# DETERMINANTS OF PERINATAL MORTALITY AMONG WOMEN OF CHILD-BEARING AGE IN BARINGO CENTRAL SUB COUNTY, BARINGO COUNTY

**BY**

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**A THESIS SUBMITTED TO THE SCHOOL OF PUBLIC HEALTH, COLLEGE OF HEALTH SCIENCES IN PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR THE AWARD OF THE DEGREE OF MASTER OF SCIENCE IN FIELD EPIDEMIOLOGY**

## DECLARATION

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## SUPERVISOR'S CERTIFICATION

We confirm that the work reported in this thesis was carried out by the candidate under our supervision and has been submitted to the Moi University with our approval as University supervisors

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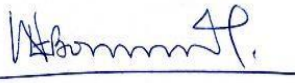
Sign:  Date

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**DEDICATION**

I dedicate this work to my wife Dorcas J Ngetich, all my children and parents for their patience and support during my study.

## ABSTRACT

**Background:** Perinatal deaths comprise of all the stillborn children of more than the 28 weeks' gestation period and the mortality experienced during the first week of life. Perinatal mortality is a major issue major issue of concern on public health in the emerging countries. According to the World Health Organization (WHO) recent perinatal statistics, worldwide in 2020, approximately 2.4 million children died in their first month of life. This translate to approximately 6700 new-born deaths every day, this accounts to about 50% of all child deaths under the age of 5 years, In Kenya perinatal mortality stands at 31/1,000 live births The perinatal mortality rate in Baringo County has been increasing from 21/1000 in 2015 to 25/1000 in 2018. Majority of these deaths 9/1000 were reported in Baringo Central Sub County

**Objectives:** To identify the determinants of perinatal mortality among women of child-bearing age in Baringo Central Sub-County, Baringo County, Kenya

**Methodology:** A community based Cross sectional study design was conducted on women of productive age using purposive (multi-stage) sampling to enrol 384 study participants from August–November 2020. Quantitative data were collected by administering a structured questionnaires administered, and for qualitative data, Focused Group Discussion and key informant interviews were conducted. Data was analyzed using Epi Info Version 7.2.2. Qualitative data were transcribed, translated, grouped and analysed thematically. Descriptive statistics were performed on demographic data. Categorical variables data were summarized using proportions and percentages. Continuous variables were summarized using mean and standard deviations. For determinants of perinatal mortality, inferential statistics (Chi Square); prevalence odds ratio (pOR), adjusted odds ratios (aOR), with their corresponding 95%CI and P-Values. Variables with P-value $\leq 0.2$ by bivariate analysis were entered into a multivariate model, with logistic regression, variables with P-value $\leq 0.05$ were considered statistically significant.

**Results:** A total of 384 study participants were enrolled, their mean age was 24±5 years Of the 384 study participants 59 (15.1%) recorded perinatal mortalities. Among mothers aged 25-29 years reported 23 (39%) perinatal deaths. The socio-economic and cultural practices that determine perinatal mortality were seclusion 43(72.9%; P=0.06.), dietary restriction 48(81.4%; p=0.001); traditional remedies 40 (67.8%), female genital mutilation 37 (62.7%); and late attendance to ANC when pregnancy is visible.

**Conclusion**: perinatal mortality in Baringo Central Sub County was high. Majority of the teenage mothers (25-30 years) recorded high number of perinatal mortality rates Perinatal mortalities were high among neonates who had birth weight of less 1500gms and among mothers who experienced prolonged labour. Determinants of perinatal mortality were; Seclusion of women, dietary restrictions, seeking traditional remedies, female genital mutilation and late ANC attendance.

**Recommendations:** Health education program on perinatal mortality to ANC mothers and the need for targeted community based Health education talks and sensitization on the determinants of perinatal mortality in Baringo Central Sub-County.

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## ABBREVIATIONS AND ACRONYMS

| | |
|---|---|
| ANC: | Antenatal Care |
| APH: | Antepartum Hemorrhage |
| CDC: | Centre for Disease Control |
| CHMT: | County Heath Management Team |
| DHIS: | District Health Information System |
| DoH: | Department of Health |
| FELTP: | Field Epidemiology and Laboratory Program |
| FSB: | Fresh still birth |
| HIV: | Human Immunodeficiency Virus |
| IUFD: | Intrauterine fatal death |
| MCH: | Maternal child clinic |
| MDSR: | Maternal Death Surveillance and Response |
| MOH: | Ministry of Health |
| MSB: | Macerated still birth |
| NGO: | Non-Governmental organization |
| NICU: | Neonatal Intensive Care Unit |
| PDNF: | Perinatal death notification form |
| PDR: | Perinatal death review form |
| PDSR: | Perinatal Death Surveillance and Response |
| PMR: | Perinatal mortality rate |
| PPH: | Postpartum hemorrhage |
| PROM: | Premature rupture of membranes |
| UN: | United Nations |
| WHO: | World Health Organization |

## DEFINITION OF OPERATIONAL TERMS

**Awareness factors:** These are factors or influencers which help someone to get familiarity with something or someone who can increase information, facts, direction, skill acquired through exposure or education. This relates to issues like STDs, Danger signs, Mortality and morbidity causes, Knowledge, ignorance, information, conceptualization, perception, interpretations, insight.

**Cultural Factors:** These are factors that relate to cultural characteristics such as way of life, race, ethnicity, Norms, Traditions, beliefs, taboos, values, cultural historical perspectives, cultural inheritance, cultural practices, cultural discipline, traditions, cultural corrective measures, cultural inhibitions, cultural enforcements, cultural barriers.

**Demographics factors:** These are factors that relate to personal characteristics such as age, gender, family background, parity, marital status, Education level, Occupation, Area of residence, multiple partners.

**Disposition factors:** These are either favourable or unfavourable evaluation of something, or a personal perspective toward a specific target and way of seeing and doing things. It includes susceptibility, Severity, benefits of screening, barriers, and emotions, feeling of anxiety, fears, and attitude.

**Early neonatal death:** Any death of a live birth within twenty weeks' gestation period or born with a birth weight of 400g or more who pass on within the first seven days after delivery.

**Economic factors:** These are factors that relate to economic characteristics such as Employment, monthly earning, wealth, business, property, economic development, Environmental security, safety, sanitation, refuse disposal, roads, natural resources, public health, environmental facilities, stability, governance, natural disasters, Nutrition, food resources and security, food quality, nutritional values, food production and distribution, food hygiene, food safety.

**Habit factors:** These are routine behaviours that when repeated regularly and tends to occur unknowingly**.** It is learning by repeating. It involves sexual orientation, smoking, contraceptive use, sexual intercourse at an early age, health seeking behaviour, follow up clinics, practice, attitude, fears, stress, assumptions, carefree, lack of commitment, taking things for granted, behaviour, character, personality, relationships, interactions, emotions, mistrust, reactions, feelings, practice, experience, institutional utility, delay in seeking medical care, delivery out of hospital, poor maternal care, abnormal deliveries.

**Intrapartum stillbirth:** Is defined as foetal death occurring after the onset of labour and prior to delivery. The baby is born without signs of life A

| | |
|---|---|
| | baby given birth to after 22 weeks' gestation period with no indications of being alive but had been known to be alive throughout the labour period. |
| **Neonatal death:** | Is defined as the death of a live born baby, regardless of gestational age at birth, within the first 28 completed days of life. Each neonatal death can be further clarified into viable and non-viable deaths depending on the gestational age at which they were born, and where they were born. |
| **Perinatal deaths:** | These are either stillbirths after at least 22 completed gestational weeks, or an early neonatal death in the first 7 days after birth. They constitute pregnancy losses that occurred seven months of the gestation period and the deaths that are experienced during the first week upon being born. |
| **Perinatal mortality** | Perinatal mortality (PM) refers to the death of a fetus after the age of viability, until the 7th day of life. It equals the sum of still birth and early neonatal death |
| **Perinatal period** | Is the time which commences at twenty two completed weeks (154 days) of gestation and ends seven completed days after birth |
| **Perinatal mortality rate (PNMR)** | This is the "number of stillbirths and deaths in the first week of life per 1,000 total births |
| **Seclusion** | This is state of being private and being away from other people |

**Social factors:** These are things that affect someone's lifestyle. These could include wealth, religion, buying habits, education level, family size and structure and population density. What may be acceptable in one country could be a possible no-no somewhere else.

**Still birth:** This is a death of a baby occurring before or during birth once a pregnancy has reached 24 weeks.

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# CHAPTER ONE

## 1.0 INTRODUCTION

### 1.1 Background information

The World Health Organization (WHO) defines perinatal mortality as the "number of stillbirths and deaths in the first week of life per 1,000 total births, the perinatal period commences at twenty two completed weeks (154 days) of gestation and ends seven completed days after birth (Upto date)

Perinatal mortality is a major issue major issue of concern on public health in the emerging countries (WHO). According to the World Health Organization (WHO) recent perinatal statistics, worldwide in 2020, approximately 2.4 million children died in their first month of life. This translate to approximately 6700 newborn deaths every day, this accounts to about 50% of all child deaths under the age of 5 years, up from 40% in 1990.

The world has made substantial progress in child survival since 1990. Globally, the number of neonatal deaths declined from 5 million in 1990 to 2.4 million in 2020. However, the decline in neonatal mortality from 1990 to 2020 has been slower than that of post-neonatal under-5 mortality (WHO, 2020)

The chances of survival from birth varies widely depending on where a child is born. Sub-Saharan Africa had the highest neonatal mortality rate in 2020 at 27 (25–32) deaths per 1000 live births, followed by central and southern Asia with 23 (21–25) deaths per 1000 live births. A child born in sub-Saharan Africa is 10 times more likely to die in the first month than a child born in a high-income country. Country-level neonatal mortality rates in 2020 ranged from 1 death per 1000 live births to 44 and the risk of dying before the $28^{th}$ day of life for a child born in the highest-mortality country was approximately 56 times higher than the lowest-mortality country (WHO, 2020)

The under-five mortality rates have decreased substantially over the past 20 years in developing countries, but perinatal mortality has not followed the same patterns and continues to present a huge burden. Perinatal mortality is a key health indicator of a country's socio-economic status and the quality of care especially to maternal health during the antenatal period, during delivery and the early neonatal period

Perinatal mortality reflects the quality and utilization of prenatal, delivery and immediate post-delivery care available to women and their new born infants. Perinatal mortality, comprising of still births and early neonatal deaths is one of the sensitive indices of the quality of prenatal, obstetric and early neonatal care available to women and new-borns. Perinatal health is a good indicator of both maternal health status and the level of socioeconomic status attained in any community. In addition infant mortality remains a challenge in the care of pregnant women worldwide, but particularly for developing countries and the need to understand contributory factors is crucial for addressing appropriate perinatal health. Hence, further reductions in infant mortality will largely depend on decreasing deaths due to perinatal causes. Improvements in the coverage and particularly in the quality of antenatal and delivery care are urgently needed.(Khasakhala et al,. 2022)

It is essential to highlight that perinatal deaths comprise of stillbirth of babies born after 28 weeks of gestation period and the deaths that occurs within the first seven days of life. 2014 Global statistics on perinatal deaths has revealed that close to 3.3 million of stillbirths and another 2.8 million early neonatal mortalities are experienced globally on annual basis. New born deaths occurring in less than one-month account for close to 40% of all the deaths cases reported on under five globally. Millennium Development goal number 4 aim

at reducing children mortality rate; specifically, those who are below five years by 66% 5come between the period of 1990 and 2015 (WHO; 2015).

Intrapartum stillbirths are considered not common in the first world countries, as they only represent less than 10% of all the 84 thousand stillbirths, with an average intrapartum stillbirth being recorded to be at 0.6 per one thousand live births. The intrapartum in the third world economies are approximated to be responsible for around 24% and 37% of the total number of stillbirths, an illustration that shows that close to 34 percent of all the 3.2 million stillbirths are experienced during the time of delivery. Moreover, the risk associated with intrapartum stillbirth is more than 14 times higher within the developing nations than it is in the already developed world. Within the developing countries, the risk continues to increase seventeen times more than it is being experienced in the already developed world. The current perinatal death prevalence in sub-Sahara Africa is 45 deaths/1000 live births. Deaths occurring here within 7 days of life is 76 per 1000 live births (World Bank report, 2016).

According to the Kenya Demographic Health Survey Report of (2022), Kenya has experienced a remarkable decline in all levels of childhood mortality rates as observed in the five year period prior to the survey; the mortality rates reduced to; 41 deaths per 1,000 live births for under, to 32 deaths per 1,000 live births for the infant mortality rate, and to 21 deaths per 1,000 live births for the neonatal mortality rate in 2022, this was a reduction from 59 deaths per 1,000 live births for under5, 39 deaths per 1,000 live births for infant mortality and 22 deaths per 1,000 live births for neonatal mortality (KDHS, 2022) .though there was a steady reduction in these mortalities, neonatal deaths still accounted for 66% of infant deaths and 51% of under-5 deaths in Kenya (KDHS, 2022). However perinatal mortality rate in Kenya according to a recent study has shown that the neonatal mortality rate between

2011 and 2015 was 27% on average (UNICEF, WHO, World Bank, UNDESA population, 2015). This is indicative of a worsening situation. It is therefore evident that there is a significant problem of high perinatal Mortality Rate in Kenya. This mortality rate is alarming and contravenes the sustainable development goal which aims to end preventable deaths of newborns and children under 5 years of age, with all countries aiming to reduce neonatal mortality to at least as low as 12 per 1,000 live births and under-5 mortality to at least as low as 25 per 1,000 live births mortality by 2030 (World Bank report, 2016. Baringo County had a 31/1000 neonatal mortality rate and 21/1000 post-natal mortality rate in 2015 respectively.

According Kenya Demographic Health Survey (2015) perinatal mortality was at 45 deaths per 1000, with variations by provinces highest in coast province at 58 deaths per 1000 and western lowest with 28 deaths per 1000. Baringo County recorded a perinatal death rate of 31 per 1000 live births. It is therefore of importance to identify the factors, determinants and the levels of perinatal mortality which contribute significantly to the Infant measures that improved maternal health care during antenatal, delivery as well as early neonatal life so as to minimize perinatal mortality and in turn reduce Infant Mortality Rate (WHO, 2011b).

Deaths are minimal in the towns. Rural areas have poor entrance to health care. Therefore, there is also need for specific health tutoring to mothers and families (Kimney *et al*., 2010). Delays in making decision to go to the hospital and receive medical care, to reach an adequately furnished health care facility or receive satisfactory care at the hospital is causing some of the greatest problems. Delays, which include caretaker delays (44%), delays in reaching health care facility (34%) and household and transport delay must be effectively overcome (Ravi *et al*., 2012). Gender discernment, low level of female

education, lack of women empowerment to seek health care, autonomy towards male decisions and poor access of women to health care cause delays as well as unnecessary deaths (Kimney *et al*., 2010). Conflict areas and natural disasters also cause complex emergencies. This increases mortality. It promotes corruption, authoritarian regimes, deteriorating transport network, bad and waning health conditions and loss of health human resource. This creates unstable institutions, weak health systems, lack of apparatus, supplies and poor systems for making referrals. The conflicts and natural disasters are more prevalent in developing countries with worse outcome (Kimney *et al*., 2010). Causes of perinatal deaths are mainly preterm births, severe infections, asphyxia and neonatal tetanus. Indirect causes of death are low birth weights and maternal complications in labour with poverty strongly being associated with increased risks (Lawn *et al*., 2005). The deaths are usually related to gestational age, place of birth, personnel conducting delivery and birth weight among others. In Sierra Leone, for instance, the high maternal and child mortality is due to high poverty, illiteracy, teenage pregnancy and reduced family planning (reproductive, new born and child health strategy, 2011-2015).

**1.2 Problem Statement**

Perinatal mortality is a major public health concern globally. The current perinatal death rate in sub-Sahara Africa is 45 deaths/1000 live births. This is recorded as the highest globally. Deaths occurring here within 7 days of life is 76/1000 live births (World Bank report, 2016). Kenya being in Saharan Africa region has experienced a remarkable decline in all levels of childhood mortality rates as observed in the KDHS. However, the same cannot be said of the perinatal mortality rates in the country. The perinatal mortality presently contributes to more than 60% of all the infant mortalities cases with the rate of neonatal deaths being reported to be at 31 per every 1,000 live births in Kenya (KDHS,

2014). The perinatal mortality rate in Baringo County is the same as the national one standing at 31/1000 neonatal mortality rate and 21/1000 post-natal mortality rate respectively in 2015. The perinatal mortality rate in Baringo County has been increasing from 21/1000 in 2015 to 25/1000 in 2018. Majority of these deaths 9/1000 were reported in Baringo Central Sub County. More so, perinatal deaths usually causes great emotional disturbance like depressive plus some other relevant social effects on the mothers like deteriorating relationships between the husband and the mother.

### 1.3 Study Justification

This study provides the current information on the perinatal mortality rate and its determinants Baringo Central Sub County. Its findings provide the current evidence-based information that is useful for planning and informing policy on perinatal determinants for interventional programs geared towards reducing perinatal deaths in the Sub County.

This study is in line with the 2030 vision for Sustainable Development Goals (SDG), Goal 3,2 which advocate specifically for action aimed towards reduction of neonatal mortality

Majority of the perinatal deaths occurring are still births at home and their causes remain largely unknown. Information is still lacking on inadequacy of modifiable factors in the homes, communities, health facilities and referral mechanisms and environmental factors to perinatal mortality in the country. Hence, the great need to gain understanding of the most important household, environmental, community and socioeconomic factors that are linked to perinatal deaths so as to guide in the development of effective policy making.

The determinants of perinatal mortality have not been fully established since no similar study of such nature has ever been done in Baringo County for decision making. This study therefore aimed at studying the determinants of perinatal mortality among women of child-bearing age delivering in rural community of Baringo central, Baringo County.

## 1.4 Research Questions

This study sought to answer the following questions;

i. What is the perinatal mortality rate among women of child-bearing age in Baringo Central Sub-County, Baringo County, Kenya?
ii. What are the socio-economic determinants of perinatal mortality among women of child-bearing age in Baringo Central Sub-County, Baringo County, Kenya?
iii. What are the health system factors that determine perinatal mortality among women of child-bearing age in Baringo Central Sub-County, Baringo County, Kenya?
iv. What are the cultural factors that determine perinatal mortality among women of child-bearing age in Baringo Central Sub-County, Baringo County, Kenya?

## 1.5 Objectives

### 1.5.1 Broad Objective

To identify the determinants of perinatal mortality among women of child-bearing age in Baringo Central Sub-County, Baringo County, Kenya

### 1.5.2 Specific Objectives

i. To estimate the perinatal mortality rate among women of child-bearing age in Baringo Central Sub-County, Baringo County, Kenya
ii. To identify socio-economic determinants of perinatal mortality among women of child-bearing age in Baringo Central Sub-County, Baringo County, Kenya
iii. To identify the health system factors that determines perinatal mortality among women of child-bearing age in Baringo Central Sub-County, Baringo County, Kenya
iv. To identify socio-cultural determinants of perinatal mortality among women of child-bearing age in Baringo Central Sub-County, Baringo County, Kenya

## 1.6 Significance of the Study

The finding of the study would help guide in policy making, come up with interventions aimed at reversing the trends of perinatal mortalities, identify the health care needs help in improving staff training to better their knowledge in delivering clinical services and stimulate more research activities.

This study would also go a long way in helping the healthcare providers in the management of mothers and children after delivery.

The knowledge gained would facilitate timely sharing of relevant healthcare information across the health care delivery spectrum as well as help post-natal mothers in taking care of their children after delivery.

Perinatal mortality is a health indicator which plays an important and crucial role in providing the most current and reliable information needed to improve the health status or outcomes s of pregnant women, new mothers and the newborns. In turn this information allows implementers and decision or decision makers or county health managers to identify problems, track temporal and geographical trends and disparities.

# CHAPTER TWO

## 2.0 LITERATURE REVIEW

### 2.1 Introduction

This section covers the empirical literature review relating to the contributing factors of perinatal mortality. The literature was guided by the following study objectives; socioeconomic factors that contribute to perinatal mortality, health systems factors and cultural factors.

### 2.2 Background of the study.

**Global distribution of Infant mortality rate**

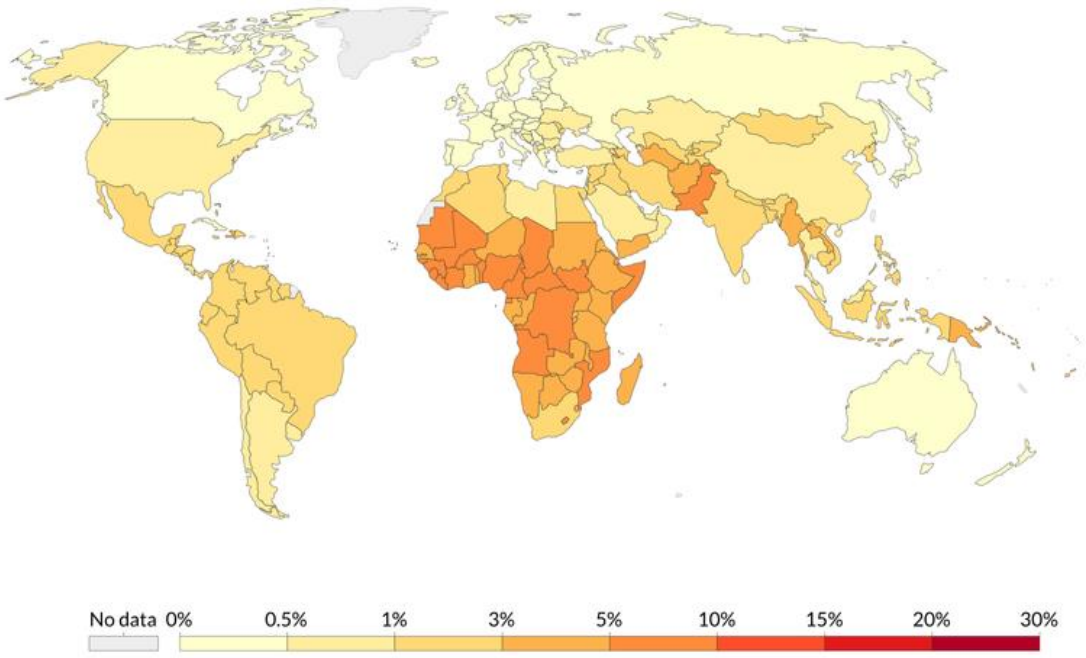


**Figure 1: Global distribution of Infant mortality rate**

Source: UN Inter-agency group for Child Mortality Estimation, 2019 (Via World Bank)

Globally, 3.3 million of stillbirths and another 2.8 million early neonatal mortalities are experienced on annual basis. The new-born deaths occurring in less than one month

account for close to 40% of all the deaths cases reported on under five globally. Sustainable Development Goal number 3 aim at reducing children mortality rate; specifically, those who are below five years by 66% come between the period of 1990 and 2015 (WHO; 2016).

Intrapartum Care in the third world economies are approximated to be responsible for around 24% and 37% of the total number of stillbirths, an illustration that shows that close to 34 percent of all the 3.2 million stillbirths are experienced during the time of delivery. Moreover, the risk associated with intrapartum stillbirth is more than 14 times higher within the developing nations than it is in the already developed world. Within the developing countries, the risk continues to increase 17 times more than it is being experienced in the already developed world (World Bank report, 2016).

The current perinatal death prevalence in sub-Sahara Africa is 45 deaths/1000 live births. Deaths occurring here within 7 days of life is 76/1000 live births (World Bank report, 2016). Kenya has experienced a remarkable decline in all levels of childhood mortality rates as observed in the 2008 KDHS. However, the same cannot be said of the perinatal mortality rates in the country. Between 2003 and 2008 NMR has reduced slightly to 31/1000 live births (World Bank report, 2016).

**2.3 Social and economic determinants of perinatal mortality**

Factors that relate to personal characteristics such as age, gender, family background, parity, marital status, education level, occupation, area of residence, multiple partners are have been found to influence the perinatal mortality. In a study done in India, teenagers less than 20 years had a high incidence of neonatal mortality due to psychosocial immaturity. Furthermore, they had a higher incidence of low birth weight babies (LBWB) with increases of neonatal mortality. Mothers older than 30 years were reported to have

high neonatal mortality rates due to increased risk of congenital malformations (Amu Patel *et al.,* 2011). In a study done in Kenya women, especially single mothers, engage in sexual relations in order to survive poverty. This can lead to STDs and HIV. If the mother's health is compromised, it leads to poor neonatal outcome (Wintz *et al*., 2013).

In a study carried out recently in Russia village of north Nigeria, it was discovered that mothers with formal education delivered in hospitals and the perinatal outcome was good. Those without formal education preferred home delivery and thus putting their newborn babies into risk. They were in danger of dying from birth complications due to lack of trained midwives and non-availability of resuscitation equipment. In the study, 40% of expectant mothers had home delivery (Joshua *et al*., 2015).

The level of education therefore plays a role in dropping perinatal deaths. In the same study by Akinyemi above, perinatal mortality was consistently about 41/1000 live births for thirteen years between 1990 and 2013. There was thus no improvement in perinatal mortality over the period. Bio-demographic factors were found to be the main determinant of Neonatal survival. Lack of improvement in perinatal mortality rates have been noted in many other African countries (Akinyemi *et al*., 2015). Knowledge of causes of neonatal deaths increases with age and education interventions before discharge. Risk of neonatal death also reduces with increased birth interval length up to 36 months. Chronic malnutrition is also related to birth spacing. Increased chronic and general malnutrition is associated with reduced birth spacing (Oommen and Vatsa, 2013).

In a study done in Gujarat in India, babies delivered in families with low socioeconomic class had a higher risk of perinatal deaths because of minimal or poor child care (Amu Patel *et al*., 2011). Jehovah's Witness religion restricts medications like iron and vitamins supplements which lead to prenatal maternal anemia. This results in poor neonatal outcome

and can cause perinatal death. The Roman Catholics also don't accept family planning methods other than natural ones. This may cause poor maternal health because of ineffective birth spacing. Every time the mother's health is compromised neonatal health is at stake and may end in perinatal death (Walter *et al*., 2013). As reported by Roberts et al., (2017), gender discrimination contributes to stillbirths in India. It includes disparity of female education, son preference, early marriage and low female autonomy. In addition, traditions such as seclusion of pregnant women; dissuading women from utilizing preventive services; prescribing birthing practices such as dietary restrictions; the type of remedies sought when problems arise, such as traditional remedies and spiritual healing; and other practices such as consanguineous marriages have been linked to stillbirths.

In those countries with high income there was low perinatal mortality. This confirmed that income was an important determining variable in perinatal mortality assessment (Rahman, 2010). Middle income countries need to dramatically reduce perinatal deaths to achieve the expected standards of child survival. Increase in preterm births and quality of care is also causing medicalization problems (Fernando et al., 2015). Increased education, improved existing and working settings and increased access to safe water and adequate sanitation are some of the benefits of good economic status. These are mainly found in uncrowded urban areas. They are also places where perinatal deaths are less experienced because of the prevailing lifestyle (Kimney *et al*., 2015).

In low income countries, perinatal mortality was high. Low birth weight deliveries cause huge health economic burden on poor economies around the globe especially in developing countries. Most are preterm deliveries to mothers with short inter-pregnancy intervals (Ugbona and Onyearuja, 2013). In a Pakistan study done in Qatar, low economic level was found to be the main determinant of perinatal mortality with poverty being the main

determinant. It led to increase in poor maternal outcome and perinatal deaths (Ansari *et al*., 2015). In another study, done in Sierra Leone, premarital sex for money among the teenagers was high because of poverty. It made them to be susceptible to STDs and HIV/AIDS with resultant poor neonatal outcome (Akombi & Renzaho, 2019).

Poverty is an underlying factor associated with perinatal mortality. Studies have associated poverty with perinatal mortality. Poverty is multidimensional, with economic, political, social, governance, health and environmental components that influence child survival at the individual, household and societal level. It results in the inability to afford health care costs, which leads to poor utilization of health care services, thus increasing the risk of perinatal mortality (Akombi & Renzaho, 2019). Poverty is a major underlying cause of many perinatal deaths. Increased risk of illness, undernourishment, inadequate housing, and condensed care pursuing and reduced access to relevant health service are some of its constraints. Increased urbanization causing congested living conditions and poor sanitation also contributes to widespread poverty and disease especially in the slam areas. In a PEARL study done in low income areas; it was found that the main variable leading to neonatal mortality was poor economic status (Akombi & Renzaho, 2019).

**2.4 Health institutional determinants of perinatal mortality**

These are factors like health facilities availability and accessibility, skilled health care providers, preventive and promotive health services, cost of treatment, quality of health services, availability of supplies and modern equipment which indirectly affect maternal health hence perinatal outcome. Over a period of 10 years, the global health community recognized that there is extra ordinarily high mortality burden of perinatal deaths. There is need to establish best policies to reduce it. Efforts have been made to reduce this by establishing the AAP/AHA neonatal resuscitation program, WHO essential newborn care

program and USAID/SNL/WHO helping babies breathe program. Essential newborn care package can reduce perinatal mortality rate by 30% (Engman, 2011).

Developing countries have 90% of world malaria deaths, 67% of world HIV patients and 28% of underweight children. They also have the worst state of perinatal deaths in the background of marked communicable and non- communicable disease burden and economic constraints; let alone the problems of poor governance and population pressure (Herlily *et al*., 2013).

There is shortage of qualified and specialized front line health workers for essential health care in Africa. The continent has 24% of the global disease burden and only 3% of world health workers (Herlily *et al*., 2013). Thirty-six percent (36%) of the countries in Africa have critical shortage of human resource. In Mozambique, Malawi and Tanzania about 90% of emergency obstetric operations are done by clinical officers and not qualified doctors. Use of extension workers like community health workers is inevitable. Although Africa is the worst hit, shortage of health personnel is also reflected in other developing countries (Herlily *et al*., 2013).

Over 60 million women give birth annually outside health facilities. 52 million deliver under the services of skilled health attendants and 15 to 25 million in the hands of traditional birth attendants. This creates a big burden to the delivering mothers, the health care systems and the health service providers. Most of these deliveries are in developing countries with relatively poorer health care systems and wanting economic states. (Herlily *et al*., 2013).

In a study done in Uganda on advancing the application of health systems and understanding the dynamics of neonatal mortality, it was found that 40% of mothers preferred home delivery than hospital delivery. 14.7% of the respondents lacked trust in

health care system because of poor or lack of equipment, insufficient health workers, overcrowding in the health facilities, long waiting, poor staff attitude (rudeness, abuse to pregnant mothers), and cost of treatment and high cost of delivery as the main factors why they preferred home delivery. Mothers said quality of health services and hygiene was good but out of their reach. 71% said that hygiene needed improvement. The health care providers also said that they were not motivated to work because of poor pay, less staff, lack of equipment and supplies; e.g. 34% of the health workers lacked resuscitation equipment. 67% of the staff respondents said there were no ultra sound facilities resulting in poor maternal and fetal outcome (Rwashana *et al*., 2014).

**2.5 Cultural determinants of perinatal mortality**

There are very many cultural differences globally. Strong cultural beliefs are especially experienced in rural settings. Postponement of medical consultations and employment of traditional approaches based on wrongly held traditional beliefs is often practiced. In some cultures, when there is neonatal death, burial is done quickly without ceremonies. There is no formal expression of grief. No discussions are held on account of the deceased newborns. The dead child is regarded as a spirit child. The African/American/Black cultures have restrictions on pregnant mothers against consuming certain foods and drinks. This may compromise the health of the mothers and indirectly affect fetal and neonatal health. In some cultures, the sick newborn is viewed as belonging to the Gods. This makes neonatal deaths complaisant (Walter *et al*., 2013; Paudel et al., 2018).

In one study, it was discovered that mothers having under one-year-old were performing dangerous traditional practices of offering care to the child. They were applying salt on the neonates‟ skin. This led to high neonatal mortality rate (Baser *et al*., 2010). In another study done in Australia; no relationship was established between maternal ethnicity and

neonatal mortality. However, it was noted that maternal ethnicity influenced fetal and neonatal growth and morbidity (Ruan *et al*., 2011).

This was in contrast with another study done in Brussels in which there was a high perinatal mortality in ethnic groups with low socioeconomic status (Rucape *et al*., 2010). There are also false beliefs like the cord falling off due to the baby being carried on the mothers back. Use of traditional tools and methods in baby care is a common practice. In many occasions no proper sterilization is observed (Herlily *et al*., 2013).

**2.6 Conceptual Framework**

From the literature review presented, it has been established that most newborns die at home. They are essentially under the care of their mothers who should be adequately empowered in this role. The evaluation of maternal capabilities in understanding the extent of their own contribution (maternal perspectives) to the risks of perinatal deaths is therefore appropriate as defined in the relationships designed in the conceptual framework which borrowed many factors from the figure 2.2 below: The concepts stated in the frame was remodeled into a conceptual framework to guide this study which was to help us understand how they influence the mothers‟ awareness, disposition and habits towards the care of their own newborn babies. The figure below shows that perinatal mortality is a result of many factors. This relates to the mother in many ways. The mother is therefore the most central person in determining the outcome of newborn babies‟ mortality and morbidity.

The figure below depicts a model developed for the study and the relationship between the research variables. The independent variables are the determinants of perinatal mortality among women of child bearing age namely; socio economic, health system and cultural determinants were adopted and modified from Al Kibria et al., 2018. These independent variables do influence the dependent variable which is birth outcome.

Community factors that relate to community characteristics such as proportion of women receiving antenatal care, women in the cluster delivered in health facilities, educated women in the cluster, religion, poverty level and residence. Socio-economic factors are factors that relate to social characteristics such as sex, maternal education, paternal education and household wealth while proximate determinants comprise of infant characteristic, maternal factors, antenatal factors and delivery factors. The outcome variable are survival and death. The conceptual framework therefore depicts the association between the dependent variable survival and death among the infants born to the women of reproductive age in Baringo Central Sub County and independent variables (the associated determinants). The direction of the arrows illustrates the relationship and the effect of variables on the outcome variable. Figure 2.2

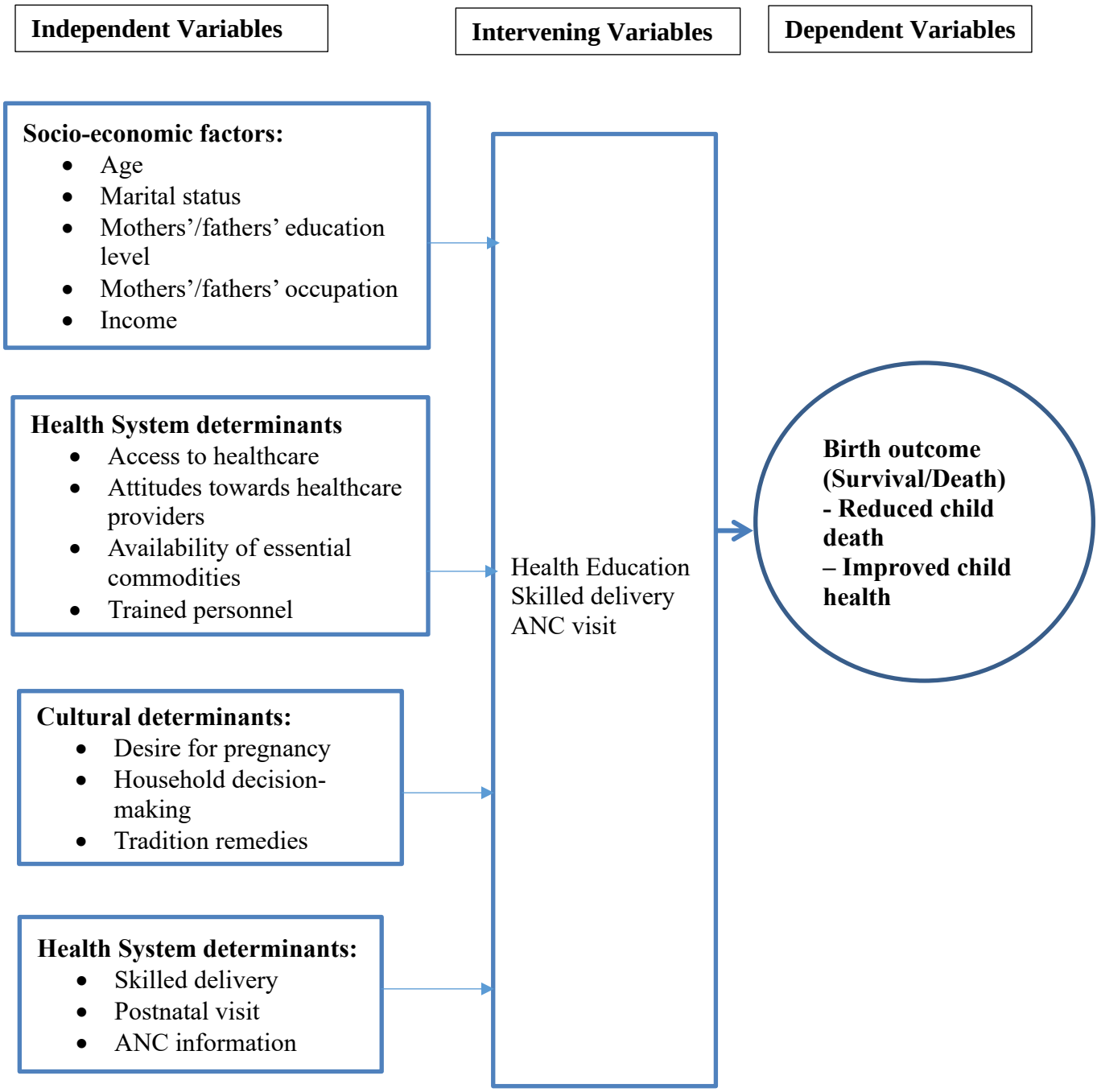


***Figure 2:Conceptual framework***

Source: Adopted and modified from Al Kibria et al, 2018

# CHAPTER THREE

## 3.0 RESEARCH METHODOLOGY

### 3.1 Introduction

The present chapter highlights the methodological steps taken during the study. Specifically, the study focus on the study site, study population, study design, sample size, sampling techniques, quality assurance, study's validity and reliability, data collection instruments, limitations of the study, ethical issues, data collections, data analysis and data management study limitations, among some other important concepts.

### 3.2 Study Site

The study site was in Baringo County, one of the 47 counties found in Kenya. Baringo County is located in Rift Valley Region and borders other 8 counties namely: Elgeyo Marakwet to its west, Uasin-Gishu, Kericho, Nakuru, Laikipia, Samburu, Turkana and West Pokot to the North West. Baringo County has six Sub-Counties namely Tiaty, Baringo North, Baringo Central, Eldama Ravine, Mogotio, and lastly Baringo South. The County has 30 wards and more than 100 locations.

#### 3.2.1 Baringo Central Sub County profile

Baringo Central Sub County has 5 wards namely Kabarnet, Sacho, Tenges, Kapropita and Ewalel Chapchap (CIDP, 2018). The county has 1,210 staff in the health services department distributed across the levels of the healthcare system. The distribution of staff across cadres indicates that there are 9 medical specialists, 19 doctors, 535 nurses, and 113 clinical officers who are distributed across the county. The distribution of health personnel in Baringo Central Sub-County is summarized in table 3.1 below. The Sub-County has 1 GoK hospital, 6 GoK health centers, 29 GoK dispensaries and 1 FBO dispensary, 10 private clinics, 4 active community units and l Nursing homes (Health Strategic plan, 2018). The

sub-county has the highest population density at 188 persons per square kilometer compared to other Sub-Counties. On approximation, Baringo County occupies a land area equivalent to 11,015 Kilometers square and has a population of 853,515 as at the projected statistics of 2017.The population of women of child-bearing age (15-49) is expected to rise from 158,824 in 2017 to 164,337 in 2018 further raise to 169,901 in 2019. The main ethnic communities in Baringo are Pokot, Tugen and Ilchamus with some minority groups like Turkana, Kikuyu and Ogiek also living in the county. The county experiences a high illiteracy levels as a result of the cultural practices and beliefs that education is not important (CIDP, 2018). It reported majority of the perinatal deaths compared to other sub counties in Baringo County and some of the residents still practice traditional beliefs.

***Table 1:Distribution of health care providers attending women of child-bearing age in Baringo Central Sub-County***

| **Profession or cadre** | **Sacho ward** | **Kabarnet ward** | | **Kapropita ward** | **Ewalel ward** | **Tenges ward** |
|---|---|---|---|---|---|---|
| | | **Rural facilities** | **County Referral Hospital** | | | |
| Pediatricians | 0 | 0 | 1 | 0 | 0 | 0 |
| Gynecologists | 0 | 0 | 1 | 0 | 0 | 0 |
| Doctors | 0 | 0 | 25 | 0 | 0 | 0 |
| Clinical officers | 2 | 8 | 24 | 2 | 2 | 3 |
| Nurses | 12 | 21 | 101 | 5 | 7 | 15 |
| Laboratory technologists | 2 | 6 | 8 | 0 | 3 | 4 |
| Nutritionists | 2 | 4 | 5 | 1 | 2 | 2 |
| **Functional community units** | | | | | | |
| Number of community Units | 1 | 1 | 0 | 0 | 1 | 1 |

*Source: Baringo County Health department (2020*)

### 3.3 Study Population

Women of child-bearing age in Baringo county stands at 173, 4239 (Census, 2009) distributed to its sub counties as follows: Baringo central (25,434) Baringo North (29,277) Tiaty (41,576) Baringo south (25,244) Mogotio (19,028) Eldama/Ravine (32,816).

Tiaty and Baringo North sub counties both have slightly higher proportion of women of child-bearing age and high proportion of perinatal mortality in the county, but due to perennial insecurity in those areas, inadequate infrastructural facilities, lack of various medical specialists and other skilled personnel, the researcher excluded. While Eldama ravine and Mogotio sub counties were also excluded due to their improved socio economic status as compared to the other sub counties. Baringo central, was purposely chosen because the County Referral Hospital is where it is situated and has been consistently reporting high perinatal mortality in the county. It is in such facilities that various medical specialists and health experts are found. An obstetrician from the county referral hospital, a midwife/maternity in-charges and a sub-county reproductive health coordinator be Key Informants as well as the main referral centre for the surrounding community and the other sub counties. The selected Women of Child-bearing Age (WRA), Focus Group Discussion (FGD) participants and Key Informants (KIs) would form the study population from Baringo Central Sub-County.

### 3.4 Study Design

This was a household based descriptive-analytical and qualitative study designs were used; where quantitative data were collected and qualitative data employing Focused Group Discussion and key informant interviews were conducted. Descriptive study design are described based on the fact that the patterns of the problem without undertaking any inferential analysis. The design was selected as it demonstrates the cause-effect

relationships. The researcher used information that are available in the public domain and used such to make evaluations and final analysis (Kothari, 2014). Mixed methods approach in which both qualitative and quantitative method of data collection was applied. Such approach, commonly referred to as triangulation enable the researcher to provide a comprehensive understanding of the problem under investigation and hence assure validity and reliability of the study findings (Creswell, 2014).

**3.5 Sample size determination**

Formula by Andrew fisher was used by the researcher to determine the sample size of the study. Since we are able to determine the population, the confidence interval and the confidence level. The sample size was determined using Fischer's (1998) formula as shown below

$n = z^2pq/d^2$

Where:

***n***= The desired sample size (for population greater than 10000),

***z***=The normal standard deviation at 95% confidence interval set at 1.96.

***p***= The proportion of reproductive women with the desired characteristics which is assumed to be 50%

Calculating sample size for this study using the mortality of 19/1000 live births from a study on the "Determinants of Perinatal Mortality in Kenya" (Imbo *et al*., 2021) gave a sample size of 29 study participants. This sample size could have reduced the power of this study and could not have been adequate and for the detection of determinants for perinatal mortality in Baringo Central. Therefore, an assumed 50% prevalence to calculate the sample size in order to increase the sample size and increase the power of the study.

***q*** = (1-p) which is 1-0.5=0.5

Therefore, n= $(1.96)^2$ (0.5) (0.5)/ $0.05^2$

n= 384.16

The sample was 384 participants.

### 3.6 Sampling Procedure

The study sought to employ purposive (multi-stage) sampling approach;

#### 3.6.1 Selection of the wards

First, three out of the five wards in Baringo Central Sub-County were purposely selected based on their high number of reproductive women who had given birth within the last two years. This was done by ranking the wards from the lowest to the highest and subsequently selecting the first three wards having the highest cases of perinatal mortality. Kabarnet Ward, Ewalel/Chap Chap and Kapropita ward were therefore selected in this case as indicated in Table 3.2 below

***Table 2: Selected administrative Wards in Baringo Central Sub County***

| **WARDS/** | **Total Population** | **No of women of R.A** | **Remarks** |
|---|---|---|---|
| Kabarnet Ward | 23,430 | 5,623 | **Selected** |
| Ewalel/Chap Chap | 17,021 | 4,085 | **Selected** |
| Kapropita ward | 16,232 | 3,895 | **Selected** |
| Sacho ward | 15,230 | 3,656 | |
| Tenges ward | 9,567 | 2,296 | |
| **TOTAL** | **81,480** | **19,555** | |

### 3.6.2 Selection of the villages

Secondly, upon the selection of the wards, the next step was to purposely select the Community Units (CUs) from the respective three wards. Each of these selected administrative wards has one active community unit i.e. There is 1 CU in Kabarnet Ward, 1 in Ewalel/Chap Chap and 1 in Kapropita ward. Therefore, a total of 3 Community Units was selected, one from each ward.

The number of villages were then determined from each community units. The number of villages picked per community unit was based on the population of women of reproductive age who had given birth within the last two years in such a village and the proportional sample size. For this study's feasibility, 54 villages were randomly selected for the study. The names of villages to be included per CU were randomly selected through simple random sampling in which case the names of all villages were written in different pieces of paper and folded and the researcher asked to randomly pick the required number of villages per CU. A total of 54 villages were picked through this method.

### 3.6.3 Sampling of the study households/participants

Once the villages were selected, the final step was selection of households with women of child bearing age who had given birth within the last two years. The households to be visited were chosen using consecutive sampling method until the required sampled size was arrived at in every selected village based on the proportion to size. The Community Health Volunteers (CHVs) assisted the principal researcher identify the households that meet the inclusion criteria in their respective villages. The researcher then conveniently picked every eligible household or study participant until the required sample size per village was achieved. The table 3.3 below shows sample size distribution per selected units in Baringo Central Sub-County.

***Table 3: Sample size distribution in the selected Units, Baringo Central Sub-County 2020***

| Community Unit (CU) | Total Population | No of women of R.A | Total number of Villages | Number of villages selected | Sample size |
|---|---|---|---|---|---|
| 1. Salawa | 23,430 | 5,623 | 58 | 16 | 158 |
| 2. Timboiywo | 17,021 | 4,085 | 61 | 18 | 116 |
| 3. Kituro | 16,232 | 3,895 | 65 | 20 | 110 |
| **Total** | **56,683** | **13,603** | **184** | **54** | **384** |

**3.7 Inclusion criteria**

Women of child-bearing age (WRA) who had given birth within the last two years were included in the study.

Children up to two years' period are considered since they are key with regard to HIE

In polygamous household as well as women in a homestead where both or several women of reproductive age living in a homestead only one was included in the study.

They must be of sound mind, willing to participate and are ready to give informed consent.

Women of reproductive age who were residents of the study area were included in the study

**3.8 Exclusion Criteria**

Women of reproductive age who were less than 18 years of age without parents/guardians to sign their assent forms were excluded in the study.

Women of reproductive age who met the inclusion criteria but were mentally ill without parents/guardians to sign their consent forms were excluded in the study.

Visitors with up to 2 year old child were also excluded in the study.

### 3.9 Data collection instruments and methods

A semi-structured researcher administered questionnaire was used to collect quantitative data from eligible women of reproductive age who had given birth within the last two years. The questionnaire was organized objectively. Both open-ended and close-ended questions were used so as to generate both quantitative and qualitative data. It is an interview schedule in which the researcher asks the respondents questions as they write the responses verbatim.

The technique was chosen since questions can be rephrased to the understanding of the respondent especially those with low literacy level. Key informants' interviews and Focus Group discussions was used to collect qualitative data. Specifically, the principal investigator conducted ten Key Informant interviews on the Sub-County reproductive health coordinator, maternity department nursing officer in-charges at the Baringo County Referral Hospital and health centres in the three wards and the lead Community Health Extension Workers (CHEWs), postnatal ward nursing officer in-charge, the County Reproductive Health Coordinator, County Obstetrician and the County paediatrician. Three Focus Group discussions was conducted with Community Health Volunteers from the three wards. That is, there was one focus group discussion with between 10 to 15 Community Health Volunteers from one selected Community Unit per ward. These are believed to have good knowledge of the study concepts, especially on the health system factors that determine perinatal mortality among women of child-bearing age in Baringo County.

Before the data collection, a pre-test was conducted in three villages of the neighboring Eldama-ravine sub county on a 10% (38) of the sample size population. The selected participants were not included in the study. The pre-test results were used to improve the

study Instruments. Training of research assistants and pre-testing instruments helped to ensure validity and reliability.

### 3.10 Study variables

#### 3.10.1 Dependent variable

The dependent variable in this study was birth outcome i.e. either alive or death.

#### 3.10.2 Independent variables (Risk determinants)

Demographic data variables collected included; age (mean and standard deviations, age groups), marital status (whether single, in polygamous or monogamous marriage, divorced or widow), education status: no formal education, (partial primary, completed primary, partial secondary, completed secondary or tertiary education), occupation (Whether unemployed or employed), location (village of residence). Among other variables collected were on: Cultural practices (traditional remedies, traditional seclusion, traditional circumcision, dietary restrictions), obstetric factors (parity, desire for pregnancy, hospital related factors (history of unskilled deliveries; lack of diagnostic equipment, distance to the facility, any surgical procedure, ANC and PNC attendance)

### 3.11 Data Management

Upon completion, the questionnaires were checked for completeness before leaving the participants. The collected data was entered into the computer, coded, edited and cleaned prior to analysis. The data on hard copies were stored under key and lock while the keyed data was safeguarded with a password. The quantitative data was analyzed using epi info version 7 Atlanta Georgia. Descriptive data such as mean, mode, percentage and frequencies was used to give descriptive information. Inferential statistics like Chi Square was used to measure the association between the dependent and independent variables. Qualitative data, were transcribed, translated, grouped and analyzed thematically.

### 3.12 Data analysis

Descriptive, bivariate and multivariate data analysis was conducted for this study using Epi Info version 7.2.2.

#### 3.12.1 Descriptive Analysis

A Descriptive statistics was performed on demographic profile of participants by calculating the measures of central tendencies and their 95% confidence interval and frequencies of different variables, which was compared to observe their tendencies. Categorical variables were summarized using simple proportions and percentages while continuous variables were summarized using mean/median and standard deviations/Interquartile range.

#### 3.12.2 Bivariate analysis

The prevalence odds ratio (pOR) and their 95% confidence intervals (CI) were calculated. The level of significance was estimated using Pearson's chi-squared test or Fisher's exact test. Factors with P Value ≤0.2 were considered for multivariate analysis.

#### 3.12.3 Multivariate analysis

Factors with P value of less than 0.2 at bivariate analysis were entered into unconditional logistic regression (forward stepwise). Determinant with P value ≤0.05 were considered significantly associated with perinatal mortality.

### 3.13 Quality Assurance

The structured questionnaires were piloted and pretested before the actual data collection, whereby, a pre-test was conducted in three villages of the neighbouring Koibatek sub county on a 10% (38) of the sample size population. The pre-test results were used to improve the study Instruments. Training of research assistants and pre-testing instruments helped to ensure validity and reliability. Based on the gathered information, the

questionnaire was further fine-tuned. Among the findings were; some mothers had difficulties in understanding some terms like; Occupation was explained as “What do you do daily for a living?” Have you had formal education, was explained as “did you attend any school)?” and How many children do you have? For “(Parity)”. This helped in obtaining quality data from the respondents.

**3.14 Validity and Reliability**

Validity and reliability of the interview protocol was examined. As established by Mays, and Pope (2020), validity in quantitative approach denotes the truthfulness in addition to presentation of the methodology followed as well as the degree of precision of accuracy of findings and their reflection of the data. Conversely, reliability refers to the uniformity with regard to adopted analytical processes. In the present research, a number of strategies were adopted to ensure the validity and reliability of findings. By using both qualitative and quantitative data collection methods, that is triangulation, instruments maximize the validity. In addition, the instruments were organized in line with the study objectives and pretested prior to data collection to increase validity. Thorough record keeping which shows a concise decision trail was done to ensure the elucidations of data are both unswerving and transparent. The researcher further included rich as well as thick verbatim portrayals of participants account in supporting findings and ensuring trustworthiness of findings. To ensure reliability, the enumerators were trained to ensure consistent data collection. Training standardizes data collection thus ensuring uniformity. Non response that occurs as a result of missing/incomplete data was catered for by ensuring a nonresponse and attrition levels below are 5%. Moreover, quality checks during the fieldwork would do daily to minimize non response errors.

### 3.15 Ethical Considerations

**Institutional Research and Review Committee (IREC) approval and clearance:** The study was undertaken with approval from Moi University/Moi Teaching and Referral Hospital Institutional Research and Ethics Committee (MU MTRH-IREC), Ref: IREC/2020/47 (approval number 0003624) which grants approval for research studies involving human subjects. Research license was granted by National Commission for Science, Technology and Innovation (NACOSTI), License No; NACOSTI/P/20/6088 and permission to carry out research was further sought from Baringo County Department of Health and participation in the study was voluntary.

**Good clinical practice:** The research assistants were trained for two days by the principal investigator where they were taken through the purpose of the study, procedures involved, and questionnaires. They were taken through good clinical practice and ethics, they were informed that, the study involved women of reproductive age who are among the vulnerable group; therefore their rights were be respected at all times and that their cultural, religious and social rights were respected.

Sensitive questions in the questionnaires were asked in a decent manner which preserves dignity among this special group of people and no other question(s) outside the questionnaire would be asked.

**Informed consent:** A written informed consent was signed after detailed explanation of the study purpose, processes, benefits and risks have been explained to them before being enrolled into the study, for pregnant women less than 18 years old permission was sought from their caretakers or guardians. Thumb-prints were used in the event of difficulties in writing. Participation was voluntary and participants had the right to withdraw their

participation to the study at any time without any given reason, without being denied the care necessary.

**Confidentiality:** Subject's data was recorded anonymously using only unique identifier codes. No data was released to anyone outside of the study for any reason. No individual identifiers were used in any reports from this study. Information in computers was stored in password-protected locations and in password protected formats. All data from this study would be presented in an aggregated format.

**Potential risks and protection against risks:** there was no any discomfort or risks involved in this study, however, the participants were slightly inconvenienced due to the length of the interview.

**Compensation:** No compensation was paid to the study participants and no special incentive was offered to persuade persons to participate.

**Dissemination of results:** Research findings were disseminated to all the relevant stakeholders, and this study would be published in peer reviewed journals and would also be presented in scientific conferences. It was also disseminated through a thesis book and thesis defense.

### 3.16 Limitations of the study

Since the study was conducted in the rural community of Baringo central sub county covering only a small population of women of child bearing age experiencing perinatal mortality. This gives a picture of only one sub county and to get a representative sample, efforts were made to reach more than 90% of the study subjects. However, the study aimed at identifying varying factors at the community level contributing to perinatal mortality. In addition, subject bias might not be completely avoided since majority of mothers who would have experienced perinatal deaths might have recall bias. This however was

minimized by pretesting the questionnaires to ensure validity and its reliability. Also tthese were further mitigated by giving adequate information and enough time to the study participants.

Despite these limitations, this study was able to estimate birth outcomes and identify or detect determinants for perinatal deaths among women of reproductive age in Baringo Central Sub County.

# CHAPTER FOUR

## 4.0 RESULTS

### 4.1 Introduction

This chapter represents the results of the study findings and the results of multivariate analysis on determinants of perinatal mortality among women of reproductive age in Baringo Central Sub County. Section 4.2 describes the socio demographic characteristics of the population under study while section 4.3 examines the qualitative analysis results, section 4.4 describes the Hospital related determinants of perinatal mortality, section 4.5 examines the health systems related determinants of the perinatal mortality, section 4.6 describes the bivariate analysis for the determinants for perinatal mortality, section 4.7 describes the Multivariate analysis of Socio-Cultural Factors on Perinatal Mortalities, section 4.8 describes the pregnancy related outcomes associated with perinatal mortality

**Summary**

A total of 384 women of reproductive age were interviewed representing 100% of the respondents' rate, thus the study sample size was 384 mothers.

### 4.2 Socio-demographic Characteristics of women of reproductive age who experienced perinatal Mortality.

From the table 4.2.4 below the overall mean age of the mothers was 24±5 years; while among those who experienced perinatal deaths their mean age was 24.66±5.33 year. The mean age for those who experienced perinatal deaths was 25.66±5.32 while those who did not have perinatal deaths their mean age were 24.48±5.32.

Twenty three (39%) of deaths were recorded in mothers aged between 25-29 years. Generally, among the 384 mothers who participated in the study, 59 (15.1%) recorded perinatal mortalities. In addition, most 23 (39%) of perinatal deaths were reported among

mothers aged 25-29 years old whereas the lowest 4(6.8%) was recorded among mothers aged 35 years and above and none of the perinatal death among the mother who had 14 years old. In regard to marital status the highest number 40 (67.8%) of perinatal deaths were recorded among mothers who were currently married as compared to those who were not married 19 (32.2%).

Mothers who had completed secondary education recorded the highest 20 (33.9%) of the perinatal deaths while 12 (20.3%) perinatal deaths were recorded in then mothers who had no formal education. The study depicts that 57 (96.6%) of perinatal deaths were recorded among mothers who were not employed. Among the 59 perinatal deaths a higher number 33 (59.3%) were male while a lower 26 (44.1%) comprised of female.

The study indicated that 44 (74.6%) of the mortalities were reported among mothers who were Christians/protestants while Muslims recorded the lowest 1 (1.7%). Most 27 (45.8%) of the perinatal deaths were from Ewalel/Chap chap while the lowest 10(17.0) was recorded in Kapropita.Table 4.2.4

***Table 4: Sociodemographic Characteristics of the study participants***

| **Variables** | | **Deaths(n=59)** | **Alive(n=325)** |
|---|---|---|---|
| **Mothers age in years** | | | |
| **Mean age + SD Overall (**24±5 years) | | 24.66±5.32 | 24.48±5.32 |
| **Age group** | 14 Years | 0(0) | 1(0.3) |
| | 15-19 | 5(8.5) | 51(15.7) |
| | 20-24 | **20(33.9)** | 111(34.2) |
| | 25-29 | **23(39%)** | 109(33.5) |
| | 30-34 | 7(11.9) | 39(12) |
| | 35-49 | 4(6.8%) | 14(4.3) |
| **Marital status** | Currently Married | **40(67.8)** | 231(71.1) |
| | Currently not married | 19(32.2) | 94(28.9) |
| **Mother's Education Level** | No Formal Education | 12(20.3) | 113(29.4) |
| | Completed Primary Education | 14(23.7) | 120(31.3) |
| | Completed Secondary Education | **20(33.9)** | 93(24.2) |

| | | | |
|---|---|---|---|
| | Completed Tertiary Education | 13(22.0) | 58(15.1) |
| **Employment status of the mother** | Yes | 2(3.4) | 18(5.5) |
| | No | **57(96.6)** | 307(94.5) |
| **Family size** | 2 | 7(11.9) | 12(3.7) |
| | 3-5 | **35(59.3)** | 187(57.5) |
| | >6 | 17(28.8) | 126(38.8) |
| **Sex of the new born** | Male | **33(55.9)** | 175(53.8) |
| | Female | 26(44.1) | 150(46.2) |
| **Religion** | Protestant | **44(74.6)** | 221(68.0) |
| | Catholic | 12(20.3) | 55(16.9) |
| | Traditional Beliefs | 2(3.4) | 38(11.7) |
| | Muslim | 1(1.7) | 11(3.4) |
| **Source of income** | | | |
| **Charcoal Burning** | Yes | 17(28.8) | 117(36.0) |
| | No | **42(71.2)** | 208(64.0) |
| **Business** | Yes | 14(23.7) | 85(26.1) |
| | No | **45(76.3)** | 240(73.9) |
| **Farming** | Yes | **33(55.9)** | 188(57.8) |
| | No | 26(44.1) | 137(42.2) |
| **Livestock Rearing** | Yes | 12(20.3) | 106(32.6) |
| | No | **47(79.7)** | 219(67.4) |
| **Residence Ward** | Ewalel/Chapchap | **27(45.8)** | 102(31.4) |
| | Kabarnet | **22(37.2)** | 94(28.9) |
| | Kapropita | 10(17.0) | 129(39.7) |

### 4.2.1 Distribution of perinatal deaths per age group, Baringo central sub county, Baringo County, 2020

The graph below indicates that most perinatal deaths 23(39%) occurred in mothers aged between 25-29 years while no 0 (%) perinatal death was recorded among woman aged 14 years old. Figure 4.2.3

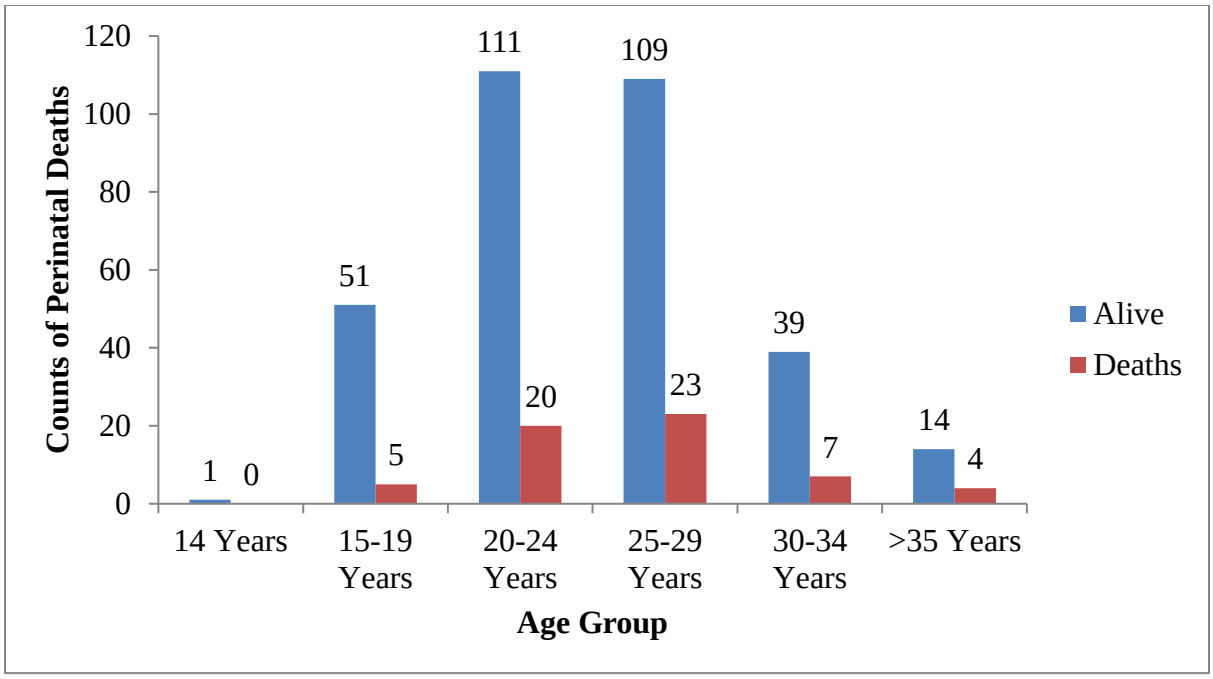


***Figure 3: Distribution of death per Age Group***

**4.2.4 Proportion of reported perinatal deaths per village, Baringo central sub county Baringo County, 2020**

From the graph below the highest 7 (11.8%) number of perinatal deaths were from Kiptimin village followed by 5 (8.5%) deaths from Tumgoi village while 4 (6.8%) deaths were from Kapsia, Kipkaech and Kitumbei villages (Fig 4.1.4)

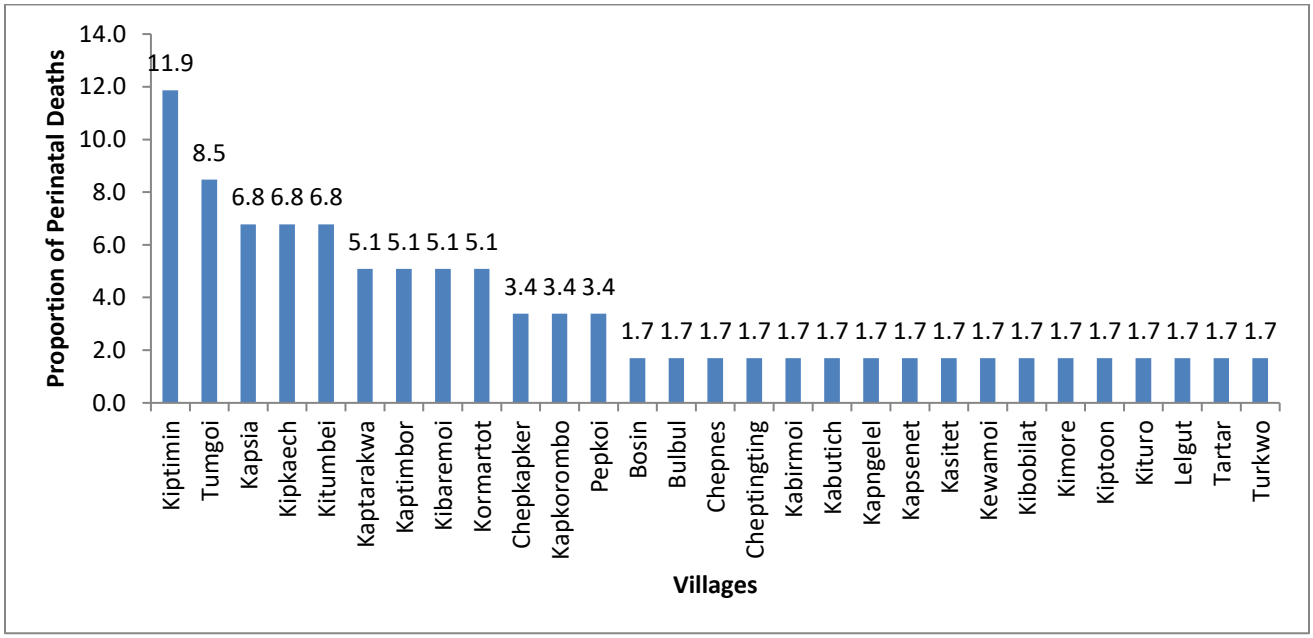


***Figure 4: Distribution of Deaths per village***

### 4.2.5 Household Income per month

One hundred and forty two (50%) women of reproductive age earned an income of Ksh.5000 to Ksh. 10000, among those earned below Ksh. 5000 were 72 (25%), while those earned between Ksh. 10,001 to Ksh. 20,000 and who earned between Ksh. 20,001 to Ksh. 25,000 were 36 (12.5%) each. Figure 4.2.5

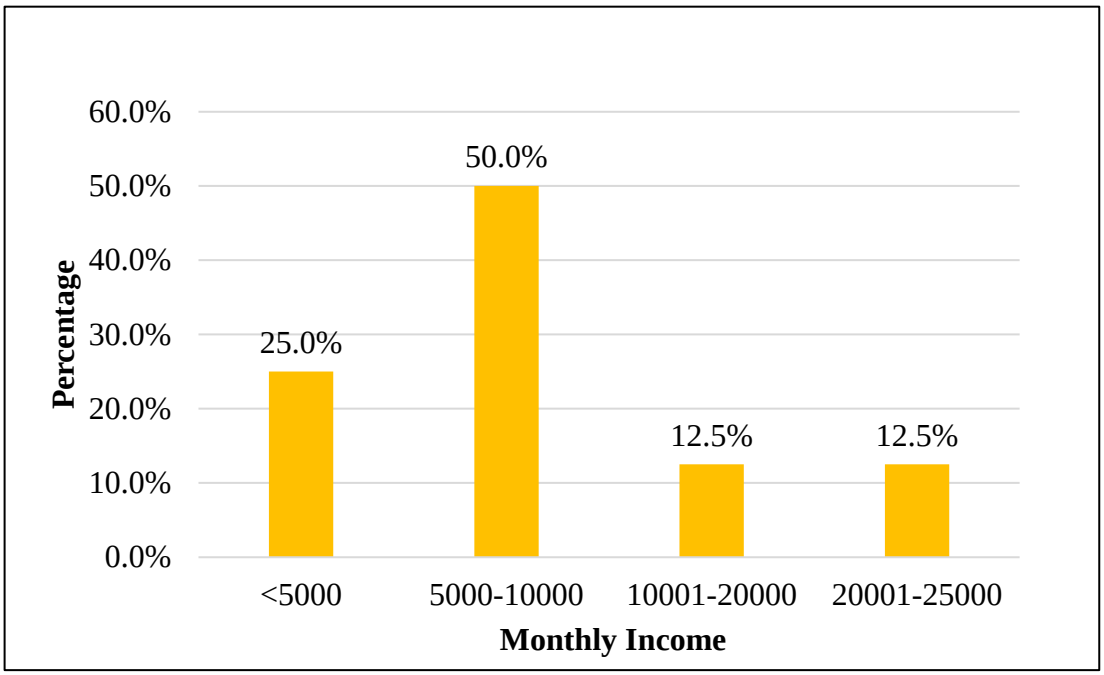


***Figure 5: Household Income per month***

### 4.3 The perinatal mortality rate among women of child-bearing age in Baringo Central Sub-County

Of the 384 study participants, 59 (15.3%) experienced perinatal deaths, this translates to 153 deaths per 1000 live births.

Twenty three (39%) of deaths were recorded in mothers aged between 25-29 years while 4(6.8%) perinatal deaths were recorded among mothers aged 35 years and above and none of the perinatal death among the mother who had 14 years old.

***Table 5: Qualitative analysis***

| **Variable** | **Response** |
|---|---|
| **Antenatal Natal Clinic attendance** | Mothers of reproductive age who attended ANC clinic had the following reasons<br>• Checking the health of the baby and the mother to avoid risks during delivery<br>• Monitoring progress of mother and child<br>• Knowing the status and growth of the baby<br>• Teaching about the development of the child and care of the mother during that stage<br>• Understanding ways of boosting babies' immunity and resistance to diseases<br>• Vaccination to get rid of complications |
| **Reasons for miscarriage** | • Lack of enough fluid for baby's survival in the womb<br>• Miscarriage due to stillbirth<br>• Twins pregnancy, all the babies passed away after two days due to birth complications and also there was no alternative source of power at New Born Unit<br>• Not having pregnancy that did not result to live birth since the previous incident, there is no any commend that resulted to live birth |

| | |
|---|---|
| **Attitude towards postnatal visit within 7 days** | Most mothers commented positively toward postnatal visit within seven days as follows: -<br>• Postnatal visit is good for assessing the health status of the baby and mother<br>• To know more information about baby and the mother |
| **Desire for pregnancy** | The study revealed that most teenage mothers don't like pregnancy so age factor matters on the desire to be pregnant. However, mature mothers indicated that being pregnant is the best feeling and accomplishes God's plan. It is also makes marriage meaningful especially for a stable future and family. |
| **Delivery assistance** | Overall all mothers attending services at the ANC at Baringo Central Sub County reported that staff working in the Hospital were good and assisted in safe delivery. Nurses and other care givers are punctual and arrive to work on time. |
| **Traditional birth practices** | From the findings most mothers said that traditional birth practices were bad to both the mother and child, can cause infections such as HIV AIDS and can lead to lose of blood and even death. |
| **Services provided by the Hospital** | The study revealed that service delivery was good |

### 4.4 Hospital related determinants of perinatal mortality

From the table below, ANC recorded 58 (98.3%) deaths among mothers who visited the clinic while 1 (1.7%) was among mothers who never visited the clinic. During the study 26 (44.1%) of deaths occurred among women who visited the clinic three times while 1(1.7%) was recorded among those who didn't attend the clinic. Despite there being adequate number of HCWs, majority 42 (71.2%) of the mortalities were recorded. In addition 38 (64.4%) of the deaths were recorded among mothers who afforded health care services. In addition, most deaths 33 (55.9%) occurred among mothers who walked to the hospital while the lowest 1 (1.7%) was bicycle. Mothers who walked for 1 to 2 hours experienced high perinatal deaths 44 (74.6%) whereas the lowest 4 (6.8%) was recorded for those who walked for less than one hour.

***Table 6: Hospital related determinants of perinatal mortality***

| **Variables** | **Deaths(n=59)** | **Alive(n=325)** |
|---|---|---|
| **Having ANC visit** | | |
| **Yes** | **58 (98.3)** | 7 (2.2) |
| No | 1(1.7) | 318 (97.8) |
| **No. of ANC Visits** | | |
| Zero | 1 (1.7) | 7 (2.2) |
| Once | 8(13.6) | 42 (12.9) |
| Twice | 12(20.3) | 75 (23.1) |
| **Thrice** | **26(44.1)** | 136 (41.8) |
| Four Times | 12(2.03) | 64 (19.7) |
| More than Four | 0(0) | 1 (0.3) |

| | | |
|---|---|---|
| **Adequacy of HCWs** | | |
| No | 17(28.8) | 65 (20.0) |
| Yes | 42(71.2) | 260(80.0) |
| **Affordability of Health services** | | |
| Not Affordable | 21(35.6) | 76(23.4) |
| Affordable | 38(64.4) | 249(76.6) |
| **Mode of transport to HCF** | | |
| Bicycle | 1(1.7) | 14(4.3) |
| Boda Boda(Motor Cycle) | 25(42.4) | 183(56.3) |
| Walking | **33(55.9)** | **124(38.2)** |
| Taxi | 0(0) | 2(0.6) |
| Personal Car | 0(0) | 2(0.6) |
| **Postnatal visit within 7 days** | | |
| Yes | 21(35.6) | 141(43.4) |
| No | 38(64.4) | 184(56.6) |
| **Walking distance from the nearest health facility** | | |
| < 1 hour | 4(6.8) | 193(59.3) |
| 1-2 hours | 44(74.6) | 53(16.3) |
| > 2 hours | 11(19.0) | 79(24.4) |
| **Type of delivery** | | |
| Skilled | 45(76.3) | 302(92.9) |
| Unskilled | 14(23.7) | 23(7.1) |

### 4.5 Health System level determinants perinatal mortality

Among the hospital factors, the study showed a relationship between unskilled deliveries and perinatal deaths, that is, P=0001. Majority of the deaths were reported in neonates born through unskilled deliveries.

***Table 7: Health System level determinants perinatal mortality***

| **Variable** | **Deaths(n=59)** | **Alive(n=325)** | **pOR(95% CI)** | **P-Value** | **AOR(95%CI)** | **P Value** |
|---|---|---|---|---|---|---|
| Ever had ANC visit | | | | | | |
| No | 1(1.7) | 7(2.4) | 0.78(0.0946-6.4859) | 1 | | |
| Yes | 48(98.3) | 318(84.6) | | | | |
| No. of ANC Visits | | | | | | |
| <2 | 21(35.6) | 124(38.1 | 0.9(0.5025-1.5968) | 0.82 | | |
| >2 | 48(64.5) | 201(61.9) | | | | |
| Adequate HCWs | | | | | | |
| No | 17(28.8) | 65(20.0) | 1.62(0.8661-30.0265) | 0.2 | 0.850 (0.219-3.306 | 0.12 |
| Yes | 42(71.2) | 260(80.0) | | | | |
| Ever had PNC visit within 7 days of delivery | | | | | | |
| No | 38(64.4) | 184(56.6) | 1.39(0.7792-2.4675) | 0.33 | | |
| Yes | 21(35.6) | 141(43.4) | | | | |
| Walking distance to nearest HCF in Hrs. | | | | | | |

| | | | | | | |
|---|---|---|---|---|---|---|
| >2 Hrs. | 12(20.3 | 78(24.0) | 0.83(0.4083 -1.6009) | 0.65 | | |
| <2 Hrs. | 47(79.7) | 247(76.0) | | | | |
| Type of delivery | | | | | | |
| Unskilled | 14(23.7) | 23(7.1) | 4.08(1.9597 -8.5151) | 0.0001 | 5.357(2.502-10.997) | 0.035 |
| Skilled | 45(73.3) | 302(92.9) | | | | |

Lack of early diagnostic tools, lack of strong referral system from peripheral health facility, lack of extra or more theatre in case of more than one caesarean section at ago, weak maternal and perinatal death surveillance and response committees, being a referral site - severely sick new-borns who rarely survive were being referred, congenital anomaly - lack of preconception care i.e. Iron, contamination/lack of proper Infection Prevention and Control (IPC)- e.g. no restriction of visitors to maternity, neonatal sepsis, improper use of Partograph or improper interpretation, staff negative attitude, the health workers not prepared the mother with individual birth plan, most facilities not being able to conduct deliveries and equipped to diagnose well the problem early e.g. maternity, lab, ultra sound, no emergency protocol.

### 4.6 Independent analysis – Bivariate Analysis

#### 4.6.1 Bivariate and Multivariate analysis of socio demographic characteristics

The results depicted that mothers with no formal education had few cases of neonatal deaths compared to those who had education. This relationship was significant, P=0.0071. In addition, there was a significant association between sex of the new born and perinatal death, thus male neonates were likely to die than female neonates' counterparts, that is, Male 33(55.9%), P= 0.02. Table 4.6.8

***Table 8: Bivariate and Multivariate analysis of socio demographic characteristics***

| Variable | Deaths(n=59) | Alive(n=325) | p OR | 95% CI | P-Value | AOR(95%CI) | P Value |
|---|---|---|---|---|---|---|---|
| Age | | | | | | | |
| >17yrs | 25(42.4) | 163(50.2) | 0.73 | 0.4173 - 1.2797 | 0.34 | | |
| <17yrs | 34(57.6) | 162(49.8) | | | Ref | | |
| Currently married | | | | | | | |
| Yes | 40(67.8) | 231(71.1) | 0.87 | 0.4718 - 1.5554 | 0.72 | | |
| No | 19(32.2) | 94(28.9) | | | Ref | | |
| Mothers education | | | | | | | |
| **No formal education** | **26(44.1)** | **207(63.7)** | **0.44** | **0.2562 - 0.7875** | **0.0071** | **1.279(0.669-2.814)** | **0.067** |
| Has formal education | 33(55.3) | 118(36.3) | | | Ref | | |
| Fathers education | | | | | | | |
| No formal education | 30(50.9) | 194(59.7) | 0.69 | 0.4004 - 1.2186 | 0.261 | | |
| Has formal education | 29(49.1) | 131(40.3) | | | | | |
| Mothers Employment status | | | | | | | |
| Not Employed | 57(96.6) | 307(94.5) | 1.67 | 0.774-7.3996 | 0.71 | | |
| Employed | 2(3.4) | 18(5.5) | | | Ref | | |
| Fathers Employment status | | | | | | | |
| Not Employed | 54(91.5) | 295(90.8) | 1.1 | 0.4080 - 2.9564 | 1 | | |
| Employed | 5(8.5) | 30(9.2) | | | Ref | | |
| Sex of the newborn | | | | | | | |
| **M** | **33(55.9)** | **175(53.9)** | **1.1** | **0.6225 - 1.9014** | **0.02** | **1.429(0.101-3.848)** | **0.07** |
| F | 26(44.1) | 150(46.1) | | | Ref | | |

## 4.7 Multivariate analysis of Socio-Cultural Factors on Perinatal Mortalities

On unconditional logistic regression (forward stepwise) analysis for socio cultural determinants of perinatal mortality, women who secluded recorded more 43 (72.9%) perinatal deaths compared to those who did not seclude 16 (27.1%). There was no association between seclusion of pregnant women and perinatal deaths, thus, P=0.06. Women who had dietary restriction had high deaths 48 (81.4%) compared to those who had no restrictions. This relationship was significant, thus p=0.001. The study also showed that women who took traditional remedies recorded high mortalities 40 (67.8%) than those who did not. Moreover, there was an association between uptake of traditional remedies and deaths, that is, p=0.03. The study also showed a relationship between female genital mutilation and perinatal deaths, that is, P=0.0001. Those who underwent female genital mutilation recorded higher death 37 (62.7%) than those who did not 22(37.3%). Table 47.9

***Table 9: Multivariate model analysis on socio cultural factors***

| Variable | Deaths(n=59) | Alive(n=325) | pOR(95%CI) | P-Value | AOR(95%CI) | P Value |
|---|---|---|---|---|---|---|
| Seclusion of pregnant women | | | | | | |
| Yes | 43(72.9) | 192(59.1) | 1.9(1.0064-3.4437) | 0.06 | 1.385 (0.119-4.247) | 0.05 |
| No | 16(27.1) | 133(40.9) | | Ref | | |
| Dissuading | | | | | | |
| Yes | 3(5.1) | 33(10.2) | 0.5(0.1121-1.4545) | 0.32 | | |
| No | 56(84.9) | 292(89.8) | | Ref | | |
| Dietary restrictions | | | | | | |
| Yes | 48(81.4) | 190(58.5) | 3.1(1.5531-6.1897) | 0.001 | 5.478(2.512-11.887) | 0.03 |
| No | 11(18.6) | 135(41.5) | | Ref | | |
| Traditional remedies | | | | | | |
| Yes | 40(67.8) | 263(80.9) | 0.5(0.2691-0.9154) | 0.03 | 1.842 (0.236-9.214) | 0.05 |
| No | 19(32.2) | 62(19.1) | | Ref | | |
| Spiritual healing | | | | | | |
| Yes | 21(35.6) | 197(60.6) | 0.4(0.2015-0.6397) | 0.0006 | 1.110 (0.236-9.406) | 0.05 |

| | | | | | | |
|---|---|---|---|---|---|---|
| No | 38(64.4) | 128(39.4) | | Ref | | |
| Female Genital Mutilation | | | | | | |
| yes | 37(62.7) | 99(30.5) | 3.8(2.1536-6.8444) | 0.0001 | 5.425(2.271-12.960 | 0.02 |
| No | 22(37.3) | 226(69.5) | | | | |
| Desire for pregnancy | | | | | | |
| No | 29(49.2) | 146(44.9) | 1.2(0.6802-2.0650) | 0.6 | | |
| Yes | 30(50.8) | 179(55.1) | | Ref | | |

Late attendance to ANC when pregnancy is visible, multiparty in the event of wanting to deliver a specific sex especially boy child, early marriages was equal to early pregnancy with complication for instance Pre-Eclampsia Toxaemia (PET) – preterm. They believe they have to go to hospital in strong labour, thus delay in reaching the hospital

**4.8 Pregnancy outcome determinants of perinatal mortality**

The results showed an association between prolonged labour and perinatal deaths, that is P=0.000001. Those who had prolonged labour recorded higher deaths 51(86.4%) compared to those who did not 8(13.6%). Similarly, type multiple birth was strongly associated with perinatal deaths, that is, P=0.00001. There were more deaths 43(72.9%) in multiple births than single births 16(27.1%).

Regarding birthweight, those who had birth weight of less 1500gms had high 51(86.4%) death rate compared to those above 1500gms. This relationship was significant, that is, P=0001. Table 4.4.10

***Table 10: Pregnancy outcome determinants of perinatal mortality***

| Variable | Deaths(n=59) | Alive(n=325) | pOR(95% CI) | P-Value | AOR(95%CI) | P Value |
|---|---|---|---|---|---|---|
| Parity | | | | | | |
| >2 | 37(62.7) | 200(61.5) | 1.05(0.5926-1.8644 | 0.98 | | |
| <2 | 12(37.30 | 125(38.5) | | | | |
| Prolonged labour | | | | | | |
| Yes | 51(86.4) | 144(44.30 | 8.0(3.6850-17.4244 | 0.000001 | 5.425(2.271-12.960 | 0.03 |
| No | 8(13.6) | 181(55.7) | | | | |
| Presence of any Obs complications | | | | | | |
| Yes | 9(15.3) | 48(14.8) | 1(0.4795-2.2503) | 1 | | |
| No | 50(84.7) | 277(85.2) | | | | |
| Type of Birth | | | | | | |
| Multiple | 43(72.9) | 44(13.5) | 17.2(8.9059-33.0771) | 0.00001 | 9.425(5.271-13.960 | 0.035 |
| Single | 16(27.1) | 281(86.5) | | | | |
| Birth Weight | | | | | | |
| <1500g | 51(86.4) | 26(8.0) | 73.3(31.4528-170.8822) | 0.0001 | 28.24(8.128-39.016 | 0.001 |
| >1500g | 8(13.6) | 299(92.0) | | | | |

### 4.9 Health System determinants of perinatal mortality

Among the hospital factors, the study found out that there was a relationship between unskilled deliveries and perinatal deaths, that is, P=0001. Majority of the deaths were reported in neonates born through unskilled deliveries. Table 4.4.11

***Table 11: Hospital determinants analysis of perinatal mortality***

| Variable | Deaths(n=59) | Alive(n=325) | pOR(95% CI) | P-Value | AOR(95%CI) | P Value |
|---|---|---|---|---|---|---|
| Ever had ANC visit | | | | | | |
| No | 1(1.7) | 7(2.4) | 0.78(0.0946-6.4859) | 1 | | |
| Yes | 48(98.3) | 318(84.6) | | | | |
| No. of ANC Visits | | | | | | |
| <2 | 21(35.6) | 124(38.1 | 0.9(0.5025-1.5968) | 0.82 | | |
| >2 | 48(64.5) | 201(61.9) | | | | |
| Adequate HCWs | | | | | | |
| No | 17(28.8) | 65(20.0) | 1.62(0.8661-30.0265) | 0.2 | 0.850 (0. 219-3.306 | 0.12 |
| Yes | 42(71.2) | 260(80.0) | | | | |
| Ever had PNC visit within 7 days of delivery | | | | | | |
| No | 38(64.4) | 184(56.6) | 1.39(0.7792-2.4675) | 0.33 | | |
| Yes | 21(35.6) | 141(43.4) | | | | |
| Walking distance to nearest HCF in Hrs. | | | | | | |
| >2 Hrs. | 12(20.3 | 78(24.0) | 0.83(0.4083-1.6009) | 0.65 | | |
| <2 Hrs. | 47(79.7) | 247(76.0) | | | | |
| Type of delivery | | | | | | |
| Unskilled | 14(23.7) | 23(7.1) | 4.08(1.9597-8.5151) | 0.0001 | 5.357(2.502-10.997) | 0.035 |
| Skilled | 45(73.3) | 302(92.9) | | | | |

Lack of early diagnostic tools, lack of strong referral system from peripheral health facility, lack of extra/more theatre in case of more than one C/S at ago, weak MATERNAL AND PERINATAL DEATH SURVEILLANCE AND RESPONSE committees, being a referral site - severely sick new-borns who rarely survive were being referred, congenital anomaly

- lack of preconception care i.e. Iron, contamination/lack of proper IPC- e.g. no restriction of visitors to maternity, neonatal sepsis, improper use of Partograph or improper interpretation, staff negative attitude, the health workers not prepared the mother with individual birth plan, most facilities not being able to conduct deliveries and equipped to diagnose well the problem early e.g. maternity, lab, ultra sound, no emergency protocol.

# CHAPTER FIVE

## 5.0 DISCUSSION

### 5.1 Introduction

The discussion on determinants of perinatal mortality among women of child-bearing age in Baringo Central Sub County, Baringo County is presented based on the study objectives; To determine the birth outcomes among women of reproductive age, to identify socio-economic determinants of perinatal mortality, identify the health system factors that determines perinatal mortality and identify cultural factors that determines perinatal mortality in comparison with the literature review and study results.

The perinatal mortality in Baringo Central Sub County was higher than that of the national. The global call to reduced preventable perinatal deaths anchored in the SDG is contradicted by this higher perinatal mortality in Baringo Central.

### 5.2 Age Distribution for Perinatal Mothers

The study revealed that mothers aged 25-29 years recorded high number of perinatal mortality rates while mothers who were below 20 years and those above 30 years reported low rates of neonatal mortalities. On the contrary, (Amu Patel et al,.2011) in their study done in India indicated that mothers younger than 20 years and those older than 30 years reported high cases of perinatal mortalities. Also a study done in Nigeria in public health facilities contradicts this finding (Uzoechina et al., 2020) and a study done in Zanzibar implicated mothers who were above 35 years old experienced perinatal deaths than the young (Bakar et al., 2019). These differences could be due to the study setting, study design, study participants or due to geographical setting. Further research need to done on

the disparities arising between perinatal outcomes among women with different age groups.

### 5.3 Education level perinatal mothers

According to this study's findings, mothers who had no formal education had better perinatal outcomes than those with formal education. This relationship was significant, P=0.0071. This finding appeared to contradict the findings of various studies which have shown that women of reproductive age with formal education experienced low perinatal deaths as they are knowledgeable on danger signs in pregnancy. For example, a study done in Kenya on determinants of perinatal mortality revealed that, mothers with no education had higher odds of experiencing perinatal deaths (Imbo et al., 2021), another study which contradicts this findings a study by Joshua et al (2015) in Northern Nigeria disagreed with this finding where mothers with formal education had better outcomes in neonatal mortalities compared those without formal education. This findings also disagreed with the findings by a study done in South west of Ethiopia which alluded that high education and being knowledgeable enough helped significantly in reducing perinatal deaths (Debelew, 2020) and. study carried out recently in Russia village of north Nigeria, it was discovered that mothers with formal education delivered in hospitals and the perinatal outcome was good. Those without formal education preferred home delivery and thus putting their new born babies into risk. They were in danger of dying from birth complications due to lack of trained midwives and non-availability of resuscitation equipment. In the study, 40% of expectant mothers had home delivery (Joshua *et al*., 2015). A . Hence level of education did not play a role in dropping perinatal death different studies have shown consistencies on the women with high level of education reduced infant mortality for example, a study on effects of education on perinatal mortality in Ethiopia revealed that education was

associated with a 28% reduction in the odds of infant mortality compared to those infants born to mothers who were illiterate (Kiross et al., 2019), a Indonesian study on effect of female education on child mortality: evidence from Indonesia (Wang, 2021). Although the results showed that mothers who had completed secondary education recorded the highest perinatal deaths compared to mothers who had no formal education. This findings contradicts findings by a study done in Ethiopia (Getiye & Fantahun, 2017). The study by Akinyemi depicted that level of education therefore plays a role in dropping perinatal deaths. Therefore, level of mothers' education plays a significant role in reduction of perinatal deaths as evidenced by a study carried out recently in village of north Nigeria, it was discovered that mothers with formal education delivered in hospitals and the perinatal outcome was good. Those without formal education preferred home delivery and thus putting their new-born babies into risk. They were in danger of dying from birth complications due to lack of trained midwives and non-availability of resuscitation equipment. In the study, 40% of expectant mothers had home delivery (Joshua et al., 2015).

The level of education therefore plays a role in dropping perinatal deaths.

### 5.4 Socio-economic status Perinatal Mothers

The study showed that, there was no significant relationship between low income earning mothers who had low income and perinatal deaths since low income of women did not increase the perinatal deaths. This findings were in agreement with a study done in Nepal on factors associated with perinatal mortality (Ghimire et al., 2019) and also this findings were concordant with the findings of a study done in Ethiopia on **f**actors associated with perinatal mortality among public health deliveries in Addis Ababa(Getiye & Fantahun, 2017) and with another study done in Ethiopia (Jena et al., 2020)

Poverty among women of reproductions was because of non-availability of resources. Nevertheless, according Ansari et al (2015) high death rates were reported among countries where poverty among women was the main determinant. This findings were in agreement with a study done in Nepal (Ghimire et al., 2019). Low socioeconomic status has been implicated to be associated with perinatal mortality.

**5.5 Measurement of Perinatal Mortalities or birth outcomes**

This study found out that among the enrolled study participants, the perinatal mortality in Baringo Central Sub County was higher at 153 perinatal deaths per 1000 live births; this was far higher than that of the national 31 perinatal deaths per 1000 live births. This mortality rate is alarming and contravenes the sustainable development goal which aims to end preventable deaths of new born and children under 5 years of age, with all countries aiming to reduce neonatal mortality to at least as low as 12 per 1,000 live births and under-5 mortality to at least as low as 25 per 1,000 live births mortality rate by 2030 (World Bank report, 2016). According to this study, this high perinatal mortality in the community is significantly or indicates that there are high perinatal mortalities in similar rural settings. Similar findings were found by a study done in a community in Nigeria (Ezeh et al., 2019). However a Tanzanian study contradicts this, as it revealed that, perinatal mortality was more common in the rural setting than the urban set up (Macharia et al., 2023)

In regards to the association of prolonged labour and perinatal mortality, this study found out that, there was an association between prolonged labour and perinatal deaths. Those who had prolonged labour recorded higher deaths compared to those who did not. This findings were in agreement with a Ugandan study on incidences and determinants of perinatal deaths (Musaba et al., 2021) and another study done in Oromia in Ethiopia (Roro

et al., 2018). This could be reduced by giving proper care, medications and comprehensive care to pregnant women at the facilities.

In regards to the birthweight, those who had birth weight of less 1500gms had high death rate compared to those above 1500gms, similar findings were revealed by a study done in India on the relationship between low birth weight and perinatal mortality (Jana et al., 2023) Another study done in the extreme south of Brazil also concurred with this findings (Vilanova et al., 2019). This finding therefore indicates that incidence of mothers having Low Birth Weight Babies (LBWB) increases chances of perinatal deaths. Several studies have shown that, the new-borns who weighs less than 2500 g have a higher risk of neonatal morbidity and mortality, susceptibility to infections, malnutrition in the first year of life, respiratory distress and traumas during childbirth, and development of chronic non-communicable diseases (NCDs) contrary to the new-borns with adequate birth weight (Watkins et al., 2016)

**5.6 Socio Cultural factors affecting Women of Child Bearing Age**

A study by Roberts et al., (2017) indicated that a tradition such as seclusion of pregnant women was linked to stillbirths. These findings were in agreement with the results where women who were secluded and those who had dietary restrictions recorded more perinatal deaths compared to those who were neither secluded nor had dietary restrictions. However, there was no association between seclusion of pregnant women and perinatal deaths. On the contrary, the relationship between dietary restrictions and perinatal deaths, this was also seen in women who took traditional remedies recorded high mortalities than those who did not where the association was significant. More so, these findings concurred with a Ugandan study which associated the perinatal cultural beliefs (Arach et al., 2023)

From the findings most mothers said that traditional birth practices were bad to both the mother and child, can cause infections such as HIV AIDS and can lead to lose of blood and even death. These findings were in agreement with the study Walter *et al*, (2013) and Paudel *et al*., (2018) study where the African/American/Black cultures had restrictions on pregnant mothers against consuming certain foods and drinks since it could compromise the health of the mothers and indirectly affect fetal and neonatal health. However, in some cultures, the sick newborn is viewed as belonging to the Gods. This makes neonatal deaths complaisant (Walter *et al*., 2013; Paudel et al., 2018). In another study by Baser *et al.*, (2010) it was discovered that mothers with under one-year-old performed dangerous traditional practices of offering care to the child where they applied salt on the neonates' skin leading to high neonatal mortality rate.

Based on religion, this study indicated that most mothers were recorded among Christians, however, the study did not indicate more details about religion hence it was difficult to indicate the influence of Jehovah witness on perinatal deaths due to restrictions on medications such as iron and vitamins supplements that lead to perinatal maternal anaemia which result in poor outcome and can cause perinatal deaths as reported by Walter *et al.*, (2013).

This study also found out that seeking traditional remedies was one of the determinants of perinatal mortality. Similar findings were revealed by a study done on factors for perinatal morbidity and mortality in mountain villages in Nepal (Paudel et al., 2018)

Some cultures still belief about perinatal sickness and death due to supernatural forces, baby's illnesses but also mother's common illnesses, birth complications and contraceptive norms are considered to be in God's control, and therefore, belief that for a sickness due to

God's wrath, going to health facilities might negatively impact on the cure. Health workers are therefore consulted only when none of these work, and usually only after permission is obtained from the faith healers (Bhattarai et al., 2015)

In regards to seclusion of mothers, this study revealed that keeping mothers away in a secret place with their infants was associated with perinatal deaths, this was in agreement with the findings by a study done in Nepal (Joshi & Acharya, 2022)

There are very many cultural differences globally. Strong cultural beliefs are especially experienced in rural settings. Postponement of medical consultations and employment of traditional approaches based on wrongly held traditional beliefs is often practiced. In some cultures, when there is neonatal death, burial is done quickly without ceremonies or secretly.

### 5.7 Health System Factors affecting Women of Child Bearing Age

From the findings hospital factors showed a relationship between unskilled deliveries and perinatal deaths where majority of the deaths were reported in neonates born through unskilled deliveries. Similarly, Herlily *et al*., (2013) demonstrated shortage of qualified and specialized front line health workers for essential health care in Africa impacted negatively on perinatal deaths. It was also indicated that thirty-six percent (36%) of the countries in Africa have critical shortage of human resource.

During the study, lack of early diagnostic tools, lack of extra/more theatre in case of more than one C/S at ago, lack of preconception care i.e. Iron, contamination/lack of proper IPC- e.g. no restriction of visitors to the maternity, improper use of Partograph or improper interpretation by the health workers not prepared the mother with individual birth plan. In addition, despite there being adequate number of HCWs, 71% of the mortalities occurred

where there were adequate HCWs. In addition, 64% of the deaths were recorded in mothers who afforded health care services. This was similar in a study done in Uganda by Rwashana et al (2014) that showed that most mothers preferred home delivery than hospital delivery due to lack of trust in health care system or lack of equipment, overcrowding in the health facilities and high cost of delivery as the main factors why they preferred home delivery. Another Ugandan study also associated perinatal deaths to biomedical explanations such as teenage pregnancies, inadequate pregnancy care, health system challenges and poor health-seeking behaviour(Arach et al., 2023)

The findings indicated that neonates who had birth weight of less 1500gms had high death rate 86.4% death which showed a strong significant (P=0001). This was in agreement with a study by Amu Patel et al, (2011) that showed a higher incidence of low birth weight babies with increases of neonatal mortality. This findings also concurred with the findings by a study done in Easter Ethiopia which implicated low birth weight with increasing perinatal deaths (Mohamed et al., 2022). From the findings it was noted that prolonged labour recorded higher deaths at 86.4%, no information was literature to support this argument. Similarly, mothers who had undergone genital mutilation recorded higher perinatal deaths of 62.7% which was also significant (P=0.0001).

Can you provide a new section; Summary of the discussion to highlight on the new knowledge and what confirms findings from other studies and probable explanations. Lack of early diagnostic tools, lack of strong referral system from peripheral health facility, lack of extra/more theatre in case of more than one C/S at ago, weak maternal and perinatal death surveillance and response committees, being a referral site - severely sick new-borns who rarely survive were being referred, congenital anomaly - lack of preconception care

i.e. Iron, contamination/lack of proper IPC- e.g. no restriction of visitors to maternity, neonatal sepsis, improper use of Partograph or improper interpretation, staff negative attitude, the health workers not prepared the mother with individual birth plan, most facilities not being able to conduct deliveries and equipped to diagnose well the problem early e.g. maternity, lab, ultra sound, no emergency protocol.

In a study done in Uganda on advancing the application of health systems and understanding the dynamics of neonatal mortality, it was found that 40% of mothers preferred home delivery than hospital delivery. 14.7% of the respondents lacked trust in health care system because of poor or lack of equipment, insufficient health workers, overcrowding in the health facilities, long waiting, poor staff attitude (rudeness, abuse to pregnant mothers), and cost of treatment and high cost of delivery as the main factors why they preferred home delivery. Mothers said quality of health services and hygiene was good but out of their reach. 71% said that hygiene needed improvement. The health care providers also said that they were not motivated to work because of poor pay, less staff, lack of equipment and supplies; e.g. 34% of the health workers lacked resuscitation equipment. 67% of the staff respondents said there were no ultra sound facilities resulting in poor maternal and foetal outcome (Rwashana *et al*., 2017).

In some cultures, when there is neonatal death, burial is done quickly without ceremonies. There is no formal expression of grief. No discussions are held on account of the deceased new-borns. The dead child is regarded as a spirit child. The African/American/Black cultures have restrictions on pregnant mothers against consuming certain foods and drinks. This may compromise the health of the mothers and indirectly affect foetal and neonatal

health. In some cultures, the sick new-born is viewed as belonging to the Gods. This makes neonatal deaths complaisant (Walter et al., 2013; Paudel et al., 2018).

In one study, it was discovered that mothers having under one-year-old were performing dangerous traditional practices of offering care to the child. They were applying salt on the neonates‟ skin. This led to high neonatal mortality rate (Baser et al., 2017).

# CHAPTER SIX

## 6.0 CONCLUSIONS AND RECOMMENDATIONS

### 6.1 Conclusion

This chapter represents a summary of the study findings and conclusions, as well as recommendations for policy and research drawn from the findings.

During the study made conclusions based on the objectives. This was summarized as follows;

Perinatal mortality in Baringo Central Sub County was high. Majority of the teenage mothers (25-30 years) recorded high number of perinatal mortality rates. Perinatal mortalities were high among neonates who had birth weight of less 1500gms and among mothers who experienced prolonged labour. Determinants of perinatal mortality were; Seclusion of women, dietary restrictions, seeking traditional remedies, female genital mutilation, birth attendance by unskilled deliveries and late ANC attendance.

Perinatal mortalities were specific to any age group since there were varied results between the literature and the current results. Majority of the teenage mothers (25-30 years) are likely to record high number of perinatal mortality rates while in the literature it indicated less than 20 and more than 30 years.

Formal education did not have any influence in improving perinatal mortality outcomes in the current study compared to the literature review, thus the level of education did not play a role in dropping perinatal deaths.

Low income among mothers with neonates had no influence on perinatal deaths according to the results. High level of education such secondary did not play any role in reducing

perinatal deaths. Seclusion of women and dietary restrictions led to increased perinatal deaths and still birth.

Unskilled deliveries, lack of early diagnostic tools, poor motivation of healthcare workers and poor preparation of the mother and preconception care impacted negatively on perinatal deaths.

Perinatal mortalities were high among neonates who had birth weight of less 1500gms together with prolonged labour.

### 6.2 Recommendation

To reduce perinatal mortality among women of reproductive age in Baringo Central Sub County; the Baringo County Department of Health Services should;

i. Introduce health education talks on determinants of perinatal mortality to ANC mothers and; encourage them on the avoidance of traditional remedies, seclusion of mothers, ANC attendance, and avoidance of female genital mutilations.

ii. Have a program for targeted community based intervention on mothers aged 20-30 years to reduce perinatal mortality.

iii. There is need for continuous professional education on health care providers so as to improve their attitude and preparation of mothers with individual birth plan.

iv. The governments need to ensure that health facilities in the county better equipped with human capital and equipment in order to conduct deliveries.

v. The ministry of health should ensure that women are not secluded and have education on improvement of diet.

vi. There is need to ensure that all women complete all four ANC visits to ensure that

both the mother and child are healthy and achieve the require weight.

vii. Need for other advanced studies to be conducted in the larger population Baringo Central Sub County.

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# APPENDICES

## Appendix 1: Consent form for the study participants

### Introduction

Good morning/Good afternoon! My name is Hosea K. Serech a Master of Public Health in Field Epidemiology and laboratory training programme (FELTP) student at Moi University, Eldoret.

### Type of research

This is a research on the determinants of perinatal mortality among women of child-bearing age delivering at rural community of Baringo central sub county, Baringo County.

### Participant selection

Your selection to participate in this study is voluntary.

### Duration

The duration of the interview is approximately 30 to 45 minutes.

### Risks and side effects

Talking about experiences of perinatal mortality is not pleasant as it may result to one recalling frightening or painful experiences leading to a strong emotional reaction.

### Benefits

Perinatal mortality has negative impacts on an individual, family, community and state. Every community member has a reason to want to eliminate it by all means. Your participation in this study would therefore contribute towards developing effective interventions to address the scourge.

### Reimbursements

As a participant do not expect any payments for participating in this study.

### Confidentiality and sharing of the results

The information you give would not be discussed or shared with someone else.

### Right to refuse or withdraw

Your participating in this study is voluntary. You can choose not to answer all or some of the questions. However, your participation would be highly appreciated since your views are important.

**Who to contact**

In case of any complaints contact Hosea K. Serech (Principle investigator), Cell phone: 0722256153 or you may also contact the chairman of Moi University and MTRH research and ethical committee chairman.

**Part II**

**Certificate of consent**

I have been informed about this study, its purpose and objectives with understanding. I hereby agree to participate.

**Name and signature of the study participant**……...

**Statement by the researcher/person taking the consent**

I, the undersigned, have explained to the participant the purpose of this study, objectives, and risks

**Name and signature of the researcher of this study** ……

**Kiambatisho 1: Fomu ya idhini kwa washiriki wa utafiti**

**Utangulizi**

Habari za asubuhi/Mchana mwema! Jina langu ni Hosea K. Serech mwanafunzi wa Shahada ya Uzamili ya Afya ya Umma katika Mpango wa Mafunzo ya Maabara na Maabara (FELTP) katika Chuo Kikuu cha Moi, Eldoret.

Aina ya utafiti

Huu ni utafiti kuhusu viambuzi vya vifo vya wakati wa kujifungua miongoni mwa wanawake wa umri wa kuzaa wanaojifungua katika jamii ya mashambani ya kaunti ndogo ya Baringo ya kati, Kaunti ya Baringo.

Uchaguzi wa mshiriki

Uteuzi wako wa kushiriki katika utafiti huu ni wa hiari.

Muda

Muda wa mahojiano ni takriban dakika 30 hadi 45.

Hatari na madhara

Kuzungumza kuhusu matukio ya vifo wakati wa kujifungua si jambo la kufurahisha kwani kunaweza kusababisha mtu kukumbuka matukio ya kuogofya au maumivu yanayoongoza kwenye hisia kali.

Faida

Vifo vya uzazi vina athari mbaya kwa mtu binafsi, familia, jamii na serikali. Kila mwanajamii ana sababu ya kutaka kuiondoa kwa njia zote. Kwa hivyo, ushiriki wako katika utafiti huu ungechangia katika kukuza afua madhubuti za kushughulikia janga hili.

Marejesho

Kama mshiriki usitegemee malipo yoyote kwa kushiriki katika utafiti huu.

Usiri na kushiriki matokeo

Taarifa utakazotoa hazitajadiliwa au kushirikiwa na mtu mwingine.

Haki ya kukataa au kujiondoa

Kushiriki kwako katika utafiti huu ni kwa hiari. Unaweza kuchagua kutojibu maswali yote au baadhi ya maswali. Walakini, ushiriki wako utathaminiwa sana kwani maoni yako ni muhimu.

Nani wa kuwasiliana naye

Ikiwa kuna malalamiko yoyote wasiliana na Hosea K. Serech (Mpelelezi wa Kanuni), Simu ya rununu: 0722256153 au unaweza pia kuwasiliana na mwenyekiti wa Chuo Kikuu cha Moi na mwenyekiti wa kamati ya utafiti na maadili ya MTRH.

Sehemu ya II

Hati ya idhini

Nimefahamishwa kuhusu utafiti huu, madhumuni yake na malengo kwa uelewa. Ninakubali kushiriki.

Jina na saini ya mshiriki wa utafiti ……

Kauli ya mtafiti/mtu anayechukua ridhaa

Mimi, niliyetia sahihi chini, nimemweleza mshiriki madhumuni ya utafiti huu, malengo, hatari

Jina na saini ya mtafiti wa utafiti huu ……

**Appendix 2: Assent Form**

Dear Participant,

My Name is _____ I am a student at Moi University. This paper questionnaire is prepared to collect information on a community based cross-sectional study on "***DETERMINANTS OF PERINATAL MORTALITY AMONG WOMEN OF CHILD-BEARING AGE IN BARINGO CENTRAL SUB COUNTY, BARINGO COUNTY***."

You are hereby been asked to participate in this study. This assent form gives you information about the study, which will be discussed with you. Once you understand the study, and if you agree to be enrolled, you will be asked to talk this over with your parents or guardians before being enrolled to participate to give their permission for you to take part in this study. But even if you they say "yes" to this study, you can still decide to not take part in the study, and that will be fine.

If you do not want to be in this study, then you do not have to participate. This study is voluntary, which means that you decide whether or not to take part in the study. Being in this study is up to you, and no one will be upset in any way if you do not want to participate or even if you change your mind later and want to stop.

Signing your name at the bottom means that you agree to be in this study. You and your parents/guardians will be given a copy of this form after you have signed.

Please note that your participation in this research is entirely voluntary and no coercion. The main purpose of this research study is to identify the determinants of perinatal mortality among women of reproductive age in Baringo Central Sub County, Baringo County. A total of 384 pregnant women are expected to participate in this study for a period of forty days. Once you have agreed to enroll in the study, you will be asked some questions concerning the study. There is no monetary benefit from this study and there is no cost to you for enrolling in the study. However, the findings and knowledge gained from this study may help in the prevention and reduction of perinatal mortalities among women of reproductive age in our community in the future. Any information you will give regarding this study and records will be treated with utmost confidentiality. You will be identified by a unique participant identification number; and personal information from your records will not be released without your written permission. You will not be personally identified in any publication about this study.

**Contacts information**

For any more information or any clarification, kindly don't hesitate to contact the following:

Principal Investigator: Hosea K Serech, Telephone: +2540722256153

**Or**

Moi University Institutional Research and Ethics Committee (IREC)

Telephone: +254787723677 E-mail: irecmtrh@gmail.com or contact@irec.or.ke

**Assent signing**

I, the undersigned, do hereby assent to participate in this study whose nature, purpose and objectives have been fully explained to me. I was given an opportunity to ask questions, all of which have been answered to my satisfaction and that I have chosen to participate. I am aware that participation is voluntary and that there are no consequences of withdrawing from the study. I have been informed that all data provided will be used for the purposes of the study only.

I declare that the information I will give is correct to the best of my knowledge.

Participant's Unique Id: _____

Signature/ thumbprint:_____Date: _____

Parent/Quardian: _____Date: _____Signature: _____

Name of person obtaining asssent:_____Signature _____Date: _____

Kiambatisho 2b: Fomu ya idhini

Mpendwa Mshiriki,

Jina langu ni _____ mimi ni mwanafunzi katika Chuo Kikuu cha Moi. Dodoso hili la karatasi liko tayari kukusanya habari juu ya utafiti wa msingi wa sehemu ya jamii juu ya " DEETERMINANTS ZA MARAFIKI WA KIJAMII AMONG WANAWAKE WA MTOTO-BEARING AGE IN BARINGO CENTRAL SUB COUNTY, BARINGO COUNTY."

Kwa hivyo umeulizwa kushiriki katika utafiti huu. Fomu hii ya ridhaa inakupa habari juu ya utafiti huo, ambao utajadiliwa na wewe. Mara tu ukielewa utafiti, na ikiwa unakubali kuandikishwa, utaulizwa kuongea haya na wazazi wako au walezi kabla ya kujiandikisha kushiriki ili kutoa ruhusa yao kwako kushiriki katika utafiti huu. Lakini hata ikiwa unasema " ndio " kwa utafiti huu, bado unaweza kuamua kutoshiriki kwenye utafiti, na hiyo itakuwa sawa.

Ikiwa hutaki kuwa katika utafiti huu, basi sio lazima ushiriki. Utafiti huu ni wa hiari, ambayo inamaanisha kwamba unaamua ikiwa unaweza kushiriki katika utafiti. Kuwa katika utafiti huu ni juu yako, na hakuna mtu atakayekasirika kwa njia yoyote ikiwa hutaki kushiriki au hata ukibadilisha mawazo yako baadaye na unataka kuacha.

Kusaini jina lako chini inamaanisha kuwa unakubali kuwa katika utafiti huu. Wewe na wazazi wako / walezi watapewa nakala ya fomu hii baada ya kusaini.

Tafadhali kumbuka kuwa ushiriki wako katika utafiti huu ni wa hiari kabisa na hakuna kulazimisha. Kusudi kuu la utafiti huu wa utafiti ni kubaini viashiria vya vifo vya watoto kati ya wanawake wa umri wa kuzaa katika Kaunti ya Kati ya Baringo, Kaunti ya Baringo. Jumla ya wanawake wajawazito 384 inatarajiwa kushiriki katika utafiti huu kwa kipindi cha siku arobaini. Mara tu umekubali kujiandikisha katika utafiti, utaulizwa maswali kadhaa kuhusu utafiti. Hakuna faida ya kifedha kutoka kwa utafiti huu na hakuna gharama kwako kwa kujiandikisha katika utafiti. Walakini, matokeo na maarifa yaliyopatikana kutoka kwa utafiti huu yanaweza kusaidia katika kuzuia na kupunguza vifo vya watu miongoni mwa wanawake wa umri wa kuzaa katika jamii yetu katika siku zijazo. Habari yoyote utakayotoa kuhusu utafiti huu na rekodi zitatibiwa kwa usiri mkubwa. Utatambuliwa na nambari ya kitambulisho cha mshiriki wa kipekee; na habari ya kibinafsi kutoka kwa rekodi zako haitatolewa bila idhini yako iliyoandikwa. Hautatambuliwa kibinafsi katika chapisho lolote kuhusu utafiti huu.

Maelezo ya mawasiliano

Kwa habari yoyote zaidi au ufafanuzi wowote, kwa huruma usisite kuwasiliana na yafuatayo:

Mpelelezi mkuu: Hosea K Serech, Simu: + 2540722256153

Au

Kamati ya Utafiti na Maadili ya Chuo Kikuu cha Moi ( IREC )

Simu: + 254787723677 Barua pepe: irecmtrh@gmail.com au contact@irec.or.ke

Kusaini kwa dhamana

Mimi, waliotengwa, ninakubali kushiriki katika utafiti huu ambao asili, madhumuni na malengo yamefafanuliwa kikamilifu kwangu. Nilipewa nafasi ya kuuliza maswali, ambayo yote yamejibiwa kwa kuridhika kwangu na kwamba nimechagua kushiriki. Ninajua kuwa ushiriki ni wa hiari na kwamba hakuna matokeo ya kujiondoa kwenye utafiti. Nimearifiwa kuwa data yote iliyotolewa itatumika kwa madhumuni ya utafiti tu.

Ninatangaza kuwa habari nitakayotoa ni sahihi kwa ufahamu wangu wote.

Kitambulisho cha kipekee cha Mshiriki: _____

Saini / alama ya vidole: _____Tarehe: _____

Mzazi / Quardian: _____Tarehe: _____Sahihi: _____

Jina la mtu kupata idhini: _____Sahihi _____Date: _____

## Appendix 2: Questionnaire

Survey number (Household No.) _____ Location_____

Ward_____Village_____

Date_____

Interviewer ID_____ Data entry ID_____

| Section I: Socio-demographic characteristics | | | | |
|---|---|---|---|---|
| 1. | Mothers age in years | | | |
| 2. | Marital status | 1. Currently Married<br>2. Currently not married | | |
| 3. | Level of Schooling of the mother | 1. No formal education<br>2. Completed Primary<br>3. Completed Secondary<br>4. Completed college or higher | | |
| 4. | Education level of the father | 1. No formal education<br>2. Completed Primary<br>3. Completed Secondary<br>4. Completed college or higher | | |
| 5. | Religion | 1. Protestant<br>2. Catholic<br>3. Others (Specify_____<br>4. No information | | |
| 6. | Sex of the new born | 1. Male<br>2. Female | | |
| 7. | Think back to your last | 1. Single<br>2. Multiple | | |

| | | | | |
|---|---|---|---|---|
| | pregnancy; was that single or multiple pregnancies? | | | |
| 8. | Was the baby born alive, born dead or lost before birth? | 1. Born alive<br>2. Born dead<br>3. Lost before birth | | |
| **Section 2: Socio-economic factors** | | | | |
| 9. | Occupation status of the mother | 1. Employed<br>2. Not employed | | |
| 10. | Occupational status of father | 1. Employed<br>2. Not employed | | |
| 11. | What is the main source of family income? | 1. Salary<br>2. Farming<br>3. Business<br>4. Livestock<br>5. Charcoal burning<br>6. Others (Specify_____ | | |
| 12. | Household average income per month | Household average income in Ksh_____ | | |
| 13. | Family size | | | |
| 14. | Do you think healthcare services are affordable to you? | 1. Yes<br>2. No | | |
| **Section 3: Health system factors** | | | | |
| 15. | Walking distance to the nearest health facility (in complete hours | Walking distance in hours_____ | | |
| 16. | Have you ever visited health facility to seek for | 1. Yes<br>2. No | | |

| | | | |
|---|---|---|---|
| | ANC/PNC services? | | |
| 17. | If yes in 12 above, how would you describe how you were handled by service provider? | 1. Good-Friendly<br>2. Moderate<br>3. Bad as he was rude | |
| 18. | Have you ever visited an hospital and missed the services you required | 1. Yes<br>2. No | |
| 19. | If yes in 14 above, state the services you missed and why | _____<br>_____<br>_____<br>_____<br>_____<br>_____<br>_____<br>__ | |
| 20. | Do you think the hospitals have adequate healthcare providers | 1. Yes<br>2. No | |
| 21. | Is drug supply sufficient in your hospital? | 1. Yes<br>2. No<br>I am not sure<br>I don't know | |
| **Section 4: Cultural factors** | | | |
| 22. | Desire for pregnancy | 1. Wanted then<br>2. Wanted later | |
| 23. | Delivery assistance | 1. Unskilled birth attendant<br>2. Skilled delivery attendant | |
| 24. | Have you ever had about skilled delivery? | 1. Yes<br>2. No | |

| | | | |
|---|---|---|---|
| 25. | Postnatal visit within 7 days | 1. Yes<br>2. No | |
| 26. | What was the source of information? | 1. Doctor<br>2. Clinical officer<br>3. Nurse<br>4. Community health Volunteer<br>5. NGO | |
| 27. | Who makes decision regarding household finances in your community? | 1. Husband<br>2. Wife<br>3. Both<br>4. Other (Specify-<br>_____ | |
| 28. | Who decides where the baby should be delivered? | 1. Husband<br>2. Wife<br>3. Both<br>4. Other (Specify-<br>_____ | |
| 29. | In your opinion, are there traditional birth practices? ***(Multiple responses allowed. Tick (√) all that apply)*** | 1. Seclusion of pregnant women<br>2. Dissuading women from utilizing<br>3. preventive services<br>4. Dietary restrictions<br>5. Traditional remedies<br>6. Spiritual healing | |

***Thank you for participating in this study***

**Kiambatisho 2: Dodoso**

Nambari ya uchunguzi ( Kaya Na. ) _____

Mahali_____

Ward_____Kijiji_____

_

Tarehe_____

Mahojiano

ID_____

Sehemu ya 1: Tabia za kijamii na idadi ya watu

1.Umri wa mama katika miaka

2.Hali ya ndoa

1. Hivi sasa Imeolewa

2. Hivi sasa sio ndoa

3.Kiwango cha Shule ya mama

1.Hakuna elimu rasmi

2.Msingi uliokamilika

3.Sekondari iliyokamilishwa

4.Chuo kilichokamilishwa au cha juu

4.Kiwango cha elimu cha baba

1.Hakuna elimu rasmi

2.Msingi uliokamilika

3.Sekondari iliyokamilishwa

4.Chuo kilichokamilishwa au cha juu

5.Dini

1.Mprotestanti

2.Katoliki

3.Wengine ( Specify_____

4.Hakuna habari

6.Ngono ya kuzaliwa mpya 1.Mwanaume

2.Kike

7.Fikiria nyuma kwa ujauzito wako wa mwisho; hiyo ilikuwa mimba moja au nyingi?1.Moja

2.Multiple

8.Je! Mtoto alizaliwa akiwa hai, amezaliwa amekufa au amepotea kabla ya kuzaliwa?1.Mzaliwa hai

2.Mzaliwa amekufa

3.Iliyopotea kabla ya kuzaliwa

Sehemu ya 2: Sababu za kiuchumi na kijamii

9.Hali ya kazi ya mama 1.Imeajiriwa

2.Haijaajiriwa

10.Hali ya kazi ya baba

1.Imeajiriwa

2.Haijaajiriwa

11.Je! Ni nini chanzo kikuu cha mapato ya familia?

1.Mshahara

2.Ukulima

3.Biashara

4.Mifugo

5.Kuchoma mkaa

6.Wengine ( Specify_____

12.Mapato ya wastani ya kaya kwa mwezi Kaya mapato ya wastani katika Ksh_____

13.Saizi ya familia

14.Je! Unafikiri huduma za afya ni za bei nafuu kwako?1. Ndio

2. Hapana

Sehemu ya 3: Sababu za mfumo wa afya

15.Kutembea umbali wa kituo cha karibu cha afya ( katika masaa kamili Kutembea umbali katika
masaa_____
_____
_____
_____

16.Je! Umewahi kutembelea kituo cha afya kutafuta huduma za ANC / PNC?1.Ndio2.Hapana

17.Ikiwa ndio mnamo 12 hapo juu, ungeelezeaje jinsi ulivyoshughulikiwa na mtoaji wa huduma?1.Kwaheri

2.Wastani

3.Mbaya kama alikuwa mchafu

18.Je! Umewahi kutembelea hospitali na kukosa huduma ulizohitaji 1.Ndio

2.Hapana

19._____

20.Je! Unafikiri hospitali zina watoa huduma za afya 1.Ndio

2.Hapana

21.Je! Ugavi wa dawa za kutosha hospitalini mwako?1.Ndio

2.Hapana

Sina hakika

Sijui

Sehemu ya 4: Sababu za kitamaduni

22.Tamaa ya ujauzito

1.Alitaka basi

2.Alitaka baadaye

23.Msaada wa utoaji

1.Mhudumu wa kuzaliwa asiye na ujuzi

2.Mhudumu wa utoaji wa ujuzi

24.Je! Umewahi kuwa na juu ya utoaji wa ujuzi?1.Ndio

2.Hapana

25.Ziara ya baada ya siku 7 1.Ndio

2.Hapana

26.Je! Chanzo cha habari kilikuwa nini?

1.Daktari

2.Afisa wa kliniki

3.Muuguzi

4.Kujitolea kwa afya ya Jamii

5.NGO

27.Nani hufanya uamuzi kuhusu fedha za kaya katika jamii yako?

1.Mume

2.Mke

3.Wote wawili

4.Nyingine ( Taja-_____

28.Nani anaamua mtoto anapaswa kutolewa wapi?

1.Mume

2.Mke

3.Wote wawili

4.Nyingine ( Taja-_____

29.Kwa maoni yako, je! Kuna mazoea ya kuzaliwa ya jadi? ( Majibu mengi yanaruhusiwa. Jibu ( √ ) yote yanayotumika ) 1.Kutengwa kwa wanawake wajawazito

2.Kufukuza wanawake kutokana na kutumia

3. huduma za kuzuia

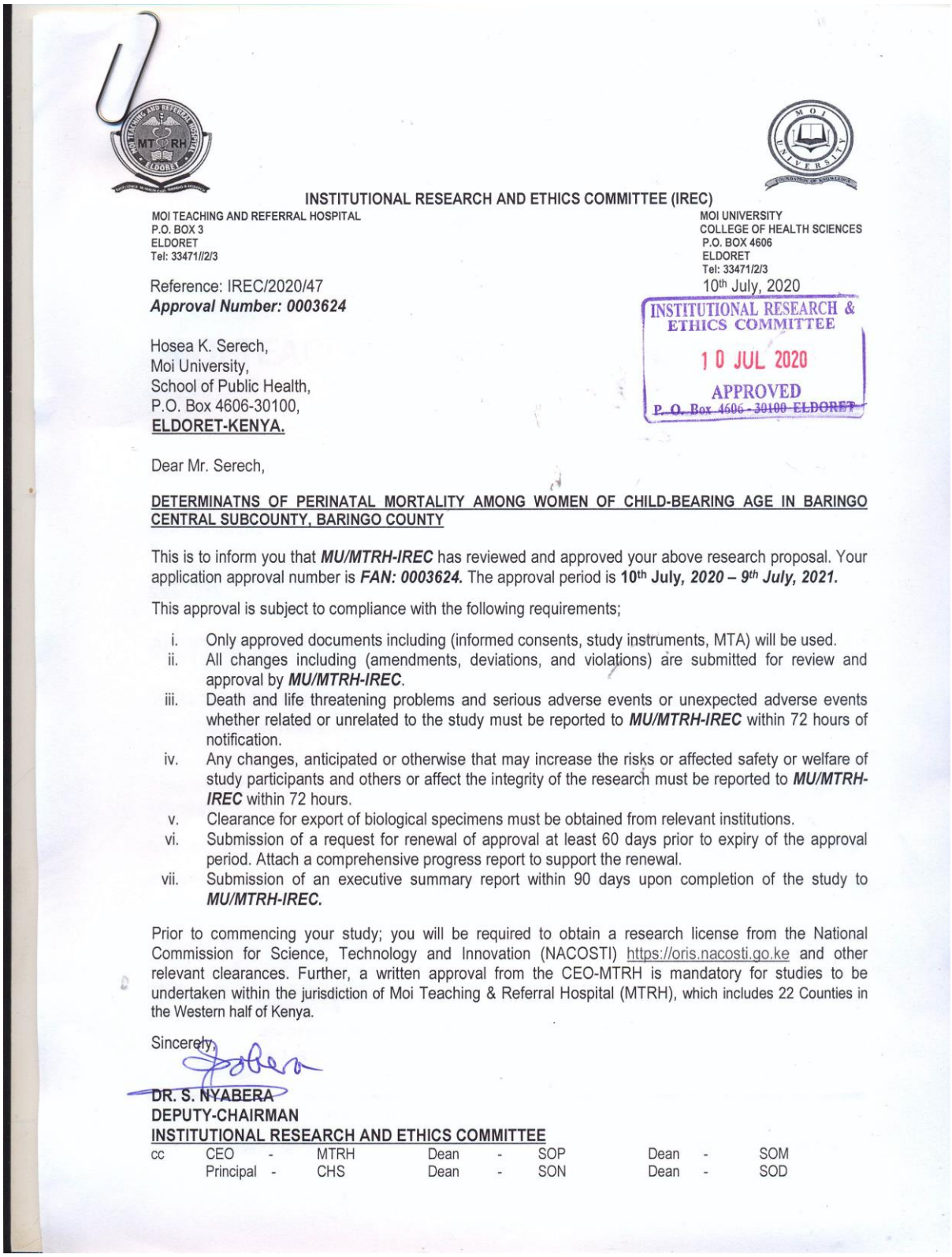
4.Vizuizi vya lishe

5.Tiba za jadi

6.Uponyaji wa kiroho

***Asante kwa kushiriki katika utafiti huu***

## Appendix 3: Ethical Approval



INSTITUTIONAL RESEARCH AND ETHICS COMMITTEE (IREC)

MOI TEACHING AND REFERRAL HOSPITAL
P.O. BOX 3
ELDORET
Tel: 33471//2/3

MOI UNIVERSITY
COLLEGE OF HEALTH SCIENCES
P.O. BOX 4606
ELDORET
Tel: 33471/2/3

Reference: IREC/2020/47
***Approval Number: 0003624***

10th July, 2020

INSTITUTIONAL RESEARCH & ETHICS COMMITTEE
10 JUL 2020
APPROVED
P. O. Box 4606 - 30100 ELDORET

Hosea K. Serech,
Moi University,
School of Public Health,
P.O. Box 4606-30100,
**ELDORET-KENYA.**

Dear Mr. Serech,

**DETERMINATNS OF PERINATAL MORTALITY AMONG WOMEN OF CHILD-BEARING AGE IN BARINGO CENTRAL SUBCOUNTY, BARINGO COUNTY**

This is to inform you that ***MU/MTRH-IREC*** has reviewed and approved your above research proposal. Your application approval number is ***FAN: 0003624.*** The approval period is **10th July, *2020 – 9th July, 2021.***

This approval is subject to compliance with the following requirements;

i. Only approved documents including (informed consents, study instruments, MTA) will be used.
ii. All changes including (amendments, deviations, and violations) are submitted for review and approval by ***MU/MTRH-IREC***.
iii. Death and life threatening problems and serious adverse events or unexpected adverse events whether related or unrelated to the study must be reported to ***MU/MTRH-IREC*** within 72 hours of notification.
iv. Any changes, anticipated or otherwise that may increase the risks or affected safety or welfare of study participants and others or affect the integrity of the research must be reported to ***MU/MTRH-IREC*** within 72 hours.
v. Clearance for export of biological specimens must be obtained from relevant institutions.
vi. Submission of a request for renewal of approval at least 60 days prior to expiry of the approval period. Attach a comprehensive progress report to support the renewal.
vii. Submission of an executive summary report within 90 days upon completion of the study to ***MU/MTRH-IREC.***

Prior to commencing your study; you will be required to obtain a research license from the National Commission for Science, Technology and Innovation (NACOSTI) https://oris.nacosti.go.ke and other relevant clearances. Further, a written approval from the CEO-MTRH is mandatory for studies to be undertaken within the jurisdiction of Moi Teaching & Referral Hospital (MTRH), which includes 22 Counties in the Western half of Kenya.

Sincerely,

**DR. S. NYABERA**
**DEPUTY-CHAIRMAN**
**INSTITUTIONAL RESEARCH AND ETHICS COMMITTEE**

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| cc | CEO | - | MTRH | Dean | - | SOP | Dean | - | SOM |
| | Principal | - | CHS | Dean | - | SON | Dean | - | SOD |

## Appendix 4: Research Licence

REPUBLIC OF KENYA

NATIONAL COMMISSION FOR SCIENCE,TECHNOLOGY & INNOVATION

Ref No: 688936

Date of Issue: 11/August/2020

# RESEARCH LICENSE

This is to Certify that Mr.. Hosea Kibet Serech of Moi University, has been licensed to conduct research in Baringo on the topic: Determinants of Perinatal Mortality Among Women of Child-Bearing Age in Baringo Central Sub-County, Baringo County. for the period ending : 11/August/2021.

License No: NACOSTI/P/20/6088

688936

Applicant Identification Number

Director General
NATIONAL COMMISSION FOR SCIENCE,TECHNOLOGY & INNOVATION

Verification QR Code

NOTE: This is a computer generated License. To verify the authenticity of this document, Scan the QR Code using QR scanner application.

**Appendix 5: Authorization Letter**

Hosea Serech

Moi University

School of Public Health

P.O. Box 4606-30100

**ELDORET.**

**RE: RESEARCH AUTHORIZATION**

Following your request for authority to carry out a study on "***Determinants Of Perinatal Mortality Among Women Of Child-Bearing Age In Baringo Central Sub county, Baringo County.***". I am pleased to inform you that you have been authorized to conduct your research as mentioned in your request.

By the copy of this letter, the Sub County Medical officer of Health, Baringo Central Sub County is asked to accord you necessary assistance.

Kindly note you shall submit a copy of your final research report to The County Director of Health Baringo County and a soft copy to be submitted through online research information system as this applies to any applicant who has been licensed by NACOSTI act 2013.

Thank you

Dr Patrick Boruett

COUNTY DIRECTOR OF HEALTH

BARINGO COUNTY

cc. – Sub County Medical officer of Health