ADDIS ABABA UNIVERSITY

COLLEGE OF HEALTH SCIENCES

SCHOOL OF PUBLIC HEALTH

PERINATAL MORTALITY AMONG COHORTS OF PREGNANT WOMEN IN THREE DISTRICTS OF NORTH SHEWA (DEGEM, KUYU AND WORE JARSO), OROMIA REGION: MAGNITUDE, CAUSES AND DETERMINANTS

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Dedication

This work is dedicated to those families who lost their newborn babies and mothers who gave their valuable life while giving birth in the study rural areas of Ethiopia.Without their free and full cooperation in sharing their experience of perinatal death information in areas where even nobody donot wants to disclose their pregagncy status this work couldnot be successful.

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Acronyms

AAU	Addis Ababa University
COD	Cause of Death
EDHS	Ethiopia Demographic and Health Survey
ENMR	Early Neonatal Mortality Rate
ENNM	Early Neonatal Mortality
EPHA	Ethiopia Public Health Association
FMOH	Federal Ministry of Health
HEW	Health Extension Workers
HSDP	Health Sector Development Program
ICD	International Disease Classification
MaNHEP	Maternal and Newborn Health Ethiopia Partnership
MDG	Millennium Development Goal
MMR	Maternal Mortality Rate
MNH	Maternal and Neonatal Health
OHB	Oromia Health Bureau
OR	Odds Ratio
PNMR	Perinatal Mortality Rate
RR	Relative Risk
SBR	Still Birth Rate
SPH	School of Public Health
SSA	Sub-Saharan Africa

Abstract

Background: Improving perinatal health is key in decreasing child and infant mortality rates but information on perinatal deaths is highly susceptible to omission and misreporting. Hence community based data can provide more representative and reliable information.

Objective: this Study is intended to assess the magnitude, determinants and main cause of perinatal mortality among babies born from cohorts of pregnant women in three selected districts of North Shewa zone Oromia Regional State namely Degem, Kuyu and Warajarso.

Methods: A cohort of 5,784 pregnant women were followed through delivery by the Maternal and Newborn Health in Ethiopia Partnership (MaNHEP) from March 2011 to February 2012 in three districts of North Shewa zone of Oromia Regional State where MaNHEP is providing maternal and neonatal health intervention. At the beginning of the study, pregnancy outcomes of 3,916 women were identified by house to house visit using the initial records of MaNHEP in each kebele. Using this cohort we conducted community based nested case-control design among 67 cases and 134 controls. All perinatal deaths reported between March 2011 to February 2012 were included in the study and two live birth controls born from mothers in the cohort were included for each perinatal death after a random selection from the same Gote with the cases. A standard verbal autopsy instrument was used as a main data collection tool after adapting to the local situation. Data were entered using Epi Info version 3.5.1 for windows and exported to SPSS version 20.0 for analysis. Logistic regression model was employed with Crude and Adjusted Odds Ratio at 95 CI, p-value 0.05 taken as level of statistical significance. The probable causes of deaths were assigned by two pediatricians using ICD 10. Principal component analysis was used to construct household socio-economic status of the study participants.

Result: Data were collected from 67 cases and 134 controls. Twenty four (30.38 %) of the cases were still births while 43(54.43%) were early neonatal deaths. The overall perinatal mortality rate in the study area was 19.5 per 1000 live births and still birth. Maternal age greater than 30 years [AOR 2.665, (95% CI:1.026-6.922)], having previous history of neonatal mortality [AOR 6.833, (95% CI:2.782-16.782)], preterm births [AOR 6.929,(95% CI:1.779-26.994)], male sex [AOR 4.049,(95% CI:1.836-8.926)] and home delivery [AOR 3.704,(95% CI:1.192-11.506)] were significantly associated with perinatal mortality in the final model. Birth asphyxia (31%), sepsis (25%), chorioamnionitis (11%), antepartum hemorrhage (9%) were the four leading causes of perinatal death.

Conclusion: The study reported lower perinatal mortality rate than other studies conducted in the country. Majority of the deaths occurred in the first twenty four hours suggesting that interventions should focus on this critical time of vulnerability to save lives of newborn. Potential determinants and causes of perinatal mortality identified in this study were related with maternal factors implies that still there is a need to focus on these major causes of deaths for further intervention.

1. Introduction

1.1 Background

The concept of a perinatal period emerged in the late 1940s as clinicians and researchers became increasingly aware of the relatively large number of deaths occurring in the period immediately before and after delivery [1]. Perinatal mortality is calculated per thousand live and stillborn babies in that specified period [2, 20, 56].

Perinatal mortality includes deaths occurring during late pregnancy (above 28 weeks of gestation), during birth and within seven days after birth [4]. The perinatal period is considered as the most critical phase of life [5, 6, 35], which reflects the general health and the various socio-biological features of mothers and babies. Perinatal mortality rate gives a good indication of the extent of pregnancy losses and the quality of health care available to mothers and the newborns in any setting [7, 72, 73].

Each year, 3 million newborns die during their first seven days of life, accounting for 75 percent of all neonatal deaths. If mortality rates during the first five years of life are adjusted to rates per week, the risk in the first week of life is massively higher than during any other time of life: 24 per 1,000 in the first week compared with 3 per 1,000 per week for the rest of the first month and only 0.12 per 1,000 per week after the first year of life. Yet the first week is the very critical period in the continuum of care when services are most likely to be lacking, particularly in poor communities, where most deaths occur [76].

In 2006, there were 133 million live births with over 6.3 million perinatal deaths worldwide. From these deaths, 3.3 were stillborn while 3 million deaths occurred in the first week in the same year. Ninety-eight per cent of deaths took place in the developing world, where 90% of babies were born [19]. Stillbirths accounted for over half of all perinatal deaths however, registration of neonatal deaths in general and stillbirths in particular is lacking in these countries. One in three of these deaths occurs during delivery and could largely be prevented [3].

Perinatal deaths usually results from complications of preterm birth, birth asphyxia, trauma during birth, infections, severe malformations and other causes. Maternal health is important for neonatal health, and maternal infections contribute to adverse pregnancy outcomes [10].

Reducing perinatal and maternal mortality throughout the world has been one of the major challenges for obstetricians for many years. A lot of effort has been made by the World Health Organization (WHO) in

assisting governmental and non-governmental organizations to develop national plans for maternal and perinatal health care, by allocating resources to those people who are most in need of it [12].

Although a number of antenatal and intrapartum interventions had shown some evidence of impact on stillbirth incidence, much confusion surrounds ideal strategies for delivering these interventions within health systems, particularly in low and middle-income countries where 98% of the world's stillbirths occur. Improving the uptake of quality antenatal and intrapartum care is critical for evidence-based interventions to generate an impact at a population level [5, 15].

Childhood mortality in general and infant mortality in particular is often used as broad indicator of social development or as specific indicator of health status. Childhood mortality analyses are thus useful in identifying promising directions for health programs and advancing child survival efforts. Measures of childhood mortality are also useful for population projections [20].

Neonatal deaths accounts for 38 percent childhood mortality in the world. The first week of life, contributes to 75 percent of all neonatal and 50 per-cent of maternal deaths. This is associated with low health care coverage, particularly in poor communities [52, 75, 76].

There is no much progress in declining of deaths in the first week of life. In 1980, only 23% of deaths were recorded in the first week of life; by the year 2000 this figure had increased to an estimated 28% (3 million deaths). Similarly results of successive DHS in Ethiopia showed an increasing trend of perinatal mortality rate from 37 per1000 live births in 2005 [20] to 46 per 1000 live birth in 2011 [56] over the last one decade. To meet Millennium Development Goal four(MDG-4),which targeted two third reduction of under-five mortality rate by 2015 a substantial reduction in NMRs in high-mortality countries is needed, and reducing deaths in the first week of life will be essential to progress [77]. Therefore, we intended to study the magnitude, causes and determinants of perinatal mortality that will provide some inputs for the health program managers and policy makers to formulate appropriate intervention strategies to reduce perinatal mortality.

1.2 Statement of the problem

Health of newborn babies has been neglected despite the huge number of deaths due to various reasons. Most deaths during the neonatal period occur at home and are often unregistered in most countries. Social invisibility is linked to an expectation of high mortality; many traditional societies do not name newborns for up to six weeks reflecting a sense of fatalism and cultural adaptation of high mortality [75, 76]. The World Health Organization (WHO) has estimated that three perinatal causes (birth asphyxia (23%), prematurity (28%), and perinatal infection including tetanus, sepsis, pneumonia, and diarrhea (36%);

contribute to large proportion of perinatal mortality. Although these causes represent only part of the neonatal burden, the WHO estimated that the burden is more ;than triple compared to that of deaths caused due to HIV and yet receives remarkably little attention [76].

About eight million perinatal deaths are reported annually in the world of which 40-60% is early neonatal mortality and almost all are in developing countries. Three quarters of neonatal deaths occurs in the first week, and more than one quarter occurs in the first four hours [13, 22].

Perinatal mortality rates are highest in Africa where it is more than six times higher than in developed regions. Perinatal mortality rates of around 10 deaths per 1000 total births are recorded in developed regions compared to 50 per 1000 in developing regions and over 60 per 1000 in least developed countries. Currently international attention has been given to child mortality as indicated by Millennium Development Goal which targets to decrease child mortality by two third by the year 2015. However it would be difficult to achieve this goal without giving attention to perinatal mortality while contributes a third of infant mortality [8, 9].

Sub-Saharan Africa has the highest perinatal mortality rate (PNMR), estimated to be 56 per 1000 births in 2006, and followed very closely by the Asian region with 47 per 1000 births. The risk of death in the perinatal period was over nine times greater than in developed countries; in the least developed countries it was 10 times higher than in developed countries [19].

Given the present importance and high priority of child mortality globally and in Ethiopia thorough understanding of the determinants and causes of child mortality is needed. Nowadays, efforts are being made to carry out more appropriate analytical studies instead of relying entirely on the literature available in this topic. It is believed that such an attempt is likely to provide more accurate results, which would lead to more appropriate interventions [16].

In Ethiopia, successive DHS reported perinatal mortality rate 52 per1000 during 2000, 37 per 1000live birth in 2005 and 46 per 1000 live births in 2011 showing a higher rate among women living in rural areas, Oromia region accounts about the regional prevalence of 45 per 1000 [56, 24] show an increasing trend between the 2005 and current DHS[56]. Community based prospective study from rural Butajira found perinatal mortality rate 45 per 1000 live births [70]. Another community based comparative cross-sectional study from Dire Dawa town reported perinatal mortality rate of 73/1000 live births [22] and perinatal mortality audit from Jimma hospital over 10 years reported the highest perinatal mortality rate of

130 per 1000 live birth with an increasing trend which identified hypertensive disorder, lethal congenital anomaly, prematurity, antepartum hemorrhage, infection as the main causes of perinatal deaths [51].

1.3 Significance of the study

Ethiopia is striving to achieve Millennium Development Goals. One of the goals is reducing child mortality by two third while stillbirths and neonatal deaths contribute largely to child mortality rates but, information on stillbirths and deaths of infants within the first week of life are highly susceptible to omission and misreporting.

In Ethiopia, where there is no vital registration only very few facility based studies had been conducted in the country regarding perinatal mortality which cannot be representative as most births occurs at home. Demographic and Health Survey is the only national community based estimate of perinatal mortality in the country which is still not free from misclassification and underreporting that even doesn't reflect district level prevalence.

To this effect, in the study area, the Maternal and Newborn Health Partnership in Ethiopia (MaNHEP), a collaborative project between Ministry of Health of Ethiopia, Addis Ababa University and Emory University, Atlanta USA introduced an educational intervention by identification and registration of all pregnant mother in three districts of Oromia from the time of pregnancy notification until the outcome of the pregnancy is known. This helps to track the child and mother outcome at a community level.

Hence, community based prospective studies would provide a relatively reliable magnitude of the perinatal mortality. Using an already established cohort of pregnant women by MaNHEP, this study was planned to assess the magnitude, causes and determinants of perinatal mortality in three districts of North Shewa Zone, Oromia Regional State. The outcome of this study is believed to help health managers to design appropriate intervention based on the findings.

2. Literature review

2.1 Magnitude of perinatal mortality

Perinatal mortality is deaths occurring during late pregnancy (28 weeks of gestation), during birth and within seven days after delivery. Perinatal mortality is a sum of late fetal mortality (still birth) and deaths within the first week of life in a certain period is calculated per thousand live and stillborn babies in that period [2,56]. Death of an infant in utero or at birth has always been a devastating experience for the mother and of concern in clinical practice. 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 [23], because most of the risk factors were preventable with simple local interventions such as birth spacing using family planning methods, training of TBAs of basic delivery skills.

The magnitude of perinatal mortality rate is varying in the world. There are enormous variations both among and within countries [55]. This holds true in Ethiopia which ranges from 58 per 1000 live birth 23 per 1000 live birth in Benishagul to Dire Dawa regional states respectively [56]. Results of successive Ethiopia Demographic and Health Survey(EDHS) revealed that there is substantial decrease in infant and under five mortality trends, but the neonatal mortality rate was relatively stable (only decreased 2 per 1000 live birth over a decade) [56]. This is also similar with the finding from demographic research of 31 countries comprising 80 DHS result of South and East Africa, Central and West Africa and South and South-East Asia and the Western Pacific show slight but non-significant declines declined only by 1.9 % per annum [57].

The prevalence of perinatal mortality is high all over the world. In 2004, there were 5.9 million perinatal deaths in the world where, almost all had occurred in developing countries where 90% of babies were born and 30% of these were in the least developed countries. Stillbirths accounted for over half of all perinatal deaths. Perinatal mortality in East Africa was estimated to be 48/1000 in 2004 [3,19], this is due to limited access to health care services, lack of awareness and skills at local, low health seeking behavior and low literacy level.

As study conducted in China among 552 pregnant women reported perinatal mortality rate was 69 per 1000 births, the rate of stillbirth was 24 per 1000 births, and the early neonatal mortality was 46 per 1000 live births. The early neonatal mortality was 29 in boys and 69 in girls per 1000 live births [24]. Other prospective study done in Burkina Faso in 2010 reported the perinatal mortality rate (PNMR), still birth

rate(SBR) and early neonatal mortality rate(ENMR), were 79 per 1000, 54 per 1000 and 27 per 1000 respectively [25].

In Ethiopia, high perinatal mortality rate of deaths 46 per 1000 pregnancies in the first seven days of life to all neonatal deaths was recorded [56, 23]. According to perinatal mortality audit from Jimma hospital during 1990-1999 reported perinatal mortality rate of 138.9 per thousand live births with an increasing trend [51]. Another community based study done in Dire Dawa town has found that perinatal mortality rate of 73 per 1000 live births and community based prospective study from rural Butajira reported 45 per1000 live births [22, 71].

2.2 Determinants of perinatal mortality

Different factors contribute to perinatal mortality. Based on a study in different area identified the major determinants perinatal mortality including demographic factors, Socio-economic and environmental factors and causes like Birth Asphyxia, prematurity /low birth weight/, infections and these factors were mosty related to early neonatal mortalities.

These factors were reviewed below

2.2.1 Demographic factors

Different demographic factors were associated with increased risks of perinatal mortality like extreme maternal age(less than 20 or greater than 35), parity, birth order, short birth intervals, sex of the newborn baby and whether single or multiple birth as stated below.

In USA, infant Mortality Statistics 2004 reported that multiple births, the infant mortality rate was 30.46, more than five times the rate of 5.94 for single births. The infant mortality rate for twins (28.70) was nearly five times the rate for single births (5.94), for triplets (55.53) was nine times, and the rate for quadruplets (166.74) was 28 times higher than the rate for single[41].

As study done in Zimbabwe indicated, the early neonatal mortality was related with multitudes of risk factors including demographic characteristics of mothers. Mothers under 20 years old were 69% more likely than mothers 20 to 35 years of age to deliver an infant who died within the first hour of life, and similarly, risk for primiparous women was 81% compared to multiparous women. Male infants had a 69% increased risk of dying within the first hour of life. Women who did not receive prenatal care consistently had over a 2.4-fold increase in the risk of early neonatal mortality (ENNM)[23, 29].

Study conducted in Burkina Faso revealed, nulliparous women (RR=2.90), primipara mothers (RR=2.20), twins (RR=4.0) were factors associated with increased risk of perinatal death [25].

As study from Uganda indicates, Perinatal mortality rate was 63/1000 live birth among teenage mothers, 76/1000 live birth among nulliparous women and 61/1000 live birth among women delivering at home who, after controlling for potential confounders, had a 3.7 times higher Perinatal mortality than women who gave birth in a health facility [27].

The analysis of Kenyan Demographic and Health Survey of 2003 (KDHS 2003) has shown that demographic factors such as age at first birth, parity, birth order and birth interval are the main predictors of perinatal deaths [49].

2.2.2 Socio-economic and environmental factors

Perinatal mortality is associated with different socio-economic factors. As case-control study done in India and China indicated perinatal mortality rate increased notably with higher lower income per capita families [26].

The key findings of the study done in Kenya indicated that poverty is a major factor in child morbidity and mortality, because of low-income families were not concerned to improve the sanitation that was in turn going to improve the health status of the children [45].

Study from Zimbabwe revealed, socio-demographic factors associated with increased the risk of perinatal mortality were having living on a farm or in rural areas, and maternal unemployment but, living within 5 km of a health facility and having a gainfully employed husband reduced the risk of perinatal mortality [46].

The percentage of perinatal mortality specially still births is higher among mothers in poor environmental conditions such as poor housing, lack of piped water, those with no garbage dumping facilities[50].

Autopsy (post-mortem examination) improve perinatal mortality rate. For developed countries the autopsy rate varies from 40-80% whereas in many developing countries, autopsy is not performed for any stillbirth even though it can provide valuable information about still births. In 2009, the American College of Obstetricians and Gynecologists issued new guidelines designed to urge parents to allow an autopsy for stillbirth, to ensure the autopsies are performed uniformly, better and to the same set of standards across jurisdictions [32].

Delivering interventions to reduce the global burden of stillbirths and early neonatal deaths are necessary. Strategies to improve quality of care by upgrading the skills of community cadres have shown demonstrable impact on perinatal mortality, particularly in conjunction with health systems strengthening and facilitation of referrals. Neonatal resuscitation training for physicians and other health workers shows potential to prevent many neonatal deaths currently misclassified as stillbirths [15, 32]. In Ethiopia different trainings were given by ministry health and different NGO`s like MaNHEP for front line workers on basic obstetric and delivery skills [33] to improve pregnancy out comes in the country, but these interventions were not universal for the whole country.

2.2.3 Birth Asphyxia

In developing countries, the WHO reported 60.5% of early neonatal deaths were due to prematurity, 22.5% to asphyxia and birth trauma, 12.7% to congenital anomalies, 1.4% to infection, and the rest to unknown causes. In contrast, there are a low proportion of infections and intrapartum causes and high congenital anomalities [32].

According to 2001 estimates of WHO, Neonatal deaths are largely the result of infections (32%), birth asphyxia and injuries (29%), and complications of prematurity (24%), [36].

Study from developing country identified commonly reported medical causes of perinatal deaths like birth asphyxia, preterm birth, sepsis and congenital anomalies [55].

Studies done in Pakistan revealed, the main causes of death among neonates were asphyxia conditions, neonatal sepsis, conditions associated with prematurity and neonatal pneumonia. The majority of stillbirths were due to asphyxia conditions as they occurred in the intra-partum period [29].

Other study done in the rural Bangladesh identified birth asphyxia (45%), prematurity/low birth weight (15%), sepsis/meningitis (12%), respiratory distress syndrome (7%), and pneumonia (6%) were the major direct causes of death, birth asphyxia (52.8%) was the single largest category of cause of death in the early neonatal period while meningitis/sepsis (48.3%) was the single largest category in the late neonatal period [37]. Prospective population-based cohort study done in urban Pakistan also identified the final causes of neonatal death were classified as birth asphyxia (26%) and infection (23%) [39].

In Nigeria the leading causes of death are intrapartum-related, or ‘birth asphyxia’ (28%), complications of preterm birth (28%), and severe infections (26%) [38] while, study from Ethiopia identified the majority of perinatal deaths were due to mechanical factors related to the peripartum period (53.3%), with

obstructed labor with or without ruptured uterus being the single most important cause responsible for 37.4% of perinatal mortality [51].

2.2.4 Low birth weight /prematurity/

Verbal Autopsy Survey of Perinatal Mortality in Rural Pakistan showed, almost 90% of perinatal period deaths were potentially preventable. Babies die mainly due to infections, preterm birth and asphyxia and, between 60 and 80% will also have been underweight at birth [29].

Perinatal mortality was very high among low-birth-weight preterm infants, and was very high for preterm low-birth-weight babies with relative risk of 21.2 [31]. A community based Case-control study from Tanzania showed birth weight remained as a strong predictor, with the odds for neonatal death for low birth weight infants (<2500 grams) was 5.5 times the odds for the normal weight infants (2500 – 3500 grams) [31].

Low birth weight (LBW), an indicator associated with the social status of women, has profound implications for neonatal health and survival and is an underlying factor in 40–80% or more of neonatal deaths [36].

Infants born with low birth weight (less than 2500 grams) suffer from extremely high rates of morbidity and mortality from infectious disease, and are underweight, stunted or wasted beginning in the neonatal period through childhood. Infants weighing 2000−2499 g at birth are 4 times more likely to die during their first 28 days of life than infants who weigh 2500−2999 g, and 10 times more likely to die than infants weighing 3000−3499 g. Low birth weight is associated with impaired immune function, poor cognitive development, and high risks of developing acute diarrhea or pneumonia [40].

According to Judith, P. and K. Laura 2000, Low birth weight (LBW) is an overriding factor in the majority of the deaths. Conditions that affect the neonate, including LBW, impact not only neonatal mortality but also long - term morbidity through effects on neurological and cognitive development and associations with chronic diseases such as diabetes, cardiovascular disease and chronic lung disease [41].

A review evidence of 186 studies from developing countries, of which only 64 were community-based studies reporting primary perinatal/neonatal health status outcomes such as stillbirths and perinatal and/or neonatal mortality, and 74 were community-based studies reporting secondary perinatal/neonatal health outcomes such as low birth weight (LBW) and/or anthropometrics, preterm birth, breastfeeding rates, and morbidities [42].

One study from rural Egypt identified Causes of neonatal death were Low birth weight (29.2%), prematurity (20.8%), infection (20.8%), congenital malformation (14.5%), intrapartum asphyxia (6.3%) and antepartum hemorrhage (4.2%) [59].

According to national strategy for child survival in Ethiopia 2005 shows that 90% of child mortality in Ethiopia can be attributed to five conditions, low birth weight takes 2nd rank together with (low birth weight, sepsis and asphyxia) /Neonatal causes [43].

2.2.5 Other causes

A meta-analysis of twelve randomized control trials of 5,939 women in ten different countries revealed, induction of labor beyond 41 weeks was associated with a reduction in perinatal death when compared to expectant management [RR] 0.30. Multiple studies have shown that the risk of perinatal mortality increases with the length of gestation from 37 weeks onwards, but evidence associating elective delivery 14 around term with decreased numbers of stillbirths and reduced neonatal mortality is limited[26, 27, 28].

As study done in Australia and New Zealand indicated prematurity was the dominant risk factor, infants born at 25 weeks having 32 times greater odds of death than infants born at 31 weeks. Low birth weight for gestational age also had a dose–response effect: the more growth restricted the infant the greater the risk of mortality; infants below the 3rd centile had eight times greater odds of death than those between the 25th and 75th centiles. Male sex was also a significant risk factor (AOR 1.550 [28].

Study from Ghana among 10,947 breastfed singleton infants showed risk of neonatal death was fourfold higher in children given milk-based fluids or solids in addition to breast milk. There was a marked increasing risk of neonatal mortality with increasing delay in initiation of breastfeeding from 1 hour to day 7; overall late initiation (after day 1) was associated with a 2.4-fold increase in risk[48].

Viral infections, hypertensive disease, pre-eclampsia, poor nutritional status, poverty, un-established prenatal care, fetal asphyxia induced by prolonged labor, and the insufficiency or inadequacy of medical skills and facilities are the primary causes of still birth in developing countries[25,32].

2.3 Conceptual framework

Based on the Mosley and Chen conceptual framework for the study of child survival in developing countries [71] after modifying it to the local situation the following frame was developed.

The conceptual framework emphasizes the following:

- ✓ Death is the final biological expression of a process that is determined basically by the economic and social structure of a country or region. These conditions determine the occurrence of disease and its development, where the worst possible outcome is death.
- ✓ Structural determinants are mediated at the family level, since the child's growth and development are heavily dependent on the living environment of his /her family. These conditions generate the biological risk factors that act directly on the child's health.

These determinants of mortality are grouped into three categories, namely;

1) The community level factors such as socio economic characteristics of mother's occupation, residence, mean household resources, mean paternal income, and mean paternal education mean antenatal care in the community.
2) The intervening/housing conditions/environmental variables such as source of water, toilet facilities and distance from home to the nearest health facility.
3) The proximate determinant factors such as factors related to the mother, factors related to the baby, antenatal, delivery and postnatal care. From the conceptual framework shown in Figure 1, it is clear that socio-economic characteristics of mother play a key role in determining child mortality.

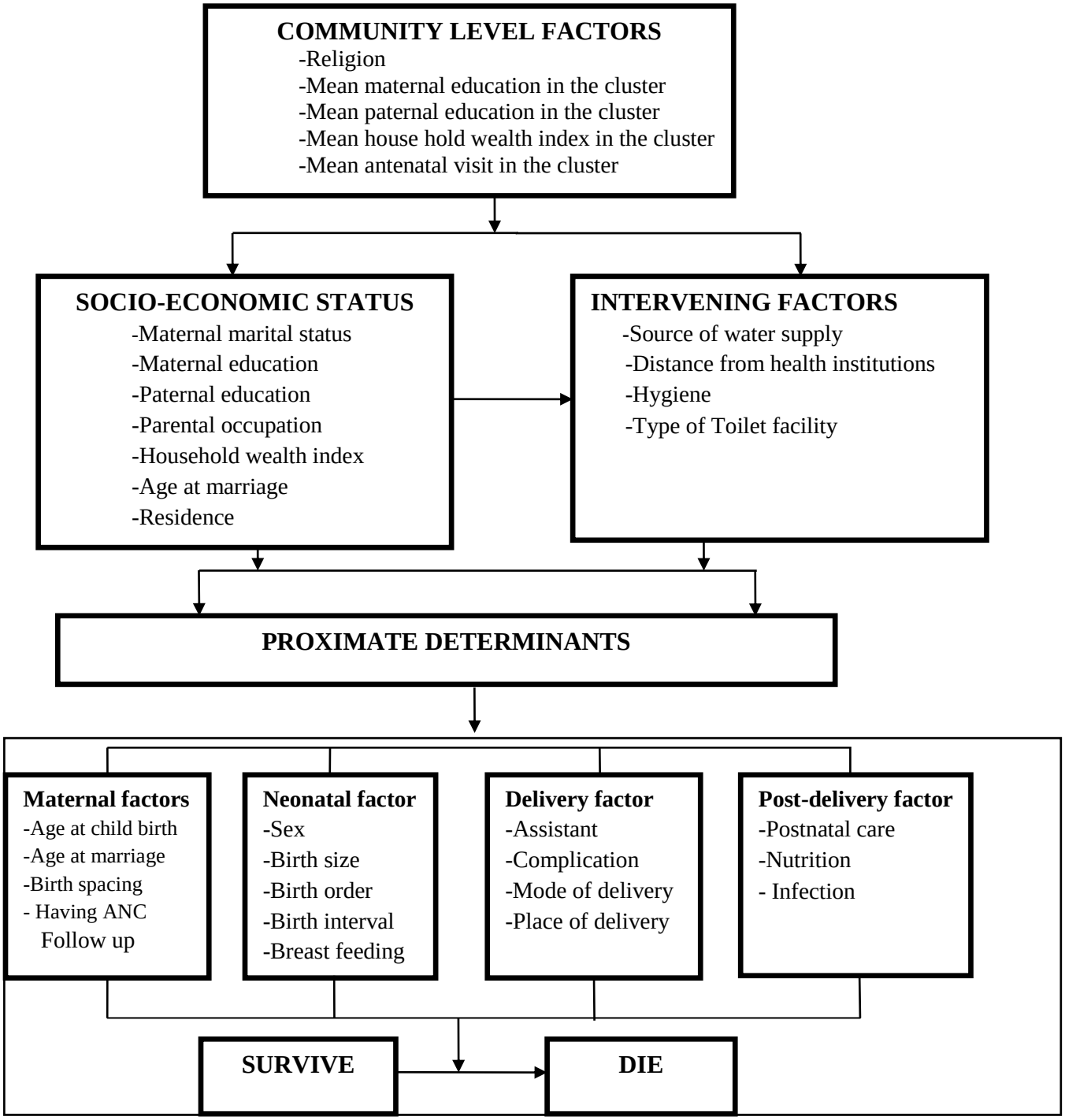

Figure 1.Conceptual frame work for risk factors for perinatal mortality.

3. Objectives

3.1 General objective

- The main objective of this study is to assess prevalence, causes and risk factors for perinatal mortality in three districts (Degem, Kuyu and Worejarso) North Shewa Zone, Oromia Regional state, February 2012.

3.2 Specific objectives

- To assess the magnitude of perinatal mortality among cohort of pregnant women in the study area.
- To identify determinants of perinatal mortality among cohort of pregnant women in the study area.
- To ascertain the probable causes of perinatal mortality in the study area.

4. Methods and Materials

4.1 Study design and period

A community based nested case-control study was conducted in three districts of North Shewa Zone of Oromia Regional State, among an open cohort of pregnant women followed from March 2011 to February 2012. Using this cohort we conducted the study from November 2011 to February 2012.

4.2 Study area

North Shewa zone is one among the 20 zones of Oromia regional state with the total population of 1,445,993. The sex composition of the zone is 724,894(50.1%) males and 721,099(49.9%) females. The zone is located 170 km away to the North of capital Addis Ababa. Majority of the population in the study area were farmers. The study was conducted in 27 kebeles from three selected Districts of North Shewa zone namely: Degem, Kuyu, Warajarso among an open cohort of pregnant women formed by Maternal and New born Health Ethiopia Partner (MaNHEP) from March 2011 to February 2012.

Maternal and New borne Health Ethiopia Partner(MaNHEP) is non-governmental organization working to strengthen the implementation of health extension program by building skills of front line health workers and developing the systems needed to deliver quality maternal and newborn health care workers in three districts in each of Amhara and Oromia regions, led by Emory University, in collaboration with John Snow Research Institutes and Training, Bahir Dar and Addis Ababa University under the leadership of federal ministry of health.

The project has developed an integrated program of maternal and new born health training, quality improvement and behavioral change communications including encouraging mothers to get ANC, pregnancy prepardness and complication readness like money preparation and postnatal care reaches all women within 48 hours after delivery and basic new borne care.

Overall MaNHEP supports FMOH to achieve millennium development goals 4 & 5 by building capacity in maternal and newborn health care by strengthening district wide administrative and health systems to support and improve care during pregnancy through the critical birth to 48 hour's period of vulnerability. Within each region, three districts were selected based on previously determined criteria: need, population size/number of expected deliveries, presence of frontline workers, and absence of other development partners working on the same or similar issues. The health system comprised of three districts; two health

centers within each of these districts, all health posts within the catchment area of the two health centers, and the informal care system within the health post catchment areas/communities [44].

4.3 Establishment of the Cohort

The cohort we used for the study was established by Maternal and New borne Health Ethiopia Partner (MaNHEP) mid 2010. From three districts, 27 kebeles were selected where 5,784 pregnant women were identified by ateam of trained voluntary community workers one from each gote in the kebele. Every identified pregnant woman were registered on a master list prepared by MaNHEP and was kept at each health post located in the intervention sites. The master list is a registration book used at kebele level by the HEWs which contains lists of all the identified pregnant women and their full addresses in that kebele. It is also used as follow-up tool for the cohort until the pregnancy outcome is seen (survived or perinatal death). At the begining of the study that is by November 2011 preganancy out come of 3,916 mothers were known from which about 275 of mothers were tracked who were not registered in the masterlist by house to house visit after hiring additional data trackers. As a result when we start the study we have the pregnancy outcomes of 3,916 mothers from the total cohort 5,784 pregnant women who were followed from March 2011 through February 2012. The study was conducted from November 2011 to February 2012 among 3,916 women with known pregnancy outcomes. The study used 3,916 women with known pregnancy outcome as denomirator for the calculation of perinatal mortality rate.

4.4 The source population

The source populations were all women of reproductive age groups who reside in Degem, Kuyu and Warajarso Districts.

4.4.1 The study population

The study population were all pregnant women from 7 months or more of pregnancy who live in the three districts and were registered on MaNHEP master list from mid 2010 and who were followed from March 2011 to February 2012.

4.4.2 Study Subjects

Any pregnant women who were parts of the cohort with still birth or live birth but lost child within the first week of life for cases and mothers with live birth, child survived the first week of life for controls and randomly selected from the same Gote with case for an interview.

4.4.2.1 Inclusion criteria

- Pregnant mothers who lived in the selected districts from seven months of her pregnancy and registered on the master list from mid 2010 and followed from March 2011 to February 2012.The registration can be at any month of her pregagnacy but the intervention will be given from seventh months of preganancy until 48 hours after delivery.

4.4.2.2 Exclusion criteria

- ✓ Pregnant women who moved out of the selected kebele before her pregnancy outcome was known.

4.4.2.3. Cases

- All perinatal death (still birth and early neonatal mortality) reported during March 2011 to February 2012 born from registered pregnant mothers from mid 2010.

4.4.2.4 Controls

- Randomly selected live birth baby born from registered pregnant women in the cohort during December 2010 and followed from March 2011 to February 2012 infant survived the perinatal period.
- For every case two controls were selected randomly for interview from the same Gote with the cases.

4.5 Sampling procedure

From a total of **84,558** women found in the three districts [44], an open cohort of pregnant women was established between mid 2010. New pregnant mothers were entering the cohort while those delivered were simultaneously taken out after individual data was collected. The identification and recruitment of the pregnant mothers was done by trained Frontline worker (FLW) team members.

After being part of the cohort every mother was followed by trained frontline worker (FLW) teams till the outcome of the pregnancy occurred. After the outcome of pregnancy had occurred, the respective data collectors collected data from all perinatal mortality reported between March 2011 through February 2012 for the cases or normal delivery and live baby in case of the controls.

All perinatal mortality reported from March 2011 until the end February 2012 were taken as cases. For every case of perinatal mortality, two controls with live birth and infant survived the first week were randomly interviewed from the same Gote with case. Whenever perinatal death/s was/were/ reported two controls were randomly selected using lottery method from the frame of the cohort with a preference to those births that occurred in the same Gote to the cases. Figure 3 shows the full schematic presentation of sampling procedure for the study.

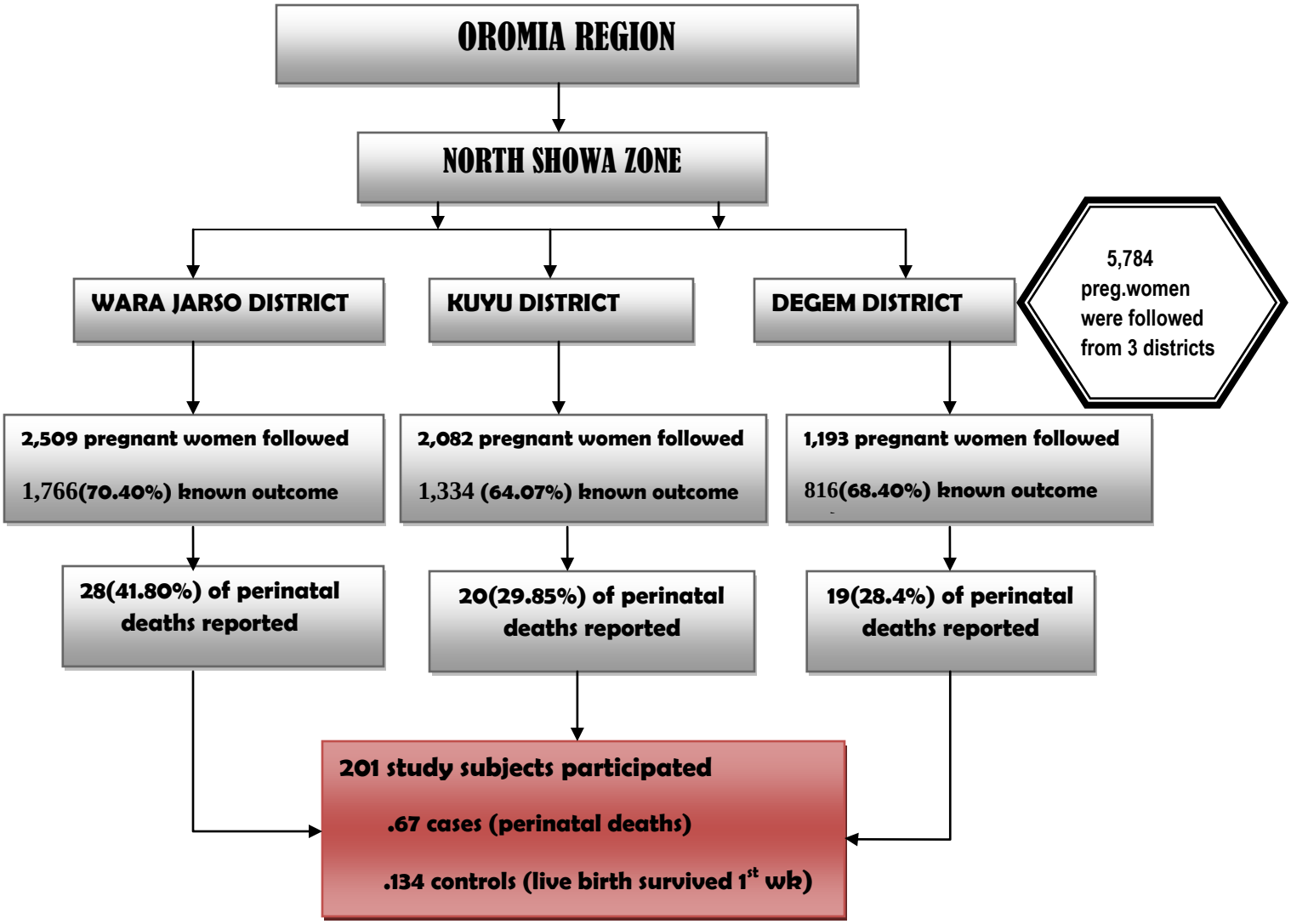

Figure: 2 Schematic presentation of sampling procedure for study perinatal mortality North Showa 2012.

4.5 Sample size determination

The study employed all pregnant mothers' traced by the cohort from 27 intervention kebeles. However, the sample size was calculated only to check the adequacy of the cohort based the most recent EDHS prevalence of perinatal mortality of the Oromia region [20].

As the study was unmatched case–control study, sample sizes was calculated by taking into account of the major determinant factors for perinatal mortality from related literatures and using the STATCALC program of the EPI INFO version 3.5.1 statistical package. In this regard, a minimum detectable OR (Odds Ratio) of 0.32[46], 5% level of significance , a power of 80% and a two to one allocation ratio of control to case (2:1) were assumed. Additional 10 percent was also added for non-response. The prevalence of important determinants was considered (national antenatal care coverage) 34% was taken [20] for controls and 15% proportion difference for cases was considered which yielded large sample size among the considered scenarios. In addition, the time for follow up and the available cohort for study were taken into account. Based on the above assumptions, the total sample size was 361 from these 124 for cases and 237 for control.Variables used in this sample size calculation for this study were taken in the absence of intervention since we could not get studies done with the same intervention in the country so that it should be taken into cnsideration.

4.6 Data collection instruments and procedures

4.6.1. Data collection tools

Data were collected by using World Health Organization standard face to face interviewer administered verbal autopsy questionnaire adopted for the Ethiopian context[36] by incorporating some of the most important cause deaths and household wealth information from DHS[20]. The questionnaire was translated to the Regional working language Afan Oromo by the Principal Investigator and back-translated to English by language expert who had no any information about the study [35].

The data collection instrument contains about 12 sections which included information about the respondents, basic demographic information of the parents and the deceased infant, pregnancy history, delivery history and information about the family wealth. Section one through section six addresses questions regarding determinants of perinatal mortality and to be interviewed for both cases and controls while, section seven through section 12 was designed for cases only and was used to assign the probable causes of perinatal mortality in the study area.

Though the questioner is standardized, a pretest was done outside the intervention site within similar setup in order assess the administration ability of the data collectors which was supervised by the Principal Investigator. After the pretest we have modified some local wordings.

4.6.2. Data collection procedures

Data were collected by high school completed experienced trained data collectors. Five days intensive training was given for the data collectors. Data collectors were responsible for collecting detailed data from both the cases and controls. Data were collected from perinatal deaths (i.e. for the cases) after the end of the fortieth post-partum (40^{th}) day ensuring that the bereaved copes with the grief which is the local norm of the study area by using house to house tracers to reach each pregnant mothers in the cohort. For controls data were collected from randomly selected control who survived the first week of life.

4.7 Data quality control

Since the study involved all the identified cases, the risk of selection bias was minimal. To minimize the possible risk of information bias all possible data quality control measures were instituted. To minimize recall bias, data collection was done as early as the eight date of birth for controls and fortieth day for the cases.

To ensure consistency of the idea of each variable during translation, the questionnaire was translated by principal investigator to Afan Oromo and then back translated to English by an expert who has no prior information about the study. Furthermore WHO standardized verbal autopsy questionnaire was used in this study which reduces the error that might possibly be introduced while designing the variables [35] and enable for comparison.

Five days intensive training was given for data collectors to be well versed with the questionnaire and develop their communication skill during the interview. The causes of death (COD) were assigned by two pediatricians from the Department of Pediatrics, at AAU black lion hospital. Each of the physicians reviewed the data independently from verbal autopsy interview to assign the cause of perinatal death, then both came together and discussed on each of the assigned causes. When discordant COD are assigned a thie breaker, a third physician was involved to decide in the COD.

The process of data collection was closely supervised by the PI on site and collected data were checked at the spot and questionnaires those with major errors were taken back to the respondent and re-interviewed.

During physician cause of death assignment, information that were having a problem or missing was also sent back to the field for further work.

4.8 Operational definition

Perinatal mortality: Perinatal deaths include pregnancy losses of at least seven months' (28 weeks) of gestation (stillbirths) and deaths to live births within the first seven days of life (early neonatal deaths).

Master list: is registration book that contains the list of names and address of every pregnant mothers in the intervention area.

Guide team: is team of volunteer community members who were trained on the intervention being provided in the area and responsible to register and train the pregnant mother and her family members at their home within their Gote (catchment).

Unmarried: The unmarried category comprised cohabiting, single, divorced, widowed and separated.

4.9 Data analysis procedures

The data collected from cases and controls were given unique identification number to differentiate data from cases and controls. Data were entered by the Principal Investigator using **Epi Info** version 3.5.1 statistical software for windows. Data cleaning was both on the field and after data entered by observing simple frequency distributions. Extreme value that was identified and checked by sorting the data in an ascending and descending order.

Cleaned data were exported to the **SPSS** version 20 for windows statistical software for further processing and analysis. Univariate analysis was done for each variable by calculating for the proportion and frequency of the variables.

To examine factors associated with perinatal mortality, logistic regression analysis were conducted with their corresponding Crude and Adjusted Odds Ratio at 95% CI. The P-value of 0.05 was taken as a cutoff point to establish significance.

Principal component analysis(PCA) was employed to determine the household wealth index of the family by considering sample adequacy KOM (Kaiser-Meyer-Olkin) greater than 0.5, Bartlett`s test of sphericity less than the level of significant, initial Eigen value greater than 1.0 that explained more than 60% of the overall variance. Based on these assumptions/principles we had included five variables in the final analysis.

Bivariate analysis was conducted to determine individual effects of explanatory variables like marital status of the mothers, parity, and gestational age of the baby at birth, sex of the baby, and occupation of the mothers and history of neonatal mortality on perinatal mortality and others socio-demographic and

delivery related variables of interest were added to binary logistic regression model for each of the variables separately.

All of the explanatory variables were included into multivariate (logistic) regression model simultaneously to identify potential determinants of perinatal mortality. To control for colinearity among explanatory variables stratified analysis test was conducted and those variables that were associated both with each other and with outcome were excluded. Variable like wealth quantiles, previous birth intervals, parity were identified as cofounders and excluded from the final multivariate model. Perinatal mortality rate was calculated as the sum of still birth and early neonatal death divided by still birth plus live birth multiplied by 1000.

4.10 Ethical consideration

Letter of Ethical approval was obtained from Addis Ababa University School of public health Ethical Review Committee (REC) before proceeding with the study. Written consent was sought from each of the study subjects after detail explanations of the study objectives before the interview. Privacy of the respondents during the interview was maintained by conducting the interview in an isolated place. For those mothers who lost their newborns, data were collected after 40 days of bereavement period according to the local norm by assuming the grief memory will be minimal. Collected data were kept anonymous by assigning unique identification numbers for each questionnaire.

The study subjects culture, language and values were respected. The study subjects were informed that the study process didn't harm them and confidentiality were kept. Any respondent who was not willing to respond were not forced to respond and given full right to stop at any time during an interview. The consent form was attached to annex with the questionnaire.

5. Results

The study was conducted among pregnant mothers who were included in the MaNHEP master list from November 2011 to February 2012. In this period, we followed 5,784 pregnant women where the pregnancy outcomes of 3,916 (67.70%) mothers were known for the study period, the rest were remained under follow up since they were not delivered yet. Data were collected from 237 mothers of whom 79 were mothers who lost their children within 28 days including still births (cases) and 158 mothers of children survived the neonatal period (controls). Out of the interviewed participants, 224 had singleton birth and 13 had multiple births.

Twenty four (6.1 per 1000 live births) of the cases were still births, 43(11per 1000 live births) were early neonatal deaths, while 12(15.19%) were late neonatal mortality. Among the cases 67(84.81) were perinatal mortality (died within the first week of life). Forty nine (73.9%) of the perinatal deaths occurred at home while 18(26.9%) deaths occurred at health institution. The prevalence of perinatal mortality rate varies from15per 1000 live births in kuyu district to 23 per 1000 live births in Degem district with an overall perinatal mortality rate was 17.11 per 1000 live births and still births.

Table 1 Per-district distribution of prevalence of Perinatal Mortality Rate in North showa Feb. 2012.

No	Name of district	Number births	Number of perinatal deaths	Perinatal Mortality Rate
1	Degem	816	19	23
2	Kuyu	1,334	20	15
3	Wara jarso	1,766	28	16
Total		3,916	67	**17**

5.1 Socio-demographic characteristics of mothers in North showa Zone, Feb. 2012

Most of the mothers 138(68.7%) were found in the age range of 20 to 30 years while 23(11.4%) were less than 20 years where as 40(19.9%) were greater than 30 years of age with an overall a mean age of 26.72, SD 5.32 (Table 2).

More than Ninety three percent of the mothers were married and 156(77.6%) of the study participants were illiterate while about 181(90.0%) were farmers (Table 2).

Among the study participants, few of the households 12(6.0%) had only two family members and relatively higher proportion 89(44.3%) of the households had six and above family size whereas 48(23.9%) had five (current average Ethiopian family size) family members living together in the same house. The average household family size was 5.5 (Table 2).

Table 2 Socio-demographic details of respondents in North Showa Zone, Feb. 2012.

Variables	Cases(n=67)	Controls(n=134)	Total
Mothers age in years			
20-30	37(55.2%)	101(75.4%)	138(68.7%)
<20	10(14.9%)	13(9.7%)	23(11.4%)
>30	20(29.9%)	20(14.9%)	40(19.9%)
Marital status			
Married	59(88.1%)	129(96.3%)	188(93.5%)
Currently not married	8(11.9%)	5(3.7%)	13(6.5%)
Educational of the mother			
Literate	19(28.4%)	26(19.4%)	45(22.4%)
Illiterate	48(71.6%)	108(80.6%)	156(77.6%)
Educational of the father			
Literate	26(38.8%)	52(38.8%)	78(38.8%)
Illiterate	41(61.2%)	82(61.2%)	123(61.2%)
Occupation of the mother			
Farmer	56(83.6%)	125(93.7%)	181(90.0%)
Other money earning jobs	11(16.4%)	9(6.7%)	20(10.0%)
Family size			
Two	11(16.4%)	1(0.7%)	12(6.0%)
Three to four	19(28.4%)	33(24.6%)	52(25.9%)
Five	13(19.4%)	35(26.1%)	48(23.9%)
Six and above	24(35.8%)	65(48.5%)	89(44.3%)

5.2 Pregnancy outcomes and delivery related characteristics of mothers in North showa Zone, Feb. 2012

One hundred and fifty one (75.1%) of the mothers were booked for ANC. From these 29(14.4%) started ANC follow-up during their first trimester, 83(41.3%) in second trimester while 29(14.4%) in third trimester of pregnancy. One hundred and thirty eight (68.7%) of the mothers received Tetanus Toxiod vaccine of which, 21(15.2%) had single dose while, 117(84.8%) had two and more doses (Table 3).

Out of the study participants, a quarter 50(24.9%) have to walk more than two hours, 69(34.3%) have to walk less than an hour walking distance while majority 82(40.8%)of them have to walk from one to two hours to get care from any of the health facility found in their vicinity. The household wealth of the respondents showed similar distribution above and below the middle quintile (Table 3).

More than half 108(53.7%) of the mothers did not get postnatal care within first week of delivery. One hundred and fifty seven (78.1%) mothers spaced between their last delivery and current birth less than two years, 31(15.4%) lasted two years or above intervals between their current child and last pregnancy about 13(6.5%) had first birth. Majority of the mothers 124(61.7%) had delivered two to five children whereas 48(23.9%) delivered six and more, 29(14.4%) had only their first child. Most of babies born at home 178(88.6%) while 23(11.4%) gave birth at health institution. Only 23(11.4%) deliveries were assisted by health professionals (Table 3).

Table 3 Health service utilization and related characteristics of mothers in north showa Zone, Feb. 2012.

Variables	Cases(n=67)	Controls (n=134)	Total
Having ANC visit			
Yes	46(68.7%)	105(78.4%)	151(75.1%)
No	21(31.3%)	29(21.6%)	50(24.9%)
Gestational Age at first ANC			
First trimester	11(16.4%)	18(13.4%)	29(14.4%)
Second trimester	24(35.8%)	59(44.0%)	83(41.3%)
Third trimester	11(16.4%)	28(20.9%)	39(19.4%)
Dose of TT immunization			
$\geq$ 2	37(86.0%)	77(81.1%)	114(82.6%)
1	6(14.0%)	18(18.9%)	24(17.4%)
Post natal visit within 7 days			
Yes	31(46.3%)	62(46.3%)	93(46.3%)
No	36(53.7%)	72(53.7%)	108(53.7%)
Previous birth intervals			
First child	6(9.0%)	7(5.2%)	13(6.5%)
Less than two years	48(71.6%)	109(81.3%)	157(78.1%)
More than two years	13(19.4%)	18(13.4%)	31(15.4%)
Walking distance from the nearest health facility			
< 1 hour	21(31.3%)	48(35.8%)	69(34.3%)
1-2 hours	25(37.3%)	57(42.5%)	82(40.8%)
> 2 hours	21(31.3%)	29(21.6%)	50(24.9%)
Household Wealth quintile			
Lowest	3(11.1%)	12(24.5%)	15(19.7%)
Second	8 (29.6%)	6(12.2%)	14(18.4%)
Middle	6(22.2%)	11(22.4%)	17(22.4%)
Fourth	3(11.1%)	12(24.5%)	15(19.7%)
Highest	7(25.9%)	8(16.3%)	15(19.7%)
Place of delivery			
Health Facility	14(20.9%)	9(6.7%)	23(11.4%)
Home	53(79.1%)	125(93.3%)	178(88.6%)
Birth attendants			
TBA	34(50.7%)	82(61.2%)	116(57.7%)
Family member	15(22.4%)	28(20.9%)	43(21.4%)
Health professional	13(19.4%)	10(7.5%)	23(11.4%)
HEW	5(7.5%)	14(10.4%)	19(9.5%)

5.3 Pregnancy outcomes and related characteristics of mothers in North showa Zone, Feb. 2012

Majority of the mothers 140(69.7%) had their third and higher birth order, while the rest had first and second order. Most of these deliveries 143(71.1%) were at-term. More than half 116(57.7%) of the babies were males while 85(42.3%) were females (Table 4).

About 23(11.40%) of the mothers encountered Abortion. Forty five 45 (22.4%) of the mothers had history of neonatal mortality among which nearly halve 22 (48.9%) experienced two and more neonatal deaths (Table 4).

Table 4 Pregnancy outcomes and related characteristics of mothers in North Showa Zone, Feb. 2012.

Variable	Cases(n=67)	Controls(n=134)	Total
Birth Order			
First	14(20.9%)	18(13.4%)	32(15.9%)
Second	7(10.4%)	22(16.4%)	29(14.4%)
Third	46(68.7%)	94(70.1%)	140(69.7%)
Total number of births			
One	11(16.4%)	18(13.4%)	29(14.4%)
Two to five	36(53.7%)	88(65.7%)	124(61.7%)
Six and above	20(29.9%)	28(20.9%)	48(23.9%)
History of abortion			
No	59(88.1%)	119(88.8%)	178(88.6%)
Yes	8(11.9%)	15(11.2%)	23(11.4%)
Number neonatal mortality			
1	11(40.7%)	12(66.7%)	23(51.1%)
2+	16(59.3%)	6(33.3%)	22(48.9%)
History of neonatal mortality			
No	40(59.7%)	116(86.6%)	156(77.6%)
Yes	27(40.3%)	18(13.4%)	45(22.4%)
Gestational age at delivery			
At term	45(67.2%)	98(73.1%)	143(71.1%)
Preterm	9(13.4%)	7(5.2%)	16(8.0%)
Post term	13(19.4%)	29(21.6%)	42(20.9%)
Sex of the new born			
Male	51(76.1%)	66(49.3%)	116(57.7%)
Female	16(23.9%)	68(50.7%)	85(42.3%)
Type of birth			
Singleton	58(86.6%)	123(91.8%)	181(90.0%)
Multiple births	9(13.4%)	11(8.2%)	20(10.0%)
Parity			
1	11(16.4%)	18(13.4%)	29(14.4%)
2-3	13(19.4%)	50(37.3%)	63(31.3%)
$\geq$4	43(64.2%)	66(49.3%)	109(54.2%)
Pre-term delivery			
No	57(85.1%)	128(95.5%)	185(92.0%)
Yes	10(14.9%)	6(4.5%)	16(8.0%)

5.4 Socio-demographic, maternal health and contextual factors associated with perinatal mortality in North Showa Zone, Feb. 2012.

In this study socio-demographic variables in model 1 and maternal health and contextual variables in model 2 were examined separately to look their effect on perinatal mortality then the third model address the combined effect of all variables at the same time. Each of the three models were dealt as follows:

5.4.1 Socio-demographic factors associated with perinatal mortality

Bivariate (unadjusted) analysis showed that maternal age greater than 30 years [COR 2.730, (95% CI:1.322-5.638)], mothers currently not married [COR 2.728, (95% CI: 1.070-6.954) and engaged money earning jobs than farming [COR 2.728, (95% CI: 1.070-6.954)] were factors socio-demographic factors increased the risk of perinatal mortality and family size remained protective at all category in unadjusted analysis (Table 5). Neither maternal nor paternal education showed any evidence of association with perinatal mortality unadjusted analysis (Table 5).

In multivariate (adjusted) analysis of model 1 children born from mothers more than 30 years of age [AOR **4.769, (95% CI: 1.962-11.595)]** and those born from currently not married mothers [AOR 4.064, (95% CI: 1.074-15.376)] were more four times at risk of perinatal death as compared to children born from mothers less than 30 years old and currently married mothers (Table 5).

Table 5 Socio-demographic factors associated with perinatal mortality in North Showa Zone, Feb. 2012.

Variables	Cases(n=67)	Controls(n=134)	COR(95% CI)	AOR(95% CI)
Mothers age in years				
20-30	37(55.2%)	101(75.4%)	1	1
<20	10(14.9%)	13(9.7%)	2.100(0.848-5.198)	0.411(0.097-1.746)
>30	20(29.9%)	20(14.9%)	**2.730(1.322-5.638)***	**4.769(1.962-11.595)***
Marital status				
Married	59(88.1%)	129(96.3%)	1	1
Currently not married	8(11.9%)	5(3.7%)	**2.728(1.070-6.954)***	**4.064(1.074-15.376)***
Educational status of the father				
Literate	26(38.8%)	52(38.8%)	1	1
Illiterate	41(61.2%)	82(61.2%)	1.000(0.548-1.825)	1.343(0.569-3.169)
Educational status of the mother				
Literate	19(28.4%)	26(19.4%)	1	1
Illiterate	48(71.6%)	108(80.6%)	1.644(0.831-3.253)	1.343(0.569-3.169)
Occupation of the mother				
Farmer	56(83.6%)	125(93.7%)	1	1
Money earning jobs	11(16.4%)	9(6.7%)	**2.728(1.070-6.954)***	1.207(0.381-3.819)
Family size				
Two	11(16.4%)	1(0.7%)	1	1
Three	19(28.4%)	33(24.6%)	**0.052(0.006-0.438)***	**0.030(0.003-0.305)***
Five	13(19.4%)	35(26.1%)	**0.034(0.004-0.288)***	**0.013(0.001-0.148)***
Six and above	24(35.8%)	65(48.5%)	**0.034(0.004-0.274)***	**0.008(0.001-0.096)***

Nb. * shows significant association at p-value <0.05.

5.4.2 Maternal health and contextual factors associated with perinatal mortality

In model two among maternal health & contextual factors, having previous history of neonatal mortality [COR 4.350, (95 % CI: 2.168-8.728)], Male babies [COR 3.284, (95% CI: 1.704-6.328)], pre-term birth [COR 3.743, (95% CI:1.298-10.794)], less than two years birth interval [COR 2.625, (95% CI:1.070-6.444)], institutional delivery [COR 3.669, (95% CI:1.496-8.996)] and higher parity[COR 2.473, (95% CI:1.229-4.976)] were associated deaths within the first weeks in unadjusted (at bivariate) analysis (Table 6). On the other hand none of birth order, having history of abortion, type of birth, having ANC visit and post-natal visits within first week were not associated neither at bivariate (unadjusted) nor multivariate(adjusted) analysis (Table 6).

In adjusted (multivariate) analysis mothers having previous history of neonatal mortality [AOR 7.376, (95% CI: 2.934-18.543)], Male babies [AOR 4.721, (95% CI: 2.095-10.639)], pre-term birth [AOR 8.622, (95% CI: 2.194-33.884)], institutional delivery [AOR 3.806, (95% CI: 1.256-11.536)] and mothers with two and above parity [AOR 3.147, (95% CI:1.095-9.040) were all associated with an increased risk of perinatal mortality(Table 6). Each these variables were detailed in discussion part. Birth interval couldn't show further statistical association with perinatal mortality (Table 6).

Table 6 Maternal health and contextual factors associated with perinatal mortality in North Showa Zone, Feb. 2012.

Variable	Cases(n=67)	Controls(n=134)	COR(95% CI)	AOR(95% CI)
Birth Order				
First	14(20.9%)	18(13.4%)	1	1
Second	7(10.4%)	22(16.4%)	0.409(0.136-1.230)	0.465 (0.070-3.072)
Third	46(68.7%)	94(70.1%)	0.629(0.288-1.376)	0.294 (0.057-1.502)
History of abortion				
No	59(88.1%)	119(88.8%)	1	1
Yes	8(11.9%)	15(11.2%)	1.076(0.432-2.681)	0.451 (0.139-1.468)
History of neonatal mortality				
No	40(59.7%)	116(86.6%)	1	1
Yes	27(40.3%)	18(13.4%)	**4.350(2.168-8.728)***	**7.376 (2.934-18.543)***
Sex of the new born				
Female	16(23.9%)	68(50.7%)	1	1
Male	51(76.1%)	66(49.3%)	**3.284(1.704-6.328)***	**4.721 (2.095-10.639)***
Type of birth				
Singleton	58(86.6%)	123(91.8%)	1	1
Multiple births	9(13.4%)	11(8.2%)	1.735(0.681-4.418)	2.813 (0.912-8.676)
Pre-term delivery				
No	57(85.1%)	128(95.5%)	1	1
Yes	10(14.9%)	6(4.5%)	**3.743(1.298-10.794)***	**8.622(2.194-33.884)***
Having ANC visit				
Yes	46(68.7%)	105(78.4%)	1	1
No	21(31.3%)	29(21.6%)	1.653(0.854-3.198)	1.312 (0.544-3.162)
Post natal visit within 7 days				
Yes	31(46.3%)	62(46.3%)	1	1
No	36(53.7%)	72(53.7%)	0.972(0.539-1.755)	1.032 (0.476-2.237)
Previous birth intervals				
First child	6(9.0%)	7(5.2%)	1	1
Less than two years	48(71.6%)	109(81.3%)	**2.625(1.070-6.444)***	0.868 (0.184-4.082)
More than two years	13(19.4%)	18(13.4%)	1.800(0.825-3.927)	1.585 (0.606-4.145)
Place of delivery				
Home	14(20.9%)	9(6.7%)	1	1
Health institution	53(79.1%)	125(93.3%)	**3.669(1.496-8.996)***	**3.806 (1.256-11.536)***
Parity				
One	13(19.4%)	50(37.3%)	1	1
Two and above	54(80.6%)	84(62.7%)	**2.473(1.229-4.976)***	**3.147 (1.095-9.040)***

Nb. * shows significant association at p-value <0.05.

5.4.3 Determinant factors associated with perinatal mortality in North Showa Zone, Feb. 2012.

Table 7 below presents the third final regression model was adjusted for socio-demographic factors (model 1) and maternal health & contextual factors (model 2) were examined together in a single model. In this final model all those explanatory variables those showed association with increased risk of perinatal mortality at bivariate (unadjusted) analysis further showed association with an increasing Odds Ration values in adjusted (multivariate) analysis except maternal occupation and birth intervals (Table 7). Both Maternal occupation and birth interval variables lost their association at multivariate analysis in the final model 3 which was similar pattern with analysis in model 1(Table 5) and in model 2(Table 6) analysis above (Table 7).

Twin birth babies showed statistical association with perinatal mortality in the final model at multivariate analysis after adjusting for socio-demography and maternal health & contextual factors in single model even though it was not previously associated when adjusted only for socio-demographic variables while Family size remained protective in the final model (Table 7).

Generally in the final model after adjusting for socio-demographic and maternal health & contextual factors maternal age greater than thirty years [AOR 6.807, (95% CI:2.234-20.741)], currently unmarried mothers [AOR 6.006, (95% CI:1.075-33.539)], having previous history of neonatal death [AOR 7.653, (95% CI:2.654-22.068)], Male sex [AOR 3.567, (95% CI:1.441-8.831)], Twin births [AOR 4.541, (95% CI: 4.541-16.873)], pre-term birth [AOR 9.994, (95% CI :2.266-44.071)], institutional delivery [AOR 4.442, (95% CI:1.118-17.652)] were identified as potential determinants of perinatal mortality in this study (Table 7). Further details were found in discussion part.

Table 7 Socio demographic, maternal and contextual factors associated with perinatal mortality in North Showa Zone, Feb. 2012.

Variables	Cases(n=67)	Controls(n=134)	COR(95% CI)	AOR(95% CI)
Mothers age in years				
20-30	37(55.2%)	101(75.4%)	1	1
<20	10(14.9%)	13(9.7%)	2.100(0.848-5.198)	1.221(0.173-8.637)
>30	20(29.9%)	20(14.9%)	**2.730(1.322-5.638)***	**6.807(2.234-20.741)***
Marital status				
Married	59(88.1%)	129(96.3%)	1	1
Currently not married	8(11.9%)	5(3.7%)	**3.498 (1.098-11.149)***	**6.006(1.075-33.539)***
Educational status of the father				
Literate	26(38.8%)	52(38.8%)	1	1
Illiterate	41(61.2%)	82(61.2%)	1.000(0.548-1.825)	0.615(0.230-1.648)
Educational status of the mother				
Literate	19(28.4%)	26(19.4%)	1	1
Illiterate	48(71.6%)	108(80.6%)	1.644(0.831-3.253)	1.433(0.504-4.076)
Occupation of the mother				
Farmer	56(83.6%)	125(93.7%)	1	1
Other money earning jobs	11(16.4%)	9(6.7%)	**2.728(1.070-6.954)***	0.884(0.224-3.4980
Family size				
Two	11(16.4%)	1(0.7%)	1	1
Three	19(28.4%)	33(24.6%)	**0.052(0.006-0.438)***	**0.033(0.002-0.452)***
Five	13(19.4%)	35(26.1%)	**0.034(0.004-0.288)***	**0.009(0.001-0.159)***
Six and above	24(35.8%)	65(48.5%)	**0.034(0.004-0.274)***	**0.006(0.000-0.116)***
Birth order				
First	14(20.9%)	18(13.4%)	1	1
Second	7(10.4%)	22(16.4%)	0.409(0.136-1.230)	0.387(0.033-4.605)
Third	46(68.7%)	94(70.1%)	0.629(0.288-1.376)	0.967(0.082-11.412)
History of abortion				
No	59(88.1%)	119(88.8%)	1	1
Yes	8(11.9%)	15(11.2%)	1.076(0.432-2.681)	0.509(0.122-2.119)
History of neonatal mortality				
No	40(59.7%)	116(86.6%)	1	1
Yes	27(40.3%)	18(13.4%)	**4.350(2.168-8.728)***	**7.653(2.654-22.068)***
Sex of the new born				
Female	16(23.9%)	68(50.7%)	1	1
Male	51(76.1%)	66(49.3%)	**3.284(1.704-6.328)***	**3.567(1.441-8.831)***
Type of birth				
Singleton	58(86.6%)	123(91.8%)	1	1
Twin births	9(13.4%)	11(8.2%)	1.735(0.681-4.418)	**4.541(1.222-16.873)***
Pre-term delivery				
No	57(85.1%)	128(95.5%)	1	1
Yes	10(14.9%)	6(4.5%)	**3.743(1.298-10.794)***	**9.994(2.266-44.071)***
Having ANC visit				
Yes	46(68.7%)	105(78.4%)	1	1
No	21(31.3%)	29(21.6%)	1.653(0.854-3.198)	1.686(0.625-4.553)
Post natal visit within 7 days				
Yes	31(46.3%)	62(46.3%)	1	1
No	36(53.7%)	72(53.7%)	0.972(0.539-1.755)	1.104(0.452-2.695)
Previous birth intervals				
First child	6(9.0%)	7(5.2%)	1	1
Less than two years	48(71.6%)	109(81.3%)	**2.625(1.070-6.444)***	0.632(0.090-4.429)
More than two years	13(19.4%)	18(13.4%)	1.800(0.825-3.927)	1.400(0.484-4.051)
Place of delivery				
Home	14(20.9%)	9(6.7%)	1	1
Health Facility	53(79.1%)	125(93.3%)	**3.669(1.496-8.996)***	**4.442(1.118-17.652)***

Nb. * shows significant association at p-value <0.05.

5.5 Physician reviewed probable causes of perinatal deaths

Asphyxia and sepsis were the major causes of early neonatal death contributed about 20(31.3%) 17(25.4%) respectively while chorioamnionitis 8(12.1%), antepartum hemorrhage 6(9%) were responsible for majority of the still births (Table-6).

Table 8 Physicians ascertained causes of perinatal death in North Showa Zone, Feb 2012.

Type of perinatal death	Probable Cause of death	Frequency
Early Neonatal	Asphyxia	21(31.3%)
	Sepsis	17(25.4%)
	Prematurity	2(3.0%)
	Birth Injury	1(1.5%)
	Tetanus	1(1.5%)
	Pneumonia	1(1.5%)
Still births	Chorioamnionitis	8(11.9%)
	Antepartum hemorrhage	6(9.0%)
	Hypertensive disorder of pregnancy	5(7.5%)
	Obstructed labor	2(3.0%)
	Cardiac case	1(1.5%)
	Unknown	2(3.0%)

6. Discussion

In this community based nested case control study we characterized perinatal mortality in rural Ethiopia. The Perinatal Mortality Rate was 17.11 per 1000 live births. Maternal age greater than 30, having previous history of neonatal mortality, preterm births, institutional delivery, male sex, currently unmarried mothers, Twin birth babies were independently conferred an increased risks of perinatal mortality. Majority (84%) of the early neonatal deaths were attributed to birth asphyxia and sepsis while nearly similar proportion 86% of the still births was attributed to chorioamnionitis, antepartum hemorrhage, and hypertensive disorder of pregnancy.

6.1 Estimates of perinatal mortality rate

Current study found an overall perinatal mortality rate 17.11 per 1000 live birth with slight variation within the districts from 15 per 1000 live birth in Kuyu district to 23 per 1000 live births in Degem district. This figure is substantially lower than the recent EDHS reported 45 per 1000 live birth for Oromia regional magnitude in which our study was conducted [56], and lower than community based prospective studies done in rural Ethiopia, Eastern Uganda, Burkina Faso and rural Congo among cohorts of pregnant women found perinatal mortality rate 45 per 1000 live birth, 41 per 1000 live birth, 79 per 1000 live birth and 61 per 1000 live birth respectively [24, 27, 70, 79]. In contrast the perinatal mortality rate of Ethiopia had shown an increasing trend from 37 per1000 live births in 2005 [20] to 46 per 1000 live birth in 2011 [56] over the last one decade. The discrepancy may be due to our study setting was an intervention area: better birth preparedness where about 46% of the pregnant women completed four ANC visits and about 89% of the mothers had post-natal care within 48 hours of for both the mother and new born [81] even though other intervention were there other governmental and non-governmental organization in the area. The present study revealed that a higher perinatal deaths observed were among illiterate parents especially mothers as well as births from larger family size (six and above) and shorter birth intervals (less than two years) even though these variables were not significantly associated with perinatal mortality in multivariate analysis.

Early neonatal mortality rate in current study was found to be 11 per 1000 live births (54.43 %) of the total neonatal mortality which is fairly comparable with community based cohort study done in Egypt which reported 15 per 1000 live birth [59], but lower than EDHS 2011 which was 79% of neonatal mortality [56], studies from rural Nigeria that found 33.5 per 1000 live births [27] and Pakistan which was 34.8 per 1000 live births [58]. But still this figure found within the estimated range from study finding across 106 national DHS surveys from developing countries set range of ENM rate from 9 to 45 per 1000 live births with an average of 24 per 1000 live birth for developing countries [58]. This

substantial reduction of early neonatal mortality rate may be attributed to the interventions being implemented in the current study site even though it is not the only intervention in the study area.

6.2 Determinants (risk factors) of perinatal mortality

In this study a significant association was observed between mothers older than 30 years and perinatal mortality. This result was supported by a population based prospective cohort study done in Eastern Uganda among pregnant women found babies born to mothers greater than 30 years old was more than 2 folds risk to experience perinatal death than younger mothers [28] but other studies from rural Pakistan and Tanzania reported maternal age above 35[39, 64] as risk for perinatal death. This study can give a clue that as early as 30 years of maternal age may be a risk for perinatal death in the study area even though it needs further investigation in other setting.

Mothers having previous history of neonatal mortality were remained strong determinant of perinatal mortality in this study. This finding was consistent with population based retrospective cohort study from Missouri USA had found out, women with previous infant mortality results in an elevated risk for subsequent stillbirth, with the most profound increase observed among black women [60]. Mothers with a history of neonatal mortality during their first pregnancy were about 5 times more likely to experience stillbirth in the second pregnancy [46, 61]. Case control study from Zimbabwe [46] and Community based prospective cohort study from Sweden identified previous still birth represented one of the most important risk factors for perinatal mortality [62].

Pre-term birth was significantly associated with an increased risk of perinatal mortality in this study. The overall proportion of preterm babies in this study was 8% and 15% of the deaths were preterm. This relatively higher than study conducted in Addis Ababa selected public health facilities reported 7.1% [63]. This may be related to home delivery as majority of the birth were occurred at home which was supported by study from Nepal [66] and access to health care limited since the study was conducted in rural where preterm babies needs advanced care that health posts and health centers cannot provide. Another studies from north east India and Uganda revealed that the risk of perinatal death was high among preterm babies when adjusted for factors [31, 64] and study from São Paulo concluded preterm born babies as most proximate risk factor for early neonatal mortality [65].

Move over, in this study relatively more percentages of case babies were born to teenage mothers of less than 20 years relative to control babies who born to same age group mothers even though statistically not significant as witnessed by finding from Nepal [66] whereas more control babies born to mother in the age range of 20 to 30 years which is relatively less risky age group for perinatal death.

Current study found that male babies were at higher risk of death than their female counter parts during the perinatal period as found in analysis of 22 years cohort data from rural Ethiopia Butajira [47], and Nederland [2]. Similarly in most developing countries, male child mortality exceeds female mortality [76] current study also reported more death among male babies. Infant and neonatal mortality was also higher in males, as found in the community based cohort studies from Zimbabwe [23], Australia and New Zealand [28], Pakistan [39] and Ethiopia [67]. This is true among all population presumably because of biological factors affecting high risk of male [52, 68]. The excess male deaths observed in current finding may be due to most of male babies born to older and teenager mothers relative their female counter parts.

In the current study babied born at health institution were more than four times at risk of death than those babies born at home in the perinatal period. The possible reason may be late health seeking behavior of the mothers after the complication occurred. The health institution they can find in their vicinity were health posts and health centers were they can`t provide care for complicated pregnancy that needs more advanced care. In addition about 66% of respondents reported that they have to walk more than one hour on foot to get any the health facility for care in the study area and the society had strong believe that pregnant mothers can safely deliver at home (about 88% gave birth at home in the study) and they take her to health institution only if the labor lasted longer than 24 hours.

Twin born babies were more than four times at risk of death than singletons in this study. This study was consistent with other studies elsewhere [24, 67]. Babies born to currently unmarried mothers were at increased risk of death during perinatal period than married mothers supported by studies [65]. This may be due to unmarried mothers (separated, widowed and divorced) were less likely to get care and support of their husband and more likely have poor income in the rural area where mothers were dependents on their husbands income. Larger family size remained protective in this study and which needs further study.

6.3 Causes of perinatal mortality

The leading causes of perinatal deaths identified in this study were birth Asphyxia accounted about 30% alone. This may due to majority of the deaths (75%) occurred at home attended by unskilled birth attendants who lack the skills and equipment to help resuscitate babies asphyxiated at birth. This finding was substantiated by the study finding from developing countries like Pakistan [29, 39], Bangladesh [37], Nigeria [38], Congo [79], where Asphyxia ranked first level among the leading causes of perinatal deaths while according to national strategy for child survival in Ethiopia 2005 shows that 90% of child mortality in Ethiopia can be attributed to five conditions, (low birth weight, sepsis and asphyxia)/Neonatal causes takes 2nd rank together [43] but this document focused on the causes of child mortality than perinatal specifically.

Infections like sepsis, tetanus and Pneumonia together contributed about same percentage of with birth Asphyxia from the overall cause of deaths in perinatal period in this study. Sepsis alone ranked second among the leading causes of perinatal death in this study. This high proportion of sepsis may be resulted from unhygienic birth place, unhygienic cord care at birth including cord cutting and tying materials, and cultural taboos regarding taking babies out of home even when the newborn is sick. In this study Tetanus shared relatively small contribution to the death which may be linked to better Tetanus Toxiod immunization coverage due to national campaign at different times by government and about 82.6% of the mothers reported as vaccinated for at-least two doses TT immunization study area. Studies done else-where also reported similar finding [29, 36, 37, 38, 39, 55, 70] infection/sepsis as most common cause of perinatal deaths even though the variability in the relative frequency of individual causes may depend upon features of the environment, demography of the population, the healthcare system and perhaps more important factor influencing the reported causes of death is the methodology used for assigning a causes. In this study we used, assignment of a cause of perinatal death was based on the local physician's knowledge and familiarity with the expected diseases in the region so that our data should be interpreted with some caution.

Major Causes of still births identified were chorioamnionitis, antepartum hemorrhage, and hypertensive disorder of pregnancy which are linked with maternal causes of death and is similar with finding from Ethiopia and north India [51, 80]. Information related to causes death for still births in this study may be less reliable since mothers were more likely to be unconscious to tell about the history of signs and symptoms of the still births at the time birth.

6.4 Strength of the study

- This study used standardized data collection tool that reduces the possible errors that can be introduced during development.

- Enrolment of the all cases population in the study area (non –sampled) helps to make direct inference to the study population.

6.5 Limitation of the study

- Recall bias especially about the sign and symptoms that lead the child to death in ascertaining of cause of death.

- The tool used in this study may be less sensitive for assessment of causes death for still births since it needs medical diagnosis (laboratory confirmation) so that causes for this category should be referred with care.

6.6 Conclusion

The study reported the relatively lower perinatal mortality rate than reported by other studies conducted in the country Ethiopia. The fact that majority of the deaths occurred in the first twenty four hours warrants interventions would better focus in this critical time of vulnerability to save lives of the newborn. Maternal age greater than 30, having previous history of neonatal mortality, institutional delivery, preterm births and male sex were independently conferred an increased risks of perinatal mortality. Majority (84%) of the early neonatal deaths were attributed to birth asphyxia and sepsis while nearly similar proportion 86% of the still births was attributed to chorioamnionitis, antepartum hemorrhage, and hypertensive disorder of pregnancy which implies that still there is a need to focus on these major causes of deaths for further intervention. The identified determinants and causes of perinatal mortality are closely linked to the causes of maternal mortality; hence programs, policies and intervention would better if formulated in such a way that can address both child and maternal issues in an integrated manner.

7. Recommendations

At policy level

- ✓ Providing a continuum of care for mothers and newborns in an integrated while ensuring universal coverage of these interventions would better address the interrelated issues of mothers and the newborn.
- ✓ Ministry of health and other organization working on maternal and child health area need to take into consideration these major causes of death responsible for the majority of perinatal mortality for further intervention.

Program level

- ✓ As most births are being conducted by traditional birth attendants at home, basic delivery and child care skills should be given for all of TBA by woreda health offices.
- ✓ Health promotion strategies to increase awareness of the importance of institutional delivery and strengthening of postnatal care utilization are needed.
- ✓ Woreda health office should give due attention on the major causes of perinatal deaths like birth asphyxia, sepsis, APH and hypertensive disorder pregnancy.

For researchers

- ✓ Further research if conducted prospectively will provide better results.

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9. Annexes

9.1 Standardized verbal autopsy Questionnaire English Version

Instructions to interviewer: Introduce yourself and explain the purpose of your visit. Ask to speak to the mother or to another adult caretaker who was present during the illness that led to death. If this is not possible, arrange a time to revisit the household when the mother or caretaker will be home.

INTERNATIONAL STANDARD VERBAL AUTOPSY QUESTIONNAIRE

DEATH OF A CHILD UNDER 4 WEEKS

SECTION 1 INTERVIEWER VISITS Interviewer Put 1 for cases and 2 for referents in the Box ☐

INTERVIEWER VISITS	**1**	**2**	**3**	**FINAL VISIT**
DATE	……	……	……	DAY…… MONTH
INTERVIEWER NAME	…….	……	……	YEAR
RESULT CODE				INT. NUMBER RESULT……..……
NEXT VISIT: DATE	……	……	……	TOTAL NUMBER OF VISITS ……..……
TIME	……	……	……	

RESULT CODES

1=COMPLETED 3=POSTPONED 5=PARTLY COMPLETED

2=NOT AT HOME RESPONDENT FOUND 4=RESPONDENT REFUSED 6 =NO APPROPRIATE

7 = OTHER (SPECIFY)_____

SUPERVISOR	FIELD EDITOR	OFFICE	KEYED BY
Name _____	Name _____	EDITOR	
Date _____	Date _____		

PLACE NAME/ LOCATION_____

ADDRESS LOCATION TO THE HOUSEHOLD_____

SUPERVISOR SIGNATURE AND DATE……..……	……
DATA ENTRY SIGNATURE AND DATE……..	……

Hello my name is _____and am working with MaNHEP

We are collecting information on the causes of death in the community. We would very much appreciate your participation in this effort. We want to ask you about the circumstances leading to the death of the deceased. Whatever information you provide will be kept strictly confidential. No information identifying you or the deceased will ever be realized to anyone outside of this information –collection activity.

Participation in this survey is voluntary and you can choose not to answer any individual question or all of the questions. You may also stop the interview completely at any time without any consequences at all. However, we hope that you will participate in this survey since the results will help the government improve service for people.

At this time, do you want to ask me anything about the purpose or content of this interview?

May I began the interview now?

Signature of interviewer: _____date _____

Respondent Agree to be interviewed……1

Respondent do not agree to be interviewed----------2 END

SECTION 2. BASIC INFORMATION ABOUT THE RESPONDENT

201 Record the time at start of interview		Hour Minutes			
202 What is the name of the main respondent:					
203. What is the relationship of the main respondent with (name of the child) d child? (Circle relevant number					
1. Father	2. Mother	3. Sibling	4. Other relative	5.No relation	*6. Other (specify):*
204. Can the respondent read and write?		1. Yes		2. No	
205. How many years of school did the main respondent complete? ……					
206. Were other people present at the interview? ……			1.Yes	2. No	
207. Name of the deceased or control					
208 Age of the deceased or the control (in days)					
209. Sex of the child			1. Male 2. Female		

SECTION 3 - LIVELIHOODS AND HEALTH SERVICES

301. What is the main source income for the family? ***PROBE TWO TIMES 'ANYTHING ELSE?' CIRCLE ALL THAT APPLY***	1 =Farming 2 = Domestic worker/cleaner 3 = Construction work 4 = Petty trader 5 = Dressmaker/hairdresser 6 = Waitress / barmaid 7 = Financial support from families or children abroad 8.= Financial support from children or other families in the country 9 = Making tela, areke, other alcoholic drink 10 =Plumber, elect, carpenter, mason, mechanic, etc.) 11 = Professional (health care, teacher, manager, etc.) 12= Pension 13 = Any other source of income? (Specify)
. 302. Do you rent, own, or are you provided with the place/house that you live?	1 = Owned 2 = Provided by employer 3 = Provided by relatives

	4 = Rented from employer 5 = Rented from kebele 6 = Rented from private owners 7 = Rented from other (Specify) …… **If owned or provided go to no 5**	
303. How many rooms does the household have?	Number of rooms	
304. Is there a separate place for cattle and people?	1. 1=Yes 2=No	
304. Number of windows in the household?		
. 305. What is the main material of the roof?	1=Corrugated iron sheet 2 =Thatch or grass 3 = Other (specify) ……	
. 306. What is the main material of the floor?	1.Earthen floor 2.Cement 3. Straw 4.Plastic tiles 5.Plastic sheet 6.wood	
307. Who often do you cook in the house?	1. All the time 2. Some times	
. 308. What is the main type of cooking fuel?	1 = Mainly collected firewood 2 = Mainly purchased firewood 3 = Charcoal 4 = Kerosene 5 = Butane gas 6 = Electricity 7 = Leaves/dung cakes 8 = Other (specify) ……	
. 309. What type of toilet facility does the household have?	1 = Flush toilet, private 2 = Flush toilet, shared with another household 3 = Pit latrine, private 4 = Pit latrine, shared 5 = Container (from household items)	

	6 = Field/forest 7 = Other (specify) …… → 311	
310. Does the family use the toilet regularly?	1. Yes always 2. Some times 3. Never	
. 311. What is the main source of drinking water?	1 = Tap water 2 = Protected well/spring 3 = Unprotected well/spring 4= Rain water 5 = River, lake or pond	

I want to talk about the items that a household or individual might own or possess. I will ask you about what your current household own.

312. Does any member of the household own any land that can be used for agriculture	1 = Yes 2= No
313. How many (Local Units) of agricultural land do members of household own?	Local Units_____
314. Does this household own any livestock, heard, or farm animals?	1 = Yes 2= No
315. How many of the following animals does this household own? Cattle Milk cows, oxen, or bulls? Horses, donkeys or mules? Camels? Goals?	Cattle ..... ☐☐ Milk cows, oxen, or bulls?..... ☐☐ Horses, donkeys or mules?..... ☐☐ Camels?..... ☐☐ Goals?..... ☐☐ Sheep?..... ☐☐ Chicken?..... ☐☐☐

316. READ EACH ITEM. IF ITEM IS OWNED BY HH CIRCLE '1'. IF ITEM IS OWNED BY THE HH ***CIRCLE '2' IF ITEM IS NOT PRESENT/OWNED BY HH***	Item	Yes	No
	A=Electricity	1	2
	B = Radio	1	2
	C= Television	1	2
	D=Telephone	1	2
	E.=Mobile phone	1	2
	F =Electric Mitad	1	2
	G = Kerosene Lamp	1	2

	H = Bed.	1	2
	I = Plough	1	2
	J = Tractor	1	2
	K = Motor cycle	1	2
	L= Cart	1	2
	M= Cash Crops, such as coffee, sesame, etc..	1	2
	N= Tables	1	2
	O.= Refrigerator	1	2
	P= Stove/electric /gas	1	2
	Q= Car/Van	1	2
	R= Chairs	1	2

317. Do you have any personal cash savings you keep for future plans or in case of emergencies?	1 = Yes 0 = No → 317	
. 318. Where do you currently keep your savings? ***PROBE TWO TIMES 'ANYTHING ELSE?' CIRCLE ALL THAT APPLY***	1 = Bank 2 = Micro finance organization 3 = Ekub 4 = Mobile bank 5 = At home 6 = With a friend 7 = Other (specify) ……	
329. Approximately how much personal savings do you currently have?	|____|____|____|____| BIRR 98=Non-response	
320. If the family faced a financial problem for health care, is there any source that can lend the HH money ?	1. Certainly 2. I think so 3. I do not think so 4. Never	
321. What is the main income of the family		
322. Type of health facility in the vicinity	1. Hospital 2. Health centre 3. Private clinic 4. Health post	
323. What is the average distance to a nearest HF	_____ walking distance (in days)	
324. What is the average distance to the nearest hospital	_____ days	

325. Where do you usually seek health if someone in the HH gets sick?				
1. Traditional healer	2. Religious leader	3. Public Hospital	4. Health centre or clinic	5.Health post
6. Private clinic	7. Pharmacy, drug seller		9. Holy water	Other (specify)

SECTION 4 MOTHER'S HEALTH AND CONTEXTUAL FACTORS

401 What was the age of the mother at the time the baby died?	YEARS ……. DON'T KNOW ……9 8	
402. What was the marital status of the mother when the baby died?	Married.....1 Single.....2 Divorced.....3. Separated..... 4 Widowed..... 5	
403 What is the educational status of the mother?	Illiterate.....1 Read and write.....2 Complete (1-6)grade.....3 Completed 7-10grade.....4 Above high school level…….....5	
404 What is the educational status of the father?	Illiterate.....1 Read and write.....2 Complete (1-6)grade.....3 Completed 7-10grade.....4 Above high school level.....5	
405. Mother's occupation?	House wife.....1 Factory worker.....2 Civil servant.....3 Mercha.....4 Farmer.....5 Other specify.....6 Daily labourer.....7	

406. What is your family size?	Numbers_____	
407. Did the mother receive antenatal care?	Yes ……..... ....1 No…….. ...2 Don't know ……....98	
408. When did you start attending ANC?	First three months.....1 Second three month.....2 Third three months.....3	
409. Where did you attend ANC service?	Hospital.....1 Health centre.....2 Health post.....3 Private clinic.....4	
410. Was there any abnormality identified during ANC?	1.yes 2.No	
411. Did you get any advice	Yes…….....1 No…….....2 Don't know …….....98	
412. Did the mother receive tetanus toxoid (TT) vaccine?	Yes…….....1 No…….....2 Don't know …….....98	
413. How many doses?	Number of doses _____ Don't know……98	
414. How is the mother's health now?	Healthy……. ……1 Ill…….. ……....2 Not alive ……...3 Don't know……..……98	
415. Have you ever had an abortion?	Yes …….....1 No……..……2 Don't know …….....98	
416. How many abortions have you had?	Numbers_____	
417. Have you had a previous neonatal mortality?	Yes …….....1 No……2	
418. How many neonatal deaths did you encounter?	Numbers ……	

419. Was the child birth preceding your last delivery at the expected time?	Term.....1 Pre term.....2 Post term.....3	

SECTION 5 PREGNANCY HISTORY

501. How many births, including stillbirths, did the mother has before this baby?	Number of births/stillbirths Do not know..... 98	
502. How many months was the pregnancy when the (control baby) or the deceased was born	Gestational age_____ Do not know..... 98	
503. Did the pregnancy end earlier than expected?	Yes……1 No…… 2. → 506 Don't know……98 → 506	
504 How many weeks before the expected date of delivery?	WEEKS_____ DON'T KNOW 98	

506 During the pregnancy did the mother suffer from any of the following known illnesses:	**Yes**	**No**	**DK**
1 High blood pressure?	High blood pressure?...1	2	98
2 Heart diseases?	Heart diseases?.....1	2	98
3 Diabetes?	Diabetes?.....1	2	98
4 Epilepsy/convulsion?	Epilepsy/convulsion?...1	2	98
5 Did she suffer from any other medically diagnosed illness?	Did she suffer from any other medically diagnosed illness? ….1	2	98
6.OTHER (SPECIFY)	.OTHER (SPECIFY)_____		

507 During the last 3 months of pregnancy did the mother suffer from any of the following illnesses:	**Yes**	**No**	**DK**
1. Vaginal bleeding?			
2. Smelly vaginal discharges?	1	2	98
3.. Puffy face?	1	2	98
4. Headache?	1	2	98
5. Blurred vision?	1	2	98
6. Convulsion?	1	2	98
7. Febrile illness?	1	2	98

8. Severe abdominal pain that was not labor pain? 9 .Pallor and shortness of breath (both present)? 10.Did she suffer from any other illness? (SPECIFY)	1 2 98 1 2 98 1 2 98 Other illnesses specify _____	
508 Was the child a single or multiple birth?	SINGLETON ……..……..1 TWIN……..……..…..2 TRIPLET OR MORE …….3 DON'T KNOW …..……....98	
509 What was the birth order of the child that died?	FIRST…… ……....1 SECOND…… ……..2 THIRD OR HIGHER……..3 Do not know …….....98	
SECTION 6 DELIVERY HISTORY		
601. When did the water break?	Before labor started ……..1 During labor…….…….…..2 Don't know ...…….98	
602. How many hours after the water broke was the baby born?	Less than 24 hours ……1 24 hours or more…….2 Don't know……..98	
Question 603 – 607 only for cases		
603. Was the water foul smelling?	Yes …….....1 No...…….....2 Don't know …….……98	
604. Did the baby stop moving in the womb?	YES ……..1 NO …….2 DON'T KNOW…….98	 →608 →608
605. When did the baby stop moving in the womb?	Before labor started ……...1 During labor ……2 Don't know ……98	
606. Were fetal heart sounds present?	Yes …….....1 No...……..2 Don't know ……..….98	 →610 →610

607- 616 Both cases and controls		
607. Where was the child born?	At home ……1 At health post……..……2 Private clinic…..…….……..3 Health center……4 Hospital …….....5 Don't know ……..……..98 Others specify_____	
608. if the baby was born at home who assisted the delivery	untrained TBA……1 Trained TBA…….2 Relatives ……..3 Kebele health manager……..4 Don't know ……..…..98 Others specify_____	
609. if the baby was born at health institution what type of delivery was it?	Normal viginal delivery……1 Vacuum extraction……..2 Operation ……3 Don't know ……..…..98 Others specify_____	
610. Was there excess bleeding on the day labor started?	Yes ……1 No..……..……2 Don't know ……..……..98	
611. Did the mother have a fever on the day labor started?	Yes ……...1 No..……2 Don't know ……..98	
612. How long did the labor pains last?	Less than 12 hours……. …….1 12-23 hours……..….. ..……2 24 hours or more……..…….. 3 Don't know ……98	
613. Was it a normal vaginal delivery?	Yes ……...1 No..……..2 Don't know ……98	→615 →615

614. What type of delivery was it?	Forceps/vacuum…… 1 Caesarean section…… 2 Other (specify)…….……6 Don't know …….98	
615. Which part of the baby came first?	Head ……1 Bottom …….…….2 Feet…….…….. 3 Arm/hand…….…… 4 Other (specify)……..……6 Don't know……..…….…….98	
616. Did the umbilical cord come out before the baby was born?	Yes ……...1 No...……...2 Don't know ……..……98	

NB Section 7 through section 12 is only for cases

***SECTION 7 INFORMATION ON THE DECEASED AND* DATE/PLACE OF DEATH**													
701 what was the name of the deceased ? **(*interviewer, use NA for still births)***													PERMID
702. was the deceased male or female	1. Male			2. Female									SEX_D
703. when was the deceased born ? DD/MM/YY……. Record 98 if do not know day or month Record 9998 if do not know year													DOB
704. How old was the deceased when she/he died death:……													Age in DAYS
705. When did s/he die ……. Record 98 if do not know day or month Record 9998 if do not know year													DOD
706. Where did (name of child) die?.	1. Hospital		2. Health centre			3.Health station							

	4.) On route to hospital or health facility	5. Home
	6. Other (specify):	

707. For deaths at hospital or health facility, record facility name and address: ----------

SECTION 8: OPEN HISTORY QUESTION

801. Could you tell me about his/her illness that led to her/ his death?

Prompt: Was there anything else?

Instructions to interviewer - Allow the respondent to tell you about the illness in his or her own words. Do not prompt except for asking whether there was anything else after the respondent finishes. Keep prompting until the respondent says there was nothing else. While recording, underline any unfamiliar terms.

_____
_____
_____
_____
_____
_____
_____
_____
_____
_____
_____
_____

802 Cause of death 1 according to respondent

_____
_____

803 Cause of death 2 according to respondent

_____
_____

Take a moment to tick all items mentioned spontaneously in the open history questionnaire. Use this to guide you through the rest of the questionnaire.

804 Symptom	**Illness day that symptom began**	**Duration of symptom (days)**	**Severity: (Mild-moderate/ Severe)**
804.1			
804.2			
804.3			
804.4			
804.5			
804.6			
804.7			

Note: **When possible, use local term for the symptom**.

805 What was the length of time the child was ill before he/she died? ……				
806 Was care sought outside the home while he/she had this illness?	1.Yes	2. No	3. Don't know	→ 808

807 (*If yes ask:*) Where or from whom did you seek care when the child was seek ? *(Record all responses)*

1. Traditional healer	2. Religious leader	3. Government hospital	4. Government health centre or clinic	5.Community health agent
6. Private clinic	7. Pharmacy, drug seller		8. Relative, friend (outside household)	
9. Holy water		Other (specify)		
808 What was the length of time of the illness immediately preceding the child death (days)			999.NK	ILLD

After respondent finishes prompt: **Did you seek care anywhere else?** ***Keep using this prompt until respondent replies that they did not seek care from anyone else.***

SECTION 9 HISTORIES OF INJURY/ACCIDENTS

901. Did the baby die from an injury or accident?	Yes …….....1 No..……..……2 Don't know ……..……..98	 → 904 → 904
902. What kind of accident did the baby suffer?	Road traffic accident.....1 Fall.....2 Drowning.....3 Poisoning.....4 Burn.....5 Violence/assault..... .....6 Bite or sting.....7 circumcision.....8	
903. Was the injury/ accident inflicted by someone else?	Yes …….....1 No..……..……..2 Don't know ……..98	
904.Did the baby suffer from any insect/animal bite that lead to his death?	Yes …….....1 No..……2 Don't know ……98	 → 1001 → 1001
905. What type of animal /insect	Dog.....1 Snake .....2 Insect.....3	

	Other.....6 Do not know.....98	
906. Did the baby die at the site where the accident occurred?	Yes …….....1 No…….2 Don't know ..……98	
907. For how long after the accident or injury did the baby survive?	Days Hrs Minutes	
908. Did the baby receive medical care before death?	1.Yes----------1 2. No----------2 3. Don't know----------3	
909. Did the baby have an ongoing chronic illness or was sick in the month before the accident or injury?	Yes…….....1 No……..……2 →1005 Don't know……98 →1005	
910. What was the illness?	_____	

SECTION 10 CONDITION OF THE BABY SOON AFTER BIRTH

1001. At birth what was the size of the baby?	Smaller than normal …….1 Normal…… ……..2 Larger than normal…..…..3 Don't know…….98	
1002. Was the baby premature?	Yes ….....1 No…….....2 → 1004 Don't know ……...98 →1004	
1003. How many months or weeks long was the pregnancy?	Months …… Weeks ……... Don't know ……. 9 8	
1004. What was the birth weight of the baby? KILOGRAMS	Kilograms …… Don't know …….……...9 8	
1005. Was anything applied to the umbilical cord stump after birth?	Yes…….....1 No.....……..2 Don't know …….98	

1006. What was it? (SPECIFY)	_____ _____ _____Specify	
1007. Were there any signs of injury or broken bones?	Yes ……..1 No..……..2 Don't know …..……98	 →1009 →1009
1008. Where were the marks/ signs of injury the body?	_____ _____ _____	
1009. Was there any sign of paralysis?	Yes ……...1 No..……..2 Don't know ……..98	
1010 Did the baby have any malformations at birth?	Yes ……..1 No..……2 Don't know ……98	 →1012 →1012
1011. What kind of malformation did the baby have?	Swelling/defect on the back ..1 Very large head……..2 Very small head …….3 Defect of lip and/or palate… 4 Other malformation(specify)…6 Don't know……..… ..98	
1012. What was the color of the baby at birth?	Normal…….... 1 Pale ……..…..2 Blue/black ……...3 Don't know ……98	
1013. Was the baby able to breathe even a little after birth?	Yes …….....1 No..……2 Don't know ……..…..98	
1014. Was the baby given assistance to breathe?	Yes …….....1 No..…….2 Don't know ……98	
1015. Was the baby able to cry even a little at birth?	Yes ……...1 No..……..2 Don't know ……98	

1016. Did the baby ever move, even a little?	Yes ……...1 No..……..2 Don't know …….98	
1017. Check codes 1013, 1015 and 1016 All codes 'NO: Other _____ Baby did not breathe Baby didn't cry Baby did not move'		→1101
1017. If the baby was not breathing, crying or moving. Was it born dead?	Yes…….....1 Yes…….....2 Don't know ……..98	→1101 →1101
1018. Was the baby macerated, that is showing the signs of decay?	Yes ……..….1 No..……...2 Don't know …..……98	→1101 →1101

SECTION 11 NEONATAL ILLNESS HISTORY

1101. Was the baby ever able to suckle or bottle-feed?	Yes …….....1 No…….2 Don't know ……98	
1102How soon after birth did the baby suckle or bottle-feed?	Hours Days Do not know……..98	
1103. Did the baby stop suckling or bottle-feeding?	Yes ……..……1 No……..……2 Don't know ……..98	→1105 →1105
1104. How many days after birth did the baby stop suckling or bottle-feeding?	Days_____ Don't know……98	
1105. Was the breastfeeding exclusive	Yes ……1 No……..…..…2 Don't know ……..98	
1106. Did the baby have spasms or convulsions?	Yes …….....1 No……..……..2	→ 1108

	Don't know ……..…..98	→ 1108
1107. How soon after birth did the convulsions start?	Days…… Don't know……98	
1108. Did the baby become stiff and arched backwards?	Yes …….....1 No……..…2 Don't know ……..98	 → 1111 → 1111
1109.Did the baby have a bulging of the fontanelle?	Yes ……1 No……....2 Don't know ……..98	 →1111 →1111
1110. How many days after birth did the baby have the bulging?	Days_____ Don't know……98	
1111. Did the baby become unresponsive or unconscious?	Yes …….....1 No……..……..…....2 Don't know ……..…98	 → 1113 → 1113
1112. How many days after birth did the baby become unresponsive or unconscious?'	Days…… Don't know……98	
1113. Did the baby have a fever?	Yes ……....1 No……..……..……2 Don't know ……98	 → 1115 → 1115
1114. How many days after birth did the baby have a fever?	Days_____ Don't know……98	

1115. Did the baby become cold to the touch?	Yes …….....1 No…….2 Don't know ……98	 →1117 →1117
1116. How many days after birth did the baby become cold to the touch?	Days_____ Don't know……98	
1117. Did the baby have a cough?	Yes …….....1 No…….……2 Don't know ……98	 →1119 →1119
1118. How many days after birth did the baby start to cough?	Days_____ Don't know……98	
1119. Did the baby have fast breathing?	Yes ……1 No……..……2 Don't know ……98	 →1121 →1121
1120. How many days after birth did the baby start breathing fast?	Days_____ Don't know……..……98	
1121. Did the baby have difficulty breathing?	Yes …….....1 No…….2 Don't know ……98	 →1126 →1126
722. How many days after birth did the baby start having difficulty in breathing?	Days_____ Don't know……98	
1123. Did the baby have chest in drawing?	Yes ……...1 No…….2 Don't know ……98	
1124. Did the baby have grunting?	Yes …….....1 No…….2 Don't know ……98	
1125. Did the baby have flaring of the nostrils?	Yes…..…….....1 No……..……..……..2 Don't know ……..……98	
1126. Did the baby have diarrhea?	Yes ……..1 No…….2 Don't know ……98	 →1130 →1130

1127. How many days after birth did the baby have diarrhoea?	Days_____ Don't know……98	
1128. When the diarrhoea was most severe, how many times did the baby pass stools in a day?	Number…… Don't know……98	
1129. Was there blood in the stools?	Yes …….....1 No…….2 Don't know ……98	
1130. Did the baby have vomiting?	Yes …….....1 No…….2 Don't know ……98	 → 1230 → 1230
1131. How many days after birth did vomiting start?	Days…….…… Don't know……98	
1132. When the vomiting was most severe, how many times did the baby vomit in a day?	Number of times…… Don't know…..……98	
1133. Did the baby have abdominal distension?	Yes …….....1 No……..……..2 Don't know ……..……98	
1134. How many days after birth did the baby have abdominal distension?	Days…… Don't know……98	
1135. Did the baby have redness around, or drainage from, the umbilical cord stump	Yes …….....1 No……..……..2 Don't know ……..98	
1136. Dd the baby have postural skin rash/ areas of skin that were red, and hot or peeling?	Yes …….....1 No…….2 Don't know ……98	
1137.Did the baby have yellow palms or soles?	Yes ……...1 No…….2 Don't know ……98	
1138. How many days after birth did the yellow palms or soles begin?	Days_____ Don't know……98	
1139. For how many days did the baby have yellow palms or soles?	Days_____ Don't know……98	

SECTION 12 TREATMENT AND HEALTH SERVICE USE FOR THE FINAL ILLNESS

1201. Did the baby receive any treatment for the illness that led to death?	YES .....1 NO…… 2	→ Stop the interview
1202. Can you please list the treatments the baby was given for the illness that led to death? COPY FROM PRESCRIPTION/DISCHARGE NOTES IF AVAILABLE		
1203. Please tell me at which of the following places or facilities the baby received treatment during the illness that led to death:	Yes No DK 1 Ho 1 2 98 2 Traditional healer? 1 2 98 3 Government clinic? 1 2 98 4 Government hospital? 1 2 98 5 Private clinic? 1 2 98 6 Private hospital? 1 2 98 7 Pharmacy, drug seller? 1 2 98 8 Any other place 1 2 98	
1204.I n the month before death, how many contacts with formal health services did the baby have?	Numbers of contacts_____	
1205. Did a health care worker tell you the cause of death?	Yes …….....1 No…….2 Don't know …….....98	
1206. What did the health care worker say?	----------	

9.2 Standardized Verbal Autopsy questionnaire Afaan Oromo Version

Qajeelfama odeffannoo sassabaaf/duuf:

Gaaffiilee eegaluun keetiin dursa eenyummaa kee fi kaayyoo daawwannoo keetii sirriitti ibsuu qabda. Gaafileewwan unka odeeffanno irratti argaman haadha daa`ima hanga guyyaa 28 keessatti du`eef/duuteef yookaan ga`eessa guddiftuu daa`imaa yeroo daa`imni du`e/duute bira ture gaafachuu qabda. Yoo argachuu hin dandeenye yeroo biraa haati yookaan abbaan daa`ima du`ee /duutee yookaan guddiftuu daa`imaa manatti argamuu dandaa`an ollaa gaafattee deddeebitee gaafachuu qabda.

UNKA WAALTAWAA ODEFFANNOO DU`A DAA`IMMAN DHALATANII HANGA JI`A TOKKOO KEESSAATTI DU`AN/DU`ANII DHATAN ITTIIN SASSAABUUF QOPHAA`E

KUTAA 1: NAMA ODEFFANNOO SASSABAA/BDUUF.

Daa`ima dhalatee du`e/duuteef ykn du`ee/duutee dhalateef/dhalatteef lakkobsa. 1

Daa`ama dhalatee lubbuun jiruuf lakkofsa 2 saanduqa keessatti barressi.

Daawwannaa isa jalqabaa Odeeffannoo sassaabuu/duu	**1**	**2**	**3**	**Daawwannaa isa dhumaa** **(Final visit)**
Guyyaa **Koodii bu`aa daawwaannaa**	_____ _____ _____	_____ _____ _____	_____ _____ _____	Guyyaa_____ Baatii_____ Bara_____ Bu`aa daawwannaa___
Guyyaa daawwannaa itti aanu Yeroo(sa`atii)	_____ _____	_____ _____	…….. ……	Guyyaa daawwannaa walii galatti ------

Bakka bu`aa(koodii) daawwaannaa

1= xumura 4= Beellama 8.deebii debisuu hin kan hin dandeenye.

2=mana hin jiran 5= ni didan 7.gara tokkon kan guutame

3=yeroo dheeraaf bakka biraa deemaniiru 6 =nama sirriitti deebisuu danda`u hin arganne

9 = kan biroo (adda baasii barreessi)_____

Loqoda/afaan odeeffannoon ittiin sassabame(language used in interview)

1.Afan oromoo 2.Afaan amhaaraa 3.kan biraa(ibsi)_____

To`ataa; Maqaa, Mallattoo fi Guyyaa ……..……..….	……
Odeeffannoo sassaabaa/duu; Mallattoo fi Guyyaa……..	……

Unkaa waliigaltee

Nagaa bultanii/oltanii! Maqaan kiyya_____ jedhama, dhaabbata miti mootummaa dhimma fayyaa haadhotii fi daa`ammanii yookaan MaNHEP jedhamu waliin hojjedha.

Nuti amma yeroo kana sababoota du`a daa`immanii ilaalchisee odeeffannoo hawaasa irraa sassaabuu irratti argamna. Isin immoo qoo'annoo kana keessatti akka hirmaattaniif filatamtaniittu; gaaffiin tokko tokko nuti isin gaafannuuf deebii nuuf kennitu jennee abdii guddaa qabna.Wanta nuti isin hubachiisuu barbaannu deebiin isin nuuf deebistan/kennitan marti icciitiin kan eegamu ta'a.Qo`annaa kana keessatti hirmaachuun keessan guutummaatti fedhii keessan irratti kan hundaa`e ta`a.Kana malees qoo'annaa kana keessatti hirmaachuu fi hirmaachuu dhiisuu, gaaffii isin hin ilaallanne irra darbuu, akkasumas gaaffii fi deebii itti fufuu yoo hin barbaanne ta'e gidduutti dhaabuuf mirga guutuu qabdu. Gaaffiin tokko tokko waa'ee jireenya dhuunfaa keessanii waan ilaallatuuf deebisuuf ulfaataa ta'u ni danda'an. Deebisuu fi dhiisuu keessaniif tarkaanfiin isin irratti fudhatamu tokkollee hin jiru. Haata'u malee galmaan ga'umsa kaayyoo qorannoo kanaaf hirmaannan keessan baay'ee barbaachisaa fi kan bu'aa olaanaa qabudha.Bu`aan qo`annaa kanaa naannoo kanaa fi guutuu biyyoolessaatti tajaajila fayyaa daa`immanii fi haadholii fooyyessuuf faayidaa ol-aanaa waan qabuuf guutummaatti akka hirmaattaniif isinan jajjabeessa.Hirmaachuu keessaniif wanti isin kaffaltaniis ta`e isinii kaffalamu hin jiru. Gaaffii gaafattan yoo qabaattan isiniif deebisuuf nan danda`a. Gaaffiwwaan ani deebisuu hin dadndeenye yoo jiraate maqaa fi lakkoofsa bilbilaa garee to`attootaa armaan gadii gargaaramuu ni dandeessu?

1. **Dr.Mitikkee Mollaa Lakk.Bil. 0911131805**
2. **Elias Merdassa Lakk.Bil. 0911557735**

Odeeffannoo armaan olii irratti hunda'uudhaan, qoo'annoo kana keessatti feedhii kiyyaan qoo'annoo mata dureen isaa'**sababoota du`a daa`imman du`anii dhalatanii fi dhalatanii hanga turban tokko (guyyoota torba) keessatti du`an'** jedhu irratti hirmaachuuf unka walii galtee armaan olitti dubbiseen/naaf dubbiffame irratti hundaa`uun wanta naaf hin galin ibsa gaafachuuf carraan guutuun naaf kennamee jira, walii galuu kiyya mallattoo kiyyaan nan mirkaneessa.

Mallattoo_____

Guyyaa_____

Maqaa fi mallattoo nama odeeffannoo sassabuu: Maqaa _____mallattoo_____

Baay'ee galatoomaa!

Qo'annaa kana keessatti hirmaachuuf fedha ni qabduu?

Eeyyee ……....1

Lakki ……..2. (gaaffii fi deebii xumuri)

Deebiin keessan 'Eeyyee' yoo ta'e gara gaaffii fi deebii koottan darba.

KUTAA 2: GAAFFIIWWAN NAMA ODEEFFANNOO KENNU ILLALATAN

201. Yeroo gaaffilee eegalte galmeessi	Sa`atii_____ Daqiiqaa_____
202 .Maqaa nama odeeffannoo kennee:	_____
203. Walitti dhufeenya nama odeeffannoo kennee daa`ima waliin qaban (maqaa daa`ama du`ee waami)? (Lakkoobsa isaa itti aanu itti mari/fili)	1. Abbaa daa`imaa 2. Haadha daa`imaa 3. Haadha/abbaa buddeenaa 4. akaakayyuu/akaakilee 5.fira 6. Firummaa hin qabne *7. kan biroo (ibsi):*_____

204. Barressuu fi Dubbisuu dandeessaa?	1. Eeyyee	2.Lakkii

205. Sadarkaa barumsaa olaanaa xumurte?

0=kan barreessuu fi dubbisuu hin dandenye		11= kutaa 10ffaa kan xumurte/xumure
1=waggaa tokko gadi	6= kutaa 5ffaa kan xumurte/xumure	12= kutaa 11ffaa kan xumurte/xumure
2=kutaa 1ffaa kan xumurte/xumure	7= kutaa 6ffaa kan xumurte/xumure	13= kutaa 12ffaa kan xumurte/xumure
3= kutaa 2ffaa kan xumurte/xumure	8= kutaa 7ffaa kan xumurte/xumure	14= 10+2 dipiloomaa
4= kutaa 3ffaa kan xumurte/xumure	9= kutaa 8ffaa kan xumurte/xumure	15= 10+3 dipiloomaa
5= kutaa 4ffaa kan xumurte/xumure	10= kutaa 9ffaa kan xumurte/xumure	16=universiitii

206. Yogguu gaaffii fi deebii geggeessite namni biraan achi tureeraa?	1. Eeyyee		2.Lakkii	
	Yeroo geeffiifi deebii kana waliin turan		Yeroo daa`imni dukkubsachaa ture kana waliin turan	
Yogguu gaaffii fi deebii geggeessite namni achi ture kan armaan gadii keessaa.	Eeyyee	Lakkii	Eeyyee	Lakkii
1.Abbaa daa`imaa	1	2	1	2
2.Haadha daa`imaa	1	2	1	2
3.obboleessa/obboleettii	1	2	1	2
4.eessuma	1	2	1	2
5.akaakayyuu/akaakilee	1	2	1	2
6.fira	1	2	1	2
7.Firummaa kan hin qabne	1	2	1	2

207. Maqaa daa`ima dhalatee du`ee/lubbun jiruu bakka duwwaa irratti barreessi.	_____
208. Umurii daa`ima dhalatee du`ee/lubbun jiruu (guyyaan galmmessi)?	Guyyaa Sa`atii _____
209. Saala daa`imaa	1.dhiira 2.dhalaa

KUTAA 3 : GAAFFIWWAN HAALA JIREENYAA FI TAJAAJILA FAYYAA

301. Maddi Galii maatii keessaa inni guddaan maali? ***Ala lama irra deddeebi`ii ' <u>kanbiroo?'</u> jechuudhaan gaafadhu 'waanta sitti himan hunda filii lakkofsa isaa itti mari.***	1 =Qotee bulaa 2 = hojii qulqullinaa 3 = hojii ijaarsaa 4 = daldala xixiqqaa 5 = huccuu hodhuu/huccuu qopheessaa/rifeensa sirreessaa 6 = keessummeessaa/tuu / mana nyaataa/mana dhugaatii 7 = gargaarsa maallaqaa biyya alaa irraa/ ijoollee/irraa ergamu 8. = gargaarsa maallaqaa guddiftuurraa Ykn maatii kan biraa biyya keessaa irraa 9 = maallaqa daldaala farsoo, araqee, dhugaatii alkoolii kan biraa irraa argamu 10 =makaanika bishaanii,elektriikii,ijaarsa manaa 11 = Ogeessa (fayyaa, barsiisaa/tuu, itti gaafatamaa, kkf.) 12= soorama/xuurataa 13 = kan biraa? (ibsi) _____
. 302. Mana ati keessa jirrattu;kan Kiraayii, dhuunfaa kiyya, kennaa.	1 = dhuunfaa kiyya 2 = kennaa hojjechiisaa 3 = kennaa firaa/ kennaa maatii 4 = kiraayii hojjechisa irraa 5 = kiraayii gandaa irraa 6 = kiraayii nama dhuunfaa (gillii) irraa 7 = kiraayii kan biraa irraa (ibsi)_____
303. Manni ati keessa jiraattu kutaa meeqa qaba?	Lakkofsa kutaa galameessi ☐☐
304. Kutaan horii fi namaa gargar bahee jiraa?	1=Eeyyee 2=Lakkii
305. Manni ati keessa jiraattu foddaa (maskootii) meeqa qaba?	☐☐
. 306. Baaxii Manichaa maalirraa hojjetame?	1=Qorqorroo 2 =citaa(marga) 3 = kan biraa (ibsi) _____
. 307. Lafti manichaa maalirraa hojjetame?	1.biyyoo/biyyee/dhoqqee 2.simmontoo/liishoo 3. chidii 4.saleena

	5.shakilaa 6.laastika uwwisame 7.muka xaawulaa 8.kan biraa(ibsi)_____	
308. Mana jireenyaa keessaatii nyaata ni qopheessituu?	1. yeroo mara 2. darbee darbee 3.tasuma mana jireenyaa keessatti hin qopheessinu.	
. 309. Yeroo hedduu Maddi annisaa nyaata ittiin bilcheeffattan maali?	1 = Qoraan guuruun 2 = Qoraan Bitameen 3 = Kasala 4 = Gaasii adii 5 = Buta gaasii 6 = ibsaa(electrikii) 7 = baala/koboota(dhoqqee loonii) 8 = kan biraa (ibsi) _____	
310. Mana fincaanii qabduu?	1.eeyyee 2.lakkii(hin qabnu)	→ 313
311. Mana fincaanii gosa kam qabdu?	1 = dhuunfaa kan bishaaniin hojjetu 2 = ollaa wajjin kan bishaaniin hojjetu 3 = kan biyyee dhuunfaa(daraq) 4 = kan biyyee olla waliin 5 = baaldii/laastika 6 = caakkaa(bosona) 7 = kan biraa (ibsi) _____	
312. Maatii Hunduu mana fincaanii ni fayyadamuu?	1. eyyee ,yeroo mara 2. yeroo tokko tokko 3. Lakkii	
. 313. Maddi bishaan dhugaatii?	1 = boombaa 2 = bishaan gudgu`aadii eegamaa(kan dallaan itti	

	ijaarame) 3 = bishaan gudgu`aadii kan dallaan itti hin ijaarramne 4= bishaan roobaa 5 = bishaan lagaa, haroo.
Amma immoo waa`ee qabeenyaa akka maattiitti yookaan akka dhuunfaatti qabdan isin gaafadha.	
314. Maatii kana keessaa namni lafa qonnaaf ta`u qabu jiraa?	1 = Eeyyee 2= Lakkii → 316
315. Hektaara (gamdii) meeqa ta`a?	cimdii_____ gamzii_____ qaadaa_____
316. Maatiin keessan horii qabduu?	1 = Eeyyee 2= Lakkii → 318
317. Horiiwwan armaan gaditti tarree lokkobsaan meeqa ta`uu? Horii gaafaa Saawwaan aannanii, qotiyyoo/ korma? Farda, harree? Gaala? Re`ee? Hoolaa? Lukkuu?	Horii gaafaa_____ Saawwaan aannanii, qotiyyoo/ korma..... Farda, harree..... Gaala..... Re`ee……... Hoolaa…… Lukkuu.....

318. Gaaffilee armaang gadii dubbisi ***Qabeenyaawwan maatiin qaban Lakkofsa '1' fili.***	Qabeenyaawwan	Eeyee	Lakkii
	1=elektrikii	1	2
	2 = Raadiyoo	1	2
	3= Telezhinii	1	2
	4=Bilbila manaa	1	2
	5.=Bilbila Mobaayilaa	1	2
	6 =eelee elektrikaa	1	2
	7 = Faanosii/kurazi	1	2

	8 = Siree/algaa	1	2
	9 = meeshaa qonnaa	1	2
	10 = tiraaktera	1	2
	11 = saayikila mootoraa	1	2
	12= Gaarii	1	2
	13= oomisha gabaa, kanneen akka bunaa, saalixa,damma,xaafii, kkf..	1	2
	14 = Xarapheezaa	1	2
	15.= Firiijii	1	2
	16= stoovii	1	2
	17= konkolaataa	1	2
	18= Teessoo	1	2
319. Waraqaa Qusannoo yeroo attatamaa qabduu?	1 =Eeyyee 0 = Lakkii → 323		
. 320. Yeroo ammaa Waraqaa qusannaa kee eessa kaawwatta? ***Yeroo lama irra deddeebi`ii gaafadhu waan itti dabalataa yoo jiraate?' deebii hundaa galmeessi***	1 = Baankii 2 = Maaykiroo faayinaansii 3 = Iqqubii 4 = baankii Sossocho`aa 5 = mana 6 = hiriyaa bira 7 = kan biraa (ibsi) _____		
321. Yeroo ammaa kanaQarshii hangam qusattanii qabdu?	|____|____|____|____| qarshii(birrii) 98=deebisuuf fedhii hin qaban.		
323. Yoo maatiin tajaajila fayyaatiif maallaqa gahaa hin qabaanne namni/dhaabati isiniif liqeessu waan isinitti fakkaataa?	1. eeyyee sirriitti 2. natti fakkaata 3. natti hin fakkaatu 4. lakkii tasumaa hin jiru		

324. Dhaabbata Fayyaa dhiyeenyatti argachuu dandeessan kami?	1. Hospitaala 2. Buufata Fayyaa 3. Kiliinika dhuunfaa 4. Kellaa fayyaa
325. Dhaabbanni Fayyaa d hiyeenyatti argamu kun hangam fagaata?	_____fageenya miilaan deemsisu (g uyyaan, sa`atiin).
326. Hospitaalli dhiheenyatti argamu giddu galeessaa hangam fagaata?	_____ guyyaan (sa`atiin).
327. Maatiin keessan yoo dhukkubsatan eessatti yaalsistu (geechitu)?	1. Yaalaa aadaa 2. Mana amantaa 3. Hospitaala Uummataa 4. Buufata Fayyaa/kilinnika 5. Killaa Fayyaa 6. kiliinika Dhuunfaa 7. Faarmaasii 9. Xabala 10.Kan biraa (ibsi)_____

KUTAA 4: GAAFFIWWAN FAYYAA HAADHOLII FI WANTOOTA HIDHATA QABAN

401 .Umuriin Haadhaa yeroo mucaan du`e hangam ture?	Waggaa _____ Hin beeku_____98	
402. Haalli Fuudhaa /heeruma Haadhaa yeroo mucaan du`e akkam ture?	Kan heerumte_____1 Kan hin heerumin/hin fuudhin_____2 Kan hiikte/hike_____3 Kan gargar baate/ba`e_____4 Kan haati/abbaan manaa irraa du'e/duute _____5	
403. Haala Barnoota haadhaa 0=dubbisu fi barreessuu kan hin dandeenye 11= kutaa 10ffaa kan xumurte/xumure 1=waggaa tokko gadi 6= kutaa 5ffaa kan xumurte/xumure 12= kutaa 11ffaa kan xumurte/xumure 2=kutaa 1ffaa kan xumurte/xumure 7= kutaa 6ffaa kan xumurte/xumure 13= kutaa 12ffaa kan xumurte/xumure 3= kutaa 2ffaa kan xumurte/xumure 8= kutaa 7ffaa kan xumurte/xumure 14= 10+2 dipiloomaa 4= kutaa 3ffaa kan xumurte/xumure 9= kutaa 8ffaa kan xumurte/xumure 15= 10+3 dipiloomaa		

5= kutaa 4ffaa kan xumurte/xumure 10= kutaa 9ffaa kan xumurte/xumure 16=universiitii		
404 .Haala Barnoota abbaa mucaa/manaa? 0=dubbisu fi barreessuu kan hin dandeenye 11= kutaa 10ffaa kan xumurte/xumure 1=waggaa tokko gadi 6= kutaa 5ffaa kan xumurte/xumure 12= kutaa 11ffaa kan xumurte/xumure 2=kutaa 1ffaa kan xumurte/xumure 7= kutaa 6ffaa kan xumurte/xumure 13= kutaa 12ffaa kan xumurte/xumure 3= kutaa 2ffaa kan xumurte/xumure 8= kutaa 7ffaa kan xumurte/xumure 14= 10+2 dipiloomaa 4= kutaa 3ffaa kan xumurte/xumure 9= kutaa 8ffaa kan xumurte/xumure 15= 10+3 dipiloomaa 5= kutaa 4ffaa kan xumurte/xumure 10= kutaa 9ffaa kan xumurte/xumure 16=universiitii		
405. Hojii haadha mucaa/manaa? **<u>Hubachiisa</u>**:Haati tokko hojii tokkoo ol-qabaachuu waan dandeessuuf kan siif deebisan hunda galmeessi	Haadha manaa.....1 Hajjettuu warshaa.....2 Hojjettuu Hawaasaa….....3 Daldaaltuu ….....4 Qotaa bulaa.....5 Kan biraa(ibsi).....6 Hojjettuu Guyyaa/qansiraa.....7	
406. Baayyina maatii?	Lakkobsaan_____	
407. Haati mucaa/manaa hordoffii ulfaa da`umsa duraa hordofaa turtee?	Eeyyee..…….....1 Lakkii…..……..2 → 412 Hin beeku…….……...98 → 412	
408. Ji`a meeqaffaa irraa eegaltee hordofaa turtee?	Ji`oota jalqabaa sadan keessa... 1 Ji`oota lammaffaa sadan keessa.2 Ji`oota sadaffaa/dhumaa sadan keessa……...3	
409. Essatti hordofaa turte?	Hospitaala.....1 Buufata Fayyaa.....2 Killaa Fayyaa.....3 Kiliinika Dhuunfaa.....4	
410. Hordoffii ulfaa da`umsa duraa keessatti rakkoon fayyaa si quunname jiraa ?	1.Eeyyee……..……1 2.Lakkii……..…….2 → 12	
411. Rakkoo sanaaf gorsa ogeessa fayyaa argattee ?	Eeyyee…….....1	

	Lakkii……..…….....2 Hin beeku…..…….....98	
412. Haati mucaaTalaallii Teetanesii talaalsifamtee?	Eeyyee…….....1 Lakkii…….....2 → 414 Hin beeku…..…….....98 → 414	
413. Doozii/ yeroo meeqaaf talaalmte?	Doozii meeqa _____ Hin beeku……98	
414. Yeroo ammaa fayyaa haadhaa haala akkamii irraatti argama?	Fayyaa……..……. ……...1 Dhukkubssachaa jirti..……...2 Duutee jirti…….….....3 Hin beeku..……..98	
415. Ulfi sirraa bahee ni beekaa?	Eeyyee…….....1 Lakkii……2 → 417 Hin beeku..…….…….....98 → 417	
416. Yeroo meeqa Ulfi siirraa bahee beeka?	Lakkoobsaan_____	
417. Kana dura daa`imni dhalatee hanga ji`a tokko keessatti siduraa du`ee beektaa?	Eeyyee…….....1 Lakkii……2 → 419	
418. Yoo siduraa du`e ta`e daa`imman meeqatu siduraa du`e?	Lakkoobsaan _____	
419. Daa`imni kee kana dura godhatte inni dhumaa kun yeroo eegametti dhalatee/ttee?	Yerootti kan dhalate/tte.....1 Yeroo itti eegame durseee kan dhalate/dhalatte…….....2 Yeroo itti eegame booda/ dabarsee kan dhalate/dhalatte…..……..3 Hin beeku……..……..98	

KUTAA 5: GAAFFIWWAN HAALA (SEENAA) ULFAAN WAL-QABATAN

501. Kana dura daa`imman meeqa godhatte, (du`anii kan dhalatan dabalatee)?	Lakkoobsaan kan lubbuun dhalata/du`anii kan dhalatan dabalatee Hin beeku..... 98	☐☐
502. Yeroo daa`imni lubbuun /du`ee dhalate ulfikee ji`a(baatii) meeqa ture?	Umurii ulfaa_____ Hin beeku…..... 98	☐☐

503. Ulfichi yeroo eegame dursee dhalatee/dhufee?	Eeyyee..……..…1 Lakkii……..……2 Hin beeku.……98	 → 505 → 505
504. Torban meeqa dursee dhalate?	Torbaniin galmeessi_____ Hin beeku…….98	
505. Yeroo Ulfaa haati daa`imaa dhukkuboota armaan gadii keessaa kam dhukkubsattee turte? 1. Dhiibbaa dhiigaa? 2. Dhukkuba Onnee? 3 .Dhukkuba Sukkaaraa? 4. Dhukkuba kuffisuu, joonjii/lafaan martoo? 5..kan biraa(ibsi)_____	**Eeyyee Lakkii Hin beeku** Dhiibbaa dhiigaa.....1 2 98 Dhukkuba Onnee……1 2 98 Dhukkuba Sukkaaraa…….1 2 98 Dhukkuba kuffisuu…….1 2 98 kan biraa(ibsi)_____	
506. Baatiiwwaan gara dhumaa sadan keessaatti haati daa`imaa dhukkuboota ibsaman keessaa dhukkubsattee beektii? 1. Dhiiga karaa qaama hormaataa dhangala`u? 2. Dhangala`aa ajawaa qaama hormaataan ba`u? 3. Fuula dhiitessaa? 4. Mataa dhukkubbii? 5. Rakkoo agartuu (ijaa)? 6. Joonjii? Lafa ittiin martuu? 7. Qaama gubaa (ho`isaa)? 8. Dhukkuba garaa? 9. Gogaan qaamaa addaachuu fi hafuura kutaa (lamaanuu)? 10. Dhukkuba kan biraa? Ibsi	**Eeyyee lakkii Hin beeku** 1 2 98 1 2 98 1 2 98 1 2 98 1 2 98 1 2 98 1 2 98 1 2 98 1 2 98 _____	
507 .Daa`imni dhalate/tte lakkoofsaan meeqa turan?	Tokko..……...1 Lakkuu/ lama……..…..….2 Sadii/sadii olii ……...3 Hin beeku...……98	

508 .Daa`inmi du`e/te kun isa/ishii meeqaffaa dha?	Jalqaba……….……..… ….……….....1 Lammaffaa……….…… …………...2 Sadaffaa/olii…………………………...3 Hin beeku……………………………98	
509. Daa`ima kee isa xumuraa fi ulfa isa xumuraaa jidduu waggaa meeqa ture?	Waggaa tokko………………………..1 Waggaa tokkoo fi walakkaa…………2 Waggaa lama…………………………3 Waggaa lamaa oli……………………4 Hin beeku……………………………98	
510. Daa`ima kee isa xumuraa erga deessee booda guyyaa torba (7) keessaatti tajaajila ogeessa fayyaan argattee turtee ?	Eeyyee………………………………..1 Lakkiii………………………...……2 Hin beeku……………………………98	

<u>KUTAA 6: GAAFFIWWAN HAALA(SEENAA) DA`UMSAAN WAL-QABATAN</u>

601. Bishaan sammuu yeroo akkamii dhangala`e?	Utuu Ciniinsuun hin eegalin…………..1 Ciniinsuun keessa…..…………………2 Hin beeku……………………………98	
602. Erga Bishaan sammuu dhangala`ee booda daa`imnitichi sa`atii meeqa booda dhalate/tte ?	Sa`atii 24 dursee………………………1 Sa`atii 24 booda……………………….2 Hin beeku.……………………………98	

Gaaffileen 603 – 607 jiran Daa`mman du`aan dhalatan/lubbuun dhalatanii torba tokko keessatti du`aniif qofaaf kan quphaa`e

603. Bishaan sammuu sun ni ajawaa turee?	Eeyyee..………….............1 Lakkii.…………………....2 Hin beeku.………………98	
604. Daa`imni gadameessa keessa utuu jiruu sochii kan dhaabe?	Eeyyee………………..…..1 Lakkii…………………….2 Hin beeku……………....98	→ 608 → 608
605. Daa`imni gadameessa keessa utuu jiruu sochii kan	Ciniinsuu dura …………..1	

dhaabee yoom ture?	Ciniinsuu booda……2 Hin beeku ……98	
606. Sagaleen dhahannaa onnee daa`ima du`ee ni dhagama turee?	Eeyyee …….....1 Lakkii…….2 Hin beeku…….98	→ 610 → 610
Gaafileen 607- 616 jiran daa`imman lubbuu jiranifii, du`aanii dhalata,dhalatanii torban tokko keessaatti du`aniif qophaa`e.		
607. Daa'mni eessaatti dhalate?	Manatti .....1 kellaa fayyaa……...2 kilinika dhuunfaa……....3 Buufata Fayyaa.....4 Hospitaala…….……5 Hin beeku……98 kan biro ibsi_____	
608. Daamni manatti kan dhalate yoo tahe eenyuutu deechise?	Deechistuu aadaa hin leenjine…..1 Deechistuu aadaa kan leenjite….2 Fira …….....3 Itti waamamaa fayyaa gandaa….4 Hin beeku……98 Kan biroo ibsi_____	
609.Daamni dhaabbata fayyaatti kan dhalate yoo tahe Akkamiin Dhalate.	Nagaan karaa qaama hormaataa..1 Meeshaadhaan karaa qaama Hormaataaa……..2 Baqaqsanii hodhuudhaan……3 Hin beeku……98 Kan biro ibsi_____	
610. Yeroo ciniinsuun si eegale dhiiga hedduutu sidhangalee turee?	Eeyyee …….....1 Lakkii…….2 Hin beeku…….98	
611. Guyyaa ciniinsuun eegale haati daa`imaa ho`ina qaamaa qabdi turtee?	Eeyyee …….....1 Lakkii…….2 Hin beeku……98	
612. Dhukkubbii ciniinsuu yeroo hangamiif sirra ture?	Sa`atii 12 gadi…….……1 Sa`atii 12-24 gadi……..…2 Sa`atii 24 oli…….. 3	

	Hin beeku ……98	
613. Daa`imni nagaan karaa qaama wal-hormaataan kan dhalatee dhaa?	Eeyyee …….....1 Lakkii…….2 → 613 Hin beeku…….98 → 613	
614. Da`umsichi gosa akkamiiti?	Foorceepsii/vaakiyuum meeshaan harkisamee kan dhalate ……. 1 Baqaqsanii hodhuu…… …2 Kan biraa (ibsi)……..…..6 Hin beeku.. …….....98	
615. Qaama daa`imaa isa kamtu dura dhufe?	Mataa…….……1 Teessuma.… …….…….....2 Quba miilaa……...3 Harka ..…….4 Kan biraa(ibsi)……6 Hin beeku…… 98	
616. Hiddi handhuura daa`imaa utuu daa`imni hin dhalatin dursee argamee?	Eeyyee……....1 Lakkii…….2 Hin beeku ……98	

Gaaffileen kutaa 7-12 jiran daa`imman warra du`anii dhalatan ykn lubbuun dhalatanii torban tokko keessatti du`an qofaaf kan qophaa`e

KUTAA 7 **GAAFFIWWAN** ***GUYYAA FI BAKKA DAA`IMA DU`EE/TEE ILAALLATAN***

701. Maqaa daa`ima du`ee/tee eenyu jedhama? Yoo maqaa hin qaabanne **'NA'** gargaarami.	Maqaa daa`imaa_____	PERMID

702. Saalli daa`ima du`ee/tee maal ture?	1. Dhiira	2. Dhalaa	SEX_D

703. Daa`ima du`ee/tee yoom dhalate/tte? Guyyaa /Baatii/bara_____/_____/_____ Yoo guyyaa fi baatii daa`imni itti dhalate hin beekamne 98 barreessi						DOB

Yoo barri daa`imni itti dhalate hin beekamne 9998 barreessi						
704. Umuriin/waggaan daa`imichaa/ttii yeroo duutu/du`e guyyaa meeqa ture/rte_____						Age in DAYS
705. Daamni yoom du`e/te: guyyaa/ _____/baatii_____/bara_____ Yoo guyyaa fi baatii daa`imni itti du`e/te hin beekamne 98 barreessi Yoo barri daa`imni itti du`e/te hin beekamne 9998 barreessi						DOD

706. Eessatti (maqaa daa`imaa waami) duute/`e?	1. Hospitaala 2. Buufata Fayyaa 3.Kellaa fayyaa 4. utuu gara mana yaalaa geessinuu karaa irratti 5. Manatti 6. kan biraa (Ibsi):

707. Yoo dhaabbata fayyaa (hospitaala ykn Buufata fayyaatti) du`e/te maqaa fi teessoo: galmeessi _____

KUTAA 8: GAAFFIWWAN HAALOTA BANAMAA ILAALLATAN

801. Yeroo tokko waa`ee dhukkuba daa`ima kanaa utuu hin du`in dura yeroo dhukkusataa ture natti himuu dandeessu ?

Irra deddeebi`ii gaafadhu: Kan irraanfatame yoo jiraate?

Qajeelfama gaafataaf - Nama deebii siif kennuuf akka inni/ishiin jecha ofiisaaniitiin deebisaniif carraa kenniif. Sababoota dhukkuba daa`imaa duraa duubaan tartiiba isaanii eegii <u>sa`atii</u> mallattoowwan dhukkubaa itti eegalan galmeessi. Hanga deebisaa/deebistuun kanuma/xumureera/ siin jettutti /jedhutti gaafachuu kee ittuma fufi. Jechoota haaraa ati hin beekne jala sarari.

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802. Sababa du`a daa`imaa isa tokkoffaa namni gaaffii siif deebise sitti hime barreessi

_____
_____

803 Sababa du`a daa`imaa isa lammaffaa namni gaaffii siif deebise sitti hime barreessi

_____
_____

Hubachiisa:deebii deebisaan fuula armaan oliirratti(fuula15) irratti siif deebise hunda yeroo muraasaaf suuta jedhii ilaalii gabatee armaan gadii(gaaffii 804) kana keessatti katabi/barreessi.

804. Mallattoowwan	**Guyyaan mallattoowwan itti argamuu eegalan**	**Guyyoota meeqaaf mallattoowwan irra turan(lakk.guyyoota katabi)**	**Cimina: (salphaa-giddu galeessa/ cimaa) jechuudhaan galmeesse**
804.1			
804.2			
804.3			
804.4			
804.5			
804.6			
804.7			

Hubachiisa: Mallattowwan kana ibsuuf yoo dandaa`ame jechoota naannootti beekaman gargaarami

805 .Daa`imni kun utuu hin du`in dursee yeroo hammamiif dhukkubsataa ture_____			
806. Yeroo daa`imni dhukkubsataa ture mana yaalaa geessitanii?	1.Eeyyee 2. lakkii → 808 3. hin beeku → 808		
807. Yoo eeyyee deebisan itti fufii gaaffii itti aanu kana gaafadhu: essatti geessitan? (deebii hundaa katabi)	1. Ogeessa aadaa 2.Geggessaa amantaa 3. Hospitaala mootummaa 4. Buufata fayyaa 5.Hojjetaa exteenshii fayyaa 6. Kiliinika dhuunfaa 7. Faarmaasii 8. fira 9. Xabala 10.Kan biraa (ibsi)_____		
808. Dhukkubichi odoo daa`imni hin du`in guyyaa meeqaaf irra ture?		999.hin beeku	ILLD

KUTAA 9 GAAFFIWWAN HAALA (SEENAA) BALAA DAA`IMA IRRA GAHE ILAALLATAN

901. Daa`imni kan du`e sababa balaatiinii?	Eeyyee……..…….....1 Lakkii……..……..2 → 904 Hin beeku……....98 → 904	
902. Balaa attamii ture?	Balaa Traafikaa…….....1 kufaatii.....2 Bishaan keessa lixee/ukkaamsamee ……....3 Summii dhugee.....4 Gubatee.....5 lola/waliiti bu`iinsa.....6 Rukuttaa.....7 Dhaqna qabaa.....8 Kan biraa(ibsi)_____	
903. Balaa kan irra gahe itti yaadamee nama biraatii kan irra gaheedhaa?	Eeyyee…….....1 Lakkii……..…….…….....2 Hin beeku……..….98	
904. Balaa horii/ilbiisotaa irra gahe tureeraa?	Eeyyee…….....1 Lakkii…….…….....2 → 1001 Hin beeku…….…….98 → 1001	
905. Horii/ilbiisa akkamiitiin irra gahe?	Saree.....1 Bofa .....2 Ilbiisa.....3 Kan biraa.....6 Hin beeku.....98	
906. Bakkuma balaan irra gahetti du`ee/tee moo?	Eeyyee…….....1 Lakkii…….……...2 Hin beeku…….……98	
907. Ega balaan irra gahee booda daa`imni/ti utuu hin du`i yeroo hangamiif lubbuun ture?	Guyyoota _____ Sa`atii _____	

	Daqiiqaa _____	
908. Erga balaa irra gahee utuu hin du`in yaalamee turee/tee?	Eeyyee…….....1 Lakkii……....2 Hin beeku……...98	
909. Daa`inmi balaa irra gahuun dura dhukkuba kan biraa qaba turee?	Eeyyee…….....1 Lakkii……....2 → 910 Hin beeku……....98 → 910	
910. Dhukkubichi maal ture?	_____	

KUTAA 10: GAAFFIWWAN HAALAWWAN DAA`IMAA AKKUMA DHALATEEN ILAALLATAN

1001. Qaamni daa`imaa yeroo dhalate hangam ture?	Baayyee xiqqoo…..……..1 Giddu galeessa ……....2 Guddaa…….……...3 Hin beeku…….....98	
1002. Daa`imni utuu hin ga`in dhalatee?	Eeyyee…….....1 Lakkii…….....2 → 1004 Hin beeku……..98 → 1004	
1003. Ulfi odoo hin dhalati baatii /torban meeqa ture?	Baatiiwwan/ji`oota ☐ Torban ☐ Hin beeku……..98	
1004. Daa`imni akka dhalateen kiiloograamii meeqa ture? Kiiloograamii	kiiloograamii ☐ Hin beeku ….…….....98	
1005. Erga daa`imni dhalatee wanti handhuura isaa/ishii irraatti godhame jiraa?	Eeyyee…….....1 Lakkii……..……..2 Hin beeku…….…..98	
1006. Maaltu itti godhameef(dibamee) ture? (ibsi)	_____ _____ _____ _____	
1007. Bakka itti godhameetti Mallattoon balaa/ caba lafee ni argama turee?	Eeyyee…….....1 Lakkii……..2 → 1009 Hin beeku……..98 → 1009	

1008. Mallattoon isaa qaama daa`imaarratti nannoo kamitti argama?	_____ _____	
1009. Mallattoo qaama irraa ajjeese(laamshessaa) qaba turee?	Eeyyee…….....1 Lakkii……..…..2 Hin beeku…….….98	
1010. Rakkoo mudaa qaamaa ni qaba/qabdi turee/tee ?	Eeyyee…….....1 Lakkii…….....2 Hin beeku……..98	→1012 →1012
1011. Rakkoo/mudaa qaamaa gosa akkamiiti?	Dhiita dugdarraa …….…....1 Mataa baayyee guddaa……2 Mataa baayyeexiqqaa.....…3 Rakkoo hidhii…….……. 4 Kan biraa(ibsi)……..... 6 Hin beeku……..….....98	
1012. Daa`imni yeroo dhalate/tte bifa akkamii qaba/di ture/rte?	Sirrii…..……...1 Baayyee Diimaa…..…….2 Gurraacha/cuquliisa……..3 Hin beeku . ……98	
1013. Erga dhalate/ttee booda arganuu/hafuura baafachuu ni dandeessi/da`a turee?	Eeyyee…….....1 Lakkii…….....2 Hin beeku…….98	
1014. Akka sirriitti arganuuf /hafuura baafatuu danda`uuf gargaarsi godhameef jiraa?	Eeyyee…….....1 Lakkii…….....2 Hin beeku…….98	
1015. Erga dhalattee/tee booda yeroo muraasaaf ni boo`a turee?	Eeyyee…….....1 Lakkii…….....2 Hin beeku…….98	
1016. Erga dhalattee/tee booda yeroo xiqqooma illee ni sosocho`a turee?	Eeyyee…….....1 Lakkii…….....2	

	Hin beeku…….98	
Hubachiisa nama odeeffannoo sassabuuf: Deebiiwwan koodii lakkoofsa 1013, 1015 and 1016 irratti kenname sirriitti ilaali Daa`imni kan hafuura hin baafanne/hin arganne,hin boonye,hin sosochoone		→ 1101
1017. Erga Hin arganne/hafuura hin baafanne,Hin boonye,Hin sosochoone, du`ee dhalatee?	Eeyyee…….....1 Lakkii……...2 Hin beeku……..…….98	 →1101 →1101
1018. Daa`imni kan du`ee dhalate yoo ta`e qaamni isaa/ishii quqnca`uu/madaa`uu eegalee turee?	Eeyyee…….....1 Lakkii……...2 Hin beeku…….....98	 →1101 →1101

KUTAA 11: GAAFFIWWAN HAALA DHUKKUBA DAA`IMAA ILLAALATAN

1101. Daa`imni erga dhalatee/tee booda harma haadhaa /xuuxxoo hodhuu ni danda`a turee?	Eeyyee…….....1 Lakkii……..……....2 Hin beeku……..98	
1102.Erga dhalatee/ttee yeroo hangamii booda harma haadhaa /xuuxxoo hodhuu eegale?	Sa`atii_____. Gayyaan_____ Hin beeku…….…98	
1103. Daa`imni erga dhalatee/tee booda harma haadhaa /xuuxxoo hodhuu dhiise/dhaabe/bde turte/turee?	Eeyyee…….....1 Lakkii……...2 Hin beeku…….……..98	 →1105 →1105
1104. Guyyaa meeqa booda harma haadhaa /xuuxxoo hodhuu dhiise/dhaabe/bde?	Guyyaa_____ Hin beeku…….……..98	
1105. Harma haadhaa qofa/ duwwaa/ fudhata/hodha/ turee?	Eeyyee…….....1 Lakkii……..……....2 Hin beeku…….……..98	
1106. Daa`imtichi/ti ni haala cimaan ni hoollachiisa turee?	Eeyyee…….....1 Lakkii……...2 Hin beeku…….....98	 → 1108 →1108

1107. Dhalate guyyaa meeqa booda eegale?	Guyyaa_____ Hin beeku…….....98	
1108. Daa`imichi goggogee/gara duubaatti jallate turee?	Eeyyee….....1 Lakkii……....2 → 1111 Hin beeku……....98 → 1111	
1109. Sammuun daa`imaa dhiita`ee turee?	Eeyyee…….....1 Lakkii……....2 → 1111 Hin beeku…….…...98 → 1111	
1110. Sammuun daa`imaa guyyaa meeqaaf dhiita`ee ture?	Guyyaa_____ Hin beeku…….….....9	
1111. Daa`imni erga dhalatee of wallaalee/ of hin beeku turee?	Eeyyee…….....1 Lakkii……....2 → 1113 Hin beeku…….…...98 → 1113	
1112. Erga dhalatee booda Guyyaa meeqaaf of wallaalee/ of hin beeku turee/rte?	Guyyaa_____ Hin beeku…….…...98	
1113. Qaama gubaa/ho`isaa/ tukkusaatii ni qaba turee?	Eeyyee…….....1 Lakkii……....2 → 1115 Hin beeku…….……..98 → 1115	
1114. Qaama gubaa/ho`isaa/ tukkusaatiin guyyaa meeqaaf irra ture?	Guyyaa_____ Hin beeku……...98	

1115. Qaamni daa`imaa haala barameen oli ni diillallaa`a/ qorraa turee?	Eeyyee…….....1 Lakkii……...2 Hin beeku…….....98	 → 1117 → 1117
1116. erga dhalatee guyyaa meeqaaf irra ture?	Guyyaa_____ Hin beeku…….....98	
1117. Daa`imni ni qufaa`a ture/rtee?	Eeyyee…….....1 Lakkii……...2 Hin beeku…….....98	 → 1119 → 1119
1118. Daa`imni erga dhalatee qufaan guyyaa meeqa booda eegale?	Guyyaa_____ Hin beeku…….....98	
1119. Daa`imni argansuu atattamaa/ariifachiisaa qaba turee?	Eeyyee…….....1 Lakkii……...2 Hin beeku…….....98	 → 1121 → 1121
1120. Dhalatee guyyaa meeqa booda argansuu eegale?	Guyyaa_____ Hin beeku…….....98	
1121. Daa`imni rakkoo argansuu ni qaba turee?	Eeyyee…….....1 Lakkii……...2 Hin beeku…….....98	 →1126 →1126
1122. Daa`imni Dhalatee guyyaa meeqa booda rakkinni argansuu isa eegale?	Guyyaa_____ Hin beeku…….....98	
1123. Da'imni yeroo arganu lapheen keessa lixa turee?	Eeyyee…….....1 Lakkii…….……...2 Hin beeku…….…...98	
1124. Da'imni yeroo dubatu funyaaniin dubata turee?	Eeyyee…….....1 Lakkii……2 Hin beeku…….…...98	
1125. Da'imni yeroo arganu funyaan ni socho'a/sirba turee?	Eeyyee…….....1 Lakkii……...2 Hin beeku……...98	

1126. Daa`imni dhibee garaa kaasaa / teechisaa ni qaba turee?	Eeyyee…….....1 Lakkii……..……...2 Hin beeku…….…....98	 → 1130 → 1130
1127. Dhibee garaa kaasaa / teechisaa Guyyaa meeqaaf irra ture?	Guyyaa_____ Hin beeku…….....98	
1128. Dhibeen kun yeroo akkamii itti cima ture? Guyyaa keessati giddu galeessa ala meeqa garaa kaasa ture?	Lakkoofsaan_____ Hin beeku…….….....98	
1129. Dhiiga makaa qabaa?	Eeyyee…….....1 Lakkii……..……....2 Hin beeku…….…….98	
1130. Daa`imni dhibee ol deebisuu/ balaqqamaa qaba turee ?	Eeyyee…….....1 Lakkii……....2 Hin beeku…….....98	 → 1133 → 1133
1131. Daa`imni erga dhalatee guyyaa meeqa booda ol-deebisuu eegale?	Guyyaan_____ Hin beeku…….….....98	
1132. Dhibeen kun yeroo akkamii itti cima ture? Guyyaa keessati giddu galeessa ala meeqa balaqqamsiisa/ol deebisa ture??	Lakkoobsaan(guyyaa keessatti ala meeqa akka ta`e barreessi_____ Hin beeku…….....98	
1133. Da'imni garaa bokoksaa qaba turee?	Eeyyee…….....1 Lakkii……..…….....2 Hin beeku…….....98	
1134. Garaa bokoksaan erga dhatee/ttee guyyaa meeqa booda eegale?	Guyyaan_____ Hin beeku…….….....98	
1135. Hiddi handhuuraa daa`imaa dhalatee ni diimata turee?	Eeyyee…….....1 Lakkii……..…….....2 Hin beeku…….....98	
1136. Da'imichi gogaa irratti kan yaa'e / gogaa diimate, ho'e ykn qunca'e qaba turee?	Eeyyee…….....1 Lakkii…….…….....2	

	Hin beeku……..98	
1137. Barruun harkaa/miila daa`imaa yeroo dhalate bifa keelloo/bicaa qaba turee?	Eeyyee…….....1 Lakkii……...2 Hin beeku…….....98	
1138. Erga dhalatee/ttee guyyaa meeqa booda irratti argame/mul`ate?	Guyyaan_____ Hin beeku……...98	
1139. Guyyaa meeqaaf dhukkubstaa ture/rte?	Guyyaan_____ Hin beeku…….....98	

KUTAA 12 : GAAFFIWWAN HAALA YAALAA DHOKKUBAOOTAA FI ITTI FAYYADAMA TAJAAJILA FAYYAA ILAALCHISEE QOPHAA`AN

1201. Daa`imni odoo hin du`in dura dhukkuba isa qabeef yaalamee turee?	Eeyyee.....1 Lakkii..... 2 →	Gaaffiilee kee asumarratti dhaabi
1202. Gosawwan daawaa kennameefii hunda tokko tokkoon natti himuu dandeessaa? Yoo argatte waraqaa mana yaalaa irraa galmeessi?		
1203. Daa`imni eessatti yaalame ture?	**Eeyyee Lakkii Hin beeku** 1 .Mana 1 2 98 2 .Wallaansaaaddaa 1 2 98 3 ;Kiliinika Mootummaa 1 2 98 4 .Hospitaala Mootummaa 1 2 98 5 .Kiliinika Dhuunfaa 1 2 98 6. Hospitaala Dhuunfaa 1 2 98 7 .Faarmaasii 1 2 98 8. Bakka biraa 1 2 98	
1204. Daa`imni du`uusaan dursee baatii tokko keessatti yeroo meeqa mana yaalaa deeme?	Lakkoofsaan_____	
1205. Ogeesse fayyaa sasaba du`a /dhuukuba daa`ima keessan ajjesse/ isinnitti himee?	Eeyyee.....1 Lakkii.....2 Hin beeku.....98	
1206. Dhibee maaalii isinnitti hime?	---------- ----------	

9.3 Declaration

I the undersigned declares that this is my original work has never been presented in this or any other university and all the source materials used for this thesis work has been duly acknowledged.

Name: Elias Merdassa Roro (BSc)

Signature: _____

Date :_____

Place: Addis Ababa University, College of health sciences, School of public Health.

Date of submission: _____

This thesis has been submitted for examination with my approval as a university advisor.

Name: Dr. Mitike Molla (PhD)

Signature: _____

Date: _____

9.4 gabatee .1. Unka Haala Fayyaa Da`umsa boodaa Da`immanifi Hadholii fi Wantoota Da`umsaan Wal-qabatan ittiin Sassabamu jan.2012

5	4	3	2	1	Lakk.	
					Maqaa haadha daa`imaa	
					Umurii Haadha daa`imaa	
					-Fayyaa(N) -Yeroo durse kan dhalate(PrT) -Yeroo dabarse kan late(PsT) - Du`ee kan dhalate(D) –kan ulfi irraa bahe(A)	Haala fayyaa daa`ima dhalatee/ttee
					Qaama Tajaajila da`umsa kenne Deesistuu (key)	
					-Qabdi -Hin qabdu	Hordoffii fayyaa da`umsa boodaa
					Bakka Daa`imni itti dhalate/dhalatte	
					Saala daa`imaa	
					Guyyaa dhalalota Da`imaa (Guy/bati /bara)	
					Guyyaa Du`a Da`imaa (Guy/bati /bara)	
					Umurii Daa`imaa -Ji`aan ykn Guyyaan	
					-lubbuun kan jirtu(N) -kan duute -kan(D) -dhukkubsacha jirtu(IL)	Haala fayyumma haadhaa

Aanaa:_____Ganda:_____ Gooxii :_____ maqaa fi mallattoo_____

Furtuu (key): qaama tajaajila da`umsaa kenne

1. TBA (Desistuu Aadaa) 2. HEWs (Hojjettuu Ektenshini Fayyaa) 3. Family (maatii) 4.Nurse (narsii) 5.Physician (Doktora)