DETERMINANTS OF INFANT MORTALITY IN KISARAWE DISTRICT, TANZANIA

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A DISSERTATION SUBMITTED IN PARTIAL FULFILMENT OF THE REQUIREMENTS FOR THE DEGREE OF MASTER OF ARTS IN RURAL DEVELOPMENT OF SOKOINE UNIVERSITY OF AGRICULTURE. MOROGORO, TANZANIA.

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ABSTRACT

This study was conducted in Kisarawe District, being one of the Districts in Tanzania facing infant mortality (IM). The overall objective of this study was to investigate factors that determine infant mortality in the study area. The specific objectives were to describe neonatal mortality and postnatal mortality; to identify socio-economic factors which influence infant mortality; and to explore the demographic factors which influence infant mortality. A cross-sectional research design was applied in this study. A representative sample of 102 respondents was drawn from the sampling frame. Data from the questionnaires were analyzed statistically using statistical packages for social science (SPSS) and statistical test were done using the chi-squire to test the significant difference between the strata. The study revealed that (30.4%) of the respondents experienced IM, there were 33 incidences and (60.6%) of all incidences occurred at moment of delivery. Breastfeeding and place of delivery ($p<0.05$) were identified to be the main determinant of infant mortality. Weaknesses were as follows,(75.5%) were primary leavers; (10.8%) earned only 30000 Tsh a month; (68.6%) were not satisfied with medical services provided;(65.6%) gave birth below the age of 20; Traditional midwives are still in demand for (10.8%), all these are circumstances for IM. Yellow fever has been contributing (40.2%) of all death incidences. The study recommends that, the government should improve medical services; NGOs to invest in education and income generating activities; Mothers to seek medical help and attend clinic. Further research should be encouraged in the study area notably on yellow fever and neo-natal mortality which are generally high.

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DECLARATION

I, Mbitto Dachi Wilbert, do hereby declare to the Senate of Sokoine University of Agriculture, that this dissertation is my own work done within the period of registration and that it has neither been submitted nor being concurrently submitted for degree award to any other institution.

Wilbert, Dachi Mbitto

(M.A. Candidate)

12/11/2014

Date

The above declaration is confirmed

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12.11.2014

Date

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DEDICATIONS

This work is dedicated to my beloved parents, Mr. Dominic, A. Dachi and Stella, P Kibena for their painstaking in my education.

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LIST OF ABBREVIATIONS

CSP	Child Sponsorship Program
DD	Demographic determinants of infant mortality
HSSP	Health Sector Strategic Plan
i.e.	That is
IM	Infant mortality
IMI	Infant mortality incidences
MDC	Muhimbili medical centre
MDGs	Millennium development goals
ME	Midwifery education
MHSW	Ministry of Health and Social Welfare
NBS	National bureau of statistics
NM	Neonatal mortality
NSGRP	National strategy for growth and reduction of poverty
PM	Postnatal mortality
REPOA	Research on Poverty Alleviation
SE	Socio-economic determinants of infant mortality
SPSS	Statistical package for social sciences
SUA	Sokoine University of Agriculture
UN	United Nations
UNDP	United Nations Development Program
UNICEF	United Nations Children's Fund
URT	United Republic of Tanzania
WHO	World Health Organization
χ^2	Chi-square

CHAPTER ONE

1.0 INRODUCTION

1.1 Background

Infant mortality means deaths occurring before the newborn reach one year of age, as defined by World Health Organization (WHO, 2010). Infant mortality is also defined as death during the first year of life (Charmarbagwala *et al.*, 2005). Infant mortality is among the demographic processes that reflect the health situation, and one of the most important sensitive indicators of the social-economic and status of a community (Hisham, 2008). That is why the United Nations takes it to be one of the indexes of Human Development (UN, 2007) as cited by (Hisham, 2008).

There are high new born and mortality rates in Tanzania. These rates are caused by demographic, socio-economic and intervening factors. The health facility statistics indicate that infant mortality rate in 2002 was 95; while in 2011 was 68 per 1000 live births (URT, 2011a). The government has planned to reduce maternal and new born mortality through implementing projects to last for four years according to the National Strategy for Growth and Reduction of Poverty (NSGRP, 2005). The government's target was to see to it that infant mortality got reduced from 95 in 2002 to 50 in 2010 per 1,000 live births, but was not attained (NSGRP, 2005). Intervention to reduce maternal and new born mortality is expected to be undertaken through a national wide project to be launched from 2011to 2014 (NSGRP, 2005). Efforts to reduce infant mortality are for many years, and have made some progress in reducing these deaths as a result of improved access to health care and environmental sanitation. In 1988 and 2002, there were 115 and 95 infant mortality, respectively by National Bureau of Statistics (NBS) (URT, 2002). All the same the targeted 50 infant mortality is still high. Thus this study examined some socio-

economic and demographic determinants of infant mortality in Kisarawe District, Tanzania.

Infant mortality remains a major Public issue in developing countries where it is estimated that over 10 million preventable deaths occur yearly (Mojekwu *et al.*, 2011). Infant mortality accounts for 40% or more of all deaths in developing countries, by Muhimbili Medical Centre (MDC, 1988).

This is one of the most important items in the Millennium Development Goals (MDGs. NO.4), aiming to reduce infant and child mortality by two thirds between 1990-2015 (UNICEF, 2006). To support this initiative researchers suggest the improvement of Health Services for reducing infant mortality in developing countries (Sarah and Stephen, 2005).

1.2 Problem Statement

Kisarawe is among the districts in Coast Region with high infant mortality rate estimations of 114, where Mafia has 195, Mkuranga has 120, Bagamoyo has 113, Kibaha has 92 and finally Rufiji has 44 per 1000 live births (URT, 2007). The problem of infant mortality has been reported to be gross as 7 million new born die each year from complications of pregnancy and child birth which accounts to 90% of deaths occurring in South Asia and Sub Saharan Africa yearly (WHO, 2006). Moreover, compared with some countries in Sub-Saharan Africa, infant mortality is relatively high in Tanzania (68 per 1000 live births) (URT, 2011b). Most demographic Studies have focused on the role of birth order (Sangbery, 2009), on marriage patterns (Mtweve, 1994) and their relationship with infant mortality in Tanzania.

In Kisarawe a study has been done to assess and address maternal and newborn health challenges in general (Sera *et al.*, 2005). Moreover, efforts to prevent newborn morbidity

and mortality have been done in the study area such as, employing skilled staffs, purchasing medical facilities and providing adequate education on reproductive health (Kisanga, 2012). Apart from efforts employed, it was not known exactly what cause infant mortality in the study area. Therefore this literature gap propelled to conduct this study on the determinants of infant mortality which may assist to inform policy makers. This study was carried in order to investigate the determinants of infant mortality in the District considering the fact that disparities persist, between District and Regions, Urban versus Rural areas, and wealth status as to the causes of infant mortality (URT, 2008).

1.3 Justification

The study investigated the Determinants of infant mortality because studies have shown that deaths occur when there are circumstances leading to the loss of life to infants (Bryman and Cramer, 1990). Therefore this study provided empirical information for policy makers, non-government organizations and other development agencies when reviewing their future plans. The study may also contribute to Cluster II of the National Strategy for Growth and Reduction of Poverty NSGRP I which puts clear the policy of improving life and social well-being by reducing mortality rate from 95 in 2002 to 50 reaching 2010 per 1 000 live births (NSGRP, 2005).

The study is in line with the Millennium Development Goal number 4 to reduce infant and child mortality by two thirds between 1990-2015 (UNICEF, 2006). The realization of this goal is only possible if the government and donor agencies look beyond the health sector to find hidden causative factors such as education, housing, vibrant maternal, new born and child health interventions by doing research (Journal for Equity in Healthy, 2011). The study intended to investigate the determinants of infant mortality in Kisarawe for the sake

of saving lives of the new born, contributing to the realization of both the NSGRP and the Millennium Development Goal.

1.4 Objectives

1.4.1 General objective

The general objective of the study was, to investigate factors that determine infant mortality in the study area.

1.4.2 Specific objectives

(i) To assess neonatal mortality and postnatal mortality.

(ii) To identify socio- economic factors which influence infant mortality.

(iii) To explore the demographic factors which influence infant mortality.

1.5 Research Questions

(i) What is the assessment of neonatal mortality and postnatal mortality?

(ii) What are the socio-economic factors influencing infant mortality?

(iii)What are the demographic factors influencing infant mortality?

CHAPTER TWO

2.0 LITERATURE REVIEW

2.1 Definition of Terms

Infant. Originally from Latin in-'not' +fant-fan 'speak' therefore meaning unable to speak.

Neo-natal mortality. The probability of dying at delivery or with in the first month of life

Post-natal mortality. The possibility of dying with in one year after birth

Infant mortality. In the field of Public Health, infant mortality is a commonly statistical measure that is defined as the number of deaths occurring to newborns before reaching their first birth day (WHO, 2010).

Determinants of infant mortality: These are circumstances in which infants die. These circumstances are in turn shaped by a wider set of forces: economics, social policies, and politics (WHO, 2012).

2.2 The Magnitude of the Problem

Infant mortality accounts for 40% or more of all deaths in developing countries (MDC, 1988). According to WHO (2006), 7 million new born die each year while 530,000 women worldwide die each year from complications of pregnancy and child birth of which 90% of all deaths occur in South Asia and Sub Saharan Africa. Approximately, 15% of women experience pregnancy complication or child-birth which can be managed by skilled health care professionals. Also 7 million neo natal deaths every year could be averted if skilled health care professionals will have access to quality referred facilities and attend all births (WHO, 2006).

The UN Interagency Group for Child Mortality estimations show that countries which have done well in checking infant mortality rate and those which did not do fine at all to

be Sub Saharan Africa, Iceland has 1.6, San Marino 1.7, Liechtenstein 1.8, as the best three. The last three were Somalia 108.3, Democratic Republic of Congo 111.7 and Sierra Leone 113.7 (UN, 2010). The estimation rate for Tanzania is said to be 50 per 1 000 live births.

2.3 Factors Influencing Infant Mortality in General

Blum (1981) in his theory gives the general determinants of infant mortality which are environmental, social-economic, cultural, education, personal habits and genetic factors. Another researcher is Shruti (2009) mentions determinants for infant mortality as household income, female education, access to health services and immunization.

Infant mortality is also influenced by biomedical, cultural and environment of a particular area (MDC, 1988). Other studies consider an unskilled midwife to be a factor. A study by Levy (1918) found that skilled midwives have significantly lower incidences of infant and neo-natal mortality in their practice than do physicians. Mturi and Curtis (1995) found that short birth intervals, teenage pregnancies and previous child deaths are associated with increased risk of deaths.

Also root cause of infant mortality is the uneven distribution of resources and lack of resources. In essence like the old African proverb states "It takes a village to raise a child". "That is Children will thrive only if their families thrive and if the whole society cares enough to provide for them." Infants are faces of the future and their survival measures quality of life of any given society (Balbierz, 2010).

The design and successful implementation of programs that address determinants of infant mortality require collaborative efforts of researchers from various disciplines including

heath scientists, nutritionists, social scientists, demographers and educators (MDC, 1988). This is because disparities on determinants of infant mortality persist, between District and Regions, Urban versus Rural areas, and wealth status (URT, 2008).

2.4 Determinants of Infant Mortality in the Study Area

2.4.1 Socio-economic determinants of IM

(i) Education

Is a factor for IM in our World today, IMR are said to be higher among illiterate reproductive mothers (Quamrul, 2010). Formal or informal education makes the mother become aware of the reproductive health, therefore for a mother who is learned her priority will be to avoid any circumstances leading to IM. Most demographic Studies indicate that there is a strong statistical association between maternal education and infant mortality (Farrokh, 2009).

According to MDGs IM should be reduced to the great extent by 2015, in Pakistan realizing the impact education has on IM they have decided to educate women in the context of Pakistan i.e. avoiding using books written outside their context (Zaman, 2011). Again on education, it is said that in Minnesota education was a tool to reduce IM, (U.S.A, 2007). The study uses ratio level of measurement to capture the number of years spent at school for the respondents.

(ii) Income

This is very much associated with education, we expect an educated mother to be also economically good regardless she is employed formally or informally. Income has impact in IM for families which are not able to meet their needs are at risk of IM (Gubhaju *et al*, 1991).

Rodwin (2005) reported that, those who come from big cities are more advantageous simply because their income is higher than those from outskirts. He did his research in big cities of New York, London, Paris and Tokyo. The study uses ratio level of measurement to capture variation of income of respondents.

(iii) Employment

This is a determinant of IM as studies have stipulated that in countries where most couples employed, have fewer IM. This is of course connected with income (Otto, 2007). He also said that employments foster economic growth of the people leading them to solve their health problems so easily. Provision of employment to women has proved to have reduced IM (Askot, 1989). The study uses dummy 1 if employed 0 if otherwise.

(iv) Medical care

Medical care is considered and revealed to have caused a lot of infant mortality in many parts of the world. That is why in some countries like the US, there are a lot of promotions of prenatal care and infant care where women are advised to not repeating pregnancies in 6 months or less because it increases the risk of IM (U.S, 2006). The study uses dummy 1 if there is enough services 0 if otherwise.

(v) Place of delivery

Reports from Nigeria have shown IM to be higher to infants born at home than those born in health centres (Biosoc, 1994). There is still need to advice mothers to go to heath centres for delivery because statistics indicate 50.6% of mothers delivering at home in Tanzania (Mills, 2011). For this variable dummy is used to capture respondents with their place of delivery 1 if delivered at home and 0 if otherwise.

2.4.2 Demographic determinants of infant mortality

(i) Age of the mother at first delivery

Having seen increasing IM born to teenage mothers, a research was made in U.S.A with mothers younger than 20 and order to 34. In a neo-natal period a significantly greater overall mortality occurred in infants born to the mothers at 5.2 per 1000 among the younger and 1.0 among the older, these deaths were related to weight (Nancy, 1983).There is an association of maternal age and infant mortality where mothers between the ages of 12-35 were interviewed; it was revealed that those at the age of 27-29 had lowest deaths. Reasons for deaths were biological and social mechanisms which play role in explaining why children from young mothers have poor outcomes (Jocelyn et al, 2011). For the age of the mother at birth the study uses ratio measurement to capture how old respondents were at birth.

(ii) Birth interval/ Child spacing

Birth interval has effects in IM, it is recommended that a mother should stay 2 years or 24 months, before she gives another birth otherwise; the mother increases the chance for the expected infant to die (WHO, 2006). This tradition has been violated by many couples and those from visiting relations, where in his study Gandotra (2007) noted 61% of mothers in Gujarat and Maharashtra observed an interval of 1-17 months only, hence increased risk of IM. A short preceding birth interval has also been found to increase the probability of IM (Kaldewei, 2010). Ratio measurement is used for this variable.

(iii) Breastfeeding

It has been found that diseases and conditions can be prevented or limited in severity by pronged breastfeeding. In Chicago a lot of IM occurred in the 20th century after mothers tried to substitute breastfeeding by cow's milk (Wolf, 2010). For the breastfeeding dummy

is used to get respondents who have breastfed their infants for 6 months and above as recommended by World Health Organization (WHO, 2003). 1 if the child fed from beasts for 6 months and 0 if otherwise.

(vi) Weight of the infant at birth

This is another determinant of IM, Whelan (2011) on birth weight he found that in India birth weight was not significant in causing IM as it was in the US where he also researched still, he admits it to be a determinant of IM. It is observed that infants below 2400 g had more risk of IM than those above (Gandotra, 2007). Dummy is used 1 if the child was born below 2500g and 0 if otherwise which is in line with WHO definition of low birth weight (WHO, 2005).

2.5 Infant Mortality Incidences

Just to know that there are deaths incidences which mothers encounter when they are at the moment of delivery (NM) and there are those which they encounter with in one year after delivery (PM) because after one year a child ceases to be called infant.

2.5.1 Neonatal mortality

Studies have shown the number of NM to differ from place to place, of 7 million IM 50% occur at NM (Harriet *et al.*, 2010). Neonatal mortality is mainly caused by lack of preparedness from the family members for example funds for transport and shortage of trained personnel especially in the rural areas (Kisanga, 2012). High neo-natal mortality which most of them occur at moment of delivery remains a significant challenge, accounting for 32% of all under five deaths in Tanzania (Tujikomboe, 2012).

2.5.2 Postnatal mortality

On the other hand, according to UNICEF (2010) IM is more after delivery PM than any other time, simply because the infant stays 12 months more before he is no longer an infant. But in other places this can be different that is why researches are being done.

2.6 IM Situation in Tanzania Today

This is aimed at presenting levels, trends, in Tanzania with details on neonatal, post neonatal, infant mortality and child mortality rates which reflect a countries level of socio-economic development and quality of life. In the year 2012, situation of IM in some African countries including Tanzania was as follows, in Malawi 79, in Mozambique 77, in Zambia 65, while in East African countries the situation was as follows in Burundi 60, in Rwanda 63, in Kenya 44 in Uganda 61, while highest IMR for the East African countries was in Tanzania with 66/1000 deaths (World Fact Book, 2012). IM has been declining though not significantly, as from 1999 where IMR was 115, in 2010 after a long period you see IMR reaching 51 while the target is to have at least 38 infant mortality rates by 2015 (URT, 2011b). As Fig. 1 illustrates.

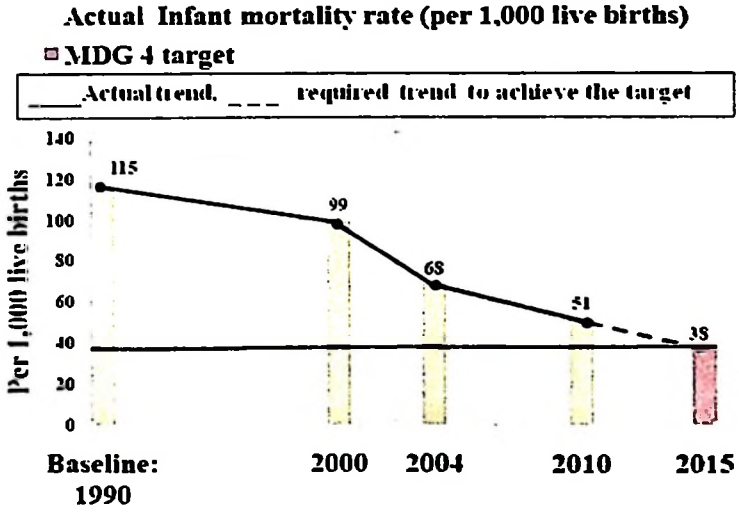

Figure 1: Infant mortality trend in Tanzania
Source: MDGs survey, 2010.

Another source explaining the situation of IM in Tanzania is by WFB, (2012) which uncovers the situation in 13 years consecutively from the year 2000 all the way to 2012. This is as follows, in the year 2000 IMR was 80.97, 2001= 79.41, 2002=77.85, 2003= 103.68, 2004= 102, 2005= 98.54, 2006= 96.48, 2007= 71.69, 2008=70.46, 2009= 69.28, 2010= 68.13, 2011= 66.93 and in 2012 IMR was 65.74.The statistics indicate IMR to be declining very gradually, therefore there is need to reduce death incidences in Tanzania.

2.7 Efforts towards Reducing Infant Mortality in Tanzania

Many expectant mothers live in constant fear and anxiety of what will happen to them and their children. They are at risk of losing their children or their own lives, or both, through child birth complications. Children face myriad obstacles before the age of 5 years (Ngowi, 2009).

In October 2008, Tanzania started a new program to reach mothers and infants before they are eligible for the child sponsorship program known as, child survival program (CSP) which aims at helping children survival the turbulent years in their growth , from birth to 5 years (URT, 2010). This is because according to UNICEF (2006) IM is still high in Tanzania. High neo natal deaths remain a significant challenge accounting 32% of all under 5 deaths in Tanzania therefore a plan is set called Health Sector Strategic Plan (HSSP) to reduce IM (MHSW, 2010).

Efforts were made improving control measures of malaria, acute respiratory infections, diarrhea, improved personal hygiene, environmental sanitation and preventive, promotive as well as curative health services (UNDP, 2010). His Excellency President Jakaya Kikwete in his inaugural speech in the Deliver now for Women and Children Campaign of

22.04.2008 emphasized that IM is still high in Tanzania so there is every reason to reduce it (Mwaikambo, 2010).

It has been found that; both maternal and neo-natal mortality can be improved with the use of skilled delivery care; utilization of a skilled birth attendant is therefore, a critical intervertation to achieve MDG 4 and 5. However in the least developed countries, only 35% of births were attended by trained providers, making it essential to develop and test programs that focus on evidence based interventions including a continuum of care, skilled attendance at birth, and access to emergence obstetric care (WHO, 2007). The provision of successful emergency obstetric care is dependent on the reduction of five major delays including, delay in recognizing the problem, delay in receiving emergency first aid, delay in deciding to seek care at the onset of the emergency, delay in seeking timely care, delay in getting quality, appropriate, and effective care. The first four delays occur at household level (Tujikomboe, 2012).

2.8 Conceptual Framework

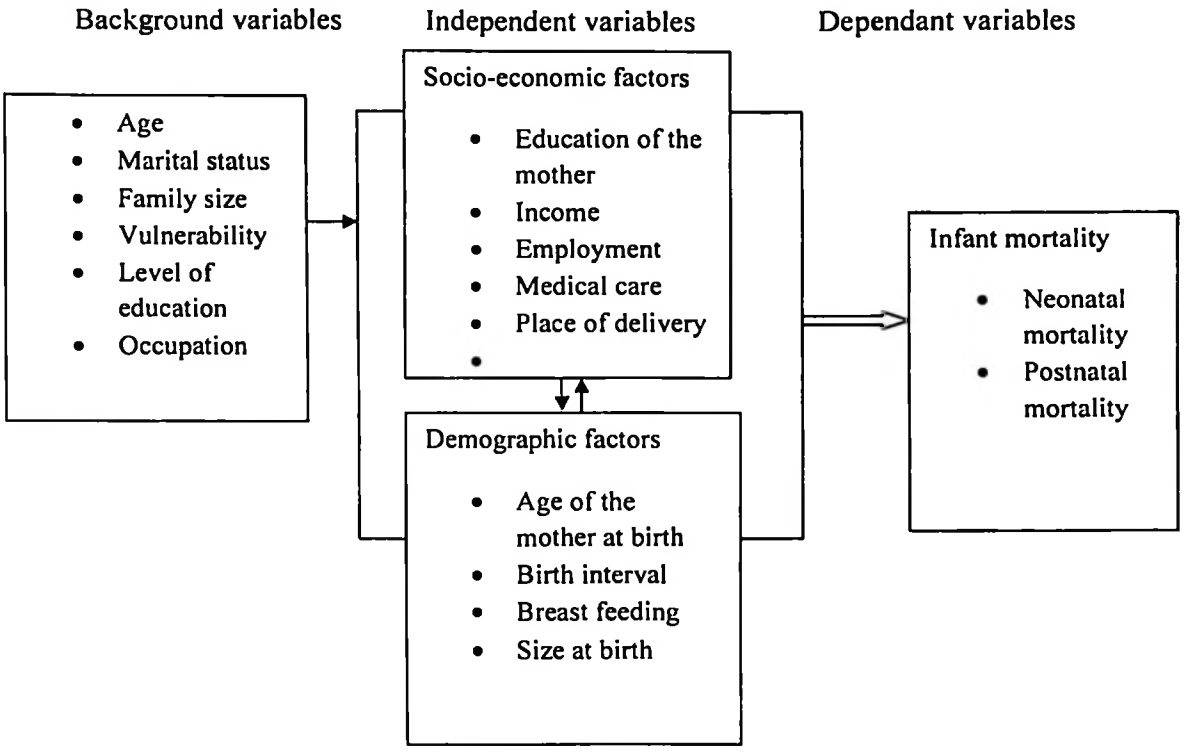

Figure 2: Conceptual Framework

2.9 Theoretical Framework

The study is based on the model by Bryman and Cramer (1990) on 'Determinants of child Survival.' According to them, death is determined by the economic and social structure of a certain location. These influence a disease and its development causing infant mortality as an outcome. Structural determinants are mediated at the family level since child's life depends on the environment at home.

CHAPTER THREE

3.0 METHODOLOGY

3.1 Location of the Study Area

The study was conducted in Kisarawe District, Coast region. The District has four administrative divisions namely Sungwi, Chole, Maneromango and Mzenga with a population of 101 598. Among them, there were 50,631 males while females were 50 967 (URT, 2013). It is among the seven Districts of the Coast Region. It boulders Dar es Salaam City to the East while to the North it boulders Kibaha town and Rufiji to the South. Children under 5 were 13 156, children under one year were 2 878, women of bearing age were 21 584, it consists of 15 wards and 74 villages (Kisanga, 2012). The District has one hospital, 3 health centres and 17 dispensaries. The time zone in Kisarawe District is Africa/Dar es Salaam, sunrise at 06:29 and sunset at 18:44. The district is located between Latitude -7.2°, and Longitude. 38.8° (URT, 2007).

3.2 Choice of the Study Area

The reasons for carrying out the study in Kisarawe District were:

(a) It is among the districts with high infant mortality rate of 114/1000 live births in the Coast Region (URT, 2007) while the Millennium Development Goal aims at reducing it, to 50/1000 (UNICEF, 2006).

(b) Again it is a District with too early pregnancy before 20 years of age and to soon pregnancy before 2 years after the last pregnancy contributing to infant deaths due to early weaning and lack of exclusive breastfeeding (Kisanga, 2012).

3.3 Research Design

A cross sectional design was used, that is measuring the unity from a sample of the population. Cross sectional research design consent data to be collected at a point in time

(Kothari, 2004). The design is used in descriptive study and for determinations of relationships of variables (Babbie, 1990 and Bailey, 1998). Given the time limit and nature of the study, the research opted to use this research design for the study (Babbie, 1973).

3.4 Population

Population for the study included all women who have experienced birth in their life time, and those who are giving birth, living in the study area.

3.5 Sample Size

Data was collected from 6 villages where from each of them 17 women respondents were selected purposively. The 17 women respondents are taken from 6 villages following Bailey who says 30 respondents and above can be a good sample for a research (Bailey, 1998). Among the respondents 31 experienced infants deaths, while 71 did not making a total of 102 respondents. Therefore the sample size was 102.

3.6 Sampling Procedure

The study used two sampling procedures to get the required sample size. These included random sampling and purposive sampling. Two divisions were randomly selected for the study. Those were Sungwi and Maneromango. From these two divisions three wards were randomly picked making a total of six wards for the study. One village was picked from each of these six wards to make six villages randomly selected. The villages randomly selected were Kisarawe, Kiluvya, Masaki, Msanga, Maneromango and Marumbo. From the six villages 17 respondents from each village were identified making a total of 102 respondents purposively selected.

3.7 Data Collection Technique

The study collected primary data using a structured questionnaire with open and closed ended questions for the attributes pertaining determinants and incidences of infant

mortality which are quantitative. Qualitative data were obtained when seeking comments of respondents as key informants on how mothers regularly sought medical help and for identifying causes of infant mortality in the study area.

3.8 Data Analysis

The information collected were sorted, coded, summarized and analysed by using Statistical Package for Social Sciences (SPSS) computer software version 20. Descriptive analysis of variables so as to obtain means, frequencies, standard deviations and percentages which appear on tables and figures were performed. Specific objective number one was analyzed by descriptive statistics to compare percentages on infant mortality incidences (IMI) at moment of delivery (NM) and after delivery (PM).

For inferential analysis, specific objective number two and three have been analyzed using binary regression logistic model. Chi-square was used to observe variation of respondents' characteristics including age, marital status, family size, education level, occupation and vulnerability history.

$$Y_i = \frac{P_i}{1 - P_i} = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \ldots\ldots \beta_n X_n + \varepsilon_i$$

$$= \frac{P_i}{1 - Pi} = \frac{Odd}{1 - Odd} = \frac{exp\,(B)}{1 - exp\,(B)} \qquad \frac{e^{(b_0 + b_1 X_1 + b_2 X_2 + \ldots\ldots b_n X_n)}}{1 - e^{(b_0 + b_1 X_1 + b_2 X_2 + \ldots\ldots b_n X_n)}}$$

Whereby;

- Yi stands for dropout as a dichotomous dependent variable measured by binary indicators; 1 if a mother experienced infant mortality incidences and 0 if not experienced;

- P_i or *Odd* or $exp(\beta_0)$ is a chance for infant mortality incidence to occur;
- β_0, and ε_i are the intercept and error term respectively;
- b_o is unbiased estimator for β_0;
- $\beta_1, \beta_2, \ldots \beta_9$ are coefficients that measure a corresponding change in odds ($exp(\beta)$) brought by a unit change in $X_1, X_2, \ldots X_9$;
- $b_1, b_2, \ldots b_{11}$ are unbiased estimators for $\beta_1, \beta_2, \ldots \beta_9$

$X_1, X_2, \ldots X_9$ are possible factors for infant mortality. Independent variables, education of the mother, income, employment, medical care, place of delivery, age of the mother at child birth, birth interval, breastfeeding and weight of the infant at birth.

3.8 Limitation of the Study

The information and data given by respondents depended heavily on memory recall especially on actual amount of income earned and expenditure done in a month, because most of them were not conversant in keeping financial records. In this situation some discrepancies were likely to happen. However, this study spent enough time to investigate the economic situation of the mother to avoid wrong information.

CHAPTER FOUR

4.0 RESULTS AND DISCUSSIONS

4.1 General Characteristics of Respondents

The general characteristics that were put into account were age, type of vulnerability, marital status, family size, education and occupation, which all of these have influence in infant mortality (Charmabagwala, 2010).

4.1.1 Age of the mother

The chi-square revealed that variation in age distribution among respondents was significantly at ($\chi^2(2) = 60.941$, $p < 0.001$) at 5% level. This means that age has influence and determines infant mortality. Minimum age of respondents was 19 and maximum was 40, according to (WHO, 2000) one should start bearing children at the age of 20 and end at the age of 35. The mean was 27.27 ± 5.68 at standard deviation. Furthermore, age from 11-20 were (7.8%), age 21-30 were (68.6%) which is normal, but 31-40 were (23.5%), these ones are at risk of losing their infants because of old age. Based on the study, some mothers give birth when they are teenagers and some others prolong even after the age of 35.Having seen sudden IM born to teenage mothers, a research was made in U.S.A from mothers younger than 20 years and order to 34 years. In neonatal period a significantly greater overall mortality occurred in infants born to the younger mothers at 5.2 per 1000 among the younger and 1.0 among the order related to low weight (Nancy, 1983). Another study which supports these findings is by (Jocelyn *et al.*, 2011) where mothers between the age of 12-35 and 27-29, were interviewed. The results were; those aged 27-29 had lower deaths, the reason was biological and social mechanisms which play role in explaining why children of young mothers have poor outcomes.

4.1.2 Marital status

The chi-square revealed that variation in marital status among respondents was significantly different at (χ^2 (3) =157.294, p< 0.00) at 5% level. Those who were single were (18.6%), these ones are also at risk of facing IM because most of them are dependant and have no where to seek for assistance in rearing the children. The married women were (77.5%), these are safe because they depend on themselves with their husbands. Generally most of the respondents were married. 1 widow (1.0%) and 3 were divorced. What is positive here is that couples live to tolerate each other no matter what they earn per month.IM has been noted to be higher in common law and visiting unions, could be because the woman had to work hard to get her basic needs. The risk of IM is higher when the infant is not born in marriage (Wright, 1997). Out of wedlock status has long been recognized as a demographic risk factor, associated with Birth weight. Marriage necessarily provides a protective environment for child bearing (Bennet, 1992).

4.1.3 Family size

The chi-square revealed that variation in family size was significantly different at (χ^2 (2) = 29.176 p< 0.001) at 5% level. Minimum size of respondents was 1 maximum 6 and mean was 3.75 ± 1.181 as standard deviation, refer Table 1,1-2 members were 14, that is (13.7 %), 3-4 were 58 that is (56.9%), 5-6 were 30, (29.4%) . Most families had 3-4 members which is normal. As far as the Coast region is concern one would have expected to find families with a big number of children, but the fact is that things have changed. There was no one who was at risk of encountering IM simply because the number of household members was big. The study is in line with other findings which got that, the increase in family size can cause the risk of experiencing IM because of the increase of the number of dependants (Charmarbagwala, 2010).

Table 1: Distribution of respondents by general characteristics

Variable	Category	Frequency	Total	Percentage (%)
Age				
	11-20	8		7.8
	21-30	70		68.6
	31-40	24	(102)	23.5
Marital status				
	Single	19		18.6
	Married	79		77.5
	Widow	1		1.0
	Divorced	3	(102)	2.9
Family size				
	1-2	14		13.7
	3-4	58		56.9
	5-6	30	(102)	29.4

4.1.4 Vulnerability

The chi-square revealed that variation in vulnerability distribution among respondents was significant at (χ^2 (2) = 144.529, $p < 0.001$) at 5% level. Orphans were (9.8%), 1 disabled (1.0%), respondents with no vulnerability were (89.2%). 40% of the orphans interviewed experienced IM therefore care is needed for this group so as to avoid these deaths. The study area has no much problem with orphans, however, no matter how few they were they faced IM highly as to be compared with other groups of vulnerability. Babies are at higher risk of deaths or malnutrition if their mothers themselves are undernourished, are in poor health and young (REPOA, 2007).

Table 2: Distribution of respondents by Vulnerability (n=102)

Variable	Frequency	Percent
Group of vulnerability		
Orphan	10	9.8
Disabled	1	1.0
None	91	89.2
Total	**102**	**100**

4.1.5 Level of education of the mother

There was a significant variation in education level among respondents at (χ^2 (3) = 128.510, p, 0.001) as revealed by chi-square. For those who had no formal education, were 4 that is 3.95%, as a matter of fact these are at risk of experiencing infant deaths. Those with primary education were (71.6%), secondary education were (22.5%), while post secondary education were only (1.95%). The study based on the importance of education revealed that women in the study area are risk of losing their children simply because ignorance is still prevailing and so far there are no enough efforts employed to improve it. Education of the mother is a determinant of IM because IMR are higher among illiterate reproductive mothers than those who spent some years at school (Quamrul, 2010).

Table 3: Distribution of respondents by education level (n=102)

Variable	Frequency	Percent
Education level		
No formal education	4	3.9
Primary education	73	71.6
Secondary education	23	22.5
Post secondary education	2	2.0
Total		**100**

4.1.6 Occupation of the mother

There was a significant variation in occupation among respondents at (χ^2 (4) = 108.490, p < 0.001) as revealed by chi-square. Occupation has momentous influence on causing deaths to infants (Quamrul, 2010). The 10.8% percent of respondents who are not working is very big, this means their life depends on other people. The study area borders Dar es Salaam city to the east and Kibaha town to the north, being near Dar es Salaam most dwellers do not engage themselves in Agriculture because they identify themselves as

people of the city ending up in poverty. For the few of them opted for business, are not doing fine because there is no enough market for their goods and services. The study expected most of them to be dealing with agriculture, the results showed that most of the respondents to be petty sellers.

Table 4: Distribution of respondent by occupation (n=102)

Variable	Frequency	Percent
Occupation		
Not working	11	10.8
Agriculture	23	22.5
Petty traders	60	58.8
Other	8	7.8
Total	**102**	**100**

4.2 Infant Mortality

The study aimed at looking for the number of death incidences occurring in the study area. It was revealed that among 102 respondents interviewed from six villages of Kisarawe District, which were Masaki, Kisarawe, Kiluvya, Msanga, Maneromango and Marumbo31 respondents experienced infant deaths. One third, which is 30.4% of all women interviewed, experienced the incidences at different moments, most of them when they were giving birth (NM) and some of them after giving birth (PM) as shown by Table 5.

Table 5: Distribution of respondents by infant death experiences (n=102)

Variable	Frequency	Percent
Mothers		
No experience	71	69.6
Experienced infant deaths	31	30.4
Total	**102**	**100**

According to the descriptive given above infant mortality in the study area is still high, for among 102 women (30.4%) lost their infants. More specifically, data from survey revealed that there were 33 incidences of infant mortality; this was because two respondents experienced infant deaths both at delivery (NM) and after delivery (PM). Therefore 29 respondents experienced infant mortality once while 2 experienced twice 29 + 2x2= 33 incidences as shown in Fig. 3, below. Neo-natal mortality is higher due to the fact that there are a lot of complications at moment of delivery than after delivery.

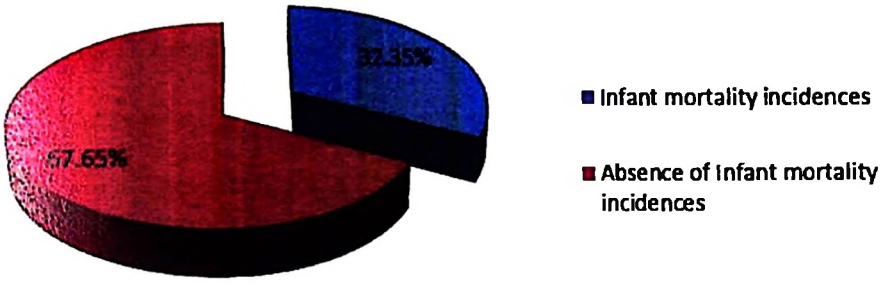

Figure 3: Infant mortality incidences (n=102)

4.2.1 Neonatal mortality

The study revealed that in Kisarawe District infant mortality occurs mostly when mothers are giving birth (NM), regardless it is first birth or not. 20 incidences were discovered to have occurred at moment of delivery by the 31 respondents interviewed. It means that 60.6% of all IM incidences occurred at delivery. The Study identified more IM at the moment of delivery (NM); on similar results a study by Harriet revealed 50% deaths occurring at NM (Harriet *et al.*, 2010).

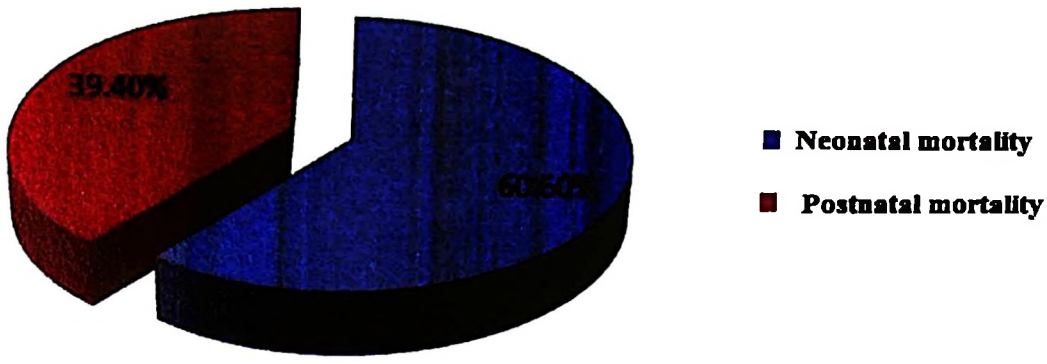

Figure 4: Neonatal and Postnatal mortality

4.2.2 Postnatal mortality

Based on data survey the study noticed few incidences after delivery as compared to incidences happening when the mother gives birth. 13 incidences are seen after delivery which is 39.4 % of all incidences of death in the study area as seen in Fig. 4. Therefore few incidences were identified after delivery. According to UNICEF (2010), in 2010 NM were 26% of all IMI while in the same year PM were 50% of all IMI.

4.3 Factors Influencing Infant Mortality

According to this study, what are given here are the determinants of infant mortality in the study area. Researchers who did on infant mortality looked at a few proximate causes of infant mortality (Askot, 1989). Education, income, employment, availability of medical services, age at delivery, child spacing, breastfeeding, place of delivery and weight of the child at birth are some of the proximate causes of infant mortality which the study used to determine IM. All the variables were used with binary logistic regression model to see their influence on infant mortality as shown in Table 6.

Table 6: Coefficients, odds ratio and standard error from Binary logistic regression of selected determinants of infant mortality in Kisarawe District (n=102)

Variable	B	SE	Wald	P-value	Exp (β)
Education	-0.035	0.102	0.120	0.729	0.965
Income	0.000	0.000	0.098	0.754	1.00
Employment	1.241	0.933	1.769	0.184	3.458
Medical services	0.116	0.523	0.049	0.825	1.123
Age at delivery	0.055	0.095	0.341	0.559	1.057
Child spacing	-0.009	0.103	0.007	0.933	0.991
Breast feeding	-2.188**	0.925	5.590	0.018	0.112
Place of delivery	1.230*	0.547	5.059	0.024	3.422
Weight of the child at birth	0.081	0.525	0.024	0.877	1.085
Constant	0.000	2.077	0.000	1.000	1.000

***'**Significant at $p < 0.05$ and $p < 0.01$ respectively**

4.3.1 Social economic factors for infant mortality

The study had five socio-economic determinants (SE) of infant mortality which are Education, Income, Employment, Medical services accessibility and Place of delivery. All these have been influencing infant mortality by creating circumstances of IM to happen in one way or another, among these place of delivery has been recognized to be more dangerous (significant) if we want our newborn to survive.

a. Education

Number of years a mother spends at school can determine IM in a certain locality simply because education has been reported to be helping mothers in taking care of their infants, health wise. According to descriptive statistics in this study minimum years a mother has spent at school is 0, Maximum is 14, mean is 7.44 ± 5.687 standard deviation as table 9 shows. There in the study area still education is not a priority. What has been noted here is

that, children are sent to school but most of them do not continue to higher levels because they have not yet seen the importance of it. Many studies have found the effect of education in reducing IM (Hanmer, 2011). Parental education means higher income and more understanding leading to reduction of IM, primary education is enough for reduction of IM (Charmarbagwala, 2010) Marternal education was found by him to be significant at 5.24***.

For inferential statistics, the study revealed that children born from parents whose education is low increase chances of dying at infancy. B is -035, hence spending few years at school increase possibility of losing infants at the strength of .120 (Wald). Though not significant because p- value is .729, and chances for it to cause death is by .965 exp (β).

Table 7: Minimum, Maximum, Mean and standard deviation statistics for Continuous variables (n=102)

Variable	Minimum	Maximum	Mean	Std deviation
Years since a respondent was born	19	40	27.27	5.689
Number of years spent at school	0	14	7.44	2.411
Income of a respondent per month in Tsh.	30 000	300 000	133529.4	73990.193
Age of the mother at first delivery	15	28	19.81	2.620
Difference of years between one child and another	0	9	2.74	2.421

b. Income

Income is a determinant of infant mortality because everything now days needs money. Children need special care especially for treatment when they are sick and even for their diet. Based on the descriptive statistics from Table 7, most respondents are economically poor, minimum income per month is 30 000 Tsh, maximum is 300 000Tsh and Mean is 133 529.4Tsh. Most respondents do not meet their day to day needs due to low income.

From the inferential statistics point of view, low income increases IM but in a very low coefficient B. at .000, at the strength of .098 (Wald). While p- value is .754 and chances for it to cause death is 1.00 exp (β). Other studies have found almost the same findings; IM has sometimes been achieved independent of growth in income (Hanmer, 2011). People can be economically poor but without causing deaths to infants. Another study comes with confirmation that income influences IM (Gubhaju *et al.*, 1991). Things were different in cities, in Mahattan at 5% level income was found to be significant but not in Tokyo, Paris and in London, therefore those good economically are safe to some extent. (Rodwin, 2005).

c. Employment

Employment is a social economic determinant of infant mortality studies have proved IM declining as more mothers get employed (Aksot, 1989). According to descriptive statistics, as table 8shows, 91.2% of the respondents were not employed formally. Therefore most of them were either farmers or sales and other activities. Rural urban migration is very much practiced in the study area especially with the youths therefore the old people left at home are not able to employ themselves for their livelihood.

As for inferential statistics, it is revealed that IM increases when more mothers are employed could be because more women are employed after they have spent a lot of years therefore delaying giving birth. B is 1.241 measuring how employment increases IM at the strength of 1.769 (Wald), but not at significant level because p-value is .184 and the chances to cause change to the dependent variable is 3.458 exp (β). The observation is contrary to that reported by Otto (2007). Employment helps, reduce IM because it fosters economic growth of the people, thereby helping them meet medical care (Otto, 2007).

Table 8: Distribution of respondents, by employment (n=102)

Variable	Frequency	Percent
Not formally employed	93	91.2
Formally employed	9	8.8
Total	**102**	**100**

d. Medical services accessibility

This is another determinant of IM as studies report. Normally IM get reduced as medical services are improved in our societies. Descriptively the study shows that the majority is not satisfied with the medical services provided in the district as Table 9 shows, 68.6% of the respondents said that medical services are poor. The number is very big, representing the situation in Tanzania.

Inferential statistics, has uncovered that in the study area when medical services are improved IM get reduced. B is .116 at strength of .341, (Wald), not significant for p-value is .825 and the chances for increasing are 1.123 exp (β). Studies suggest improvement of medical services in our societies because they determine IM (Kabir *et al.*, 2001). Studies recommend women to consult specialists always in health problems (Rebecca, 2011).

Table 9: Distribution of respondents by accessibility to medical services (n=102)

Variable	Frequency	Percent
Mothers		
No	70	68.6
Yes	32	31.4
Total	**102**	**100**

c. Place of delivery

Researchers have found infants dying more when they are delivered at home than when births are given in health centres or hospitals(Gandotra, 2007)).Descriptively, it is shown that most women go to hospitals for delivery Table 10 shows. Delivering at home is risk, studies support this truth; IM was higher to children born at home than at health centres (Biosoc, 1994).

According to the Table 10 it is seen that 75.5% of all the respondents delivered in hospital, and only 24.5% delivered at home, however this number is still big. Delivering at home for some mothers in the study area is common which is related with a study by (Kisanga, 2012) who found that 30.5% of deliveries to be conducted by unskilled delivery assistants. For inferential statistics, this is another variable whose influence is significant in causing infant mortality. The more women deliver at home the more they experience infant mortality. B is 1.230*, the strength is 5.059; it is significant at 0.24 p-value. The chances of causing death are by 3.422 exp (β). Statistics given by World Bank, as reported by Mills (2011) support this study. Mothers who deliver at home have more risk of facing IM, in Tanzania 50.6% of mothers are attended by health skilled personnel the rest do not get that chance (Mills, 2011).

Table 10: Distribution of respondents by place of delivery, at home or hospital (n=102)

Variable	Frequency	Percent
Mothers		
No (hospital)	77	75.5
Yes (home)	24.5	24.5
Total	**102**	**100**

4.3.2 Demographic factors for infant mortality

The study had four Demographic determinants (DD) of infant mortality which are, Age at delivery, Child spacing, Breastfeeding, and Weight of the infant at birth. All these have had influence to infant mortality in one way or another, but the significant determinant of infant mortality in the study area was Breastfeeding. This does not mean the other determinant should be ignored because they are all preparing a ground for IM to occur.

a. Age of the mother at delivery

Age of the mother is a determinant in either reducing or increasing IM, under normal circumstances, infants are at risk of dying when the mother is below 20 or above 35 years as shown in Table 7 and 11.Researchers have found the same; order mothers are likely to experience deaths of their infants than younger mothers (Charmarbagwala, 2010). Age at marriage has effect in IM i.e. the lower the age at effective marriage the higher would be the risk of IM. This was true in Gujarat, where 98.2% of mothers aged 15-19 were 98.2% experienced deaths of their infants (Gandotra, 2007).

Descriptive statistics indicates 65.6% of the respondents to have given birth below 20 years of age; this is not recommended (Mary, 1987)). Minimum age at delivery was 15 and maximum was 28, mean was 19.81 and standard deviation was 2.620.

With inferential statistics, the study discovered that, women advanced in age have more possibilities of losing their infants. B is .055, at the strength of .341(Wald), but not significant all the same at .559 p-value, while the chances to cause death is by 1.057 exp (β).

Table 11: Distribution of respondents, by Age at first delivery (n=102)

Variable	Frequency	Percent
Age group		
1-15	1	1.0
16-20	67	65.6
21-28	34	33.4
Total	**102**	**100**

b. Child spacing

Child spacing is a determinant of infant mortality, the mother needs to stay for a time before she gives another birth of at least 24 months (WHO, 2006). Difference in years between one child and another, minimum was 0 and maximum 9 years, mean was 2.74 at standard deviation 2.421.Descriptive statistics is given in Table 7 and 12. According to Table 13, 45.1% observed proper spacing of three years but not exceeding five years. 11.7% did not follow accepted birth interval, they were at risk for IM. Formally, that is in the past years couples did not follow proper child spacing, but currently they have changed and they are on the right truck, though the problem persists.

Inferential statistics, it is given that, as child spacing is reduced IM increases, B is -009, at strength of .007, but not significant at .933 p-value. The chances to cause death is by .112 exp (β). This also has effect in IM, recommended interval is 3 years (WHO, 2000), minimum 18 months, but most couples violate this, for example studies in India found

61.0% of mothers to be at the interval of 1-17 moths, these had more risk (Gandotra, 2007).

Table 12: Distribution of respondents, by child spacing (n=102)

Variable	Frequency	Percent
Years		
>1	33	32.4
1-2	12	11.7
3-5	46	45.1
6-8	8	7.9
9	3	2.9
Total	**102**	**100**

c. Breastfeeding

This is a determinant of IM; studies have proved that infants fed from mothers' milk for less than 6 months have possibility of dying (WHO, 2003). It has been found to support the study that, diseases and bad conditions can be prevented or even limited in severity by prolonged breastfeeding, a practice shunned by most mothers. In Chicago a lot of IM occurred in the 20 century after mothers tried to substitute breastfeeding by cow's milk (Wolf, 2010). Table 13 gives results from survey.

About inferential statistics, the study discovered that, reducing months for breastfeeding means more IM in the study area, B is -2.188** , at the strength of 5.590(Wald), this one of the two variables whose influences have been noted to be significant at p-value .018, and its chances to cause death to infants is .112 exp (β). This was found causing IM, infants who are breastfed for a long time are found to have a higher chance of survival by -8.74*** (Charmarbagwala, 2010).

Table 13: Distribution of respondents by, breastfeeding for 6 months or less (n=102)

Variable	Frequency	Percent
Mothers		
Less than 6 months	7	6.9
More than 6 months	95	93.1
Total	**102**	**100**

d. Weight of the child at birth

WHO definition of low birth weight is below 2500g i.e. child's weight is normal when born above that weight (WHO, 2005). When the child's weight is less than 2500g the infant is at risk of dying before reaching one year of age (Gandotra,2007)). According to descriptive statistics, more women had their infants at the recommended weight as Table 14 shows, 65.5% of all respondents delivered at the weight of 2500g or more than that, while 34.3 delivered at the weight below 2500g.

Inferential statistics gives that, B is .081 meaning that the more weight of the child increases at birth, possibility of the infant to die also increases, the strength is at .877 (Wald), while chances for it to cause death is by 1.085. Nutrition contributes more to underweight; also poor weight can be caused by not consuming adequate calories or right combination of protein, fat and carbohydrate (Rebecca, 2011). Weight and IM are both indicators of the Health populations, it is discovered that in India, birth weight is not significant as it is in U.S.A yet the study admits birth-weight to be a determinant of IM (Whelan, 2011).

Table 14: Distribution of respondents, by weight of the child at birth (n=102)

Variable	Frequency	Percent
Mothers		
2500 g	67	65.7
Below 2500 g	35	34.3
Total	**102**	**100**

4.4 Response of Mothers to Seeking Medical Care

Apart from using advanced methods of getting findings from the study area also comments were asked form respondents to obtain determinants of IM. At delivery mothers are assisted by doctors, midwives and nurses, when the respondents were asked every one of them had a different answer.

4.4.1 The preferred personnel at delivery

The study found out that most respondents would like to be helped by doctors for a reason that doctors have more credibility than do nurses and midwives. Descriptive statistics show that, 62.7% of all the respondents wanted to be assisted by a doctor simply because doctors are more credible and that they are kind. 26.5% liked nurses and 10.8% wanted traditional midwives to continue with their work for they are more experienced than any other person. Well, from the social point of view, it has been found by the study that women tend to be more free when they are attended by doctors at delivery than any other because apart from their credibility doctors are very kind to patients. This is what is believed by mothers who are at the bearing age. However, it is suggested that, one doctor is sufficient for every delivery, the rest of services can be performed by other attendants (WHO, 2006).

Table 15: Distribution of respondents by, delivery preference (n=102)

Variable	Frequency	Percent
Doctor	64	62.7
Nurse	27	26.5
Traditional midwife	11	10.8
Total	**102**	**100**

4.4.2 Clinic attendance

Out of the interviewed respondents (82.3%) said that they attend clinic up to the age of five, but (17.7%) of the respondents with all confidence said that, they do not see why they should go to clinic while the child is healthy. It is here where the issue of lack of education comes, for women go for clinic services unwillingly with exceptional of a few of them who have obtained formal education. They can only go for such services after they have encountered health problems of their children. Attending clinic for the mother should be inevitable, prenatal care babies whose mothers took prenatal care 2 doses of tetanus and taxoid had a relatively lower risk of IM than those who did not go to clinic at all (Gandotra, 2007). Clinic for the health of both the mother and the infant is very important, in Tanzania 95.9% go for ante-natal care by health skilled personnel (Mills, 2011). Education is given here to reduce teenage pregnancies, promotion of breast feeding, effective screening during antenatal and neo-natal period.

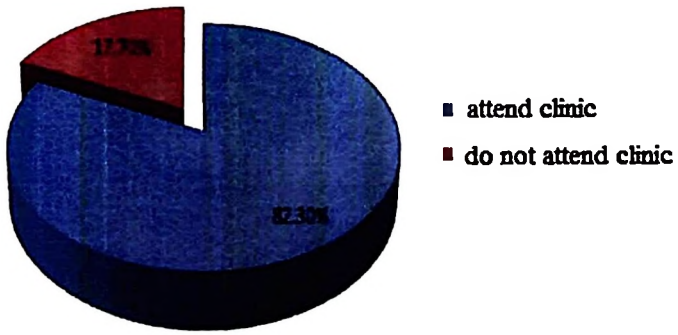

Figure 5: Distribution of respondents by, clinic attendance for the period of five years (n=102)

4.5 Causes of Infant Deaths

This study has come up with another research from the study area, (40.2%) of all who were interviewed said yellow fever is the main killer of infant in Kisarawe. While (20.6%) said pneumonia kills infants, (19.6%) said children die because of poor medical services, (9.8%) said those deaths are caused by delays to reach health centres, finally (9.8%) said they are caused by other determinants unknown. Yellow fever as far as the study is concern, it is a very big problem and the way it is most mothers are not aware of this problem, therefore, to a great extent the study has awaken them, the symptoms are more or less similar from one patient to another. Pneumonia follows, though unlike yellow fever this seems to be prevailing for a long time. Delays have contributing to infant deaths for those from the rural areas, could be because poor referral system including having no enough ambulance (Kisanga, 2012). All these together are known as determinants from specific causes. The study revealed that, (19.6%) of deaths are caused by Pneumonia, this seems to be a problem because another study noted that 12% of infants die of pneumonia in Maharashtra (Gandotra, 2007).

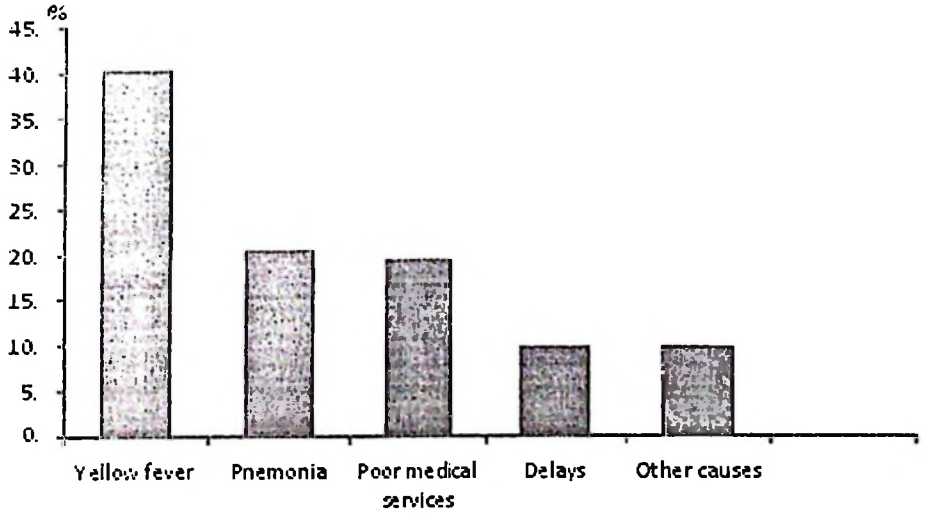

Figure 6: Specific causes of infant mortality (n=102)

4.6 Delivery Assistance

The study found that most deliveries were by skilled health personnel including doctors, nurses and midwives. It is revealed that (60.8%) of respondents were assisted by nurses, (33.4%) were assisted by doctors and (5.8%) were assisted by traditional midwives. Results have shown most mothers to be assisted by nurses, this is because they are more available than other health servants in Tanzania. Additionally, the study discovered 5.8% of the respondents to have been assisted by Traditional midwives, meaning that these unskilled delivery assistants are still playing their role. A study by Sangber (2009) supports these findings that most mothers are being attended by skilled health personnel yet IM is still high.

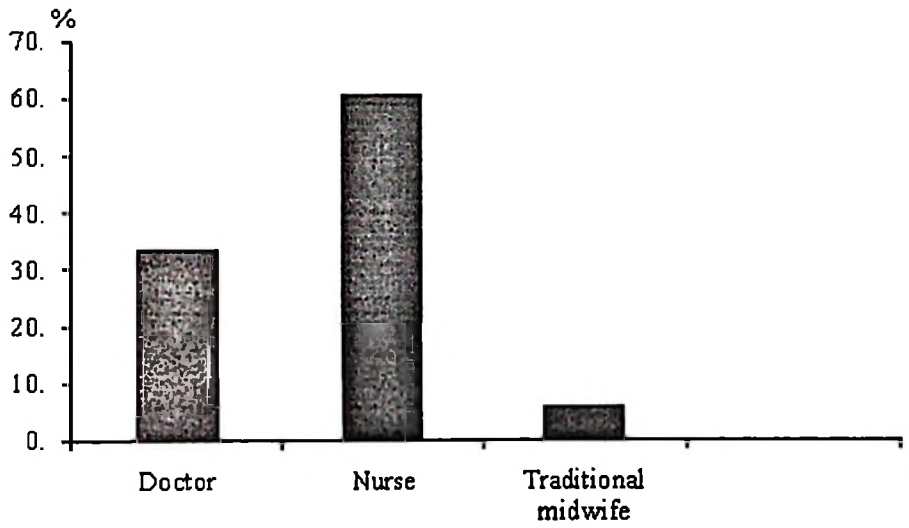

Figure 7: Distribution of respondents by delivery assistance (n=102)

CHAPTER FIVE

5.0 CONCLUSIONS AND RECOMMENDATIONS

5.1 Conclusions

i. High infant mortality rate not only is a sensitive indicator of any community's health status but also reflects the importance given by a society to its most vulnerable members. As for the assessment of neonatal mortality and postnatal mortality, the study concludes that in the study area IM occurs mostly when mothers are giving birth, that is at moment of delivery. The occurrence of these deaths at moment of delivery is because; there are many births by women below the age of twenty which is very dangerous. These premature deaths have great impact on infant mortality in many parts of Africa.

ii. For the social economic factors, the study concludes that, place of delivery has much influence in IM; therefore mothers are advised to deliver in health centres. It has been found here that some women have not yet seen the need for the health centres, a good number of women give birth to their young ones just at home without great care. Efforts should be done to see to it that women go to healthy centres in case of delivery also during pregnancies they go to their respective health centres to seek medical help. On the other hand women have been missing medical assistance because the infrastructure is not prepared for them to be to give birth in a conduive environment.

iii. Finally for the Democratic factors the study found out Breastfeeding to be influencing much on IM. Apart from that the study area has many deaths of infants occurring due to yellow fever a disease which is very common in Kisarawe District

and other areas within the Coast region. Infant Mortality has relationship with the economy of a particular place. Kisarawe District as it for many parts of our county has not done much to improve the economic sector therefore it is logical to conclude that most deaths are occurring because of poverty which prevails in the area.

5.2 Recommendations

5.2.1 Government of Tanzania

- The study results indicated that the majority of the respondents were not satisfied with the medical services provided in the study area. There is need for the government in all levels to provide medical facilities and make regular follow ups to ensure improvement of this important sector.
- Education is still a problem, there is need to encourage Tanzanians go to school, especially women for saving infants.
- More than a half of all births are by mothers below <20 years of age, the government should discourage early marriages as well as teenage pregnancies.
- Ongoing training should be given to nurses since they are the main delivery assistants in the study area.

5.2.2 NGOs

In the study area there are NGOs which are for the wellbeing of the people. I would like to call upon Plan International World Vision and many others to invest in education of these people and establish income generating activities for the welfare of women to meet their needs.

5.2.3 Families

IM is still a problem in the study area therefore households should be prepared early in advance, to make sure that they work hard to have enough income; And mothers should go to clinic from moment they realize to be pregnant.

5.2.4 Further research

The study area is highly affected by yellow fever; there is every reason to make another study about the disease and its influence on IM. Infant mortality is higher at moment of delivery (NM); a study should be conducted specifically to get reasons for that, though currently the study holds NM as due to poor medical services.

For the sake of saving children in Tanzania more Researches on IM should be encouraged by the government and even by individuals.

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APPENDICES

Appendix 1: Operational definitions

Variables of interest and their definitions for Descriptive statistics

Variables	Description	Measurement
Deaths at moment of delivery	Infants dying at moment of delivery	Number of death incidences Ratio
Deaths after delivery	Infants dying after delivery	Number of death incidences Ratio

Variables of interest and their definitions to enter the Binary logistic regression model

Variables	Description	Measurement
Socio-economic variables		
1.Education of the mother	Number of years spent by the mother in formal education	Years Ratio
2.Income	Whether a household earns at least a hundred thousand T.Sh per month or not	1/0 Dummy
3.Employment	Whether formally employed or not	1/0 Dummy
4. Medical care	Whether they access adequate medical services or not	1/0 Dummy
5. Place of delivery	Whether delivered at home or at hospital	1/0 Dummy
Demographic variables		
6.Age of the mother at birth	Age of the mother at birth	Years Ratio
7.Birth interval	Difference in years from	Years Ratio

	one child to another	
8.Breast feeding	Whether there was a breast feeding 6 months or not	1/0 Dummy
9.Size of the child at birth	Weight below 2500kg or above	1/0 Dummy
10.Infant mortality	Whether the mother experienced an infant death or not	1/0 Dummy

Appendix 2: Questionnaire and interview for respondents

INTRODUCTION

Dear respondents my name is Mbitto, Dachi Wilbert. A second year student of the degree of Master, in Rural Development Studies of Sokoine University of Agriculture Morogoro, Tanzania. Iam asking for your cooperation in this Research which is pro-life.

A.GENERAL INFORMATION:

1. Respondents name..... 2. Date.....

3 District..... 4. Division.....

5 Village..... 6.Ward.....

7 Age of respondents .....

8 Group of vulnerability (Tick one)

	1 Widow	[ ]	2 Orphan	[ ]
	3 Disabled	[ ]	4 Elder	[ ]
10 Marital Status	1 Single	[ ]	2 Married	[ ]
	3 Widow	[ ]	4 Divorced	[ ]

11 Family Size 1 Number of male children.....2 Number of female children.....

B: OTHER INFORMATION.

1 What is your level of education? None (0), primary (1), secondary (2), higher (3)

How many years have you spent at school?.....Years

2 How much do you earn per month?.....

Do you earn less than a hundred thousand or more than that?.....YES 1/ NO 0

3 What is your occupation?.....Not working (0), agriculture (1), sales (2), other (3)

Are you formally employed?.....YES 1/ NO 0