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An understanding of the underlying determinants of infant and child mortality in a Johannesburg Metro Community Health Care Centre

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A research report submitted to the Faculty of Management, University of Witwatersrand, in partial fulfillment of the requirements for the degree of Master of Management in the field of Public and Development Management

March 2013

ABSTRACT

This study attempts to explain the socio-economic factors underlying infant and child mortality in Johannesburg. The preliminary and academic literature review shows a relationship between mothers' or child-minders' education levels and child mortality. Further, indicates that children living conditions is an important factor contributing to the outcome of the child's wellbeing. To understand this relationship, 40 randomly selected mothers attending a Community Health Care Centre in the South of Johannesburg answered the questionnaires. The bivariate correlation results show no significant correlation between the identified socio-economic factors and child mortality. There is a significant association between maternal education levels and their occupation status. The mothers perceive lower levels of education, occupational status of the parents, living conditions of the child as contributory factors to child mortality.

A more detail study of these variables and their relationship, including maternal behavior and life-style needs to be done in different clusters looking at a larger sample.

The interpretation of results is based on Mosley and Chen, (1984) framework, therefore improving maternal level of education, access to clean water, good sanitation, and safe environment as a probability of reducing infant and child mortality.

Key words: Infant, child, mortality, socio-economic determinants, public health care, maternal education living conditions

DECLARATION

I declare that this thesis and dissertation is my own, unaided work. I submit it in partial fulfillment of the requirements of the degree of Master of Management in the field of Public and Development Management to the Faculty of Commerce, Law, and Management in the University of the Witwatersrand, Johannesburg. I have not submitted this report before for any other degree or examination in any other University.



Cleopatra Zinhle Sokhela

Johannesburg, March 2013

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1. CHAPTER: INTRODUCTION

1.1 An introduction to infant and child mortality

Child mortality; a probability of dying between birth and five years old expressed per 1,000 live births; a measure of socio-economic status and health care service status of a country (Rossouw & Jordaan, 1997). Child Mortality is a global public health issue; data shows that in 2010 almost nine million children around the world died of preventable illnesses before their fifth birthday (Kibel, 2010). Child mortality is one of the mostly researched topics in health sciences but with all the findings of biological causality and management thereof, it has not been sufficient to decrease infant mortality rate special in developing countries.

Preliminary studies of infant mortality in medical sciences and social sciences boarders the understanding of the determinants of infant mortality. The social sciences allude that illness causes mortality but before illness, there should be an underlying cause of that illness. In the African continent the underlying causes of child and infant mortality may be due to uneven distribution of resources, lack of resources and lack of political will to treat socio-economic inequalities as an urgent matter. Although government encourages research to be done, there is still lack of intersection between maternal and child health researches with policy makers. Some policy decisions are not usually informed by evident research, therefore not adequately achieving what they aim to achieve (Mascot, 2012)

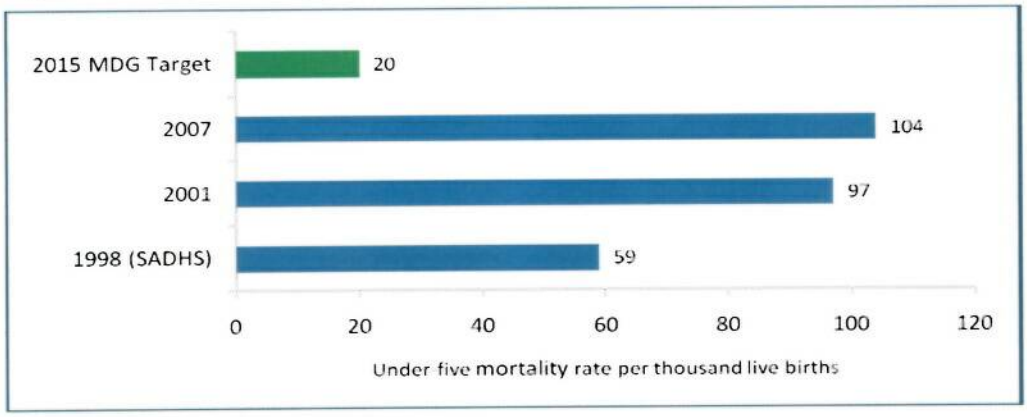
In South Africa, the under-five mortality rate in 2007 was 104 deaths per 1000 live births and in 2001; it was 97 deaths per 1000 live births (Community Health Survey, 2007). This shows a high death rate compared to the reduction target of 20 deaths per 1000 live births that must be met by 2015.

The census 2012 indicates a drastic reduction of infant and child mortality rates of 42 deaths per 1000 live birth, which is still undesirable (Stat.SA, 2012). The determinants of infant mortality in Gauteng are infections, preterm birth, birth asphyxia, and unexplained intrauterine deaths (Pattison, 2010). Children under five year die from

diarrhoea, sepsis, pneumonia, injuries and HIV & AIDS related disease. Ninety per cent of these diseases are preventable and curable but most children still die from them.

Figure 1, shows the results of a Community Health Survey done in 2007. Nannan, Dorrington, Laubscher, Zinyakatira, Prinsloo, Darikwa, Matzopoulos, & Bradshaw, (2012), argue that vital registration shows that in 2007, the majority of registered child deaths were infants at 76 percent, with 22 percent of these deaths occurring in the first month of life, either the neonatal period. Fifty-four percent of deaths occurred in the post-neonatal age group (1–11 months). Child deaths registration increased steadily since 1997, peaking in 2006. The greatest rate of increase observed in post-neonatal period, with a rise in infection-related deaths.

Figure 1 : child mortality (under – five) mortality per 1000 live births in 2007



Source: Community Health Survey, 2007

Gauteng has been proactive in ensuring the necessary policies and strategies are in place to reduce infant and child mortality. Led the implementation of programmes aimed at prevention of malnutrition, and intensification of immunisation coverage, prevention of mother to child transmition (PMTCT) of HIV/ AIDS, as well as increase access to free health care services at the Primary Health Care Level. However, while the interventions in health are strong they are not enough to reduce infant and child mortality in Gauteng.

Preliminary analysis of the determinants of infant and child mortality shows that poor health care policy development, lack of capacity in the health care sector and increase burden of disease are factors inhibiting progress in managing infant and child mortality.

The academic studies verify some of these factors in the preliminary analysis but further add maternal education levels and living conditions of people as major factors contributes to child mortality.

Caldwell & McDonald, (1982) argues that quality of childcare provided by the mother links to her educational level. For safe feeding practices, protection of the child from infections and home hazards, a young child depends on quality of care it receives from its mother at home and from health care professionals. This care begins with proper antenatal visits, birth care skills, and lifestyle of the mother during pregnancy (Rossouw & Jordaan, 1997a).

Antai & Moradi (2010), argues that children living in informal settlements are at risk of dying than children living informal settlements. This means that survival of the child is closely related to quality of thier physical environment, inside and outside the home because it affects thier exposure to infections and injuries. The type of dwelling determine the protection against weather and whether the house can be maintained in its hygienic state. In informal settlement there is overcrawding, poor sanitation and air pollution that can lead to contaminated food and water therefore causing illnessess.

The biological determinants of infant and child mortality are known and actions to manage them are executed. Health care programmes are implemented with huge financial outlays , as well as advanced medical technology used to manage illness but with little success. Henry Mosley and Lincoln Chen (1984), in their most cited article, provides a framework to manage infant and child mortality in developing countries. The core of the framework is the idea that all socio-economic and cultural variables have to work through proximate determinants that directly influence risk of exposure to diseases and mortality. Using this framework can help improve child survival at a low cost in low-income settings. This study explains underlying determinants of infant and child mortality in Johannesburg. Further, attempts to understand and explain the relationship between maternal education levels, and living conditions of the child and child mortality in Johannesburg metropolitan.

1.2 An introduction to Johannesburg and its' health care sector

Gauteng is geographically the smallest province in South Africa with the second largest population of 11.2 million and the highest population density of all provinces in the country (Stats.SA, 2012). The province is a dense area because of most people especially men of working age immigrates for job and business opportunities. The population is diverse with different social classes, culture — income inequalities and difference in infant and child mortality levels according socioeconomic class. Economically the province is active compare with other eight provinces, Gauteng contribute about 40 per cent to the Gross Domestic Product (GDP) in the country (Gauteng Provincial Government, 2011). Although economical active unemployment is high, poor education and poor health care still a problem.

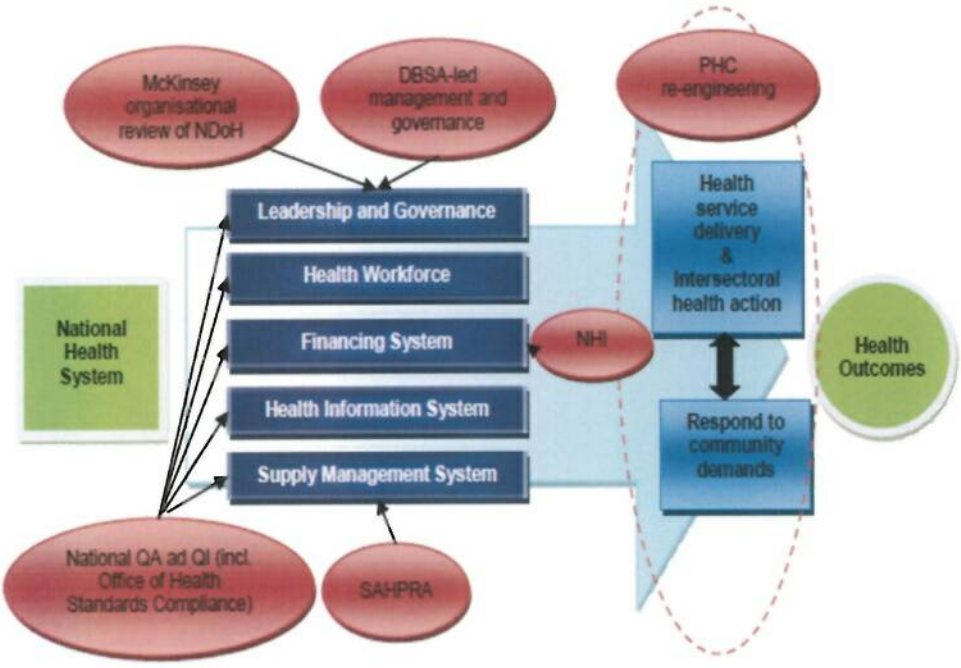
Child headed home have increase to 5 per cent since 2000 this may be because of parents dying of HIV and AIDs. Some parents have abandoned their children because they cannot afford to care for them (Department of Social Development, 2010). Although the GDP is improving, increasing demands of living are strains to poor families. The health care in Gauteng is more advance compare with other provinces. The public health care caters for 88 per cent of the population in the province and for other provinces. The private health care makes its profit from medical aids schemes and serves minority middle and high-class people.

Health inequalities are a serious problem in Gauteng. The private health care gets 60 per cent of the total health budgets while servicing 12 per cent of the total population in Gauteng (Planning Commission Report, 2011). Primary Health Care is free and supposed to be preventive and promotive but it is currently curative like hospitals.

The government as introduce a new models to address health care challenges in South Africa, the Primary Health Care (PHC) reengineering model, that is aligned to priority 4.1 of the Ten Point Plan of government. PHC reengineering is hypothesized from emerging evidence in PHC from Thailand and Brazil. Macinko (2007), state that PHC-Reengineering is informed by Brazilian Programa Saúde da Família (Family Health

Programme) model and its' supports community-orientated and participatory approaches to health care service delivery. The aim of PHC reengineering is to bring services to the people. This programme goes together with National Health Insurance (NHI) in South Africa aimed at providing quality health care to all irrespective of social status. NHI will also curb the high health care service rate in the private sector. Although these models are good to reduce inequalities in the health sector, they still focus more on the medical side of care, the socio –economic integration into health policy is still lacking. Figure 2, shows the new health care system in South Africa. The study does not explain the model in details, as it is not focus point of this study.

Figure 2 : PHC Re-engineering initiative and the health system architecture in South Africa



Source: PHC reengineering report, (2012)

Staff shortages and lack of equipment is a major challenge in the health care sector. The increasing burden of disease and continuous influx of people in the city has put a strain in health care services, example control of HIV and AIDS infection, communicable and non-communicable disease, and injuries. This study focuses on the health socio-

economic factors that affects infant and child mortality in Johannesburg formal and informal settlements, as there is a strong link between socio-economic factors and child survival, and country development status (Rossouw and Jordaan, 1997). The next paragraph provides the geographical layout of Gauteng.

The 2001 Census reveals that Johannesburg city covers 1 645 square kilometers. In Johannesburg, southwest is Soweto developed as a township for Black people under apartheid (Statistic South Africa, 2001). The struggle against apartheid was fought in Soweto, with a current population of over 5-million people (Gauteng Provincial Government, 2012). The area extends east and west of Johannesburg through several towns: Roodepoort and Krugersdorp on the west and Germiston, Springs, Boksburg and Benoni on the east (Gauteng Provincial Government, 2012). Figure 2 showthe Gauteng map and its 3 metropolitan, 3 districts, cities and its municipalities.

Figure 3: Gauteng Province map and its municipalities in 2010



Source: Gauteng Provincial Government , 2008

To the north is Pretoria, the capital of South Africa, whose southern suburbs are slowly merging with the Johannesburg slumps. The industrial and coal-mining towns of Vereeniging and Vanderbiljpark are in southern Gauteng, on the Vaal River, which is a boundary between Gauteng and Free State. There are four ethnic groups. Black Africans are the largest at 73.2 per cent, Whites at 19.4, Coloureds at 4.4, and Indians at 3 per cent of the total provincial population (General Household Survey, 2008). Of the 11.2 million people living in Gauteng, males are 50.5 per cent, forming a larger share than females. Men are more because, they come to find work (Kok and Collinson, 2006). Over 26 per cent of the population are younger than 15 years, 70 per cent are in their 'economically active' years from 15-64 years old. Six per cent are aged 60 years and older (Census 2001). The largest of the ethnic group still have poor health and higher mortality rates.

The 2007 Community Survey shows that nearly 4.7 million people completed primary or secondary schooling levels. However, 3.6 million people have highest educational achievement levels between Grades 0 and 9 or ABET[1]Level 4 equivalents. Thus third of the population have inadequate skills. These do not affect labour issues only but also health lifestyle of the people. Example education is a determining cause in occupation a person follows, his or her income category, and to housing and area a person live. Education level determines a person's socio-economic status, life style, health care a person qualifies for, and the disease a person is exposed to(Van Rensburg & Mans, 1982).

[1]ABET means Adult Basic Education and Training: ABET training encompasses outcomes-based educational and training programmes specifically targeted at adult learners with little or no prior educational qualifications. ABET education and training is made up of Level 1 to Level 4 which equate to Grade R to Grade 9 of the GET band

1.3 The research problem statement

Despite pronounced government commitment to improve the quality of life among all South Africans, various indicators and reports indicates that human conditions of the majority are still appalling. Infant and child mortality, an index widely used to gauge the socio-economic conditions of a population, remains undesirable in the country.
Gauteng is one of the nine provinces currently not on track to meet the Millennium Development Goals (MDGs) by reducing under-five mortality to 20 deaths per 1000 live births in 2015 (Chopra, Daviaud, Pattinson, Fonn, & Lawn, 2009).

The country's estimates of under-five mortality rate has raised from 56 deaths per 1000 live births in 1990 to 67 deaths per 1000 live births in 2008 (Kibel, 2010). From 2009, under-five mortality rate declined to 56 deaths per 1000 live births; in 2010 it was 53 deaths per 1000 live births and in 2011, 47 deaths per 1000 live births (Bradshaw, Dorrington, &Laubscher, 2011). This shows a continuous decline in the under-five mortality rate since 2009, albeit at the rate insufficient to achieve the Millennium Development Goal (MDG) 4 target of under-five mortality. There is uncertainty around the exact levels of child mortality in South Africa, because of incomplete and missing baseline data on children births and deaths rate.

The decline in child mortality can primarily be related to successful implementation of the prevention of mother to child transmission of HIV/AIDS programme and increased immunisation coverage against pneumococcal diseases and rotavirus from 2008. Many children continue to live in poverty and child poverty remains an important underlying or contributing factor to child deaths in South Africa. Children who are born to poor, uneducated parents and grow up in poor households are more likely to be exposed to sicknesses easily than children born to wealthy and educated parents. There is evidence that disparities in income can be coupled with inequalities in access to services and treatment (Sanders, Reynolds, & Lake, 2012). Child mortality rate globally is found to be four times higher in the poorest quintile; 87 deaths per 1000 live births than in the wealthiest quintile; 22 deaths per 1000 live births (World Health Organisation, 2007).

The huge differences of infant and child mortality according to socio-economic status and ethnicity are because of the education level of a child-minder and access to health care services (Unterhalter Beryl, 1955). A disease is a direct cause of death, but before a child gets sick something causes the sickness, for example a respiratory condition can be caused by exposure to air pollution. This respiratory condition if not treated in time can develop into a death threatening condition like pneumonia.

There is evidence that life-style, behavior of parents, parents' level of education special on health issues, income of the family and living conditions contribute to the underlying determinants of child ill-health and eventually death. Addressing only biological causes of infant and child mortality will not expedite the lower rate of mortality.

The health policy and government interventions are focused on the curative side of diseases, not on addressing the underlying factors that may contribute to ill-health. The health system responds to child illnesses as it occurs in a passive way, using new innovative technologies; machine for diagnostic purposes and new drug to treat diseases, but lack innovative technologies to prevent ill-health. This study proposes consideration of the underlying determinant of child mortality, and integrating them in planning, and in policy decision making in order to manage child mortality and to improve the general health of children in Johannesburg.

The Classical Demographic Transition theory developed by Thompson (1929), and supported by Notestein (1945), explains that industrialisation, and urbanisation improved living standards, hygiene, nutrition, sanitation, and good health for people. Notestein (1945) further argues that modernisation brings advancement to public health care as it decreases dependence on agricultural sustenance farming and bringing a decline in mortality, increase population growth. Different demographers argue that speedy unstructured urbanisation can cause harm than good, leading to overcrowding, easy transmission of diseases, depletion of resources, unemployment and others. Johannesburg is the main receiving city of migrants in South Africa, as people come looking for jobs and business opportunities, the lack of an effective plan to manage rapid urbanisation to benefit the country and the province has led to inverse results of urbanization. Any challenges in society negative or positive impacts first on the children.

1.4 The research purpose

Even though death is a biological event mainly caused by specific diseases, there is mostly an underlying causality of the disease, therefore the purpose of this study is to explain underlying determinants of infant and child mortality in the Johannesburg Metropolitan City. The study further, attempts to understand and explain maternal perceptions about the underlying determinants of infant and child mortality: focusing on education levels of mothers' or child-minders' and living condition of children as contributing factors to child mortality. For maternal education levels the following variables are taken into account; parental occupation status, the highest qualification passed, and whilst for living condition the following variable are considered; the place of residence, type of dwelling, type sanitation, access to clean water and safe environment. The researcher presents the finding of the underlying determinants of infant and child mortality, and further analyses and interprets the finding using the SPSS statics software and Mosley & Chen, (1984) framework to interpret the finding. The researcher indicates recommended strategies to combat infant and child mortality in Johannesburg.

1.5 Research question

The underlying causes of child deaths are infectious diseases that begin sequence of events leading to death, antecedent by contaminated food or water, and transmission of communicable disease. Is mothers' level of education and the living conditions of the child relate to child mortality in Johannesburg?

1. Explain the relationship between identified socio-economic factors and child mortality.
2. What are maternal perceptions towards maternal education levels being a contributory factor to child mortality?
3. What are maternal perceptions towards living conditions of the child being a contributory factor to child mortality?

1.6 Justification of the research

Activities emerging from biological research findings aimed at reducing mortality have been undertaken around the world with child mortality featuring prominently. The world embraces child mortality as the most efficient indicator of measuring socio-economic development status of the country. South Africa has been hardest affected by increase maternal and child mortality, and increase HIV/AIDS infections, these three factors has bought drastic transitional change in the population structure of South Africa not excluding other factors such as immigration ,urbanization and others. The manner in which maternal and child mortality displayed itself in the diverse population of Gauteng and the unique social backgrounds, coupled with high government commitment to reduce child mortality with little impact to meet the MDG number 4 was the motivation for this study.

To understand the background factors associated to child mortality and proper management will not only reduce child mortality, but has potential to reduce poverty and improve economic growth. Investing on applicable quality education for women and improve living conditions of people is the binging of a solution.

1.7 The research report structure

Chapter 1 introduce the study, general background, including general problem area — the cause- effect relationship to be studied in the context of the study. A research purpose statement and research questions outlined in chapter one. The literature review in Chapter 2 brings up different arguments from various studies on attributes affecting infant and child mortality in developed and developing countries. Review methods, data, and explanations of infant and child mortality studies done by other researchers. Summary of a theory that explains child mortality is explained, then last a summary of the study showing research problem and possible processes — and methods used to pursing this study.

Chapter 3 is methodology used; to find association of maternal education levels and living conditions to child mortality, mothers completed questionnaires to collate broader views, other than information provided in literature review on the determinant of child mortality. The chapter outlines research designs, sampling, and analysis methods of collected data. The population and sampling frame are explained. The last part is the validation of the study, and a summary of questionnaire pilot study and limitations of the study explained in chapter 3.

Chapter 4 presents the findings and chapter 5 present the discussions. Conclusion and recommendations are in chapter 6. References are presented after chapter 6. Attached are the informed consent form, participant information letter, and approval letter from department of health, Ethics certificate from human research ethic committee and a questionnaire and the appendix.

2. CHAPTER: LITERATURE REVIEW

The literature review is based on; books, scholarly journals, journal articles — published and unpublished dissertations, Department of Health policy documents and commissioned reports. The chapter divides into three sections; Section 2.1review methods, data, and explanations of infant and child mortality studies done by other researchers, who have tried to explain strategies to manage infant mortality in developed and developing countries. Section 2.2 explains Mosley and Chen (1984) framework helps to understand child health studies and analyses infant and child mortality risk causes. The last section 2.3 outlines a summary of a study.

2.1 Methods, data, and explanations of infant and child mortality studies

Omran(1971), research study shows mortality as a fundamental component of demographic transition influenced by fertility, migration and epidemiological transition. He further indicates that high infant and child mortality is the reflection of poor socioeconomic status, under- development resulting in low life expectancy. Preston, (1978)argues that a high level of child mortality leads to high fertility through replacement of the deceased child. In Gauteng, infant mortality is high but fertility has declined to 2.1 births per women in 2010 (Gauteng Provincial Government, 2010). This may because of HIV and AIDS illness and deaths of women at the child bearing age and increased cost of raising a child.

The reproductive aspect of a women's' life is one of the important element in the country's' population growth; therefore empowering women to make informative decision about their reproductive life may benefit the country not only by population growth but also if coupled with proper, relevant education structures may lead to socio-economic development. Caldwell (1979), argues that a woman with some education is more likely to delay reproduction until after her teens, to attend more than five antenatal visits, to give birth in a health facility to use contraception to have her child fully immunized and to consult the health facility when her child is sick. Quality childcare

provided by mother links to education level. Many studies focused on this relation and use mother education as an important sign for socio-economic status. Caldwell concludes by saying maternal education is the most important determinant in child mortality, even after controlling other socio-economic causes. He further says, maternal education should not be an indicator for general social and economic change but be examine as an important force on its own. However, Adetunji (1993) got contradictory findings and conclusion to Caldwell; he found that infant mortality was high in secondary school level mother compare to uneducated ones. He decides that other reasons than maternal education, for example, duration of breast-feeding contributes to child mortality.

European population experienced the similar high infant mortality rate in the 1900 ranging from 80 per cent to 250 per cent of deaths per 1000 live births (Omran, 1971). Europeans causes of death were mainly infectious diseases, epidemics and malnutrition as the current situation in Gauteng but adding injuries and lifestyle disease. Nutritional improvements, sanitary reforms and improved personal hygiene were selected as the main contributing factors to decrease child mortality, followed health technology and last medical practice in Europe. The improved socioeconomic status and health care benefited the survival of children first then women and then man (McLanahan, 2004).

The European, economic growth in the 20th century activated political revolution, which stimulated business trade (Omran, 1971). Education became a core strategy to increase capacity and innovation for the diversified labor market. Women status changed mortality and fertility declined due to improved education, housing —decision making for women on their reproductive life and children's health (Omran, 1971). While the population literacy level increased, living standard improved and family planning enforced.

Rogers (1979), study on the relationship between per capita incomes as a measure of national economic status and infant mortality, show inverse relationship. This study relates to the current situation in South Africa as a developing country, the GDP is increasing like in Brazil but in South Africa child, mortality and poverty rates are still high, therefore reducing child mortality and poverty has a probability of further improving the GDP.

European population continued to grow and it structure changed from younger to an old aging population as more people decreases the frequency in child bearing, female infant aborted in some families, and wealth and education become the center family life. This lead to a transition from big supportive families; kids' responsibility was to care and protect the elder. Unclear families become and the responsibilities where inverted. Through migration and urbanization, children became a liability to their families because of global fiscal status (Antai & Moradi, 2010). Heart disease, cancer and stroke replaced infections as prime killers. Although mortality has declined in these countries infant, mortality levels remain undesirable.

In developing countries, some infectious diseases remain persistent or even have increased for example HIV/ AIDS, hepatitis C and Tuberculosis. South African transition to life style diseases have appeared early — leading to a quadruple burden of infectious, non-infectious diseases— injuries and accidents, and HIV/ AIDS (WHO,2004). In short, South Africa is not experiencing a steady epidemiological transition that characterised the developed countries. An underlying contrast between the developing countries and developed countries has been the role of medicine. The first decline of mortality in developed countries was because of gradual improvements of living conditions then vaccination became the next effective method (Yaukey, Anderton, & Lundquist, 2007). The first decline of mortality in developing countries was also not because of advance medical technology but improve living condition for the people.

The striking contrast is that today developed countries are advocating for advanced medical technologies as first priority for managing infant mortality in developing countries while themselves did not start there. As a result, developing countries have not had the broad rising standard of living as developed countries are, as they focus on advance technology before establishing the basic needs of survival; availability of adequate, quality food, acceptable shelter , access to clean water and good sanitation and access to electricity, all these at an acceptable affordable cost. Then technology to improve people like can have a strong based to function on for sustainability.

Western medicine and public health programmes have made great contributions to mortality decline in developing countries. However, without improvement in living standards, lowering infant mortality further in developing countries may be difficult. Diarrheal diseases for example have been particularly resistant to control in developing countries, a failure clearly related to continued low living standards, malnutrition, ignorance and undeveloped public administration.

There are lot of foreign aids commitment to South Africa but all of it is not geared towards infrastructure development for the poor people to improve living conditions but for own benefits. For example, the strategy of building more hospitals it says we are failing to prevent sickness; we want people to get sicker so that we can manage them in hospital. This means buying more medication that is continuously changing from developed countries instead of focusing on preventing ill health by using those funds to improve living conditions for the people and invest effectively in education.

A study done by Lancet in 2011 on the progress and challenge of child and maternal health in Brazil shows that Brazil has undergone rapid changes in major social determinants of health and in the organization of health services. Infant mortality rates have reduce by 5.5 per cent a year in the 1980s to 1990s and 4.4 per cent a year since 2000 to reach 20 deaths per 1000 live births in 2008 (Victora, Aquino, Leal, and others, 2011). Regional differences in child mortality decreased, access to child-health interventions increased at almost universal coverage. Socio-economic inequities in access to health care reduced, and the median duration of breast-feeding increased from 2.5 months in the 1970s to 14 months by 2006-07. The reasons behind Brazil's progress include first socio-economic and demographic changes; economic growth, reduction in income disparities between the poor and the wealthiest populations, and proper well managed urbanization.

Second, improved education and empowerment of women leading to decreased fertility rate and HIV/AIDS infection. Interventions outside the health sector; a conditional cash transfer programme and improvement in water and sanitation. Lastly vertical health programmes promotion of breastfeeding, oral rehydration, immunization, and creation of the tax funded national health service to reach the poor areas of the country. Victora, Aquino, Leal, and others (2011), states resistant challenges remain including over

medicalization of childbirth nearly 60 per cent of babies born by caesarean section, illegal abortions, and a high frequency of preterm deliveries.

Brazil's government policies focus on the provision of social protection mechanism not only the well-known conditional cash transfer scheme but also the promotion of social inclusion in all sectors of society. As a result, the health inequalities and financial gap between the poor and wealthiest families have decrease leading to decrease infant and child mortality. Therefore Gauteng and South Africa should not only benchmark on the current state of the developed countries, looking back to what made them to be where they are, must be taken into account.

Antai & Moradi, (2010) used a cross- sectional data from the 2003 Nigeria DHS to study 'Urban area disadvantage and under-5 mortality in Nigeria". The sample was collected using a stratified two-stage cluster sampling procedure. Urbanization, the process of becoming urban reflects aggregate population growth in cities through either natural population increase or migration (Yaukey et al., 2007). Urban living has important health benefits such as better access to health care, education, and social amenities. However, with the rapid urbanization in developing countries and within the context of poor economic performance, poor governance, failure of the national and urban housing policy, and failure of the health care sector. The capacity of most urban economies in developing countries is overstretched. Hence, only a portion of the growing social needs of urban areas is met.

These results in urban people living in disadvantage conditions characterised by overcrowded homes, poor environment and inadequate social amenities and unemployment. Antai & Moradi, (2010) argues that living in socioeconomically disadvantage areas is associated with increased child mortality risk, even after adjusting for individual demographic and socio-economic characteristics. Health risk arising from living in disadvantage urban areas exceeds those of rural areas despite the general easier access of urban people to modern health services.

Child feeding practices also contribute to child mortality including weaning behavior, and age at which breast-milk is substituted, and solid food are introduced. The cultural practice and belief influence decision to breast feed.

Gule (1996) argues that longer periods of breastfeeding are associated with lower infant mortality and especially beneficial in places where sanitary conditions are poor. Early weaning impairs the nutritional status of the child and increase susceptibility to disease. As breastfeeding is associated with maternal physical changes in this modern life, the incidence and duration of breastfeeding is decreasing.

Most child and infant mortality studies use triangulation design methods and document analysis technique. Many studies use surveys such as the Demographic and Health Survey. Such surveys are stratified multistage sampling designs that result in the hierarchically structured data set (Salau, 2011). The primary sampling unit is districts within the province, selects communities within each district. The studies focus on the presentation and view of the population in terms of population dynamics and its effect on health and economic growth. The reason for focusing on population dynamics and their influence to developmental issues is to identify policy decisions that include the views of the population on methods to manage infant mortality.

Studies reflect that most of the interventions needed to save children are not costly, nor complicated. They are preventative and curative methods with a potential to reduce infant and child mortality. Improving household infrastructure, and environment such as availability of clean water, sanitation and medical assistance and maternal empowerment will fast track management of diseases thereby decreasing infant and child mortality.

2.2 The infant and child mortality determinants framework

Demographers have divided features influencing mortality into two parts background (socio-economic determinants) and proximate determinants (diseases) (Omran, 1971). Proximate determinants influence mortality directly while background determinants influence mortality indirectly by acting through proximate determinants. When explaining diseases pattern and trend influencing infant and child mortality in this study the focus is on knowing how background determinants influence proximate determinants. This study uses Mosley and Chen, (1984) framework of the study of

"child survival in developing countries". This framework provides a clear distinction between background and direct causes and their effect on child mortality. Mosley and Chen framework also connects to Caldwell's theory of 1979, which helps us to understand the influence of maternal literacy level to child health.

2.2.1 Proximate determinants of infant and child mortality

The proximate determinants are maternal issues, health care issues — neonatal, delivery place — delivery method, and pre, intra and postnatal care. Maternal issues and health care issues have an important impact on infant mortality than other groups. These two factors also affect the result of the three other groups. Maternal characteristic impact on birth weight and delivery method she recommends. The attitudes of health workers, their availability, and services on pre- natal, intra-natal and postnatal care impacts on quality care provided to the mother and the baby.

2.2.2 Background determinants of infant and child mortality

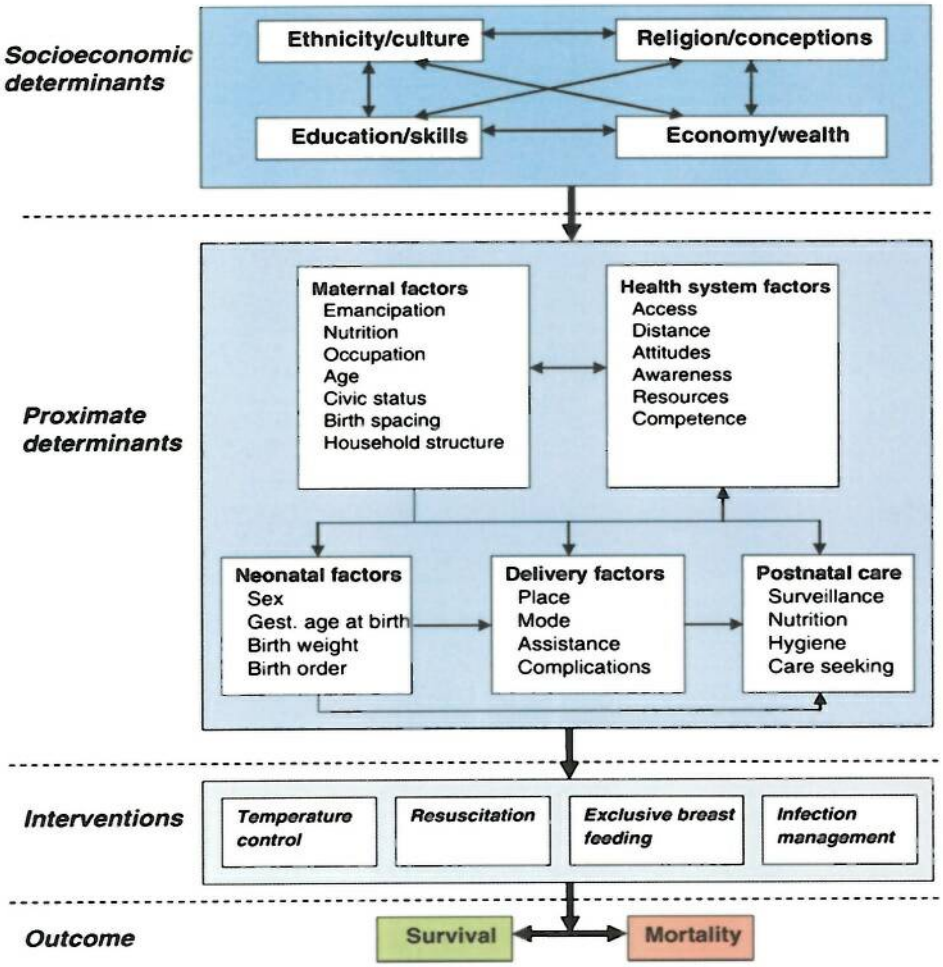
The socio-economic determinants of infant and child mortality are ethnicity, religion, education, economic wealth and environmental factors (Mosley & Chen, 1984). The socio- economic causes are interrelated and affect each other example the level of education of the mother affect her income. Masuy-Stroobant (2001), argues that there is a correlation between mother education level and child health because the mother care of her child, through the most vulnerable stages of its life. The mother's education level can affect child survival, by influencing her choices and skills in baby care. Her skills in health practices such as use of contraception, nutrition, hygiene and disease prevention and treatment account for her baby health status (Caldwell & McDonald, 1982).

Mosley and Chen (1984) framework provides a complex view of causes contributing to child mortality. Figure 4 shows the relationship of background and proximate mortality determinants. This framework provides a foundation to advance research on social policy and medical interventions integration to improve child survival. This framework integrates the two research methods. First, the social science research which focuses on

the roles of socio-economic causes and cultural causes in child mortality. The second is the medical research science, which focuses on specific diseases and use morbidity as the most common result variable. After integrating the two methods, the framework introduces a single result variable that combines both mortality and morbidity (Mosley & Chen, 1984) .

The framework allows researchers to assess overall health functioning and provide guidance on approaches for managing infant and child mortality. Policy makers can use it, to inform decision making in health policy review.

Figure 4: Diagram showing how determinants of infant and child mortality are related



Source: Mosley and Chen, 1984

2.3 The process of understanding the socio-economic determinant of child and infant mortality in Johannesburg

The 2006 Saving Children report which analyses data collected by the Child Health Problem Identification programme (CPIP), identify the leading causes of child deaths in hospitalized children as acute respiratory tract infections, sepsis, diarrhea diseases and tuberculosis. The 2007 national food consumption survey states that under-nutrition is an important underlying factor in many child deaths. To address some of the challenges mentioned. The Saving Babies 2008 to 2009 report make detailed recommendation for intervention at each stage of the reproductive lifecycle, covering ; family planning services, antenatal care, intrapartum care — early and late neonatal care.

Despite all the programmes put in place child mortality levels, remain undesirable, and the major causes of child mortality are poverty related diseases, which are caused by infection or gems, overcrowding, and lack of adequate feeding. To manage this problem it is evident that medical treatment alone is not sufficient; there is an urgent need to address the core causes of these diseases.

The preliminary analysis of infant and child mortality shows the following factors. First, poor health care policy development is a weakness, infant and childcare policies do not address children issues in totality the social, developmental, and medical issues are address in silos. There is a need for integration of all aspects to effective manages child mortality.

Second, lack of capacity in the public health care sector impede on quality health care service delivery even after introducing the new group of midlevel workers ,clinical associate . Third, increase burden of disease showing a quadrant presentation of infectious and non-infectious diseases, injuries and HIV and AIDS infection. This reflects poor developed policy enforcement and failure of the government to manage disease in totality. The good performance reports are not a true reflection of the reality of services people receive from the health sector. Example the coverage for TB vaccine is 98 per cent in 2011 and 65 per cent of all HIV infected pregnant mothers are on PMTCT programme, but TB together with HIV and AIDs are the leading killers of children in the province (Kaiser, 1995).

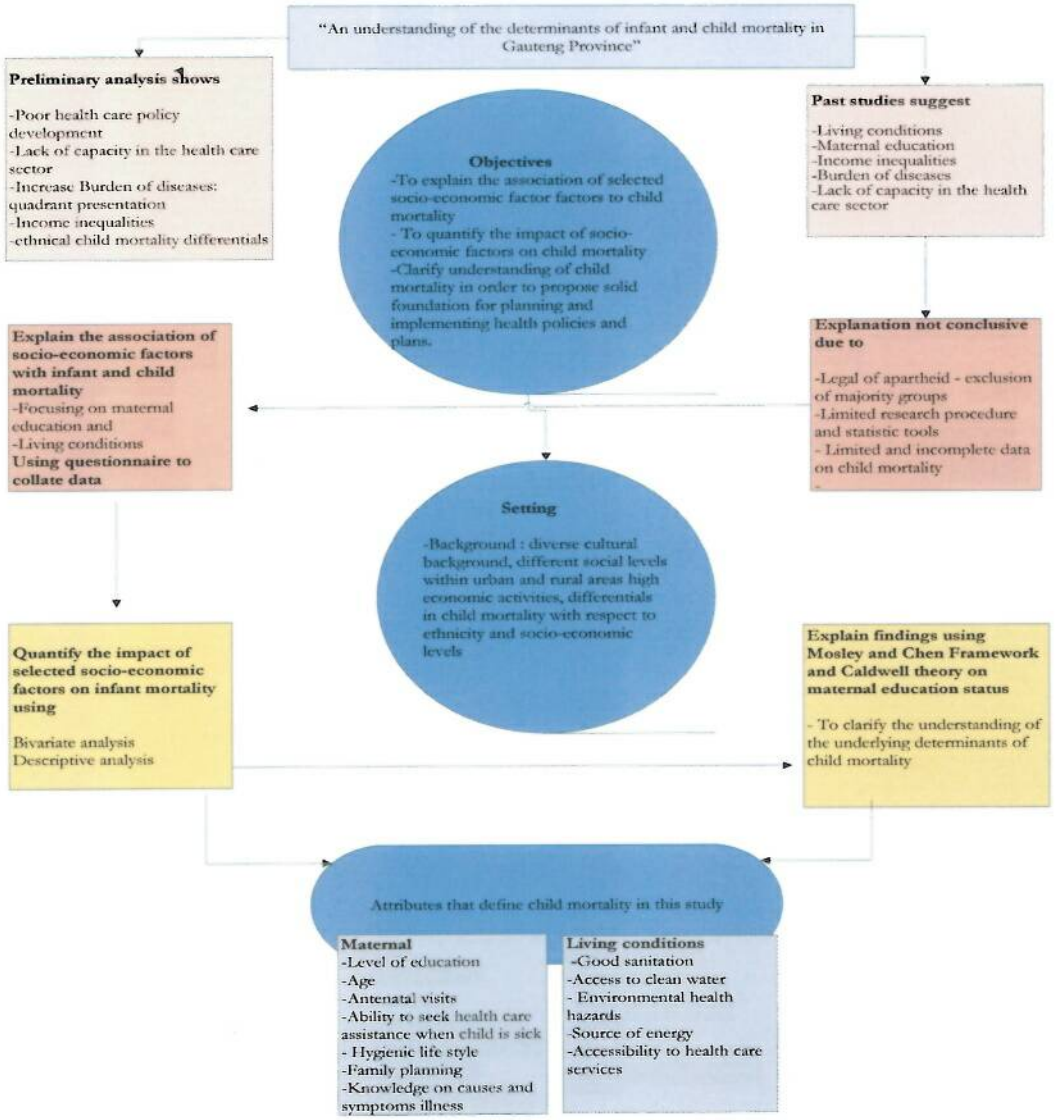
Fourth, an income inequality is a problem, children from poor families reside in places where there is no easy access to health care services, especially emergency care services, and environment pollution is a problem. Academic past studies such as (Chopra, Daviaud, Pattinson, Fonn, & Lawn, 2009), on infant and child mortality proves some of the determinants in the preliminary analysis. The association of living condition to child mortality is that children living in poor environmental conditionals are at high risk of dying because of poor prevention and management of illness. Compare to children living in formal environment, where health can services of choice are easy available and the quality of service provided is good.

Many studies like Malqvist. M, (2011), alludes' maternal education as an important element for child survival because of decisions a mother makes about her child. Example number of antenatal visit she chooses to attend, choice to breast-feeding, immunization of her child, seeking help when child is ill, and her lifestyle during pregnancy.

Child mortality levels are undesirable ; either stagnant or increasing but explanation is not conclusive because of many factors inclusive of; legacy of apartheid in South Africa, where Black African children births and deaths were not registered and not included on the census. This causes' unrepresentative national data. Poor research methods and lack of evaluation of this method for relevance in collecting data on and studying infant and child mortality lead to incomplete data. Figure 5 shows the processes of how the literature review and proposed methods attempts to answer the research problem.

Questionnaires used to collect information that assisted to understand the association of maternal education and living conditions to child and infant mortality. Multivariate and Descriptive analysis assisted to quantify the impact of selected socio-economic factors on infant and child mortality. The Mosley and Chen framework assist to explain findings by clarifying understanding of the underlying determinants of child mortality.

Figure 5: Diagram showing the research problem, possible processes and the proposed methodology of pursuing this study



In conclusion, despite limitations in data availability in South Africa; provincial and nationally on the socio-economic determinants of health, special related to infant and child mortality— many other countries have researched intensively on this phenomenon. From the preliminary studies done and the academic literature, there is an indication that infant and child mortality is the global problem in developed, developing and underdeveloped countries. The main causes of infant and child mortality in developing countries aregenetically problems, life-style diseases and injuries or incidents for example drowning and others. In developing countries cause of infant and child mortality are life- style diseases and communicable diseases and whilst in underdeveloped countries causes of infant and child mortality are infectious diseases and malnutrition.

South Africa is classified as a developing country but presents with quadruple burden of diseases mimicking all the transitions of countries development— communicable and non- communicable diseases, injuries or incidents and HIV/AIDS, TB and malnutrition. The major five causes of child mortality in Gauteng area HIV/AIDS, diarrhea, pneumonia and other infections. These conditions are classified as globally as diseases related to under development, poor quality of the health care system and weak political administration.

There is evidence that developed countries like the European countries also experienced very high infant and child mortality, and improving living conditions of people: infrastructure development, good sanitation, clean water supply, and proper dwelling structures and safe clean environment. These were the core strategies that decreased child mortality followed by empowering women through education of and immunisation programmes.

These socio-economic strategies cannot succeed on their own medical intervention are also important, therefore integration of socio-economic determinants and biological determinant will assist in effective management of infant and child mortality.

The methods used to study infant and child mortality are demographic health survey, quantitative methods, survey and case studies, the sample size of 700

households and more. Different theories are used based on the research question, but in most studies Mosley and Chan framework is cited. Data access and quality for child births and deaths is a challenge in developing countries. Births and deaths area not registered and reported upon. These create a challenge on the credibility of data that inform decision making.

3. CHAPTER: RESEARCH METHODOLOGY

3.1 Introduction

The purpose of this study is to explain the underlying socio-economic determinants of infant and child mortality. Further, understand how these determinants influence infant and child mortality. Maternal perceptions on the underlying determinants of infant and child mortality are also explained. A quantitative explanatory study used that identifies and explains approaches to manage infant and child mortality in Johannesburg. This chapter explains research designs, data collection instruments sampling, and data analysis methods used, ethical considerations and description of the respondents. The data validation and processing and limitations of the study also explained.

3.2 Research Strategy

This is a quantitative study looking at the relationship between different child mortality variables: first, maternal education; highest education level passed, mothers' occupation status. Second, living conditions; place of residence, type of the house, number of people in the house and the availability of water and toilet facilities. Burns & Grove, (2001) describes a quantitative research as a formal, objective process that describes, test relationships, and examines causes and effect of interactions among variables. The relationship between maternal education levels, living conditions and child mortality is explained. A quantitative study allows analysis of large samples and results can be generalized.

3.3 Research Design

This is an explanatory study to explaining why events occur and to build, elaborate, extend or test a theory. Explanatory research builds on exploratory and descriptive research, and identifies reasons something occurs (Neuman, 2000).

All participants responded to the questionnaires, questions written in English and explained in IsiZulu during the introduction of the study. Mothers given participant

information sheet, and the study verbal explained. Mothers that agreed to answer the questionnaire signed a consent form. The investigator collected questionnaires from the selected clinic.

3.4 Research procedure and methods

3.4.1 Data collection instruments

McColl E, Jacoby A, Thomas L, Soutter J and others, (2001), define a questionnaire as an instrument consisting of a series of questions and attitude–opinion statements designed to get responses, which can be converted, into measures of the variables under investigation.

Questionnaires were hand delivered by the investigator to participants for self-completion. Mothers from ages 19 to 45 years completed a questionnaire. The questionnaire consisted of four parts; the closed–ended questions used made it easy to compare the answers of different respondents, easy to code and to minimised biases. Structured questions used which needed a fixed response therefore making it easy to complete and analyses. Most of the questions included in the questionnaire were adapted from the previous study by Masuy-Stroobant G, (2001). The length of the questionnaire for this type of the study was acceptable and took approximately 15min to answer all the questions.

The first part of the questionnaire was on demographic information with eight questions, such as place of residence, type of household, highest education levels, and others. This part of the questionnaire provided information on participants living conditions status, and the level of formal education — occupational status of the mother. Second part, was delivery information with six questions; this part of the questionnaire provided information on mothers reproductive history. Example, age at which she had her first child, age difference of children and others questions. For easy analysis, the answers were categorized.

Third part was general questions to understand and explain the mothers' perceptions about the relationship between the underlying determinants of child mortality; maternal education levels, living condition of the child and child mortality.

The last part, was on details of the under- five children who are alive or died. This part had nine questions. Question 1, asked if the child was alive or had died question 2, child ages in categories; 0-1 years and 2-5 years , and other questions are size at birth question , sex, place of delivery type of illness, mothers age at the birth of this child, number of antenatal visits attended and the person who assisted during delivery. This question identified the biological determinants of child mortality, which was not the focus point for this study.

3.4.2 Target Population and sampling

Neuman, (2000), defines population as a large group of many cases from which the researcher draws a sample and to which results from the sample are generalized. The researcher specifies the unit being sampled, the geographical location and the temporary boundaries of population. To study infant and child mortality in the province required a large sample size of approximately 700 respondents (Rossouw & Jordaan, 1997). Mortality studies are most done through the Demographic Health Surveys and Community Health Surveys involving different districts clusters and provinces. The target population in this study selected based on academic requirements to complete the study, time available, and the limited cost. Therefore, these constrains influenced the sample size, sample design, and data collection procedures.

The Community Health Care Centre (CHC) with diverse client attendance, within its catchment area, selected. Chosen based on easy access, as the group of mothers, from different lifestyles, can be available at the same time to provide information about the health status of their children; the investigator did not have to do house visits. Forty, mothers answered the questionnaire. Rossouw & Jordaan, (1997), argues that large sample size alone does not guarantee a representative sample. A large sample without random sampling or with a poor sampling frame is less representative than a smaller one with random sampling.

Coldwell &Herbst, (2004) define sampling as an act, process or technique of selecting a representative part of a population for determining parameters or characteristics of the whole population. Sampling requires a few resources than a census and provides the needed information quickly. Probability random sampling was used to select mothers on the principle that every participant in the sampling frame has a chance to participate, but not necessarily an equal chance of being selected, (Coldwell &Herbst, 2004). This sampling method was selected to minimize bias and to ensure generalisations of the population as child mortality is a national issue that has direct or indirect effect on everyone.

3.4.3 Ethical Considerations

Ethical approval with certificate reference number (H120808) for the study was granted by the University of the Witwatersrand's Ethics Committee for Research on Human Subjects. The Gauteng Department of Health Policy, Planning and Research Unit issued an approval letter for the study.

Participation to the study was voluntary and participants were given an opportunity to withdraw at any time they felt uncomfortable to participate. Confidentiality maintained throughout the study; names of participants were not required in a questionnaire and the investigator only collected data, analyzed the data, there was no link of the information to specific individual.

Counseling services were arranged with the psychologist for the period of the study and a month after data was collected. For continuity of care the clinic social workers agreed to handle long term therapy if required by respondents that can experience uncomfortable feelings after providing information about their deceased child. The sensitivity on a deceased child information was further minimized; as recommended by medical ethics committee and head of pediatric unit; to review the structure of the questionnaire, maternal lifestyle not to be followed up by deceased child information as the link could make mother feel guilty; that they may have contributed to the death of the child through their lifestyle before and during, or after pregnancy.

None of the respondents showed symptoms of discomfort and none came after the study, complaining of any discomfort experienced during period of the study. The only inquiry received was when one mother wanted information about how she could register an adopted child aged 3 years, for a birth certificate so that, the child can receive a grant. This indicates one of the social issues that in-hinder access to services by many children in the province. If a child received the children's grant it would assist in feeding, transporting child to the clinic when ill and some would use the grant money to pay school fees.

The mother was assisted by the psychologist and referred to a social worker within the Community Health Care Centre (CHC) dealing with grant registration for children. Participants that required results of the study were given contact details and the Wits University library link to access the report.

3.4.4 Data processing and analysis

Forty questionnaires collected by the investigator in the CHC were edited, coded and entered into an excel document. Data checked for mistakes and cleaned. Then after data was converted into SPSS, labeled and further cleaned. Data cleaning, involved checking the quality of the data, for missing and erroneous values. Erroneous values in the data were assigned as missing values. All these checks were guided by the original questionnaire used in collecting the different information.

Categorical variables were also re-categorized by merging groups which were similar and had very few observations within them. For example, mother's level of education which initially had four categories (primary education, grade (8-10), grade (11-12), and tertiary education) was recoded into 3 categories (Primary education, grade 11-12), and tertiary education). The same procedure was applied to type of a house, which had five values; hostel and shack merged into one value (Shack). Both water and toilet facilities had four values; tap shared and none merged into tap shared and toilet shared and none merged into toilet shared.

The analysis was done using SPSS statistics data, in the first stage of the analysis, descriptive statistics were used to examine the distribution of the study participants in

relation to the selected variables for this study. For this frequency tables were used to summaries participants' characteristics and proportion of live births and deaths.

The second stage of the analysis was the cross- table analysis. This was done to examine the distribution between each variable of interest and the outcome variable (under-five mortality). The third stage involved the use of bivariate correlations modeling. This approach was used because it is useful in assessing the effect of the main explanatory factors; maternal level of education on under-five mortality, having controlled for the significant socioeconomic and demographic maternal factors.

The last stage used descriptive analysis-univariate analyses to understand respondent's perceptions on background determinants of child mortality. The three characteristics of each variable were looked at; 1, the distribution, 2 the central tendency and last the dispersion.

Availability of adequate reliable secondary data on health socio-economic factors of mortality in the province and South Africa is very limited, if available, it is incomplete. The investigator used primary data to fit the study specific need and to access accurate, up-to –date data.

3.5 The Pilot study

The questionnaire was piloted at the health provincial office and academic hospital. At the provincial office it was piloted to 10 people — three men and seven women. Four participants were in management positions and six were administrators. They all could communicate well in the English. The purpose of the pilot study was to identify the strength and weakness of the research instrument and whether the participants understood the questions. All participants took about 8 min to complete the questionnaire. Eight participants did not answer question B2 and the other two answered but commented that some people may not know what it means. The result of this pilot at the provincial office revealed that language needed to be reviewed to level of the participants.

Example of the Question B2 was: What are the age intervals between your children?

Now: What are the age differences of your children?

The pilot at the academic hospital was done after question B2 was reviewed. Seven people participated, two male professors, one paediatric nurse, and four mothers in the ward. Time of completion of the questionnaire was different, professors and nurse took about 5 minutes, and the mothers took about 9 minutes.

The two professors were senior researchers that managed paediatric units, they commented on the structure of the questionnaire the link between maternal life style question B and question C on child death formation can make the mother blame herself for her child sickness or death. She may think her life style or behaviour is the reason for the death or sickness of her child. Question C was only information of a deceased child the recommendation was to include information of the living children under -5 years so that focus is removed from the deceased child. This could cause stress to the mother, to include information of the living child will move focus of the mother of the deceased as she can share positive information on the living baby too.

The structure of the questionnaire was reviewed question C moved to question D and information on the living child included; age, sex, birth weight, place of delivery, number of antenatal visits attended and more. After the questionnaire was reviewed it was resubmitted to the human ethics committee for approval. The challenges accepted and new ethics certificate issued. The reviewed instrument was re-tested with four parents at the clinic. The instrument was found to be clear, and elicited the information required to meet the objectives of the study.

3.6 Description of the respondents

Appendix A shows respondents' demographic data and characteristics. Of the forty respondents, 67.5 percent reside in townships, 22.5 percent in informal settlements, and 10 percent live in suburb areas. Townships have different kinds of dwellings ranging from big houses to shacks. Thirty percent live in two bedrooms houses,(this category includes Reconstruction and Development Programme houses), 27.5 percent live in shacks, and 22.5 percent live in big houses with three or more bedrooms.

Fifty percent of mothers managed to reach Grade 11-12, and 25 percent could not go further than primary school, whilst only 25 percent managed to attain tertiary education. Employment is critical for parents to be able to maintain their children. Seventy percent of mothers are not employed, 17.5 percent of the mothers' doing white-collar jobs, 7.5 percent unskilled, and blue-collar workers were the least at 5 percent. The two variables of child mortality are categorized as 0 for alive child and 1 for death child. Table 3.1 shows more deaths of children in township, followed by informal settlement and lastly suburb area.

Table 3.1 : Place of residence and child deaths

		Child alive or has passed away		Total
		Alive	Died	
Place of residence	Suburb	1	3	4
	Township	8	19	27
	Informal Settlement	1	8	9
Total		10	30	40

Children born to mothers' that could only reach primary school experienced high deaths than children born to mothers that managed to reach grade 11-12, and fewer child deaths for children born to mothers that attained tertiary education as indicated in table 3.2.

Table 3.2 : Maternal education levels and child deaths

		Child alive or has passed away		Total
		Alive	Died	
Highest educational level	Primary School	0	10	10
	Grade 11-12	7	13	20
	Tertiary education	3	7	10
Total		10	30	40

3.7 Data Validations

The random sampling was used as it is not biased. The bivariate correlation used and descriptive statistical technique enhanced better understanding of variables and improved quality of data analysed. The SPSS identify missing data and outliers. Hundred per cent of each segment was re-entered for verification. The pilot study done enhanced the quality of the data collection instrument, therefore relevant data collected to answer the research questions. Different ethics committee contributions enhanced the quality of data.

Data analysed by the investigator, therefore confidentiality of data was maintained with one person and data was coded; respondents cannot be identified as names were not required in the questionnaire. The instruments used to analyses the data provided acceptable understanding depending on the sample size, of the importance of maternal empowerment, education and how education can also determine a person choice of residence and the standard of health for children.

3.8 Limitations of the research

The sample size and design methods are limited due to time allocated to complete the study, although the size is small does not mean the results could not be accurate. Mixed methods will also improve the result, as they complement each other. To collect data on children births and deaths, and the determinants of mortality using a representative sample for the province can take minimum two years. There are lots of variable that can be investigated in mortality studies. However, this is an important study to be conducted as it recognizes a problem with the levels of infant mortality in Johannesburg, which must be reduced to meet MDG number 4. The study further, explains the relationship between child mortality and background factors affecting infant and child mortality. The explanation of maternal perceptions to socio-economic determinants of infant and child mortality can enhance health care planning, relevant policy decisions making improve monitoring and evaluation of health programs and projects, and efficient management of child mortality in totality.

Inclusion the study used quantitative explanatory designs and 40 mothers completed the questionnaire in the community health care centre Johannesburg metropolitan. The data cleaned and analysed using SPSS statistics software. The relationship between the selected socio-economic factors and child mortality explained using bivariate correlations and descriptive analysis. Confidentiality maintained throughout as the investigator collected, analysed and stored the information, no other person had access to the raw data. Names of participants were not needed for the study therefore participants cannot be identified using the data or finding.

Although the study was done within a short-time period for academic purpose, using the different methods like maternal perceptions: descriptive analysis and correlation to support the data enhance the validity of the study. The sample was small compare to sample size done in demographic health studies to study child mortality, but using the random sampling enhanced study credibility. The data collected and analysed will serve as a baseline data for future studies on the socio-economic determinants of child mortality in Johannesburg. The respondents' description shows 50 percent of mothers living in townships had a high number of child deaths compared to mothers living urban areas. Most of the mothers living in townships could only reach grade 11-12 and high number of them are not employed.

4. CHAPTER: FINDINGS

4.1 Introduction

Ormran, (1971), argues that child mortality is globally used as an indicator for a country's development stage and health care quality status. Preliminary analysis and academic studies shows maternal education levels and living conditions as the important determinants of child mortality. Addressing these determinants of child mortality can lead to improving socio-economic status of the country.

The specific objective of this study is to explain the relationship between the selected maternal variables; highest education level passed, occupation status, and the living condition of the child, to child mortality. Mosley and Chen, (1984) framework outline the two main outcomes; survival and death as a results of the relationship between proximate and background determinants of child mortality. The frame work assists to interpret the results in the context of socio-economic factors of child mortality in Johannesburg. The summary of maternal demographic data and study population characteristics is analysed using descriptive analysis in sub- section 3.6.

4.2 The relationship between identified socio-economic factors and child mortality

Correlations used to measure how socio-economic variables are related to child mortality. Bivariate Correlations procedure calculates Spearman's rho with its significance level. The strength of the linear association between two variables is quantified by the correlation coefficient. Given a set of observations (x_1, y_1), $(x_2,y_2),(x_n,y_n)$, the formula for computing the correlation coefficient is given by

$$r = \frac{1}{n-1}\sum\left(\frac{x-\overline{x}}{s_x}\right)\left(\frac{y-\overline{y}}{s_y}\right)$$

The correlation coefficient always takes a value between -1 and 1, with 1 or -1 indicating perfect correlation. A positive correlation indicates a positive association between the variables; increasing values in one variable correspond to increasing values in the other variable, while a negative correlation indicates a negative association between the variables; increasing values is one variable correspond to decreasing values in the other variable. A correlation value close to 0 indicates no association between the variables.

There is no significant correlation between child mortality and maternal occupational status, but the direction is negative -0.130 as indicated in table 4.1. This indicates an increase in maternal occupational status has a probability of decreasing the child mortality and vice versa. There is no significant correlation between child mortality and maternal highest level of education as significant level is 0.128, near to 0, but the correlation coefficient is negative, indicating an inverse relationship to maternal education levels and child mortality.

The highest education level and maternal occupation show a strong significant correlation level of 0.02.

Table 4.1 Correlation between child mortality and maternal occupation and highest education level

			Child alive or has passed away	Respondent occupation	Highest education level
Spearman's rho	Child alive or has passed away	Correlation Coefficient	1.000	-.130	-.245
		Sig. (2-tailed)	.	.423	.128
		N	40	40	40
	Respondent occupation	Correlation Coefficient	-.130	1.000	-.365*
		Sig. (2-tailed)	.423	.	.021
		N	40	40	40
	Highest educational level	Correlation Coefficient	-.245	-.365*	1.000
		Sig. (2-tailed)	.128	.021	.
		N	40	40	40

*. Correlation is significant at the 0.05 level (2-tailed).

Table 4.2 shows no correlation between child mortality and water facilities, place of residence and toilet facilities, and type of the house , but type of the house shows a negative correlation coefficient of -0.096, which indicate an improvement in the type of the house will decrease child mortality.

Table 4.2 Correlations between child mortality and availability of water and toilet facilities, place of residence, and type of the house

			Child alive or has passed away	Water facilities	Place of residence	Type of the house	Toilet faculties
Spearman's rho	Child alive or has passed away	Correlation Coefficient	1.000	.149	.173	-.096	.061
		Sig. (2-tailed)	.	.359	.286	.557	.711
		N	40	40	40	40	40
	Water facilities	Correlation Coefficient	.149	1.000	.294	.181	.731**
		Sig. (2-tailed)	.359	.	.066	.265	.000
		N	40	40	40	40	40
	Place of residence	Correlation Coefficient	.173	.294	1.000	.174	.395*
		Sig. (2-tailed)	.286	.066	.	.282	.012
		N	40	40	40	40	40
	Type of the house	Correlation Coefficient	-.096	.181	.174	1.000	.066
		Sig. (2-tailed)	.557	.265	.282	.	.687
		N	40	40	40	40	40
	Toilet faculties	Correlation Coefficient	.061	.731**	.395*	.066	1.000
		Sig. (2-tailed)	.711	.000	.012	.687	.
		N	40	40	40	40	40

**. Correlation is significant at the 0.01 level (2-tailed).

*. Correlation is significant at the 0.05 level (2-tailed).

4.3 Maternal perceptions on the relationship between identified socio-economic factors and child mortality

The purpose of general questions on maternal education levels and child living conditions was to assess the respondent's views on the relation between child deaths and identified socio-economic factors. The views of mothers' on child mortality and maternal education as shown in figure 6, and descriptive analysis in appendix C, the standard deviation allows, some assumption that distribution of scores is normal or bell-shaped (Rubin & Babbie, 2011).

The mean for all variables under maternal education levels ranges between 2.03 and 2.93 and the standard deviation between 0.15— 0.97, therefore approximately 99 percent of scores in the sample fall within three standard deviation of the mean. Mothers views are that educated mothers, do have the privilege of accessing the health care service of choice, feeding their children required food at specific stages of growth as they can afford it. Ninety nine percent of respondents think health care seeking behavior is important, and increases chances of the child being healed.

Health professional's negative attitudes towards the clients have caused indirect harm, by not providing adequate health education to parents on child sicknesses and management. Mothers' agreed that following the medication instructions is a challenge; it is even harder for illiterate mothers. This increases chances of complications due to over dose or less dose. Nutrition is a requirement for physical and cognitive development of children; lack of nutrition therefore affects not only the physical weight of the child but also the cognitive development of the child and the immune system that prevent the child from getting sick easily. Ninety eight percent of mothers agree that most needy mothers feed their children what is available, regardless of the age of the child. Most children start adults' feeds at three months or are given tea only as mother cannot afford milk (Gule, 1996).

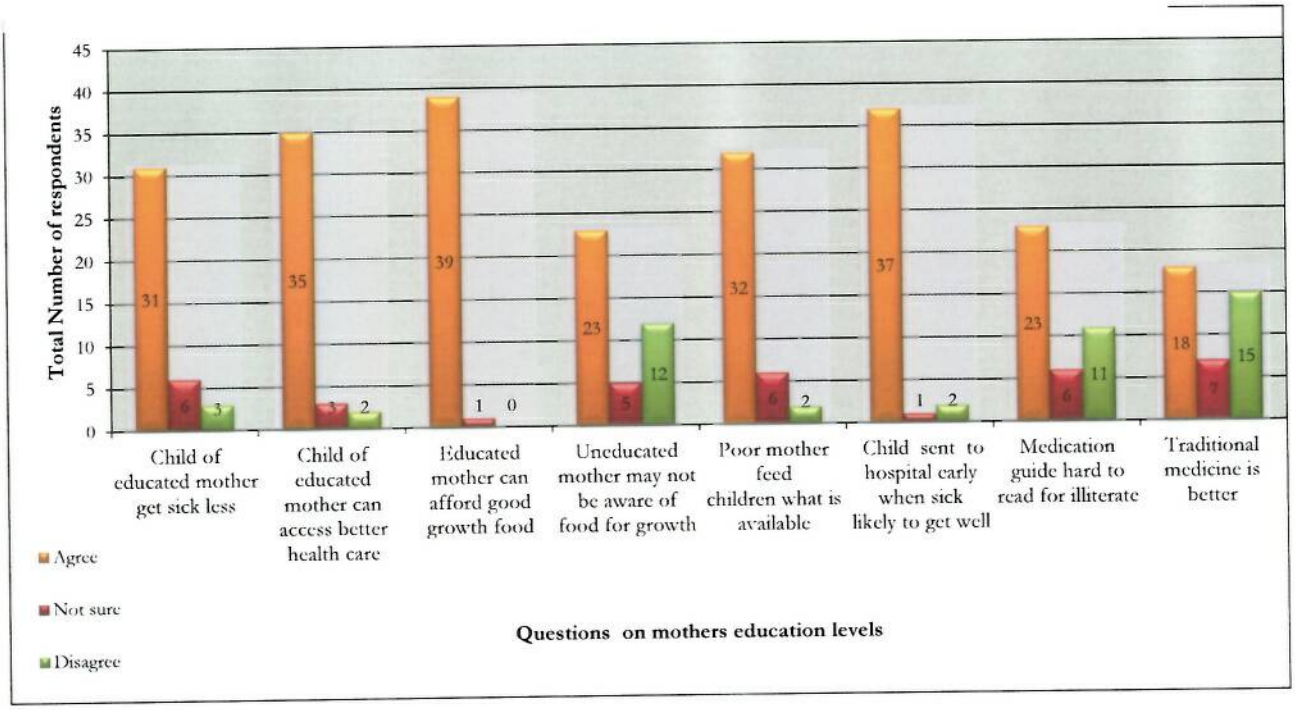
The influence of mothers believes on health care of a child, plays a critical role. There is still no clarity in the integration of traditional medicine with western medicine. More

respondents are not sure, which one is better for children; western medicine or traditional medicine, 50 percent average of the other two values are not sure.

Mixing treatment (traditional and western medicine) for children can have detrimental consequence, like instant deaths, due to chemical reaction of different medicine. Omitting treatment because of mothers believes, for example stopping antibiotics or TB treatment of a child, and inability to follow instructions on medication administration, can lead to complications.

The respondent's views in general are that mothers need to have some understanding about diseases process, management, and child care. Employment enables mother to afford basic need for their children, demographic data shows that 70 percent of the mothers were not working and could only reach grade 11-12.

Figure 6 : Mothers perceptions on mothers' education levels and deaths of children

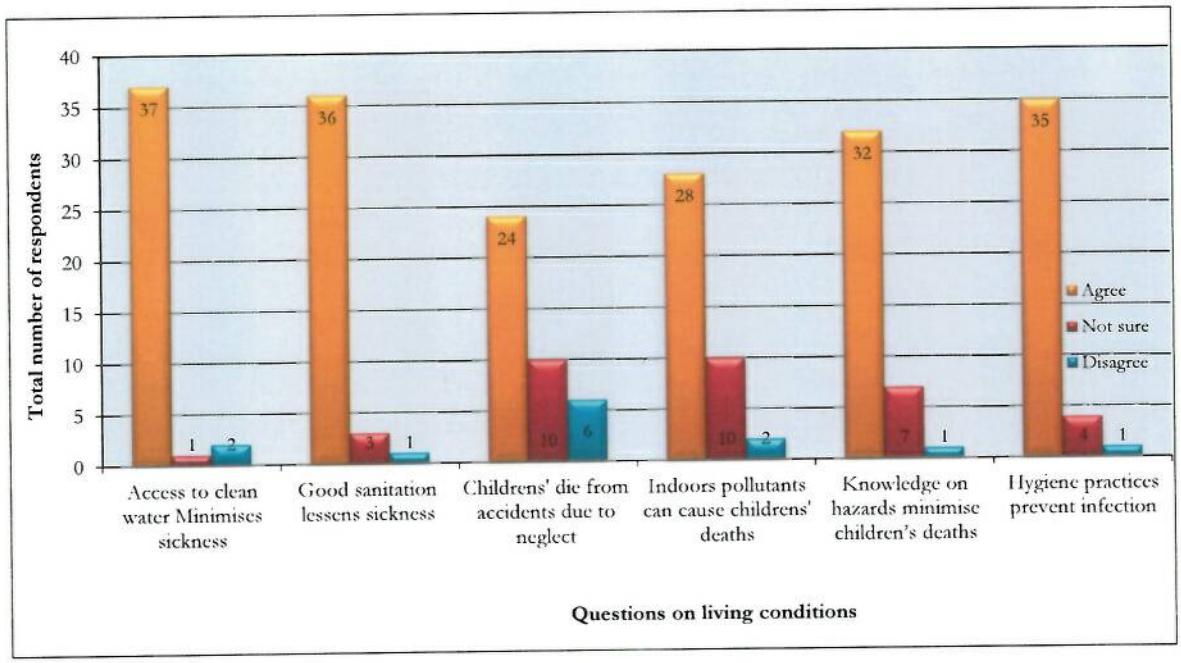


Children's internal and external environment, are the main contributory factors to child ill-health. Ormran (1971), state that demographic and epidemiological transitions affect children first. He further indicates that high infant and child mortality is the reflection of poor socio-economic status, under- development and low life expectancy.

Figure 7 shows the results of respondent's views on living conditions and child mortality. Ninety nine percent agree that contaminated water and food, lack of hygiene practices', and poor sanitation, poor house infrastructure and others, may expose children to illness that can results into deaths.

The pollution in places of residence can lead to respiratory diseases, and deaths. Ninety nine percent of respondents agree that knowledge of hazards things can minimise child mortality. Mosley and Chen (1984), framework provides an understanding that for illness to happen there should be a background factor that enabled it. The integration of two fields of thoughts shows if illness needs to be addressed the socio-economic factors that cause disease should be managed.

Figure 7 : Mothers perception on child living conditions and child deaths'



The findings of the study indicate no significant correlation between maternal education levels, and living conditions of the child with child mortality. The negative correlation coefficient of highest education level passed, occupation status of the mother, and type of the house shows an inverse relationship to child mortality. To further understand the underlying determinants of child mortality, mothers agree that maternal education level and living conditions of the child contribute to child mortality.

5. CHAPTER: DISCUSSIONS

5.1 Introduction

The main objective of this study was to understand the distribution and relationships between the selected socio-economic factors and infant mortality in Johannesburg. Specifically, the study intended to explain maternal education levels and living conditions as determinants of child mortality.

Bearing in mind that data are confined to a narrow geographic base and time thus limiting ability to draw broad generalisations pertaining to the relationship between child mortality and socio- economic factors. Mothers' education levels are regarded as contributory factors to child wellbeing. An n educated mother is able to identify the need for health service utilisation on time if the child is ill, they can approach the health professional and demand proper explanation about the child health status. Despite remarkable non significance in socio – economic factors and child mortality during the period covered by the study, a strong inverse relationship of socio -economic factors to child mortality has characterised this study population. Indicating that, an improvement in socio-economic conditions of mothers will benefit children therefore improving their health status.

Mosley and Chen (1984) developed one of the most comprehensive and systematic framework that is widely used for analysing factors behind infant mortality. The determinants in Mosley and Chen framework include both social and economic factors. Masuy-Stroobant (2001), study highlights similar factors such as maternal education, living conditions and other health factors, when improved lead to significant decline in child mortality rates.

5.2 Maternal Education levels

South Africa's education system experiences a range of problems extending beyond the simple issues of meeting the MDG targets. Poor quality education reinforces major racial inequalities in society and inadequate systems make it difficult for South Africa to deliver on internal infrastructural promises or to achieve competitive levels in a globalised economy .These factors impact negatively on long-term development and internal stability in the country.

Bloch (2010), argues that education is closely linked to health outcomes, for example poor vision, intestinal worms, foetal alcohol syndrome, the ravages of HIV and AIDS on families and the consequent existence of child-headed households, all impact negatively on educational achievement – as does schoolgirl pregnancy and the effect of sugar-daddies on the prevalence of HIV and AIDS. Achieving higher levels of education, together with women aspiring to higher goals, can be expected to impact positively on health outcomes – as in improved nutrition, better knowledge of and action around HIV and AIDS, better child and birthing expectations from mothers, and improved ability to manage the impact of ill-health and mitigate its effects. The reduced levels of poverty resulting from improved chances of employment through higher levels of education can also be expected to improve health outcomes in the long run.

Education is considered as a substitute for enlightenment and awareness both for men and women; as it results in the adoption of best practices leading to reduced infant mortality levels (Caldwell, 1972). In the estimated results, education of mothers indicates an inverse relationship with infant mortality as the coefficient of this independent variable has a negative sign. Improving access to good education for females may enable women to increase spacing between children, decrease teenage pregnancy, and delay having children, as these are some of the biological factors that contribute to child mortality. Educated women may get greater opportunities in decision making process in family matters, and in reproductive decision making to improve their family planning life.

Ijaz (2012), argue that women in our society even if educated may lack freedom of expression and decision making authority due to traditional believes and religious

practices. Most of these issues can be contested when a women is adequately enlightened. The other element maybe quality of education such as the curriculum taught at various stages of education might not be inclusive of awareness regarding personal and child health. Thus, education remains just a process where a person is promoted from a lower grade to higher grade in an education institution, but the person remains unsuccessful in applying this knowledge for bringing about change and improvement in her and other people in her everyday life. Lack of these qualities makes education of females ineffective in contributing to critical issue of child mortality in Johannesburg. The poor outcomes of the education systems impact more on poor, rural schools and township schools, which are predominantly for black people. Motala (2009), indicates that a small number of black students acquire an education of any meaningful quality in the poor, township and rural schools, this are education problems but destabilizes the health status of the country.

Bloch (2010), argues that benefits of education to individuals and society are enhanced when its quality is high and this will affect other aspects of individual behaviour in ways that bring strong social benefits. The findings of this study indicate that most mothers could only reach grade 11-12, which correlates with the literacy levels of the country in urban areas, there are high numbers of youth that reach grade 12, but could not further their studies, and are not employed. In this case study there are more females at childbearing age that could only reach grade 12, this needs urgent attention. There is a need to increase access to quality government education programmes, which could be presently hampered by several issues including legacy of poor education system for the majority group, cost of higher education, time and allocation for accessibility.

The lack of adequate education quality leads to high levels of unemployment, in particular among the youth. The minister of health in April 2013, commented on the findings of the study done in KwaZulu- Natal on HIV/AIDS infections; he indicated that young girls both schooling and none- schooling, get infected with HIV at their early teenagers years than boys. The Health Minister lambasted older men who lured girls into having sex for money. He said girls were four to eight times more likely to be infected with HIV than boys of the same age. The national department found that 28 percent of schoolgirls countrywide were HIV-positive, whereas only 4 percent of boys were infected with the virus (Massyn, Day, Baron, Haynes & English, 2013).

The noted increased teenage pregnancy in schools as a result of mostly male teaches and other older males impregnating young girls; The social development MEC in July media briefing , commented on the study done by Louw,(2013) on "The utilisation of condoms by teenagers in Gauteng". He alludes that teenage pregnancy is the problem that could not be ignored. He further states that experimentation with sex, and factors such as having multiple sexual partners and partners of disparate ages, had to be discouraged, as it leads to unwanted pregnancies, contribute to increase levels of maternal and child deaths and contributes to the level of unemployment, considering the girls who drop out of school due to pregnancy.

Where educational effort is not seen to lead to improved life prospects, and where access to further education and training becomes a financial and educational battle with poor projections, there is a risk that education is no longer valued. This can be seen in the denigration of matric results, even while pass levels have improved. There is recognition between department of education and department of health that lack of quality education may highly contribute to most ills of the society including child mortality. The coefficient of employment in the estimated results bears a negative sign indicative that increase in employment, improves the financial status of the family, thereby improving consumption patterns and expenses on health and hygiene.

5.3 Living conditions

This later proves as a significant variable that leads in reducing child mortality.
The relationship between poverty; poor income, poor living conditions and poor education and health, and their impact on diseases, such as HIV, AIDS, TB, malnutrition, injuries and communicable and non-communicable diseases is generally known in South Africa but not well researched like in other African countries like Ghana and other developed countries.

The health and ill-health not only in Johannesburg but nationally follows a social gradient: the lower the socio-economic position, the worse the health (Lutge & Friedman, 2010).The long standing cause of infant mortality from the 1960s' to current is diarrhea diseases; mostly caused by contaminated food and water, malnutrition caused by inadequate feeding and infections caused by polluted environment and

communicable diseases. These major determinants of child mortality are mostly caused by impaired social structure, medication cannot cure them, and the strategy to control and manage ill-health is recognizing that health systems are social responses to social problems.

Problem identification and prioritization of health developments is based on choice, therefore Mosley and Chen approach provides a guide to sound child health policy development and planning, example improving supply of sufficient safe water, good sanitation, and waste removals, together with, enforcement of effective personal and environmental hygiene educational programmes, may reduce infections and diarrhea diseases.

Some of the solutions are not direct responsibilities of the health care sector but if there is intersectoral collaboration and the health sector becomes proactive in educating other sectors how they impact on the well-being of society — the problems will be solve, for example injuries: drowning, burns, food poisoning happen mostly at home, and injuries caused by car accidents are most due to parents behaviors', but the health sector take responsibility of those deaths and report them under health mortality statistics.

Therefore the health sector should not cease to educate society and other stakeholders on prevention of ill-health. These social factors are viewed as simple issues but their effects to health care outcomes is huge and controlling the socio-economic determinants of health will reduce, the high cost of health care and will reduce the exportation of the health sector by pharmaceuticals companies and greed health care worker who over-charge services.

The undesirable infant mortality rate in Johannesburg indicates problems within the public health status of the province, the poor socio-economic development levels of the country and poor political administration. South Africa has a higher infant mortality rate than other countries with a similar income, example Mexico and Brazil. Over the past three years, health spending has increased from R47 billion to R74.9 billion or by over 8 percent per year (Gauteng, 2012). Despite this, the sector faces critical challenges, not least in governance and accountability.

The large increases in expenditure are noted in several areas, such as personnel, pharmaceuticals, purchasing of specialised diagnostic equipment's and others but evidence of improved performance is limited. Department is faced with a serious burden of disease and slow progress on the Millennium Development Goals, resolute steps should not only focus on socio-economic factors and health related factors, but also on both financial management, governance issues and performance.

Improving the living conditions needs infrastructure development, none of the foreign funders wants to contribute to infrastructure without gaining from the poor, example, roads improvement projects in Gauteng, funding to improve access to electricity, good sanitation and water purification mechanisms. Intersectoral collaboration between department of health, education and human settlement is a critical solution and needs to be enforced. This collaboration will address serious identified challenges and help with planning and integrated policy decisions to improve the daily living conditions of people that will benefit the children.

The Primary Health Care Re-engineering policy launched by Health Minister in 2012 is a great initiation to address community health problems, its focuses on prevention, health promotion, and act as the first point of contact for most health care services (Matsoso & Fryatt, 2013). This will provide some balance to the current dominance of hospital-centered curative care. The District Clinic Specialist Teams will focus on improving both the quality of health care and health outcomes for mothers, newborns and children by doing outreach to communities.

The municipal ward-based primary health care services include provision of home and community based health services especially in child health. Literature has shown that the role of community health workers (CHWs) in many countries has contributed to better health outcomes (Matsoso & Fryatt, 2013). School-Based PHC services: the new National Integrated School Health Policy was launched with the Departments of Basic Education and Social Development in October 2012. The policy focuses on the most disadvantaged schools in the country. School nurses uses mobile clinics to support schools and provide preventative and promotive services, by reducing health barriers to learning, and facilitate access to health and other services where required, example teenage pregnancy, HIV and TB, nutrition and exercise; personal and environmental

hygiene; abuse (sexual, physical and emotional abuse), mental health issues including drugs and substance abuse, depression, anxiety and suicide.

These are good policy reforms that can change the social ills of Johannesburg leading to improve health care status of individuals. Proper assessments of the health care system performance should be done to see this policy being achieved.

The importance of mother education cannot be ignored, and girls and women education has to be facilitated and encouraged in order to have secondary level of education obtainable. Mother education can act indirectly on mortality through biological factors and sociocultural factors; therefore an educated mother will be more capable of understanding family welfare, planning programmes and is more likely to use health facilities to seek help early. A comprehensive approach to women and girl's education policy and improving education quality is a matter of agency.

Areas for further study will include a mixed method study and an in-depth broader sample of the participants and possibly include a focus on parents that have lost children under the age of five in the past five years, and sample to include house visits and haphazard identification, to include different focus groups across the province. Determine the link between maternal lifestyles and deaths of children.

In conclusion maternal education levels improvement in townships and rural areas will not only benefit the children, but mothers will be able to get employment, have choice with regard to the place of residence, type of the dwelling, access to better health care services of choice and others. Undesirable child mortality rates in Johannesburg cannot be corrected by only by addressing the socio-economic factors, biological factors should also be taken into consideration as Mosley and Chen framework guides that child mortality will be effectively manage if the social science and medical science are integrated, as the one influence the other.

Finally, while there is a critical need for information on the exact nature of the maternal behaviors associated with child survival, we should be cautious of assigning the blame for high mortality levels directly to mothers.

6. CONCLUSION AND RECOMMENDATIONS

6.1 Introduction

The main objective of this study was to understand the distribution and relationships between the selected socio-economic factors and infant mortality in Johannesburg. Specifically, the study intended to identify maternal education levels and living conditions as determinants of child mortality. This chapter discusses the findings of the study as the researcher presents argument on the results of the findings and further makes recommendations on what could be done to reduce the levels of infant and child mortality by addressing socio-economic factors.

The socio-economic factors, which are generally referred to as non-medical factors, of infant and child mortality include; maternal education, which is measured by the highest education level passed; mothers' occupation status; environmental factors such as living conditions- place of residence, type of the house, number of people in the house and the availability of water and toilet facilities. The main causes of infant and child mortality in developing countries are genetical problems, life-style diseases and injuries or incidents for example drowning and others. In developing countries cause of infant and child mortality are life-style diseases and communicable diseases and whilst in underdeveloped countries causes of infant and child mortality are infectious diseases and malnutrition.

South Africa is classified as a developing country but presents with quadruple burden of diseases mimicking all the transitions of countries development— communicable and non-communicable diseases, injuries or incidents and HIV/AIDS, TB and malnutrition. The major five causes of child mortality in Gauteng area HIV/AIDS, diarrhea, pneumonia and other infections. There are inherent limitations with respect to data availability in South Africa, both nationally, provincially and in the local municipalities, especially data related infant and child mortality making specific reference to socio-economic determinants of death.

The preliminary analysis of infant and child mortality shows the following factors. First, poor health care policy development is a weakness, infant and childcare policies do not address children issues in totality— the social, developmental, and medical issues are address in silos. There is a need for integration of all aspects to effective manages child mortality. Second, lack of capacity in the public health care sector impede on quality health care service delivery even after introducing the new group of midlevel workers , clinical associate.

Third, increase burden of disease showing a quadrant presentation of infectious and non-infectious diseases, injuries and HIV and AIDS infection. This reflects poor developed policy enforcement and failure of the government to manage disease in totality. The Johannesburg Metro has been a recipient of nationally and provincially driven projects aimed at reducing infant and child mortality. Previous reports on causes of infant and child mortality in hospitals, listed acute respiratory tract infection, sepsis, diarrhea diseases and tuberculosis as the main causes of death (Saving the Children Report, 2006).

Despite all the programmes put in place infant and child mortality remains high for Johannesburg Metro, with the major causes of death being poverty related diseases, which are caused by infections or germs, which are quickly passed in overcrowded places, and their transition to a problematic case is exasperated by in adequate healthy feeding. Fourth, an income inequality is a problem, children from poor families reside in places where there is no easy access to health care services, especially emergency care services, and environment pollution is a problem. Academic past studies such as Chopra, Daviaud, Pattinson, Fonn, & Lawn (2009), on infant and child mortality proves some of the determinants in the preliminary analysis. The association of living condition to child mortality is that children living in poor environmental conditionals are at high risk of dying because of poor prevention and management of illness. Compared to children living in formal environment, where health can services of choice are easy available and the quality of service provided is good.

The specific objective of this study is to explain the relationship between the selected maternal variables; highest education level passed, occupation status, and the living condition of the child, to child mortality. Correlations used to measure how socio-economic variables are related to child mortality. Bivariate Correlations procedure

calculates Spearman's rho with its significance level. The strength of the linear association between two variables is quantified by the correlation coefficient.

The work of Mosley and Chen (1984) in the provision of the framework as well as arguments presented by Masuy-Stroobant (2001), gave impetus to the focus on socio-economic factors as contributory to maternal and infant mortality. The study was undertaken by using quantitative methods through the distribution of close-ended structured questionnaires using the Johannesburg Metro Community Health Care Centre as study site. According to Rossouw and Jordan (1997), in order to study infant and child mortality in the province a large sample size of approximately 700 respondents is required, however due to time allocated for this study the Johannesburg Metro Health Care Centre was chosen as it covers a huge part of the Johannesburg Metro as its catchment areas. Forty mothers that attend the baby clinic were used as sample. The questionnaires were analyzed by the researcher, and inferences made from the findings.

Data are confined to a narrow geographic base and time thus limiting ability to draw broad generalizations pertaining to the relationship between child mortality and socio-economic factors. According to the findings, there is no significant direct correlation between child mortality and maternal occupational status with infant and child mortality. Mothers' perceptions are that educated mothers, can easily use their power of choice in accessing the health care service, and providing their children with required healthy and nutritional food at specific stages of growth given their affordability. Ninety nine percent of respondents think the health care seeking behavior is important, and increases chances of the child being healed.

Mothers agreed that following the medical instruction, on the medication covers as well as those given by the medical professionals on utilization and dosage is a challenge, and it is even harder for illiterate mothers, thus causing in some cases severe complications which may shunt either the healing or growth development of the child sometimes leading to death. It is therefore concluded that the higher the level of maternal education the better the chances of the infant and children being healthier and thus living longer.

6.2 Recommendations

In South Africa, education level plays a huge role in securing mothers occupation and subsequently better salaries with higher levels of education. The quality of education plays a significant role in ensuring women become enlightened in caring for their children, and make choices on the birth spacing, during their child bearing ages. Educated women may get greater opportunities in decision making process in family matters, and in reproductive decision making to improve their family planning life.

It is recommended that the education level of mothers be improved so that they can make informed choices about the health and care of their children thus increasing the chances of their children becoming more healthy and living longer. This in turn will decrease the levels of infant and child mortality in the Johannesburg Metro in particular, and the Gauteng province and nationally in general.

It is recommended that the Johannesburg Metro Community Health Centre should intensify its maternal and child health education, strengthen its school health programme, and community Health care outreach programme, which will enlighten many women on caring for their bodies and children, thus effectively ensuring proper spacing between children as well as providing good care for them during the formative years of growth.

It is recommended that the management team of the Johannesburg Metro Community Health Centre, as the cluster head of the six clinics linked to it, encourages all clinics to revitalize their ante-natal care programmes for pregnant mothers and school health programme.

It is recommended that Johannesburg Metro Community Centre improves its collaboration with the social services unit of the Johannesburg Metropolitan City, to easily link the poor and destitute mothers to social services health support for indigents. It is recommended for the Provincial Department of health should coordinate integrated planning sessions with the Department of Social Department, Education, and Housing and Local government, Community Safety and Roads and Transport. The sessions should have as their output strategies and plans to bolster the road safety, Early Childhood care, and the indigents' benefit programmes.

This coordination will address policy decision and as well as highlight possible bottlenecks for implementation of the people development initiatives.

It is recommended that the Gauteng provincial department of health should develop an adequately efficient system to improve on data collection and ensure easy timely analysis for targeted decision making within the province. It is recommended that the National Department of health, through the Minister, include in the Negotiated Service Delivery Agreement, compulsory participation of other related departments in the promotion of caring for the environment to curb on respiratory illness that are linked to polluted air and water.

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1. APPENDIX A: DEMOGRAPHIC DATA AND CHARACTERISTIC OF RESPONDENTS.

Frequency Tables

Place of residence

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Suburb	4	10.0	10.0	10.0
	Township	27	67.5	67.5	77.5
	Informal Settlement	9	22.5	22.5	100.0
	Total	40	100.0	100.0	

Type Of The House

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	More than three bedrooms	9	22.5	22.5	22.5
	Two bed room house	12	30.0	30.0	52.5
	Room or Flat	8	20.0	20.0	72.5
	Shack	11	27.5	27.5	100.0
	Total	40	100.0	100.0	

Toilet Facilities

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	In the house	14	35.0	35.0	35.0
	Out of the house	24	60.0	60.0	95.0
	Shared or pit bucket	2	5.0	5.0	100.0
	Total	40	100.0	100.0	

Water Facilities

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Tap in the house	15	37.5	37.5	37.5
	Out of the house	20	50.0	50.0	87.5
	Tap shared	5	12.5	12.5	100.0
	Total	40	100.0	100.0	

Highest Educational Level

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Primary School	10	25.0	25.0	25.0
	Grade 11-12	20	50.0	50.0	75.0
	Tertiary education	10	25.0	25.0	100.0
	Total	40	100.0	100.0	

Respondent occupation

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	White – collar worker	7	17.5	17.5	17.5
	Unskilled worker	3	7.5	7.5	25.0
	Blue- collar worker	2	5.0	5.0	30.0
	Not working	28	70.0	70.0	100.0
	Total	40	100.0	100.0	

Husband's Occupation

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	White – collar worker	12	30.0	30.0	30.0
	unskilled worker	9	22.5	22.5	52.5
	Blue- collar worker	4	10.0	10.0	62.5
	Not working	15	37.5	37.5	100.0
	Total	40	100.0	100.0	

Child Alive Or Has Passed Away

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Alive	10	25.0	25.0	25.0
	Died	30	75.0	75.0	100.0
	Total	40	100.0	100.0	

Childs' Ages

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	0-1 years	17	42.5	42.5	42.5
	2-5 years	23	57.5	57.5	100.0
	Total	40	100.0	100.0	

Sex Of The Child

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Female	20	50.0	50.0	50.0
	Male	20	50.0	50.0	100.0
	Total	40	100.0	100.0	

Size Of Child At Birth

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Average	27	67.5	67.5	67.5
	Large than average	3	7.5	7.5	75.0
	Smaller than average	10	25.0	25.0	100.0
	Total	40	100.0	100.0	

Place Of Delivery

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Clinic	15	37.5	37.5	37.5
	Hospital	25	62.5	62.5	100.0
	Total	40	100.0	100.0	

Type of illness

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Respiratory conditions	18	45.0	45.0	45.0
	infectious conditions	22	55.0	55.0	97.5
	Total	40	100.0	100.0	

Mothers' age at birth of child.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	less than 19 years	9	22.5	22.5	22.5
	20-35 years	30	75.0	75.0	97.5
	36 years or more	1	2.5	2.5	100.0
	Total	40	100.0	100.0	

Antenatal visit attended

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Less than 5	8	20.0	20.0	20.0
	More than 5	32	80.0	80.0	100.0
	Total	40	100.0	100.0	

During delivery you were assisted by

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Doctor	14	35.0	35.0	35.0
	Nurse	24	60.0	60.0	95.0
	Student Doctor or Nurse	2	5.0	5.0	100.0
	Total	40	100.0	100.0	

Appendix C: Descriptive analysis of respondents views on maternal education and child deaths

Participant's responses on mothers' education and factors that may lead to child deaths

Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation
Educated mothers are likely to feed their children food that is needed for child growth at specific stage	40	2	3	2.03	.158
If the child is sent to hospital early when sick the chances of the child being cured are high	40	2	4	2.13	.463
Children of educated mother mostly have medical aid therefore can access better health care Services	40	2	4	2.18	.501
Prevention of mother to child HIV/AIDS transmission programme is working well	40	2	4	2.23	.480
Poor mother feed their children what is available	40	2	4	2.25	.543
Children of educated mothers get sick less	40	2	4	2.30	.608
Uneducated mothers struggle to follow instructions to give medication to their children	40	2	4	2.70	.883
Uneducated mother may not be aware which food is good for the child at what stage	40	2	4	2.73	.905
Traditional medicine is better than hospital medicine for children	40	2	4	2.93	.917
Place of residence	40	4	6	4.45	.846
Valid N (listwise)	40				

Participant's responses on living conditions and factors that may lead to child deaths

Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation
Good sanitation lessens chances of children getting sick from unclean water or food	40	2	4	2.13	.404
Access to clean water improves chances of children not getting sick	40	2	4	2.13	.463
Hygiene practices by the child minder will prevent a child from getting sick.	40	2	4	2.15	.427
Educating children minders on things that could be hazardous at home will minimise children's deaths	40	2	4	2.23	.480
Indoors air pollutants can cause children deaths	40	2	4	2.35	.580
Children die from accidents due to neglect from those minding them.	40	2	4	2.55	.749
Valid N (listwise)	40				