93	105	129	112	133	142	159	188	214
<i>E86 Volume depletion</i>	73	87	90	105	103	141	124	145	165	139
<i>Other natural causes</i>	2746	3388	3156	3344	3796	3928	4439	5983	5778	5684
<i>Non-natural causes</i>	1555	1574	1543	1432	1406	1337	1304	1296	1463	1530
<i>Total number of death</i>	7743	9436	9793	10362	11234	12047	13409	15794	15435	15893

Appendix VI: Sex differentials

Total number of death for children aged 1-4 years by sex and year of death
in South Africa: 1997-2006

<i>Sex of deceased</i>	<i>Year of death</i>									
	<i>1997</i>	<i>1998</i>	<i>1999</i>	<i>2000</i>	<i>2001</i>	<i>2002</i>	<i>2003</i>	<i>2004</i>	<i>2005</i>	<i>2006</i>
<i>Male</i>	4043	4858	5062	5366	5868	6303	7091	8181	8118	8299
<i>Female</i>	3648	4482	4633	4910	5289	5658	6240	7542	7238	7478
<i>Unknown</i>	29	11	4	2	-	2	5	1	-	-
<i>Unspecified</i>	23	85	94	84	77	84	73	70	79	116
Total	7743	9436	9793	10362	11234	12047	13409	15794	15435	15893

Appendix VI (A):

Total number of the leading immediate causes of death for children aged 1-4 years in South Africa: 1997-2006

Leading immediate causes of death	Number of deaths		
	Male	Female	Unspecified
<i>J18 Pneumonia; organism unspecified</i>	10375	9971	138
<i>A09 Diarrhoea and gastroenteritis of presumed infectious origin (A09)</i>	9997	9361	105
<i>E86 Volume depletion</i>	2433	2232	35
<i>A16 Respiratory tuberculosis; not confirmed bacteriologically or histologically (A16)</i>	1994	1881	17
<i>A41 Other septicaemia</i>	1810	1713	20
<i>I46 Cardiac arrest</i>	1569	1474	14
<i>E40 Kwashiorkor</i>	1443	1363	22
<i>E46 Unspecified protein-energy malnutrition</i>	1379	1216	17
<i>I50 Heart failure</i>	1081	1043	15
<i>G03 Meningitis due to other and unspecified causes</i>	867	732	10
Other causes	30206	26096	391
Total	63154	57082	784

Appendix VI (B)

Total number of the leading underlying causes of death by sex for children aged 1-4 years in South Africa, 1997-2006

Leading underlying causes of death	Number of deaths		
	Male	Female	Unspecified
A09 Diarrhoea and gastroenteritis of presumed infectious origin	13923	12962	160
J18 Pneumonia; organism unspecified	7302	7042	103
A16 Respiratory tuberculosis; not confirmed bacteriologically or histologically	2668	2415	27
E40 Kwashiorkor	2218	2132	37
D84 Other immunodeficiencies	1977	1943	20
E46 Unspecified protein-energy malnutrition	1520	1399	19
B33 Other viral diseases; not elsewhere classified	1046	1035	12
B20 Human immunodeficiency virus (HIV) disease resulting in infectious and parasitic diseases	997	952	10
G03 Meningitis due to other and unspecified causes	742	600	6
E86 Volume depletion	574	589	9
Other causes of death	30222	26049	382
All causes of death	63189	57118	785

Appendix VII: Provincial variation

Total number of death for children aged 1-4 years by province of death:

1997-2006

Province of death	Year of death									
	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006
<i>Western Cape</i>	490	575	563	612	580	628	637	669	568	563
<i>Eastern Cape</i>	819	969	1041	1160	1284	1298	1496	1888	1826	1764
<i>Northern Cape</i>	226	233	244	294	308	283	288	339	287	331
<i>Free State</i>	698	841	944	915	972	1075	1236	1442	1353	1477
<i>KwaZulu Natal</i>	2128	2656	2632	2625	2844	2899	3250	3982	3949	3430
<i>North West</i>	817	927	1048	1195	1207	1383	1645	1807	1743	1994
<i>Gauteng</i>	1322	1677	1709	1769	1983	2263	2396	2704	2473	2689
<i>Mpumalanga</i>	572	687	760	822	987	1059	1193	1275	1490	1520
<i>Limpopo</i>	671	870	852	970	1066	1156	1261	1678	1741	2120
Total deaths	7743	9435	9793	10362	11231	12044	13402	15784	15430	15888

Appendix VII A: Total number of the

leading immediate causes of death for
children aged 1-4 years in South

Africa:1997-2006

Leading immediate causes of death	Province of death								
	Western Cape	Eastern Cape	Northern Cape	Free State	KwaZulu- Natal	North West	Gauteng	Mpumalanga	Limpopo
<i>J18 Pneumonia, organism unspecified</i>	625	1641	447	2653	4349	3059	3582	1928	2204
<i>A09 Diarrhoea and gastroenteritis of presumed infectious origin</i>	478	1858	487	2036	5086	2592	2335	2232	2364
<i>E86 Volume depletion</i>	84	277	114	418	575	557	276	293	384
<i>A16 Respiratory tuberculosis, not confirmed bacteriologically or histologically</i>	176	516	118	224	1129	365	653	256	323
<i>A41 Other septicaemia</i>	304	291	125	217	1008	347	707	234	311
<i>I46 Cardiac arrest</i>	172	356	44	144	983	181	829	172	179
<i>E40 Kwashiorkor</i>	82	292	110	296	784	429	317	228	293
<i>E46 Unspecified protein-energy malnutrition</i>	72	240	106	378	536	501	208	229	342
<i>I50 Heart failure</i>	118	218	37	136	539	255	449	181	207
<i>G03 Meningitis due to other and unspecified causes</i>	88	148	130	168	194	174	234	237	236
All causes of death	3638	7708	1115	4283	15212	5306	11395	4375	5542
Total number of death	5885	13545	2833	10953	30395	13766	20985	10365	12385

Appendix VII B:

Total number of the leading underlying causes of death for children aged 1-4 years in South Africa, 1997-2006

Underlying causes of death	Province of death								
	Western Cape	Eastern Cape	Northern Cape	Free State	KwaZulu Natal	North West	Gauteng	Mpumalanga	Limpopo
<i>A09 Diarrhoea and gastroenteritis of presumed infectious origin</i>	713	2466	681	2803	7099	3663	3349	3181	3097
<i>R99 Other ill-defined and unspecified causes of mortality</i>	446	2663	112	995	5049	1125	3470	738	1688
<i>J18 Pneumonia; organism unspecified</i>	302	1115	231	1889	3038	2221	2495	1431	1728
<i>A16 Respiratory tuberculosis; not confirmed bacteriologically or histologically</i>	228	646	160	432	1643	597	683	368	352
<i>E40 Kwashiorkor</i>	153	402	166	426	1294	601	536	352	460
<i>D84 Other immunodeficiencies</i>	169	418	87	400	782	608	750	424	301
<i>E46 Unspecified protein-energy malnutrition</i>	75	244	119	449	663	571	228	264	326
<i>A41 Other septicaemia</i>	76	101	33	81	280	133	247	69	119
<i>B20 Human immunodeficiency virus (HIV) disease resulting in infectious and parasitic diseases</i>	255	237	88	155	494	110	352	160	107
<i>B33 Other viral diseases; not elsewhere classified</i>	117	216	42	73	529	150	763	95	109
<i>E86 Volume depletion</i>	40	160	66	264	410	376	386	194	170
Total number of deaths	2574	8668	1785	7967	21281	10155	13259	7276	8457

Appendix VIII: Month variation

Total number of deaths for children aged 1-4 years by month of death in South Africa: 1997-2006

Month of death	Year of death									
	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006
<i>January</i>	562	757	1081	852	1030	1344	1053	1392	1451	1356
<i>February</i>	727	789	1176	1005	845	1100	1111	1427	1515	1585
<i>March</i>	807	921	1218	1134	891	1157	1303	1529	1645	2052
<i>April</i>	842	864	914	966	935	1120	1169	1599	1349	1801
<i>May</i>	754	1140	802	925	1066	1052	1253	1586	1425	1590
<i>June</i>	644	892	719	801	985	975	1202	1430	1429	1390
<i>July</i>	535	608	627	826	963	975	1133	1191	1194	1090
<i>August</i>	533	585	555	765	904	829	1045	1138	1098	1013
<i>September</i>	521	611	544	718	831	797	965	1001	952	889
<i>October</i>	589	636	622	746	793	856	914	1045	1108	988
<i>November</i>	586	772	680	783	818	848	975	1113	1074	1022
<i>December</i>	643	861	855	841	1173	994	1286	1343	1195	1117
Total	7743	9436	9793	10362	11234	12047	13409	15794	15435	15893

Appendix VIII A: Total number of the leading immediate causes of death for children aged 1-4 years in South Africa: 1997-2006

Leading immediate causes of death	Month of death											
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
<i>A09 Diarrhoea and gastroenteritis of presumed infectious origin</i>	655	731	844	758	653	511	410	338	308	327	391	458
<i>J18 Pneumonia, organism unspecified</i>	331	379	422	405	393	274	220	176	155	210	180	238
<i>A16 Respiratory tuberculosis, not confirmed bacteriologically or histologically</i>	301	318	379	357	309	246	210	157	131	184	197	249
<i>A41 Other septicaemia</i>	522	589	673	548	515	404	295	225	223	253	296	458
<i>E40 Kwashiorkor</i>	152	168	181	189	174	156	162	155	125	153	147	171
<i>E46 Unspecified protein-energy malnutrition</i>	322	420	485	380	394	336	276	241	205	212	205	274
<i>E86 Volume depletion</i>	187	217	258	222	228	226	170	170	163	186	183	157
<i>G03 Meningitis due to other and unspecified causes</i>	1583	1601	1854	1842	1965	2087	1850	1753	1577	1567	1491	1629
<i>I46 Cardiac arrest</i>	4872	4986	5650	5118	5286	4840	4431	4265	3846	4215	4340	4921
<i>I50 Heart failure</i>	11074	11502	12942	11833	11860	10777	9349	8664	7986	8474	8822	10477
Other causes of death	4861	4962	5625	5090	5259	4819	4416	4253	3828	4199	16252	4912
All causes of death	10869	11276	12651	11556	11586	10464	9138	8463	7819	8292	8660	10299

Appendix VIII B: Total number of the leading underlying causes of death for children aged 1-4 years in South Africa: 1997-2006

Leading underlying causes of death	MONTH OF DEATH											
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
<i>A09 Diarrhoea and gastroenteritis of presumed infectious origin</i>	3002	3133	3406	3038	2676	2135	1519	1284	1226	1360	1756	2524
<i>A16 Respiratory tuberculosis; not confirmed bacteriologically or histologically</i>	401	368	480	433	466	452	426	441	393	419	387	444
<i>B20 Human immunodeficiency virus (HIV) disease resulting in infectious and parasitic diseases</i>	166	208	195	198	170	148	152	149	134	130	143	166
<i>D84 Other immunodeficiencies</i>	363	366	400	374	415	324	319	286	223	255	271	344
<i>E40 Kwashiorkor</i>	424	507	574	561	528	355	271	226	199	217	214	314
<i>E46 Unspecified protein-energy malnutrition</i>	258	315	353	338	294	248	225	175	159	149	197	228
<i>E86 Volume depletion</i>	112	120	149	127	112	103	85	62	63	75	74	96
<i>G03 Meningitis due to other and unspecified causes</i>	98	111	123	103	117	118	123	107	82	127	120	115
<i>J18 Pneumonia; organism unspecified</i>	1081	1046	1251	1211	1341	1536	1290	1302	1149	1090	1047	1108
Total number of death	4975	5108	5730	5180	5476	5053	4740	4440	4210	4481	4469	4982
All causes of death	10880	11282	12661	11563	11595	10472	9150	8472	7838	8303	8678	10326

Appendix X

Terminology and definitions

Amended death certificate

A second certificate of death correcting the information provided for the same decease in a previously issued certificate. The amended certificate take into account new clinical findings thus modify or completing the reported cause of death

Automated coding system

Software tools based systems on which assigns ICD codes to the entities reported on the death certificates and, through the application of ICD rules, determines the underlying cause of death. The utilization of such tools allows avoiding biases in coding and allows reproducibility and comparability between countries.

Causes of death

An y condition, which leads to or contributes to death and is classified according to the International Classification of Diseases (ICD) system.

Circumstances of injury, poisoning or violence

All events surrounding and/causing the injury, poisoning or violence

Child

Refers to a young human being of either sex (aged 1-4 in this study)

Refers to

Coding rules

Coding rules contained in the applicable revision of the ICD, published by the World Health Organization, allow to systematically select an underlying cause of death from all entity reported in the death certificate. These coding rules improve the usefulness and comparability of mortality statistics among countries by giving preference to certain categories and by consolidating conditions

Contributing cause

Any cause of death that is neither the immediate, intervening, originating antecedent nor underlying is a contributory cause of death. (i.e. conditions that should be reported on Part II)

Death certificate

Official records of individual deaths including the cause of death certified by a physician, or other legally appointed professional, and any other required identifying information as well.

External causes of death

Deaths due to accidents and violence including environment events, circumstances and conditions as the cause of injury, poisoning, and other adverse affects.

ICD-10 codes

A single ICD alphanumeric string representing a single disease or injury or the association of two of them

Immediate cause of death

Any disease or condition entered on line (a) in part I of the death certificate directly leading to death and consequent to disease entered on lower lines of Part I. Also known as terminal, direct or final cause of death.

International Classification of Diseases (ICD)

International Classification of Disease. A widely used system of classifying disease and injuries. Each disease or set of disease has an ICD code or ICD group assigned to it.

Mortality:

Multiple causes of death

All those diseases, morbid conditions or injuries which either resulted in or contributed to death and the circumstances of the accident or violence which produced any such injuries.

Place of death

The place where the death occurred.

Place of injury

Place where the injury took place

Province of death

Province where the death occurred

Trend

Temporal evolution of a phenomenon

Underlying cause of death

The disease or injury which initiated the train of morbid events leading directly to death or the circumstances of accident or violence that produced the fatal injury (WHO).

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