Prevalence of under nutrition and Associated Factors among under Five Years Children in Bule Hora Woreda, Borena Zone, Oromia Regional State

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A THESIS SUBMITTED TO JIMMA UNIVERSITY COLLEGE OF PUBLIC HEALTH AND MEDICAL SCIENCE DEPARTMENT OF EPIDEMIOLOGY IN PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR THE DEGREE OF MASTERS OF PUBLIC HEALTH IN EPIDEMIOLOGY.

June, 2013

Jimma, Ethiopia

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June, 2013

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Abstract

Background: Child nutritional status is an essential component of a country's overall human development. It continues to be widespread in a population of more than 200 million children under five (one in three children) in developing countries. To improve the nutritional status and living conditions in communities, it is necessary to determine the nature, magnitude and cause of malnutrition. This is a reason why this study focused to study the prevalence of malnutrition and associated factors in Bule Hora, Borena zone.

Objective: To assess the magnitude and factors associated with nutritional status in children under five years age in Bule Hora Woreda, Borena Zone.

Methodology: A community-based cross-sectional quantitative study design was used to assess the magnitude and factors associated with malnutrition in children less than five years of age.A structured questionnaire was used to collect data from 796 children paired with their mothers or caregivers. Bivariate and multivariate logistic regression analyses were conducted to identify determinants of nutritional status. Degree of association between dependent and independent variables was assessed using OR and 95% CI. Statistical association was declared as p-value less than 0.05.

Result: Result: The result of the study indicated that 47.6% of the children were stunted, 29.2% were underweight, and 13.4 % wasted. Prevalence of severe stunting, underweight and wasting were 20.2%, 6% and 3.9% respectively.Presence of diarrhea, being male by sex,uneducated fathers and total number of children ever born to a mother were significantly associated with underweight. Presence of diarrhea, being male by sex, Pre –lacteal feeding and not using family planning methods were significantly associated with stunting and presence of diarrhea,age at which additional food given and not using family planning were predictors ofwasting.

Conclusion: As the prevalence of malnutrition among the children was found high, it is recommended that intervention should focus on prevention and control of diarrheal disease through improving access to safe and adequate water supply, immunization, housing, sanitation and hygiene practicesandon improving promotion of nutrition education and utilization of family planning.

Key words: *nutritional status, under five, stunting, wasting and underweight.*

Acknowledgement

My heart felts great thanks to my advisors Dr. Mekitie Wondafrash and Mr. Mohammed Taha for their timely comment, advice and suggestion to do this thesis.

Also I would like to express my thanks to Jimma University College of public health and medical sciences for giving me the chance to conduct this study.

My thanks also extends to those all who cooperated with me in doing my thesis; The Bule Hora Woreda Health Office staffs, Bule Hora Woreda Health Centers staffs for their help in my research activities while on data collection.

I wish to express my gratitude and deep respects to the Bule Hora Woreda kebele administrators, study participants and community health workers who participated in the study, particularly to those who were directly involved in the study and to data collectors.

Finally I would also like to acknowledge all staff members of the Epidemiology department for-all their contribution to my thesis.

Table of contents

Contents page

Abstract i

Acknowledgement ii

Table of contents iii

List of Tables and figures v

Abbreviations and Acronyms vii

Chapter one – Introduction 1

1.1 Background 1

1.2. Statement of the problem 2

Chapter Two - Literature Review 4

2.1 Magnitude of Malnutrition 4

2.2. Factors contributing to Malnutrition 6

Significance of the study 11

Chapter Three – Objectives 12

3.1. General Objective 12

3.2. Specific objectives 12

Chapter Four - Methods and Materials 13

4.1 Study Area and Period 13

4.2. Study Design 13

4.3. Source Population 13

4.4. Study Population 13

4.5. Sample Size and Sampling technique 14

4.6. Data Collection Methods and Instruments 16

4.6.1 Measurement of child nutritional status 17

4.6.1.1 Height-for-age 17
4.6.1.2 Weight for Age 17
4.6.1.3 Weight-for-height 17
4.6.1.4 Mid-Upper Arm Circumference (MUAC) 18
4.7. Study Variables 18
4.7.1. Dependent Variable 18
4.7.2. Independent Variables 18
4.8. Data Quality Control 18
4.9. Data Management and Analysis 19
4.10. Operational Definitions 19
4.11. Ethical clearance 20
4.12. Dissemination of the finding 20
Chapter Five-Result 21
5.1. Socio-demographic conditions 21
5.2 Child characteristics and Caring practices 23
5.3 Maternal conditions 25
5.4 Environmental conditions 26
5.5 Nutritional status of the children 27
5.6 Determinants of under-five Nutritional Status 31
Chapter –six- Discussion 36
Chapter -seven-Limitation of the study 39
Chapter –Eight- Conclusions and Recommendations 40
References 41
Annex-1- Afan Oromo Version Questionnaire 45
Annex -2 – English version Questionnaire 54
Annex-3-Map of Bule Hora Woreda 61

List of Tables and figures

List of Tables

Table 1; Distribution of Socio-demographic characteristics of study participants, Bule Hora Woreda, Borena Zone, Oromia Regional State, 2013 22
Table 2; Distribution of Child characteristics, Bule Hora Woreda, Borena Zone, Oromia Regional State, 2013 23
Table 3; Distribution of child caring practices, Bule Hora Woreda, Borena Zone, Oromia Regional State, 2013 24
Table 4; Distribution of Maternal conditions, Bule Hora Woreda, Borena Zone, Oromia Regional State, 2013 25
Table 5; Distribution of Environmental conditions, Bule Hora Woreda, Borena Zone, Oromia Regional State, 2013 26
Table 6; Prevalence of Child Malnutrition, Bule Hora Woreda, Borena Zone, Oromia Regional State, 2013 27
Table 7; Prevalence and number of 6-59 months children affected by malnutrition by age category, Bule Hora Woreda, Borena Zone, Oromia Regional State, 2013 28
Table 8; Prevalence and number of 6-59 months children affected by stunting, underweight and wasting by sex category, Bule Hora Woreda, Borena Zone, Oromia Regional State, 2013 . 29
Table 9; Results from Binary and Multiple Logistic Regression analysis of selected Correlates of Underweight Bule Hora Woreda, Borena Zone, Oromia Regional State - 2013 32
Table 10; Results from Binary and Multiple Logistic Regression analysis of selected Correlates of Stunting, Bule Hora Woreda, 2013 34
Table 11; Results from Binary and Multiple Logistic Regression analysis of selected Correlates of Wasting, Bule Hora Woreda, 2013 35

List of Figures

Figure 1.Conceptual frame work which shows causes of child malnutrition 10
Figure 2- Schematic representation of Sampling Method, Bule Hora Woreda 15
Figure 3- Nutritional Status of 6-59 years age children by sex, Bule Hora Woreda, Borena Zone, Oromia Regional State, 2013..... 30

Abbreviations and Acronyms

ARI –Acute respiratory infection

CI – confidence interval

Cm - centimeter

EDHS – Ethiopian demographic and health statistics

EOS – enhanced outreach strategy

FAO – Food and Agricultural Organization

H/A – height for age

HHs – Households

Kg – kilogram

LBW –low birth weight

MDGs – millennium development goals

mm – millimeter

MUAC – mid upper arm circumference

OR – odds ratio

PEM – protein energy malnutrition

SD – standard deviation

SPSS – statistical package for social science

UNICEF – United Nation Children's Fund

WFP – World Food Program

WHO – World Health Organization

W/A – weight for age

W/H –weight for height

Chapter one – Introduction

1.1 Background

Malnutrition is the condition that results from taking an unbalanced diet in which certain nutrients are lacking, in excess (too high an intake), or in the wrong proportions. A number of different nutrition disorders may arise, depending on which nutrients are under or overabundant in the diet. In most of the world, malnutrition is present in the form of under nutrition, which is caused by a diet lacking, inadequate calories and protein (1).

Child nutritional status is an essential component of a country's overall human development. There is a growing consensus that poor nutritional status during childhood (and in utero) can have long lasting scarring consequences into adulthood, both in terms of health and mortality, and in terms of other measures of human capital such as schooling and productivity(2). Adequate nutrition is essential in early childhood to ensure healthy growth, proper organ formation and function, a strong immune system, and neurological and cognitive development. Economic growth and human development require well-nourished populations who can learn new skills, think critically and contribute to their communities. Child malnutrition impacts cognitive function and contributes to poverty through impeding individuals' ability to lead productive lives (3, 4).

Malnutrition has three commonly used comprehensive types named stunting, wasting and underweight measures by height for age, weight for height and weight for age indexes respectively. Stunting or growth retardation or chronic protein energy malnutrition (PEM) is deficiency for calories and protein available to the body tissues and it is inadequate intake of food over a long period of time, or persistent and recurrent ill-health (5).Wasting is an indicator of acute malnutrition and usually the result of recent food insecurity, infection or acute illness. Measurement of wasting is often used to assess the severity of an emergency situation, with severe wasting being highly linked with the death of a child. The third type of under five years malnutrition is underweight, an indicator of both acute and chronic malnutrition. It is theindicator used to monitor the Millennium Development Goal (MDG) of ending hunger, and targets of halving the prevalence of underweight children and adults by 2015(6, 7).

1.2. Statement of the problem

Many countries remain far from reaching the first millennium development goal (MDG) and much of the progress made has been eroded by the recent global food price and economic crisis. Progress in reducing childhood malnutrition in developing countries has been slow but more than half of these countries are not on track to achieve the Millennium Development Goal of halving the share of children who are malnourished (low weight for age) by 2015(8-10).

Child malnutrition, an indicator of both the level of food insecurity, care and health in a community and of the nutrition status of future adults (because of malnutrition's intergenerational consequences), continues to be widespread in a population of more than 200 million children under five (one in three children) in developing countries. Twenty-four countries bear 80 percent of the developing world's burden of under nutrition as measured by stunting (an indicator of chronic hunger). In Africa and Asia, stunting rates of under-fives are particularly high, at 40 per cent and 36 per cent respectively. More than 90 per cent of the developing world's stunted children live in Africa and Asia (11).

Reducing malnutrition among children under the age of five remains a huge challenge in developing countries of the World. An estimated 230 million under-five children are believed to be chronically malnourished in developing countries. Similarly, about 54% of deaths among children of this age group are believed to be associated with malnutrition in developing countries. In Sub-Saharan Africa, 41% of under-five children are malnourished and deaths from malnutrition are increasing on daily basis in the region (12).

In Ethiopia, protein energy malnutrition (PEM) is currently the most widespread and serious health problem of children and their mother's .Malnutrition is the underlying cause of 57% of child deaths in the country, with some of the highest rates of stunting and underweight in the world. Without increased efforts to improve the nutrition status of vulnerable groups such as mothers and children under five years old, Ethiopia risks falling short of reaching the Millennium Development Goals (MDGs) of halving underweight and reducing child mortality by two-thirds by 2015(13).

As of EDHS 2011 the under-five mortality rate was 88 per 1000, stunting underweight prevalence was 58%, 51%,44.4% and, 41% 33%, 28.7% according to 2000, 2005 and 2011 EDHS respectively. These rates have decreased quite a bit in the past 3 decade, most notably with mortality almost halving. However, Ethiopia still needs a concerted effort to accelerate reductions in under five years age malnutrition (14).

Underweight is reflected by wasting, stunting, or a combination of the two, and therefore MDG1 can be achieved by decreasing the prevalence of either or both (15). In Ethiopia, stunting prevalence increases rapidly after six months of age through two years , highlighting the need for more resources devoted to preventing under nutrition during the critical window from conception to two years of age (also known as the first 1000 days), after which it is almost impossible to recover from the developmental deficits(16) .

Various studies conducted on child nutritional status has given an important insight into the factors influencing child nutritional status of preschool children in different parts of the country. These studies have shown that factors such as household economic status, education of mother, employment status of mother, employment status of father, source of water and availability of toilet facility, child morbidity, age of child, birth order, birth interval of child and maternal nutritional status have a significant influence on child nutritional status. However, little attention seems to have given to the pastoralist and semi pastoralist areas.

In Bule Hora Woreda a number of cases of malnourished cases come to Bule Hora Hospital and Health Centers of the Woreda for treatment but there is no study conducted in the area to identify the factors associated with under five years malnutrition .To improve the nutritional status and living conditions in communities, it is necessary to determine the nature, magnitude and cause of malnutrition. Broad analysis of causes of malnutrition is required before action. Therefore this study aims to study the prevalence of malnutrition and associated factors in Bule Hora, Borena zone.

Chapter Two - Literature Review

2.1 Magnitude of Malnutrition

Globally, 10.6 million children below 5 years of age die every year. Under-nutrition accounts for about 35% of all deaths among these children and also the number one cause of morbidity for all age groups, accounting for 11% of the disease burden. Stunting, severe wasting and intra-uterine growth retardation are the major contributors to child mortality, accounting for about 2 million deaths of under-fives annually (17). The World Health Organization estimates that about 60% of all deaths, occurring among children aged less than five years in developing countries, could be attributed to malnutrition. PEM continues to be a major health burden in developing countries and the most important risk factor for illnesses and death especially among young children (18).

Maternal and child under nutrition account for 11% of the global burden of disease. Stunting, a chronic slowing of linear and cognitive growth, often results from inadequate access and intake of nutritious food, poor health, and inadequate child and maternal care. This chronic under nutrition affects one out of three children under five years of age in the developing world, with 80 percent of these children residing in just 22 countries(4).

A community-based descriptive cross sectional study conducted in Khartoum to assess the impact of feeding practices on prevalence of under nutrition among 6-59 months old children shows that out of 780 households visited, the prevalence of malnutrition among 6-59 months children in the study were 11.8% for moderate acute malnutrition, while 7.3% were severely wasted. Severe chronic malnutrition was observed in 27.1% while 24% were moderately malnourished, for underweight 13.6% were severely under-weight, while 21.4% were moderate (19).

A cross sectional study conducted by Bloss E. et al on prevalence and predictors of underweight, stunting, and wasting among children aged five and under in western Kenya shows that the prevalence of stunting and wasting were 47% and 7% respectively. The study also revealed that mothers who had no formal education were more likely to have children who were underweight than mothers who had secondary school (20).

Olack B et al (2011) revealed that the prevalence of stunting among children aged 6-59 months was 47%, and the prevalence increased with age through 36-47 months (58%). Severe stunting was found in 23.4% of the children. Stunting peaked (56%) in children aged 36-47 months, and compared to other age-groups, stunting was significantly more likely in children aged 36-47 months. Similar proportions (51.3%) of males were stunted as females (48.7%) (21).

A cross sectional study conducted by Shubhada S.et al on epidemiological study of malnutrition (under nutrition) among under five children in a section of rural area revealed that Out of 329 malnourished children 171 were males and 158 were females. The prevalence of malnutrition was significantly more in 1-3 year age group and the authors suggested that improper weaning, recurrent infections make this age group more vulnerable(22).

According to EDHS 2011, 44 percent of children under age five are stunted, and 21 percent of children are severely stunted. In general, the prevalence of stunting increases as the age of a child increases, with the highest prevalence of chronic malnutrition found in children age 24-35 months (57 percent) and lowest in children under age six months (10 percent). Male children are slightly more likely to be stunted than female children (46 percent and 43 percent, respectively). With the exception of first order births, there is an inverse relationship between the length of the preceding birth interval and the proportion of children who are stunted. The longer the interval, the less likely it is that the child will be stunted (14).

A study conducted on Magnitude and Factors Associated with Malnutrition of Children under five years of age in rural kebeles of Haramaya shows that malnutrition of children aged birth to 59 months was identified with stunting in 42.2% of the children. A total of 36.6% of the children were underweight and 14.1% were wasted. The study also revealed that, majority (59.4%) of the mothers claimed they fed their child with colostrum immediately after birth and the remaining mothers 40.6% provided the child with pre-lacteal feeding. Children who experienced coughs or diarrhea episodes in the preceding two weeks of the survey days were 26.5 %(23).

2.2. Factors contributing to Malnutrition

Factors contributing to the development of protein-energy-malnutrition (PEM) include cultural and social practices that lead to the exclusion of certain foods due to food taboos, food and dietary fads and migration from rural areas to urban slums (24).

The global conceptual framework developed by UNICEF identifies malnutrition and death in children and women as the result (final outcome) of a long sequence of interconnected events. These events can be classified as components of three major groups of causes: the basic, the underlying, and the immediate determinants of malnutrition. Inadequate dietary intake and disease are considered as the most significant immediate causes of malnutrition of children and women (25).

The underlying causes for inadequate dietary intake and diseases can be numerous. These are context-specific and the most important fall within the three interrelated groupings of insufficient food availability and access, inadequate care for children and mothers, and insufficient health services and inadequate provision of a healthy environment (e.g. clean water and sanitation). Finally, the major basic or structural causes of malnutrition in the hierarchy include economic, technological, political, cultural, and institutional structures and processes, the means of control of physical resources, and the level of human development (25).

Diseases are the main immediate causes of malnutrition. Most deaths of children 6-59 months old are related to malnutrition and infection. Infections play a major role in the etiology of PEM because they result in increased needs and a high energy expenditure, lower appetite, nutrient losses due to vomiting, diarrhea, poor digestion, mal-absorption and the utilization of nutrients and disruption of metabolic equilibrium (24).

Food insecurity was associated with reduced intakes of important nutrients, behavioral and psychological dysfunction as well as poor health in children. Children from food-insecure households were twice likely to have their health status reported as fair/poor compared to those from food-secure households and likely to have been hospitalized than their food-secure counterparts. A study in Bangladesh revealed that children from food-insecure households werefound to have a higher rate of morbidity than those from food-secure households(26).It also indicated that children from food-insecure households were introduced to cow milk, fruit juices

and other liquids earlier than recommended and the three types of malnutrition were significantly more prevalent among boys than among girls.The same pattern of early introduction of water, sugar and milk was also observed in Botswana(27).

A study conducted on epidemiological correlates of under-nutrition in under-5 years children in an urban slum of Ludhiana shows that being born with low birth weight appears to carry a higher risk of being underweight in the first five years of life with the prevalence of underweight being observed to be significantly higher in the LBW children. The study also revealed that highest prevalence of underweight, stunting as well as wasting was found in those who were exclusively breastfed greater than 6 months, followed by those who received exclusive breastfeed for less than 4 months and lowest for those who were exclusively breastfed for 4-6 months (28).

Stunting is a cumulative process that can begin in utero and continues to about three years after birth. A study conducted by Teshome Beka and his colleagues on magnitude and determinants of stunting in children under five years of age in food surplus region of Ethiopia identified predictors of stunting . According to this study presence of diarrhea prior to the survey, child received pre-lacteal feeding, being male, child who did not fed colostrum and children who fed less than three times a day were identified explanatory variables which have significant association with stunting(29).

The study conducted in Bangladesh on Predictors of the number of under-five malnourished children in Bangladesh: application of the generalized Poisson regression model by Mohammed I.et al showed that children from father of no education was more likely to be malnourished when compared with children of educated fathers. The study also revealed that total number of children ever born to a woman as a significant factor associated with child malnutrition(30).

According to a survey done by UNICEF and the Institute for Public Health Nutrition in 2004 in Bangladesh, one in four households is food insecure and two million children are affected by malnutrition (between six months and five years). The survey was designed to assess the impact of the food price increases in Bangladesh. Data showed that 58% of households had insufficient

food in the previous year. A link was found between malnutrition and food insecurity, with food insecure households showing a higher percentage of malnourished children (31).

A case control study conducted by Amsalu.S and Tigabu. Z on risk factors for severe acute malnutrition in children under the age of five showed that, in both groups breastfeeding was initiated within the first hour of birth in 73 (71.6%) of the cases, however, prelacteal feeds were given more frequently in the cases 24 (23.5%) than in the controls 12 (13.3. Butter is the most commonly used pre-lacteal feed 19/36(52.8%).The study also revealed that pre-lacteal feeds given, greater than three children ever born to a mother and children from uneducated fathers were positively associated with child malnutrition (32).

Impacts of PEM on the severity of infection was investigated in children with measles, diarrhea, respiratory infections, and malaria, it was found that the morbidity and mortality in patients with infections is worse if they are malnourished (33).

A study done by Bachou et al. (2006) showed that within a group of 315 malnourished children, 119 (38%) were female with a median age of 17 months while only 3% were below the age of six months. They also showed a high prevalence of infections (26%) and bacteremia (18%). The HIV infected children were more likely to have persistent diarrhea than the HIV uninfected malnourished children (34).

The study conducted in Democratic Republic of Congo shows prevalence of stunting was higher among boys compared to girls (46.1 versus 41.7 percent), has an inverse linear association with the age of the child (higher in the age groups ranging from 4 years, followed by 3 years, 2 years, 1 years but lower in the younger age (0 year): 55.1, 49.4, 48.5, 46.5 versus 23.1 percent), higher in rural areas compared with urban areas (48.4 versus 37.2 percent), higher among children born outside the hospital compared with their counterpart born in hospitals (49.1 versus 41.8 percent), linearly associated with maternal education (higher among children from non-educated mother, followed by children from mothers with primary education but lower among children from mothers with secondary or higher education: 49.8, 47.0 versus 35.2 percent)(35).

A study conducted on nutritional status and determinants of malnutrition in children under three years of age in Nghean , Vietnam showed that children from a household who use water from unprotected sources are known to be 1.2 times underweight, 0.71 times stunted,0.38 times

wasted when compared with children with households using water from protected sources. And also the study revealed that children from households having family size more than or equal to three are known to be 3.35 times underweight, 2.47 times stunted and 5.46 times wasted when compared with children from households having family size 1-2. A study also revealed that being male, exclusive breast feeding for less than six months, having diarrhea in the last two weeks low birth weight and initiation of breast feed after one hour were identified as variables which are significantly associated with child malnutrition (for the three types –underweight, wasting and stunting)(36).

A study conducted on socio-economic determinants of severe and moderate stunting among under five children of rural Bangladesh with a sample of 6,058 children 0-59 months showed that among the mothers of the children,39.4% received antenatal care (ANC) services ,10.8% births were delivered at medical facility place and 13.6%births were delivered by skilled delivery assistants(SBA). Additionally, over one-third of the fathers of the children had no formal education, while over one-fourth had primary education, one-fourth had secondary education and 8.9% had higher education. Almost three-fourths of the mothers were not working. For water, 86.0% used piped or tube well water and 14.0% had no sources of safe water for drinking. Of the children, almost one third were the first child, one-fourth were the second child, less than one-fifth were the third child, 11.3% were the fourth child and the rest (13.8%) were the fifth or higher order births of their parents(37).

Unsafe water, poor sanitation and unhygienic conditions claim many lives each year. An estimated 1.2 million children die before the age of 5 from diarrhea. Poor urban areas where insufficient water supply and sanitation coverage combine with overcrowded conditions tend to maximize the possibility of faecal contamination(38). A Case Study from Goundam Cercle, Timbuktu Region found that children whose family had latrine facility at their home shows prevalence of 27.8% of under nutrition, while those families with open air defecation had 40.7% of prevalence of under nutrition(39).

Conceptual framework of the determinants of malnutrition

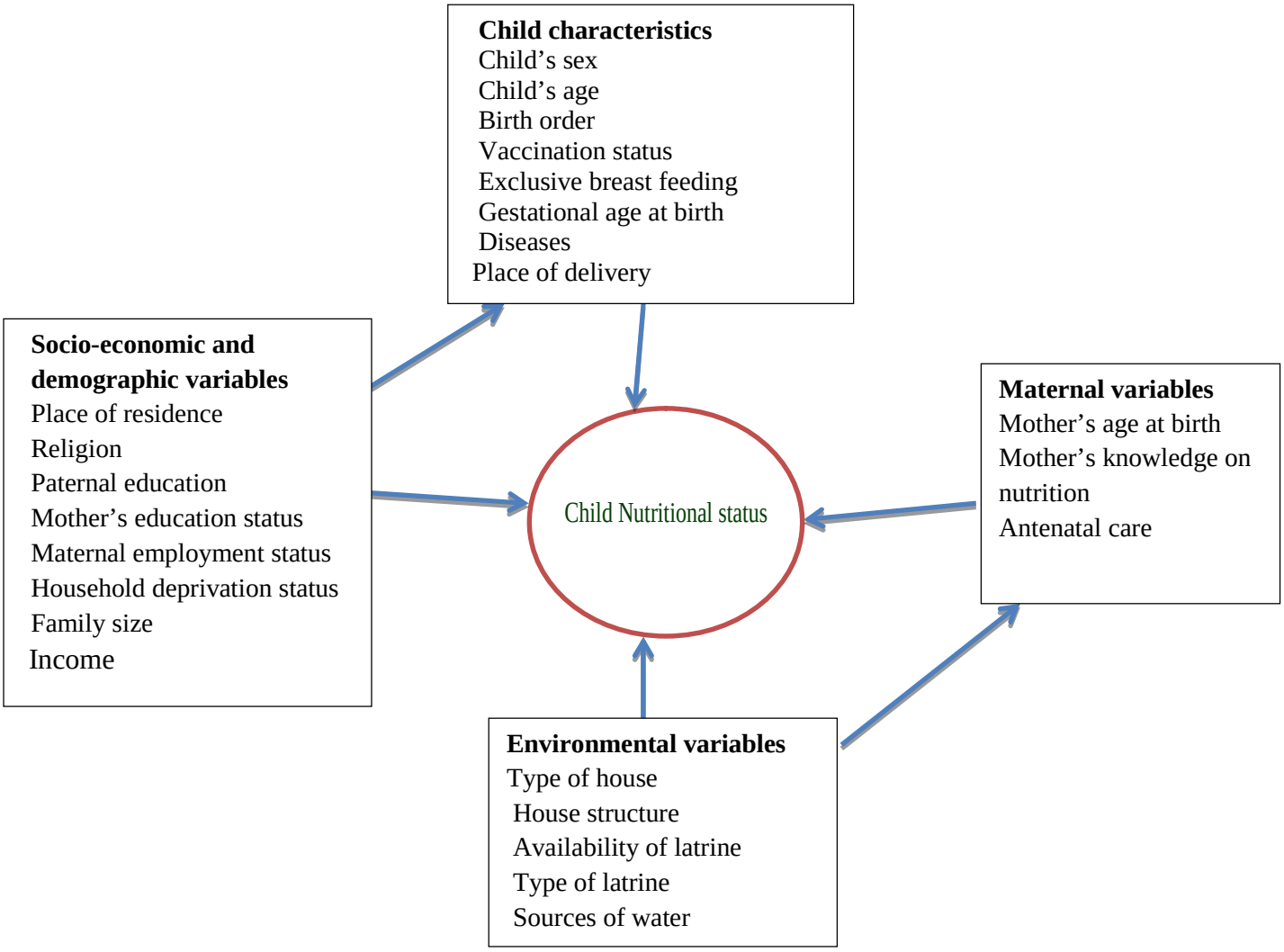

Figure 1.Conceptual framework which shows causes of child malnutrition

Source: Victora et al, 1997(40).

Significance of the study

Developing countries are facing the universal problem of child malnutrition. Even in many developed countries malnutrition of “under five” children is a threat for health policy makers because of the diversity in child rearing practice and health seeking behaviors. For the last few decades, Ethiopia has spent millions of dollars through different interventions including child immunization, primary health services, parental education and media communication. Almost all of them are direct intervention to the community. As nutritional status can vary by background characteristics, there is a need to investigate underlying variations of these nutritional indicators and determinant factors among regions and localities or residence for proper priority setting and interventions.

The result of this study, which specifies the prevalence of child malnutrition with these various causes and their relative contributions, can serve as reference in priority setting, designing effective nutritional programs to address the problem and its consequences, in monitoring and evaluation of the impacts of programs and for policy responses specifically tailored to the needs of different population groups.

Chapter Three – Objectives

3.1. General Objective

- To assess the magnitude and factors associated with nutritional status in under five years age in Bule Hora Woreda, Borena Zone, Oromia regional state, Southern Ethiopia.

3.2. Specific objectives

- To assess the prevalence of under nutrition in under five years children in Bule Hora Woreda.
- To identify the associating factors of under five years nutritional status in Bule Hora Woreda.

Chapter Four - Methods and Materials

4.1 Study Area and Period

The study was conducted in Bule Hora district from February 25 to March 25, 2013. Bule Hora is one of the Woreda in fourteen Woredas of Borena zone with 48 kebeles (43 rural and 5 town kebeles) with a total population of 317,341 of which 52,044 are under five children. Bule Hora is found at 468 km from Addis Ababa to the South and 100 km from zonal town, Yabello. The Woreda has 1 university, 1 district hospital,1teachers training college (TTC), 2 private nursing college,8 health centers, 27 health posts and 42 private clinics(all types). The Woreda is bordered on the south by the Dawa River which separates it from Arero Woreda, on the southwest by Dugda Dawa Woreda on the west by the Southern Nations, Nationalities and peoples region, on the northeast by kercha Woreda of Guji zone, and on the east by Odo Shakiso Woreda.

According to 2007 national census, concerning the religion, majority (74.42%) of the inhabitants are Protestant, while 11.24% of the population practiced traditional beliefs, 5.85% are Orthodox, 5.81% are Muslim and 1.4% are Catholic. The four largest ethnic groups are Oromo (70.98%), Gedeo (25.77%), Amhara (1.16%), and Burji (0.87%); all other ethnic groups made up 1.22% of the population. Afan Oromo was spoken as a first language by 72.2%, 25.41% spoke Gedeo and 1.59% spoke Amharic; the remaining 0.8% spoke all other primary languages reported.

4.2. Study Design*:* A community-based cross-sectional quantitative study design was used.

4.3. Source Population*:* The source population was all children less than five years of age in the district of Bule Hora who lived in the study area for at least six months prior to data collection.

4.4. Study Population*:* The study population was children 6-59 months who are residing in the eight randomly selected kebeles in the district of Bule Hora.

Inclusion and exclusion criteria

- Children 6 to 59 months of age
- Children who resided in the area for six or more months prior to data collection

4.5. Sample Size and Sampling technique*:*The required sample size of the study population was determined by using the single proportion formula:

$n=Z\ (\alpha/2)^2*p\ (1-p)/d^2$.

Where,

n= sample size

Zα/2=confidence level (1.96)

P=proportion of under five children affected by malnutrition, 44% (prevalence of stunting, from EDHS 2011, which gives highest sample size)

d=margin of error (5%)

$n = (1.96)^2*0.44(1-0.44)/ (0.05)^2$.

n=379

The sample size was n=379, by using design effect 2, the sample was 758, and also adding non-response rate of 5%, total sample size was 796. Accordingly, 796 children paired with their mothers/caregivers were selected.

Sampling procedure

A multi-stage random sampling technique was used to select the target population. Out of 48 kebeles eight were selected by using simple random sampling.From these selected kebeles, 13,048children 6-59months from 10,960households were identified by using the registration at health posts and cross-checking these registration with that of community based nutrition registration. In households with more than one children of age between 6-59 months, one child was selected randomly by lottery method. Finally, by proportional allocation of the sample size to each kebeles 796 children paired with their mothers or caregivers were selected.

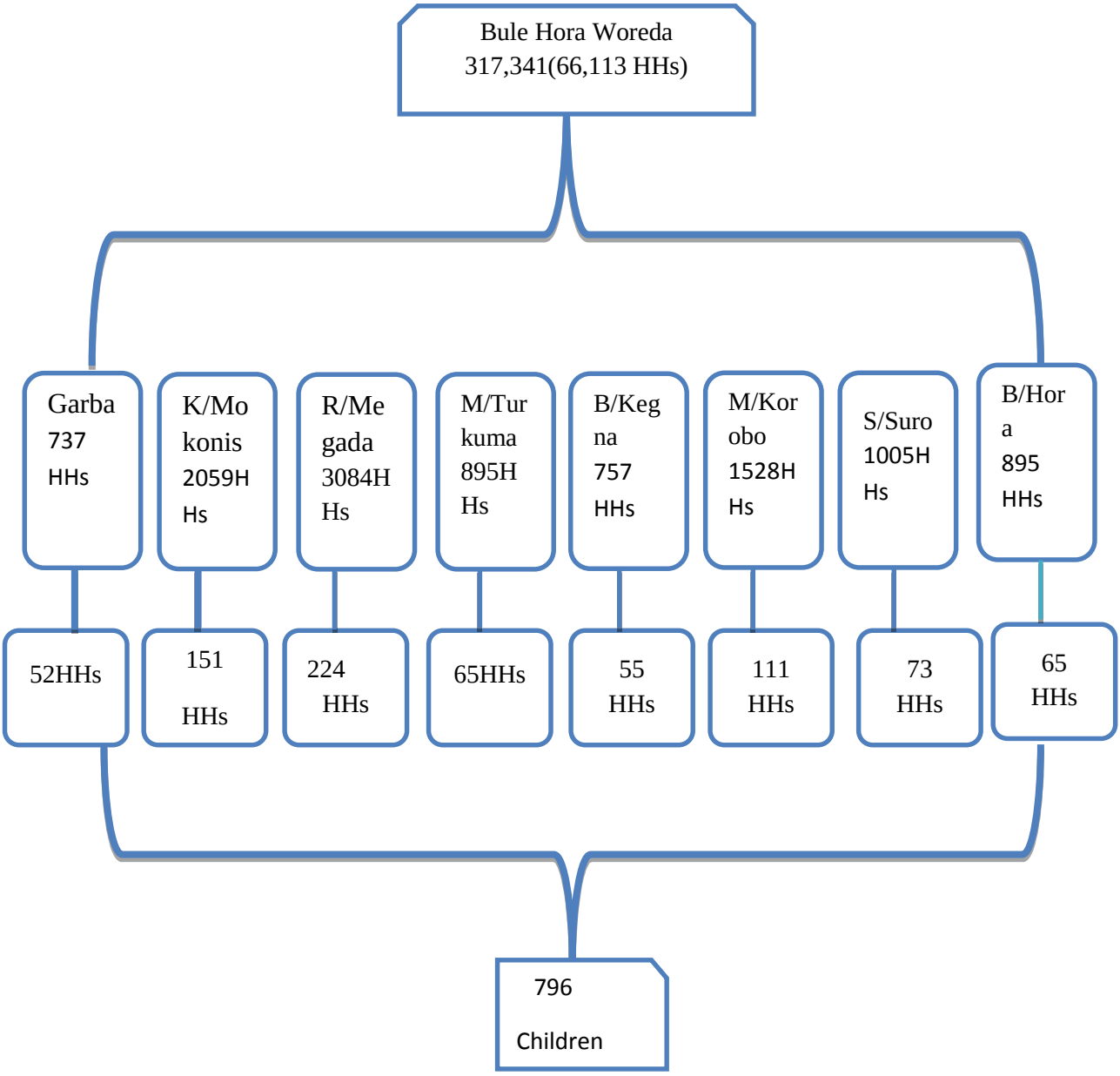

Figure 2- Schematic representation of Sampling Method, Bule Hora Woreda

4.6. Data Collection Methods and Instruments

Data was collected using structured questionnaire and anthropometric measurements. Eight nurses and eight community health workers from each selected kebeles were involved in the data collection. These nurses were recruited from Bule Hora Woreda Health centers those who have taken training on community based nutrition (CBN) and two supervisors were health officers working at Bule Hora health office. Both the interviewers (nurses) and supervisors were trained for two days on objective and methodology of the research, data collection and interviewing approach, anthropometric measurement and data recording.

Weight was measured with minimum clothing and no shoes using a hanging scale and electronic beam balance in kilogram for those less than 24 months and 24-59 months respectively, to the nearest of 0.1 kg. Measurement of length was done in a lying position with wooden board for children of age under two years and measurement of height for children above two years stature was measured in a standing position in centimeters to the nearest of 1cm.

MUAC was measured using non-stretchable tape on left mid upper arm to the nearest 1mm. Edema was assessed by applying medium thumb pressure on upper side of both feet for three seconds. It was diagnosed if a bilateral depression (pitting) remained after the pressure is released.

To identify retrospective morbidity of children, mothers were asked about any occurrence of illness during the past two weeks. Enumerators probe to confirm nature of illness based on operational case definition and also ask to identify occurrence of measles in the past six month. Vaccination status of children was checked by observing immunization card and if not mothers were asked to recall it. BCG vaccination was checked by observing scar on right (also left) arm.

4.6.1 Measurement of child nutritional status

4.6.1.1 Height-for-age

The height-for-age index provides an indicator of linear growth retardation and cumulative growth deficits in children. Children whose height-for-age Z-score is below minus two standard deviations (−2 SD) from the median of the WHO reference population are considered short for their age (stunted), or chronically malnourished. Children who are below minus three standard deviations (−3 SD) are considered severely stunted. Stunting reflects failure to receive adequate nutrition over a long period of time and is affected by recurrent and chronic illness. Height-for-age, therefore, represents the long-term effects of malnutrition in a population and is not sensitive to recent, short term changes in dietary intake.

4.6.1.2 Weight for Age

Weight-for-age is a composite index of height-for-age and weight-for-height. It takes into account both chronic and acute malnutrition. A child can be underweight for his/her age because he or she is stunted, wasted, or both. Weight-for-age is an overall indicator of a population's nutritional health. Children with weight-for-age below minus two standard deviations (−2 SD) are classified as underweight. Children with weight-for-age below minus three standard deviations (−3 SD) are considered severely underweight.

4.6.1.3 Weight-for-height

The weight-for-height index measures body mass in relation to body height or length; it describes current nutritional status. Children with Z-scores below minus two standard deviations (−2 SD) are considered thin (wasted) or acutely malnourished. Wasting represents the failure to receive adequate nutrition in the period immediately preceding the survey and may be the result of inadequate food intake or a recent episode of illness causing loss of weight and the onset of malnutrition. Children with a weight-for-height index below minus three standard deviations (−3 SD) are considered severely wasted.

4.6.1.4 Mid-Upper Arm Circumference (MUAC)

As that of Z-scores Cut-off points used to classify the severity of malnutrition also can presented by MUAC. In 2009, WHO and UNICEF endorsed the cut-off point of MUAC less than 115 mm/11.5cm as severe acute malnutrition and ≥ 115mm &< 125mm as moderate acute malnutrition(41).

4.7. Study Variables

4.7.1. Dependent Variable: The dependent variable was nutritional status in children 6-59 months years old.

4.7.2. Independent Variables

1. Socio-demographic Variables : religion, sex, economic status, family size, number of livestock owned, landholding size, the occupation of mother, marital status of the mother, age of the mother, child sex, child age, and agro-ecology.

2. Maternal and Child characteristics: immunization status of the child ,antenatal care, history of diarrhea, exclusive breast feeding, cough, maternal education, frequency of complementary foods, perceived child birth weight.

3. Environmental Health conditions: safe water supply, availability of latrine, type of latrine, presence of window, type of the floor.

4.8. Data Quality Control

Two days training was provided to data collectors and supervisors. Data was collected under the supervision of the principal investigator. Incomplete questionnaires were completed by making second visits to the homes. Pre-test was done before the actual data collection to see for the accuracy ofquestions and responses and to estimate time needed. Weighing scales was calibrated with known weight object regularly. The data collectors also have standardized the anthropometric measuring tools in the training sessions to maintain the uniformity of measurements. The scales indicator was checked against zero reading after weighing every child. The questionnaire was first prepared in English and then translated to Afan Oromo and

back translated to English by language expert to maintain the consistency of the contents of the instrument.

4.9. Data Management and Analysis

First the data was checked for completeness and consistency. Then it was entered and coded in the computer using Epidata version 3.1software.WHO Anthro software was used to convert weight, height/length and MUAC values into Z-scores of the indices; H/A, W/H and W/A taking age and sex into consideration using WHO child growth standard.

Then, thedata was exported to SPSS 16.0 program for analysis; descriptive summary using frequencies, proportions, graphs and cross tabs used to present study results.Binary logistic regressions were used to see the strength of association between independent and dependent variables .Variables which are significant at p-value less than 0.25 in bivariate analysis were candidate for multivariate analysis.Multivariate logistic regression analyses, based on UNICEF's analytical framework, was conducted to identify determinants of nutritional status i.e. independent variables that have a significant role in influencing nutritional status and to account for possible confounding factors using SPSS standard Backward Stepwise method.The degrees of association between dependent and independent variables were assessed using OR and 95% CI.P-value less than 0.05 wasconsidered as statistically significant.

4.10. Operational Definitions

Diarrhea; A child with loose stools for three or more times in a day or a sign of dehydration

Acute Respiratory Illness; A child with cough and fast breathing or difficulty in breathing

Family size; refers total number of people living in a house during the study period.

Income; It is periodical monthly earning from one's business, lands, work, investment etc.

Malnutrition; refers to under nutrition or deficiency in protein-energy nutrition.

Stunting: H/A less than the international median WHO child growth reference value by more than two standard deviations: below -3SD is severe stunting.

Wasting: W/H less than the international median WHO child growth reference value by more than two SD.

Severe wasting; W/H below -3SD or less than 70% of the median WHO reference values

Underweight: W/A less than two SD below the international median WHO child growth reference value.

4.11. Ethical clearance

Letter of ethical clearance was obtained from Research Ethics Committee of Jimma University. Letter of permission was obtained from Bule Hora Woreda health office for health centers and letter of permission also obtained from these health centers for the health posts and kebele administrators.Each respondent was informed about the objective of the study and privacy during the interview. Finally verbal consent was requested from the study participants selected for interview in the study immediately before the data collection.

4.12. Dissemination of the finding

The result of the study will be presented to Jimma University community as part of MPH thesis and it is disseminated to Jimma University, College of public health and medical science, department of Epidemiology, Oromia Regional health bureau, Borena zone health department ,Bule Hora health office and to the targeted health facilities and to Non-governmental organizations working on this area. Further attempt will be made to publish it on national and international scientific journals.

Chapter Five-Result

5.1. Socio-demographic conditions

From the total 796 planned study participants, complete response was obtained for 778(97.7%). Female headed HHs were 8.6% and 91.8% of the respondents were married. Average family size was 6.27 persons (±2.61 SD) while 55% of the HHs have more than five family members. About 47.9% of the HHs had two under five children and 5.7% of the HHs had three under five children.

Concerning educational status, 63.9% mothers of the children were illiterate, 30.7% have primary education, 4.4% were secondary education, and 1.1% were certificate or diploma holders. And 40.4% of the fathers of the children were illiterate, 50.4% have completed primary education, 5.0% completed secondary education and the rest 4.2% were a certificate or diploma holders.

About 65.2 % of the mothers were housewives, 16.3% merchants, 13.1%farmers, 1.3% government employee and 1.5% private employee. Majority of the respondents were Oromo ethnic group (89.5%) and 6.4 were Gedeo. Their religion was; 85.3% Protestants, 5.9% Orthodox Christian, 5.4% Muslim, 1.8% catholic and 1.5% were following other religions. Farm land ownership was 68.5% and 57% of these land owners had 0.5 hectare or less. Animal ownership was 64.9%(Table 1).

Table 1;Distribution of Socio-demographiccharacteristics of study participants, Bule Hora Woreda, Borena Zone, Oromia Regional State, 2013

Variables		Frequency(n)	Percent(%)
Head of HH(n=778)	Male	711	91.4
	Female	67	8.6
Marital status(n=778)	Married	714	91.8
	Divorced	25	3.2
	Widowed	33	4.2
	Single	6	0.8
Family size(n=778)	2-5	350	45
	>5	428	55
<5years children in the HH (n=778)	1	359	46.1
	2	373	47.9
	3-4	46	6
Farm land ownership(n=533)	<1hectar	304	57
	>1hectar	229	43
Ownership of Animals(n=778)	Yes	505	64.9
	No	273	35.1
Maternal education (n=778)	Uneducated	497	63.9
	Primary	239	30.7
	Secondary	34	4.4
	Certificate & Diploma	8	1.1
Ethnicity(n=778)	Oromo	696	89.5
	Gedeo	50	6.4
	Gurage	14	1.8
	Amhara	11	1.4
	Others**	7	0.9
Religion (n=778)	Protestant	664	85.3
	Orthodox	46	6.0
	Muslim	42	5.4
	Catholic	14	1.8
	Others *	12	1.5

* Traditional believe, Waqefata ** Burji, Koyira

5.2 Child characteristics and Caring practices

From the total children, 50.6% were males and mean age was 28(±14.6SD) month for both sex. Nearly half (46.4%) of the children were with second to fourth birth order. Place of delivery was at home for 89.1% of the children. Birth weight was small for 4.0% of the children, very small for 4.4%, average for 63.7%, very large for 11.7% and large for 16.2%.

Table 2; Distribution of Child characteristics, Bule Hora Woreda, Borena Zone, Oromia Regional State, 2013

Variables		Frequency(n)	Percent (%)
Child sex(n=778)	Male	384	49.4
	Female	394	50.6
Child age category(n=778)	6-11	123	15.8
	12-23	189	24.3
	24-35	160	20.6
	36-47	188	24.2
	48-59	118	15.2
Birth order(n=778)	1	151	19.4
	2-4	361	46.4
	Above 4	266	34.2
Place of delivery(n=778)	Home	693	89.1
	Health facility	85	10.9
Birth size(n=778)	Average and above	713	91.6
	Smaller than average	31	4.0
	Very small	34	4.4
Diarrhea (n=778)	Yes	377	48.5
	No	401	51.5
Acute Respiratory Infection(n=778)	Yes	26	3.3
	No	752	96.7
Having diarrhea in the last two weeks	Yes	195	25.1
	No	583	74.9
Frequency of diarrhea/year(n=377)	1 episodes	268	71.1
	2 episodes	84	22.3
	≥3 episodes	25	6.6
Fever (n=778)	Yes	41	5.3
	No	737	94.7

The study finding also shows that 32.7 % of children were exclusively breastfed for less than six months. The frequent health problem of the children was diarrhea for 41.8% children and 25.1% had diarrhea in the last two weeks. About 3.3% of the children showed symptoms of acute respiratory infection (ARI) in the past two weeks prior to the survey (Table2).

Concerning immunization, 2.1% of the children did not receive any form of vaccine and 54.3% were fully immunized .Only 51.5% of the children received vitamin A in the past six months prior to data collection. According to the study finding pre-lacteal feeding was given for 12.1% (water for 8.2%, milk 3.1% and butter for 0.8%) of the children and 2.4% mothers squeezed out the first milk. About 67.1% of the children visited health facility for illness care and 50.8% of the children took bath in every other day to week period (Table 3).

Table 3; Distribution of child caring practices, Bule Hora Woreda, Borena Zone, Oromia Regional State, 2013

Variables		Frequency	Percent
EBF(n=778)	≤4 months	32	4.1
	4-6 months	179	23.0
	6 months	525	67.5
	>6 months	34	4.4
	Unknown	8	1.0
Vaccinated (n=778)	Yes	762	97.9
	No	16	2.1
Vaccination status (n=762)	Partially	348	45.7
	Fully	414	54.3
Vitamin.A supplementation(n=778)	Yes	401	51.5
	No	377	48.5
Pre-lacteal feeding given (n=778)	Yes	94	12.1
	No	684	87.9
Ever taking child to Health institutions(n=778)	Yes	522	67.1
	No	256	32.9
Child bath taking(n=778)	Daily or twice daily	383	49.2
	Every other day to week	395	50.8

5.3 Maternal conditions

As indicated in table 4, mean age of mothers was 31.5(±6.0 SD) years and mean age of mother at first child birth was 20.4 (± 2.3 SD) year. Mothers who gave first birth at the age 18 and less years were 24.6%. Average total children born to a mother was 4.2 children (±2.5 SD); and 37.9% of the mothers gave birth of five and above children.

The study finding also showed that out of the mothers interviewed 27.5% of them did not attend ANC service during their pregnancy. About 92.9% of mothers had information about family planning methods but only 49.8% of them used family planning. No extra food was taken from the usual time during pregnancy and lactation for 65.9%% of the mothers (Table 4).

Table 4; Distribution of Maternal conditions, Bule Hora Woreda, Borena Zone, Oromia Regional State, 2013

Variable		Frequency(n)	Percent(%)
Mothers age at first birth (n=778)	15-18	191	24.6
	>18	587	75.4
Maternal age category (in years)(n=778)	15-19	10	1.3
	20-24	73	9.4
	25-29	262	33.7
	30-34	190	24.4
	35-39	148	19.0
	40-44	86	11.1
	45-49	9	1.2
Total children born to a mother(n=778)	≤4	483	62.1
	>4	295	37.9
Attended ANC (n=778)	Yes	564	72.5
	No	214	27.5
Knowing family planning methods(n=778)	Yes	723	92.9
	No	55	7.1
Ever using family planning methods(n=723)	Yes	360	49.8
	No	363	50.2
Extra food intake during pregnancy/lactation(n=778)	Yes	513	65.9
	No	265	34.1

5.4 Environmental conditions

According to the study finding, 61.9% of the households were getting water from tap water. Majority of the HHs (80.1%) have a latrine. Traditional private pit latrine with wooden slab was the commonest type (86.7%) being utilized. Housing type with corrugated iron sheet roof were 68.6% and 74.3% of the houses had windows (Table 5).

Table 5; Distributionof Environmental conditions, Bule Hora Woreda, Borena Zone, Oromia Regional State, 2013

Variables		Frequency(n)	Percent (%)
Water source (n=778)	River	48	6.2
	Pond	30	3.9
	Unprotected spring	51	6.6
	Protected spring	124	15.8
	Private well	46	5.9
	Tap water	479	61.6
Per capita water use(n=778)	≤20 liter	15	1.9
	20-40 liter	635	81.6
	>40	128	16.5
Availability of latrine (n=778)	Yes	623	80.1
	No	155	19.9
Type of latrine (n=623)	Private pit with wooden slab	540	86.7
	Others *	83	13.3
Type of residential house (n=778)	Tukul with thatched house	244	31.4
	Corrugated iron sheet	534	68.6
Presence of window(n=778)	Yes	578	74.3
	No	200	25.7

* Private pit with cement slab, Shared latrine, VIP latrine,

5.5 Nutritional status of the children

Prevalence of stunting, underweight and wasting was 47.6%, 29.1% and 13.4% respectively. Prevalence of severe stunting, underweight and wasting was 20.2%, 6% and 3.9% respectively. MUAC measurement also indicated that 10% of the children were malnourished (<12.5 cm). There was no child with nutritional edema.

Table 6; Prevalence of Child Malnutrition, Bule Hora Woreda, Borena Zone, Oromia Regional State, 2013

Malnutrition indicators	Frequency (%)
Stunting	370 (47.6)
Severe stunting	157(20.2)
Underweight	227(29.2)
Severe underweight	47(6.0)
Wasting	104(13.4)
Severe wasting	30(3.9)
Low MUAC for age (z-score<-2)	95(12.2)
Low MUAC for age (z-score <-3)	18(2.3)
Moderate acute malnutrition (MUAC≥ 11.5cm &< 12.5cm)	60(7.7)
Severe acute malnutrition (MUAC<11.5cm)	18(2.3)
MUAC<12.5	78(10)

Prevalence of stunting was highest in children of 24-35 years age and underweight was highest in the age group of 48-59 months. The prevalence of stunting was increasing 6-11 to 24-35 age category and the prevalence of underweight was increasing from 6-11 month (23.6%) to 48-59(39.6%) month age category, in the opposite the prevalence of wasting was decreasing from 6-11(16.5%) to 24-35 (7.5%) age category (Table 7).

Table 7; Prevalence and number of 6-59 months children affected by malnutrition by age category, Bule Hora Woreda, Borena Zone, Oromia Regional State, 2013

Age Category in month	Stunting	Severe stunting	Wasting	Severe Wasting	Underweight	Severe Underweight
	No (%)	No (%)	No (%)	No (%)	No (%)	No (%)
6-11	29(23.6)	12(9.8)	20(16.5)	3(2.4)	29(23.6)	3(2.4)
12-23	104(55.0)	49(25.9)	20(10.8)	2(1.1)	47(24.9)	11(5.8)
24-35	98(61.2)	41(25.6)	12(7.5)	1(0.6)	43(26.9)	6(3.8)
36-47	74(39.4)	25(13.3)	33(17.7)	19(10.1)	61(32.4)	13(6.9)
48-59	65(55.1)	30(25.4)	19(16.4)	5(4.2)	47(39.6)	14(11.9)
Total	370(47.4)	157(20.2)	104(13.4)	30(3.9)	227(29.2)	47(6.0)

Table 8 below shows that out of 157 severely stunted children 105(66.9%) were males and out of 47 severe underweight children 33(70.2%) were males. And also the study shows that the prevalence of stunting (height for age between -2 and -3SD of the median WHO reference values) is high in female children (52.6%) than males but severe stunting (height for age below -3SD of the median WHO reference values)was highest in males (66.9%).Prevalence of underweight and severe underweight was highest in males (62.2% underweight, 70.2% severe underweight) than females (37.8% underweight, 29.8% severe underweight).

Prevalence of wasting was also high in males than females. According to the finding out of 74 children with weight for height z-score between -3 and ≤-2 (weight for height between -2 and -3SD of the median WHO reference values) 49(66.2%) males and 16(53.3%) were females. Severe wasting (weight for height below -3SD of the median WHO reference values) also high in males 16(53.3%) than females 14(46.7%).

Table 8; Prevalence and number of 6-59 months children affected by stunting, underweight and wasting by sex category, Bule Hora Woreda, Borena Zone, Oromia Regional State, 2013

		Child sex		
		Male	Female	**Total**
		No (%)	N0 (%)	No (%)
Height for age z-score	Normal(z-score >-2)	178(43.6)	230(56.4)	408(100)
	stunting (z-score -3 up to≤-2	101(47.4)	112(52.6)	213(100)
	Severe stunting (≤-3)	105(66.9)	52(33.1)	157(100)
Weight for age z- score	Normal (z-score >-2)	239(43.3)	312(56.6)	551(100)
	underweight (z-score -3 up to≤-2)	112(62.2)	68(37.8)	180(100)
	Severe underweight (z-score ≤-3)	33(70.2)	14(29.8)	47(100)
Weight for height z-score	Normal (z-score >-2)	319(47.3)	355(52.3)	674(100)
	Wasting (z-score -3 up to≤-2)	49(66.2)	25(33.8)	74(100)
	Severe wasting (z-score ≤-3)	16(53.3)	14(46.7)	30(100)

The study also identified the nutritional status of under-five children by sex. The prevalence of wasting, underweight and stunting was higher in males than females. The prevalence of stunting, underweight and wasting was 53.6%, 37.8%, and 16.9% in males and 41.6%, 20.8% and 9.9% in females respectively (Fig. 3).

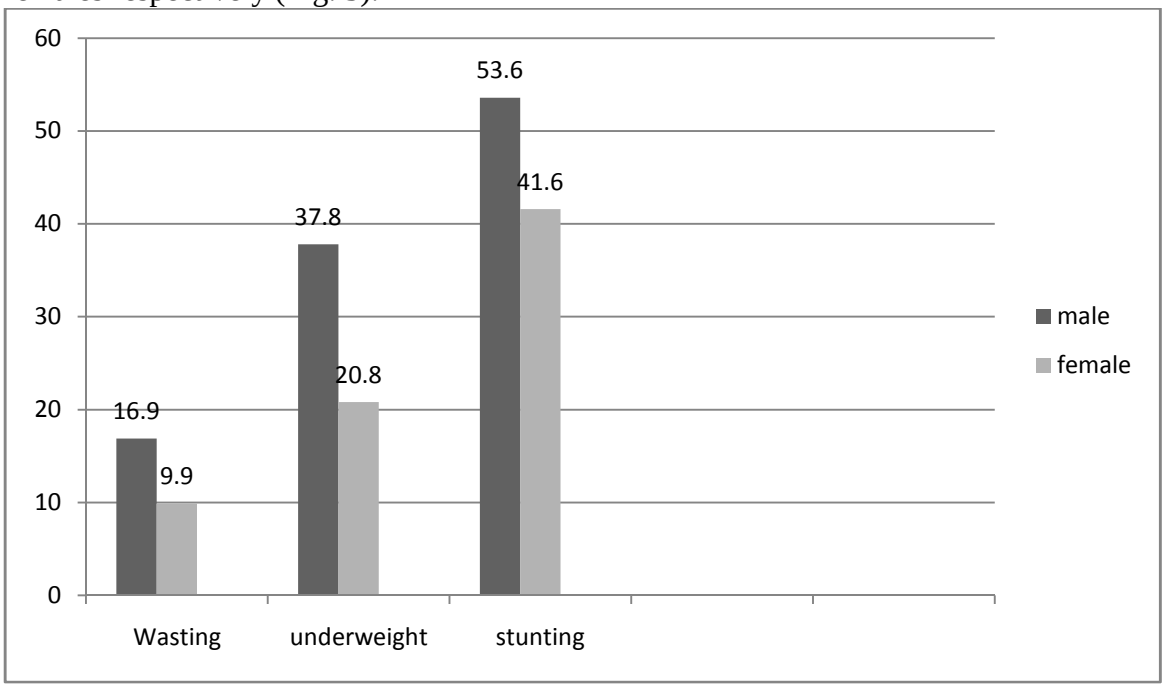

Figure 3- Nutritional Status of 6-59 years age children by sex, Bule Hora Woreda, Borena Zone, Oromia Regional State, 2013

5.6 Determinants of under-five Nutritional Status

Nutritional statusamong under five years age children was analyzed in for association with some selected variables related to demographic, socio-economic, child, maternal and environmental aspects.

According to bivariate analysis; maternal education ,paternal education , child sex, total number of children ever born to a mother, having livestock, birth order, having diarrhea in the last two weeks prior to data collection, giving pre lactation food, exclusive breast feeding, bath taking ,visiting health facility for ANC service ,using family planning methods and availability of latrine were significantly associated with underweight. In multivariate analysis only paternal education, child sex, presence of diarrheal disease in the past two weeks andtotal number of children ever born to a mother were have significant association with underweight.

The same to that of underweight many variables were significantly associated with stunting in bivariate analysis. Child sex, presence of diarrheal disease in the past two weeks, maternal use of family planning methods and pre-lacteal feeding were significantly associated with stunting in multivariate analysis. Age at which additional food started, presence of diarrhea in the past two weeks and maternal use of family planning methods were significantly associated with wasting in multivariate analysis.

Table 9 shows that the odds of being male was2.5 times (OR=2.5, 95%CI: 1.5-4.1) as high as females to become underweight. The study finding also shows that having diarrhea in the past two weeks as a predictor of child to become underweight.The odds of children having diarrhea in the past two weeks prior to the data collection was3.9 times (OR=3.9,95%CI: 2.2-6.8) as high as children who did not have diarrheal disease in the past two weeks prior to the data collection to become underweight.

Paternal lack of education was also one of the important predictors of children being low weight for age. According to the multivariate done, the odds of children whose fathers were uneducated

was 6.7 times (OR=6.7, 95%CI: 10.76-62.2) as high as children from educated fathers to become underweight.

The finding shows that total number of children ever born to a mother was also an important predictor for underweight. The odds of children born to a mother who gave birth to children of more than four was 1.8 times as high as children born to a mother who gave birth to less than four children to become underweight(Table 9).

Table 9; Factors associated with Underweight in children of 6-59 month age , Bule Hora Woreda,2013

Variables		Underweight		Crude OR (95% CI)	Adjusted OR (95%CI)
		Yes	No		
Child sex	Male	145	239	2.3(1.6-3.1)*	2.5(1.5-4.1)*
	female	82	312	1.00	1.0
Total number of children born to a mother	≤4	372	111	1.0	1.0
	>4	179	116	2.2(1.6-3.0)*	1.8(1.1-3.1)*
Presence of diarrhea in the last two weeks	Yes	102	93	4.0(2.9-5.7)*	3.9(2.2-6.8)*
	No	125	458	1.00	1.0
Maternal formal education	Yes	175	322	1.00	1.0
	No	52	229	2.4(1.7-3.4)*	1.1(0.35-3.4)
Paternal formal education	Yes	106	193	1.0	1.0
	No	121	358	2.1(1.5-2.9)*	6.9(10.76-62.2)*
Availability of latrine	Yes	162	461	1.0	1.0
	No	65	90	2.05(1.4-3.0)*	1.2(0.72-1.9)
Giving pre-lactation	Yes	39	55	1.87(1.2-2.9)*	1.1(0.63-1.9)
	No	188	496	1.0	1.0

*** Significant at p -value<0.05**

Table 10 below shows that multivariate analysis of some selected variables which predict low height for age. According to the analysis,the odds of being male was 2.8 times (OR=2.8, 95%CI: 1.5-5.3) as high as females to become stunt.Presence of diarrheal disease in the past two weeks prior to data collection also factor which influences child nutritional status. The odds of children having diarrheal disease in the past two weeks was 2.5 times (OR=2.5, 95%CI: 1.2-5.3) as high as children who did not have diarrheal disease in the past two weeks to become stunt.

Prevalence of stunting was higher in children who provided pre lacteal feeding. The odds of children who had given pre lacteal feeding was 3.8 times (OR=3.8, 95%CI: 1.2-12.2) as high as children who had not given a pre –lacteal feeding to become stunting. Maternal uses of family planning methods have significant association with chronic malnutrition. Mothers who did not use family planning methods were also the other variable which is significant at multivariate analysis. The odds of children born to mothers who did not use family planning methods was 1.5 times (OR=1.5, 95%CI: 1.0-2.1) as high as children whose mothers used family planning methods to become stunted (Table 10).

Table 10; Factors associated with Stunting in children of 6-59 month age ,Bule Hora Woreda, 2013

Variables		Stunting Yes	No	Crude OR (95% CI)	Adjusted OR (95%CI)
Child sex	Male	206	178	1.62(1.2-2.2)*	2.8(1.5-5.3)*
	female	164	230	1.00	1.0
Total family size	≤5	138	212	1.0	1.0
	>5	232	196	1.8(1.4-2.4)*	1.25(0.79-2.0)
Presence of diarrhea in the last two weeks	Yes	117	78	2.0(1.4-2.7)*	2.5(1.2-5.3)*
	No	253	330	1.0	1.0
Maternal formal education	Yes	106	233	1.0	1.0
	No	264	175	1.9(1.4-2.5)*	1.3(0.66-2.5)
Attended ANC	Yes	240	324	1.0	1.0
	No	130	84	2.1(1.5-2.9)*	1.3(0.87.2.0)
Maternal use of FP methods	Yes	136	224	1.0	1.0
	No	211	152	2.3(1.7-3.1)*	1.5(1.0-2.1)*
Maternal intake of extra food	Yes	161	104	2.3(1.7-3.1)*	0.65(0.45-0.95)
	No	209	304	1.0	1.0
Availability of latrine	Yes	91	64	1.8(1.2-2.5)*	0.89(0.57-1.4)
	No	279	344	1.0	1.0
pre-lacteal feeding	Yes	49	45	1.2(0.80-1.9)*	3.8(1.2-12.2)*
	No	321	363	1.0	1.0

***significant at p-value <0.05**

The odds of children who had diarrheal disease was 2.7 times (OR=2.7, 95%CI: 1.1-6.4) as high as children who did not have diarrheal disease in the past two weeks prior to data collection to become wasted(Table 11).

Children who started additional food before the age of 6 months were also a significant predictor for low weight for height (wasting). The odds of children who started additional food before the age of six months was 3.3 times (OR=3.3, 95%CI: 1.5-7.4) as high as children who started

additional food at the age of six month to become wasting. The odds of children born to mothers who did not use family planning was 3.8 times (OR=3.8, 95%CI: 1.3-11.6) as high as children whose mothers did not use family planning methods to become wasting(Table 11).

Table 11; Factors associated with Wasting in children of 6-59 month age , Bule Hora Woreda, 2013

Variables		Wasting		Crude OR (95% CI)	Adjusted OR (95%CI)
		Yes	No		
Child sex	Male	65	318	1.8(1.2-2.8)*	1.78(0.8-2.8)
	female	39	356	1.0	1.0
Presence of diarrhea In the last two weeks	Yes	55	140	4.2(2.8-6.5)*	2.7(1.1-6.4)*
	No	49	534	1.0	1.0
Maternal formal education	Yes	26	254	1.0	1.0
	No	78	420	1.8(1.1-2.9)*	1.5(0.9-2.6)
Age at which additional food given	<6 month	46	175	2.3(1.5-5.8)*	3.3(1.5-7.4)*
	6 month	59	498	1.0	1.0
Maternal use of FP methods	Yes	41	318	1.0	1.0
	No	52	311	1.3(0.84-2.0)	3.8(1.3-11.6)*
Availability of latrine	Yes	31	124	1.9(1.2-3.0)*	0.61(0.38-0.99)
	No	73	550	1.0	1.0
Availability of window	Yes	42	158	2.2(1.4-3.4)*	0.62(0.38-0.97)
	no	62	516	1.0	1.0
Providing pre-lacteal feeding	Yes	18	76	1.6(0.94-2.9)*	1.28(0.71-2.3)
	No	86	598	1.0	1.0

***Significant at p-value <0.05**

Chapter- six- Discussion

Prevalence of child malnutrition was high in the Woreda. This study noted that there were unprecedented levels of malnutrition among children under the age of five years in the Woreda attributed to maternal and child, behavioral, cultural and socio-economic factors.This might be also an obstacle in the achievement of the fourth millennium development goal which intends to reduce infant and young child mortality by two-thirds from 1990 to 2015.

Even though the prevalence of underweight and stunting was somewhat different (36.6% under-weight and 42.2% stunted) the result of our study was comparable to prevalence of wasting (14.1%) conducted in rural kebeles of Haramaya (23). This difference might be due to socio-economic and cultural factors between the two communities and also in their study children less than 6 months of age were included.

This study also revealed that prevalence of child malnutrition was high in the Woreda in comparison to the EDHS 2011 report (44% stunting and 10% wasting)(14).The discrepancy might be due to small sample size compared to that of EDHS and children below the age of six months were not included.

Except for that of wasting, the risk for stunting and underweight increased as age increases in both sexes up to the age of three and then relatively decreases as age increases. This is in agreement with the report from Democratic Republic of Congo which showed the nature of malnutrition to be strongly dependent on age, EDHS 2011 and the study conducted in India by Shubhada S.et al which suggested that it is due to improper weaning and recurrent infections which makes this age group more vulnerable (14,22,35).The other possibility could be inappropriate weaning method at earlier age and then later after the age three the improvement seen may be due to the fact that the child can demand and take type of food when he/she need.
The other possible reason is due to the cumulative effect of chronic malnutrition. As age increases it is expected that the rate of stunting and underweight increases. However, the pick period is around the age of 2 years.

There was very high prevalence of wasting in the study area alarming to increased risk of death to children. It signifies acute nutritional problem due to illness and/or recent food shortage. High chronic malnutrition also signifies children's failure to grow; impact on both physical and mental capacity of the affected children. Infections play a major role in the etiology of PEM because they result in increased needs and a high energy expenditure, lower appetite, nutrient losses due to vomiting, diarrhea, poor digestion, mal-absorption and the utilization of nutrients and disruption of metabolic equilibrium (24). In this study presence of diarrhea in the last two weeks prior to data collection was the main contributing factors for stunting, underweight and stunting. This study was in agreement with the study conducted in West Gojjam and Vietnam (29,36).

The prevalence of all the three types of malnutrition was higher among males than females and the prevalence of stunting, an indication of chronic malnutrition, was higher compared to wasting and underweight in the study area. A finding of this study was in agreement with the studies conducted by Nnyepi M. et al, Olack B .et al and Shubhada S.et al, (21, 22, 27).The probable reason for the males to be malnourished than females might be due to the increased attention being paid to female children, as well as reduced care and weaned male children.

Pre-lacteal feeding was also a risk factor for being stunted. This study revealed that children who provided pre lacteal feeding were more likely to be stunted than children who did not provided pre lacteal feeding. This study is consistent with the study conducted in Haramaya rural kebeles, Gondar University hospital and west Gojjam (22, 29,32).The higher risk of stunting among children who were fed pre-lacteal feed might be due to its negative impact on breastfeeding and when children are not breastfed appropriately, they are at high risk of under-nourishment.

In studying the correlates of under nutrition in children under five years of age, this finding also revealed that a negative relationship between mothers use of family planning methods and nutritional status (stunting and wasting) of children exists in this study population.This study was in line with the report of EDHS 2012 which shows that there is an inverse relationship between the length of the preceding birth interval and the proportion of children who are stunted. The longer the interval, the less likely it is that the child will be stunted(14).The probable reason is

that when there are too many children who are closely spaced in the family, there may be the tendency for malnutrition to occur.

This study also identified that children with age group 6-59 months born to a mother who gave birth to more than four children were more likely to be underweight when compared with children from a mother who gave birth to less than four children. This study was supported by the study conducted in Vietnam and Bangladesh which showed that families with more children experience more economic strain for food consumption and hence they are more likely to suffer from poor nutritional status. In other words, inadequate allocation of household resources among many children may lead to the low nutritional status. Particularly poor families cannot fulfill the nutritional requirements of the children. Families with more children generally devote less time to take care of their children (30, 32, 36).

Age at which additional food was given was also a significant predictor for being wasted. Children who started additional food before the age of six months were more likely to be wasted when compared with the children who started additional food at the age of six month. This study was in line with the study conducted in Vietnam and Ludhiana which showed that children who exclusively breast fed for <6 months were more likely to wasted when compared with those exclusively breast fed for ≥6 months (28, 36).

The finding of this study showed that children from uneducated father were more likely to be underweight when compared with children of educated fathers. This study is consistent with study conducted in Gondar University hospital by Amsalu.S and Tigabu. Z and Bangladesh by Mohammed I.et al which identified children from uneducated fathers were positively associated with child malnutrition. It is argued that fathers with higher status in the society have the ability to make decisions that improve the nutritional status of children while those with low status do not (30, 32).

Chapter – Seven- Limitation of the Study

As the study is cross-sectional in design, it neither represents seasonal variation of nutritional outcomes particularly to the wasting status nor establishes causal relationship.Dietary aspect which is the immediate determinant of nutritional status is not included in this study.The measurements may not be accurate due to subjective responses and recall bias. Age determination was difficult since there was no birth registration in the area.

Chapter- Eight- Conclusions and Recommendations

Conclusion

Based on the finding of this study it can be concluded that; acute malnutrition is at critical stage alarming. High prevalence of stunting in the area is also of particular concern in the Woreda. In the Woreda prevalence of stunting, underweight and wasting was 47.6%, 29.2% and 13% respectively and that of severe stunting; underweight and wasting was 20.2%, 6.0% and 3.9% respectively.

The study also identified the predictors of child malnutrition. Being male, presence of diarrheal disease in the last two weeks, mothers who did not use family planning and pre-lacteal feeding were the important contributing factors of stunting. Being male, total number of children ever born to a mother, presence of diarrhea in the last two weeks and uneducated fathers were significantly associated with underweight. Presence of diarrhea in the last two weeks, age at which additional food given and mothers who did not use family planning were the important predictors for wasting.

Recommendations

For Bule Hora Woreda Health Office:

- Prevention and control of diarrheal disease through improving access to safe and adequate water supply, immunization, housing, sanitation and hygiene practices.
- Intervention should focus on improving promotion of nutrition education and utilization of family planning.
- Promotion of better child and maternal caring practices.

For Researchers :

- Further research in dietary assessment is required.

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Annex-1- Afan Oromo Version Questionnaire

YUUNIVARSIITII **JIMMAATTI** FAAKAALITII FAYYAA HAWAASAA FI SAAYINSII MEEDIKAALAA QORANNAA SADARKAA SIRNA NYAATAA IJOOLLEE UMRIIN ISAANII **JI'A 6-59** TA'ANIIF KAN QOPHAA'E**.**
AANAA BULEE HORAA, GODINA BOORANAA

Waraqaa Gaaffii

Waraqaan gaaffii kun kan qophaa'e ragaa sadarkaa sirna nyaataa ijoollee fi dhimmoota murteessa isaan ta'an sadarkaa manaa manatti funaanuuf, aanaa Bulee Horaa , Godina Booranaa,Naannoo Oromiyaa

Walii galtee
Nagaa

Seensa;

Maqaan koo _____ jedhama. Ani kan hojjachaa jiru ragaa qorannaa Yuunivarsitii Jimmaa, faakalitii fayyaa hawaasaa fi Saayinii Meedikaalaa walin ta'uun mata dure "Sadarkaa sirna nyaata ijoolee fi dhimmoota murteeassa isaa ta'an" irratti gaggeeffamuuf oolu funanuu dha. Maqaan keessan guca kana irratii hin-barreeffamu, akkasumas ragaa naa keennitan walin qabsifamees itti hin-fayyadamamu.Gaaffiin isin deebisuu hin-barbaadne yoo jiraate dhiisuun mirga keessan ta'ee yeroo barbaaddanis gaaffii fi deebii gaggeessinu dhaabuu ni-dandeessu.
Haa ta'u malee, gaaffilee hundaaf deebiin sirii ta'e kaayyoo qorannaa kanaaf baay'ee barbaachisadha.
Hirmaachuudhaaf fedhii qabduu? 1. Eeyyee 2. Hin Qabnu
Gaaffii fi deebii kana xumuruuf sa'aatii _____ ta'u nutti ni fudhata.
Mallattoo gaafataa, Namni gaafatamu kun waliigaltee isaa jechaan ibsuu isaa mirkaneessuuf _____

001. Lakkoofsa waraqaa gaaffii _____
002. Maqaa nama gaafatuu _____
003. Guyyaa gaaffii fi deebii _____
004. Teessoo; 1. Magaala 2. Baadiyaa
005. Firii: 1. Hundi guutame 2. Walakkaa guutame 96.kan biraa (Ibsi)
To'ataa hordofe; Maqaa _____, Mallattoo_____

KUTAA TOKKOFFAA: GAAFFILEE HAWAASUMMAA FI DINAGDEE			
Lakk.	**Gaaffii**	**Deebii**	**Darbu/Ibsa**
101	Abbaan manaa?	1.Dhiira 2. Dubartii	
102	Haalli fuudhaa ?	1. Waliin jiru 2. Wal-hiikaniiru 3. Irraa du'e 4. Addaan bahan 5. Qofaa	
103	Baay'ina maatii mana keessa jiraatuu?	_____ lakkofsan	

104	Baay'ina ijoolleee waggaa <5 mana kessa jiran	_____ lakkofsan	
105	**Barumsa haadhaa** Sadarkaan barumsa idilee xumurtanii meeqa?	1. Kutaa _____ 2. Barumsa oogummaa sartifikeettii 3. Dippiloomaa 4. Digirii 96. kan biraa (Ibsi)_____	
106	**Barumsa Abbaa manaa** Sadarkaan barumsa idlee xumurani meeqa?	1. Kutaa _____ 2. Barumsa oogummaa sartifikeettii 3. Dippiloomaa 4. Digirii 96. kan biraa (Ibsi)_____	
107	**Hojii haadha manaa** (Deebiin tokkoo ol ni danda'ama)	1. Haadha manaa qofa 2. Qotee bulaa 3.Daldalaa 4. Hojjataa jaarmiyaa dhuunfaa 5. Hojjataa mootummaa. 6. Hojjataa guyyaa 96.Kan biraa (Ibsi)_____	
108	**Hojii abbaa manaa** (Deebiin tokkoo ol ni danda'ama)	1. Qotee bulaa 2. Hojjataa mootummaa 3. Daldalaa 4. Hojjataa jaarmiyaa dhuunfaa. 5. Hojjataa guyyaa 96. kan biraa (Ibsi)	
109	Ji'aatti galiin keessan meeqa ta'a ?	Qarshii _____	
110	Itti fayyadama maallaqa argattan irratti eenyu murteessa ?	1. Caalmaan haadha manaa 2. Caalmaan abbaa manaa 3. Abbaa manaa qofa 4. Lamaanuu waliin ta'uun	
111	Dhimma hojii manaa adda addaa irratti murteeffachuuf mirga yookiin itti-gaafatamummaa qabduu ?	1 Eeyyee 2. Lakki 99. Hin beeku	
112	Horii qabduu?	1. Qabna 2. Hin qabnu	hinqabnu, 114 tti darbi
113	Meeqa ta'u ? - Loon - Re'ee	 Lakkoofsaan_____ Lakkoofsaan_____	

	- Hoolaa - Lukkuu - Fardaa fi Harree Waliigalatti	Lakkoofsaan_____ Lakkoofsaan_____ Lakkoofsaan_____ Lakkoofsaan_____	
114	Lafa qonnaa hangam ta'u qabdu ?	1. Hin qabnu 2. Qarxii(Hektaara)____ 99. Hin beeku	
115	Qomoon keessan maali?	1. Oromoo 2.Amaaraa 3. Geedi;oo 4. Guraagee 5. Burjii 96. kan biraa (Ibsi)	
116	Amantiin keessan maali?	1. kiristaana /Pheenxee/ 2. Ortodoksii 3. Kaatolikii 4.Musiliima 96. Kan biraa (Ibsi)_____	
KUTAA LAMMAFFAA: HAALA MUCAA (yoo ijoollee waggaa <5 tokkoo ol ta'an Carraan fili)			
201	Saala mucaa	1. Dhiira 2. Durba	
202	Umriin isaa/ishee meeqa?	Ji'a_____	
203	Mucaa (Maqaa) meeqaffaatti deessan?	_____ ffaa	
204	Bakki itti deesssan eessa?	1.Mana jireenyaa 2.Mana yaalaa 96. Kan biraa (Ibsi)_____	
205	Ji'a meeqaffaatti dhalate/tte	1. Ji'a sagalii gadi 2. Ji'a saglaffaatti 3. Ji'a sagalii ol 99. Hin-beeku	
206	Yommuu dhalatu ulfinni isaa/ishee madaalameeraa?	1. Eeyee 2. lakki	Yoo lakki, 208 tti darbi
207	Yoo madaalame/te, meeqa ture/te?	Giramii_____ (kaardii/yaadaan?)	
208	Yommuu dhalatu/ttu, hangam ga'a/si?	1. Hedduu guddaa ture/te 2. Giddugaleessa ol 3. Giddugalessa 4. giddugalessaa gadi 5. xiqqaa ture/te 99. Hin-beeku	
209	Gosai dhalootaa	1. Baqqee 2. Lakkuu	
210	Mucaa (maqaa) da'uuf karoora (Qophii) qabdu turee ?	1. Eeyyee 2. Lakki	

211	Talaallii fudhate/tte beeka/beekaa/tii?	1. Eeyyee 2. Lakki	Lakki,213tti darbii
212	Talaallii kam fudhate/tte? (kaardii ilaali, yoo hin-jiraanne akka yaadatan gaafadhu) (Deebiin toko ol ni danda'ama)	1. BCG qofa 2. DPT (lakk. Dozii___) 3. Gifira/shiftoo 4. Kaardiin hin-jiru	
213	Vit. A ji'a ja'a darbe keessatti fudhate/tte	1. Eeyyee 2. Lakki 99. Hin beeku	
214	Rakkon fayya mucaa yeroo heddu mal isinitti fakkaata?	1.Dhukkuba/toota_____ 99. Hin beekamu	
215	Torban lamaan darbe keessa mucaan dhukkuba garaa kaasaa qabaa/qabdii?	1. Qaba 2. Hin qabu 99. Hin beekamu	Yoo hin-qabne, 217 tti darbi
216	Waggatti yeroo meeqa qaba?	1. tokko 2. lama 3. yeroo 3-4 4. >5 ol	
217	Torban lamaan darbe keessa mucaan dhukkuba gubaa qabaa/qabdii?	1. Qaba 2. Hin qabu 99. Hin beekamu	
218	Torban lamaan darbe keessa dhukkuba afuuraa ykn sombaa qabaa/qabdii?	1. Qaba 2. Hin qabu 99. Hin beekamu	
219	Waggaa darbe keessa dhukkuba gifiraatiin/shiftootiin qabamee beekaa/tii?	1. Qaba 2. Hin qabu 99. Hin beekamu	
220	Dhiitoo miila gadii irraa qabaa/dii? (ilaali)	1. Qaba/di 2. Hin qabu/du	
KUTAA SADAFFAA: HAALA QABINSA MUCAA			
301	Mucaa keessan harma hoosistuu?	1. Eeyyee 2. Lakki	
302	Mucaan (Maqaa) dhalatee/tte hammam turtanii harma hoosisuu eegaltan?	1. Akkuma dhalateen 2. Sa'aa _____ booda 3. Guyyaa ____ booda	
303	Akkuma deessaniin nyaatni /dhangala'aan/ mucaa (Maqaa) keennamee jiraa?	1. Eeyyee 2. Lakki	Yoo hinjirre-306 tti darbi
304	Maal kennitaniif ?	1. Bishaan 2. Dhadhaa 3. Aanan 96. Kan biraa (Ibsi)_____	

305	Aannan harmaa kan jalqabaa eelmitanii ni gattuu?	1. Eeyyee 2. Lakki	
306	Hanga ammaati hoosisaa jirtuu?	1. Eeyyee 2. Lakki	lakki, 315 tti
307	Sa'aa 24 darbeetti yeroo meeqa hoosistan?	Yeroo _____	
308	Halkan ni-hoosistuu?	1. Eeyyee 2. Lakki	
309	Mucaan (Maqaa) nyaata biraa/dhangala'aa sa'aa 24 darbe keessatti fudhateeraa/ttii?	1. Eeyyee 2. Lakki	lakki, 312tti darbi
310	Yoo fudhate/tte, nyaaata akkamii? (Deebiin tokkoo ol ni danda'ama)	1. Aannan loonii 2. Dhadhaa 3. shayii 4. Aannan bitamu (Formula) 5. Axmitii (Bulaa) 96. kan biraa (Ibsi	
311	Sa'aa 24 tti yeroo meeqa fudhate/tte?	Yeroo _____	
312	Umrii meeqatti nyaata biraa (dabalataa) kennuu eegaltan?	Ji'a _____	
313	Mucaa (Maqaa) nyaachisuuf meeshaa akkamiitti fayyadamtu?	1. Sinii 2. Butulee 3. Mankiyaa 96.Kan biraa (Ibsi)	
314	Hanga umrii meeqaatti harma hoosistan?	1. Ji'a____ 99. Hin yaadadhu	
315	Harma qofaa hanga umrii meeqaatti hoosistan?	1. Ji'a_____ 99. Hin yaadadhu	
316	Mucaa (Maqaa) nyaachisuu yeroo hedduu eenyutu hordofa?	1. Haadha 2. obboleettii 3. Akkoo 4. Hojjatuu manaa 96.kan biraa (Ibsi)_____	
317	Yeroo dhukkubaa haalli mucaa (Maqaa) itti nyaachiftan ni jijjiramaa?	1. Eeyyee 2. Lakki	Lakki,319tti darbi
318	Haalli nyaachisuu akkamitti jijjiirama?	1. Harma hoosisuu dhaabuun 2. Nyaata kennuu dhaabuun 3. Nyaata dabalataa kennuun 96. Kan biraa(Ibsi)_____	
319	Yeroo meeqatti meeshaa nyaataa kan mucaa (Maqaa) dhiqtu?	1. Guyyaatti yeroo lama 2. Guyyaa guyyaatti 3. Guyyaa lammaffaatti	

		4. Hanguma nyaachisneen 96. Kan biraa (Ibsi)_____	
320	Yeroo meeeqatti qaama mucaa dhiqtu?	1. Guyya guyyaatti 2. Torbanitti 96. Kan biraa (Ibsi)_____	
321	Yeroo mucaan dhukkubsatu/ttu akkamitti yaalchiftu?	1. Yeroo hedduu manumatti 2. Yaaltota aadaa biratti 3. Dhaabbata fayyaa geessuun 96. kan biraa (Ibsi)_____	
322	Kanaan dura yaaliidhaaf dhaabbata fayyaa geessitanii beektuu?	1. Eeyyee 2. Lakki	Lakki, kutaa 4tti darbi
323	Yeroo meeqa ?	1. Yeroo _____ 99. Hin yaadadhu	
KUTAA ARFAFFAA: HAALA HAADHAA			
401	Umriin haadhaa meeqa?	Waggaa _____ xumurame	
402	Umrii mucaa isa jalqabaa itti deessan	Waggaa _____ tti	
403	Umrii mucaa isa dhumaa itti deessan?	Waggaa _____ tti	
404	Ijoollee meeqa kanaan dura deessan?	Ijoollee _____.	
405	Ulfinni garaatti baachuu keessaniin dura qabdan meeqa ture? (mucaa isa qoratamu)	Kilogramaa _____	
406	Yeroo garaatti baattan/hoosistan (mucaa isa qoratamu) nyaata dabalataa (adda) nyaattuu?	1. Eeyyee 2. Lakki	
407	Haalli fayyaa keessanii yeroo garaatti baattaan akkam ture?	1. Gaarii ture 2. Gaarii hin-turre (Ibsi)_____	
408	Dhaabbata fayyaa qorannaa da'umsa duraa (QDD) tiif ni deemtu turee?	1. Eeyyee 2. Lakki	Lakki,411tti darbi
409	Garaatti baattanii ji'a meeqaffaatti QDD tiif dhaabbata fayyaa deemuu eegaltan?	Ji'a _____ tti	
410	Yeroo meeqa QDD tiif dhaabbata fayyaa deemtaniittu?	1. Yeroo _____ 99. Hin-beeku	

411	Waa'ee karoora maatii beektuu?	1. Eeyyee 2. Lakki	Lakki, 415 tti darbi
412	Tooftaalee karoora maatiitti fayyadamtan beektuu?	1. Eeyyee 2. Lakki	Yoo lakki, 415tti
413	Tooftaa kamitti fayyadamtanii beektu?	1. Kininii/pills 2. Diippoo 3. 'Norplant' 4. Kondomiii 96. kan biraa (Ibsi)_____	
414	Yeroo ammaa itti fayyadamaa jirtuu?	1. Eeyyee 2. Lakki	
415	Harka keessan yeroo kam dhiqattu? (Yeroo hedduu) (Deebiin toko ol ni danda'ama)	1. Mana fincaanii booda 2. Nyaata otoo hin qopheessine 3. Nyaata otoo hin dhiyeesine 4.Bobbaa ijoollee erga qulqulleessinee booda 96. kan biraa (Ibsi)_____	
416	Akkamiin (maaliin) dhiqattu?	1. Bishaan qofaan yeroo hedduu 2. Samunaa wajjin darbe darbee 3. Yeroo hunda saamunaan 4. Daaraatiin yeroo tokko tokko	
417	Mucaan keessan qaamaan (guddinni) isa maal isinitti fakkaata?	1. Qal'aa 2. Dheeraa 3. Furdaa 4. Giddugaleessa (Sirruma) 5. Xiqqaa	
418	Hanga umrii meeqaatti mucaan harma qofaa argachuu qaba jittanii yaaddu/beektu?	1. Ji'a _____ tti 99. Hin beeku	
KUTAA SHANAFFAA: HAALA EEGUMSA FAYYAA NAANNOO			
501	Madda bishaan dhugaatii keessanii?	1. Laga 2. Haroo 2. Burqaa hin ijaaramne 3. Burqaa ijaarame 4. Biirii dhuunfaa 5.Boonoo 96. Kan biraa (Ibsi)_____	
502	Guyyaatti hanga bishaan itti gargaaramtaniimeeqa?	Litira _____	
503	Yommu bishaan waraabdan deemanii deebi'uuf yeroo hangamii isinitti	Daqiiqaa _____ ni fudhata	

	fudhata?		
504	Bishaan itti fayyadamtan qulqulleessuuf yaaliin gootan ni jiraa?	1. Eeyyee (ibsi)_____ 2. Lakki	
505	Mana fincaanii ni qabduu	1. Eeyyee 2. Lakki	Yoo lakki, 507 tti darbi
506	Gosni mana fincaanii itti gargaaramtani? (Ilaali)	1. Boolla dhuunfaa kan qadaaddoo muka 2. " " " simintoo 3. Boolla waliinii kan qadaaddoo mukaa 4. " " " simintoo 5. "VIP" kan dhuunfaa 96. Kan biraa (Ibsi)_____	
507	Haalli kosii goggogaa itti gatan akkami?	1. Bakkeetti 2. Boolla dhuunfaatti 3. Boolla waliinii 4. 'Compost" gochuu 5. Gubuu 96.Kan biraa (Ibsi)_____	
508	Gosni mana jireenyaa? (Ilaali)	1. 'Tukuli/citaa 2. Qorqorroo 96. Kan biraa (Ibsi)_____	
509	Kutaan manaa meeqa? (Kushinaa fi mana kuusaa meeshaatiin alatti)	Kutaa_____	
510	Lafti mana jireenyaa maal irra hojjatame?	1. Biyyee 2.Simmintoo(Brick) 3. Muka (Bambuu) 4. Seeramikii 96.Kan biraa(Ibsi)_____	
511	Bal'nni mana nama tokkoof hangam ta'a?	_____m^2	
512	Manni jireenya foddaa qabaa?	1. Eeyyee 2. Lakki	
513	Kushinaa qofaatti qabduu?	1. Eeyyee 2. Lakki	
514	Horii yoo qabaattan mana isaanii qofaatti qabduu?	1. Eeyyee 2. Lakki	
515	Nyaata bilcheesuuf qoraan maalitti gargaaramtu?	1. Muka 2. kerosinii 3. Elektirika 4. kiboota 96. Kan biraa (Ibsi)_____	

Madaallii qaamaa

Ulfina mucaa Kilogiraamaan_____

Dheerina mucaa sentimetraan_____

'MUAC' mucaa sentimeetiraan_____

Annex -2 – English version Questionnaire

This questionnaire is prepared for collecting information on child nutritional status and determinants at household level in Bule Hora Woreda of Borena Zone.

Consent

Greetings

Introduction;

My name is_____ . I am working as data collector in a survey conducted by the collaboration of Jimma University, college of medical science and public health to assess child nutritional status and associated factors.

Your name will not be written on this form and will never be used with any information you may tell me. You don't have to answer any questions that you don't want to answer and you may end this interview at any time you want. However, your honest answer to these questions is very important for the purpose of the study. We would very much appreciate your participation in this survey by genuinely responding to the interviews. Would you be willing to participate? It would take _____ minutes to complete the questionnaire

Signature of the interviewer certifying that informed consent has been given verbally by respondent_____.

001. Questionnaire identification number /_____/_____/

002. Interviewer code_____ Name_____

003. Date of interview_____

004. Residence; 1. Urban 2. Rural

005. Result: 1. Completed 2. Partially completed 96.Others (Specify)

Checked by supervisor; Name_____, Signature_____

Part I Socio- demographic Variables			
No	Question	Response	Skip to/remark
101	Head of the House Hold	1. Male 2. female	
102	Marital status	1. Married 2. Divorced 3. Widowed 4. Separate 5. Single	
103	Total family size (How many person live in the HH?)	In number_____	

104	How many children <5 year live in the HH	In number_____	
105	**Maternal Education** What is the highest grade you completed?	Grade _____ 1. Technical/Vocational certificate 2. Diploma 3. Degree 96. Other (specify)	
106	**Paternal Education** What is the highest grade he completed?	Grade _____ 1. Technical/Vocational certificate 2. College/University Diploma 3. College/University Degree 96. Other (specify)	
107	**Occupation of mother** (More than one answer is possible)	1. Housewife only 2. Farmer 3. Merchant/Trade 4 Private Organization employee 5. Government employee 6. Daily laborer 96. Other (specify)_____	
108	**Occupation of husband** (More than one answer is possible)	1. Farmer 2. Government employee 3. Merchant/Trade 4. Private Org. employee 5. Daily laborer 96. Other (specify)_____	
109	Monthly income of the HH	_____ Birr	
110	Who decides how the money you earn will be used?	1. Mainly spouse 2. Mainly husband 3. Only husband 4. Both jointly	
111	Do you have some control and power (autonomy) in decision-making?	1. Yes 2. No 99. Do not know/not sure/	
112	Do you have livestock, herd or farm animal?	1. Yes 2. No	If, no skip to 114
113	If yes, how many? - Milk cow, Oxen and bulls? - Goat?	 _____ number _____ number	

	- Sheep? - Chicken? - Horse, donkey mule? In total	_____ number _____ number _____ number _____ number	
114	How many agricultural lands do you have?	1. Do not have 2. _____(local unit) (Hectar) 99. Do not know/not sure	
115	Ethnicity	1. Oromo 2.Amhara 3. Tigre 4. Gurage 5.Burji 96. Others (specify)	
116	What is your religion?	1. Protestant. 2.Muslim 3. Orthodox 4. Catholic 96. Others(specify)_____	
Part II CHILD CHARACTERSTICS (Randomly select if there are more than one under five)			
201	Child's sex	1. Male 2. Female	
202	Child's age	_____ Months	
203	Birth order	_____ th	
204	Place of delivery	1.Home 2.Health institution 96. Other (specify)	
205	Gestational age at birth	1. Less than 9 Months 2. At 9 months 3. Greater than 9 Months 99. Do not know /Not sure/	
206	Was your child weighed at birth	1. Yes 2. No	If no, skip to 208
207	How much was the weight?	_____ Grams (card/recall?)	
208	When (NAME) was born, How big was he/she?	1. Very large 2. Larger than average 3. Average 4. Smaller than average 5. Very small 99. Don't know	
209	Type of birth	1. Single 2. Multiple/Twin/	
210	Did you have plan (want) to give birth of the child at health facility?	1. Yes 2. No	
211	Does the child ever been immunized?	1. Yes 2. No	If no, skip to 213
212	Vaccines received (See card, if no card available ask them to recall) (More than one answer is possible)	1. BCG only (See Scar) 2. Penta (No of dose____) 3. Measles 4. No card found	
213	Vitamin. A supplementation in the	1. Yes 2. No	

	past six months?	98. Don't know/not sure	
214	What do you think is the frequent health problem to the child?	_____ Disease/s 99. Don't know	
215	Has the child had diarrhea in the last two Weeks?	1. Yes 2. No 99.Do not know/not sure	If no, skip to 217
216	How frequent in a year?	1. Once 2. Twice 3. 3-4 times 4. >5 times	
217	Has the child been ill with fever at any time in the last two weeks?	1. Yes 2. No 99. Don't know/not sure	
218	Presence of respiratory disease in the last two weeks	1. Yes 2. No 99. Do not know/not sure	
219	Has the child get sick with measles in the last year?	1. Yes 2. No 3. Do not know/not sure	
220	Presence of oedema on the child (Observe)	1. Yes 2. No	
PART THREE: CHILD CARING PRACTICE			
301	Did you ever breast fed the child (NAME)?	1. Yes 2. No	
302	How long after birth did you first out the child to breast feed?	1. Immediately 2. ___Hours (If less than 24 hours record hour) 3. ____ Days 99. Don't know/not sure/	
303	Did you give the child (NAME) pre-lactation food/fluid?	1. Yes 2. No	If no, skip to 305
304	If yes, what did you gave him (her)?	1. Water 2. Butter 3. Milk 96. other (Specify)	
305	Did you squeeze out and throw the first milk?	1. Yes 2. No	
306	Are you still breastfeed?	1. Yes 2. No	If no, skip to 309
307	How many times in the last 24 hours you breastfed?	_____ Times	
308	Do you breast feed in the night?	1. Yes 2. No	
309	Did you give the child additional food or fluid other than breast milk in the past 48 hours?	1. Yes 2. No	If no, skip to 314
310	If yes, what ingredients you gave? (More than one answer is possible)	1. Cow's milk 2. Butter 3. Sugar solution. 4. Formula milk. 96. Other (specify)_____	
311	How many times in 24 hours?	_____ times	
312	At what age did you start feeding other additional food?	_____ Months	
313	What do you use to feed the child?	1. Bottle 2. Cup 3. Spoon 96. Other (specify)	

314	How many months did you breast-feed the child?	_____ Months 99. Don't know/not sure/	
315	For how many months did you exclusively breast-fed the child?	_____ Months 99. Don't know/not sure/	
316	Who is usually taking care of the baby feeding?	1. Mother 2. Sister 3. Grand mother 4. House maid 96. Other (specify)	
317	During the illness, has the child feeding practice changed?	1. Yes 2. No	If no, skip to 319
318	How could the practice changed?	1. preventing from breast 2. preventing from giving food 3. Providing additional food 96. Other (specify)_____	
319	How frequent you wash utensils used for child feeding?	1. Twice daily 2. Once daily 3. Every other day. 4. Immediately after use 96. Other (Specify)	
320	Bath taking of the child	1. Daily 2. Weekly 96. Other (Specify)	
321	How did you usually treat your child when get sick?	1. Usually home treatment 2. Taking to traditional healers 3. Taking to Health institution 96. Other (Specify)	
322	Have you ever take your child to health institution for sickness?	1. Yes 2. No	If no, go to part 4
323	How many times have you ever taken the child to health institution getting sick?	_____ Times 99. Don't know/not sure	
PART FOUR : MATERNAL CHARACTERSTICS			
401	Mother's age in years	Year completed_____	
402	Age at first birth	_____ Years	
403	Age when the youngest child was born	_____ Years	
404	Total number of children ever born?	In number _____	
405	Pre-pregnancy weight (the child under the study)	In kilogram_____ 99. Do not know/not sure/	
406	During pregnancy or lactation, did you consume extra food? (the child under the study)	1. Yes 2. No	

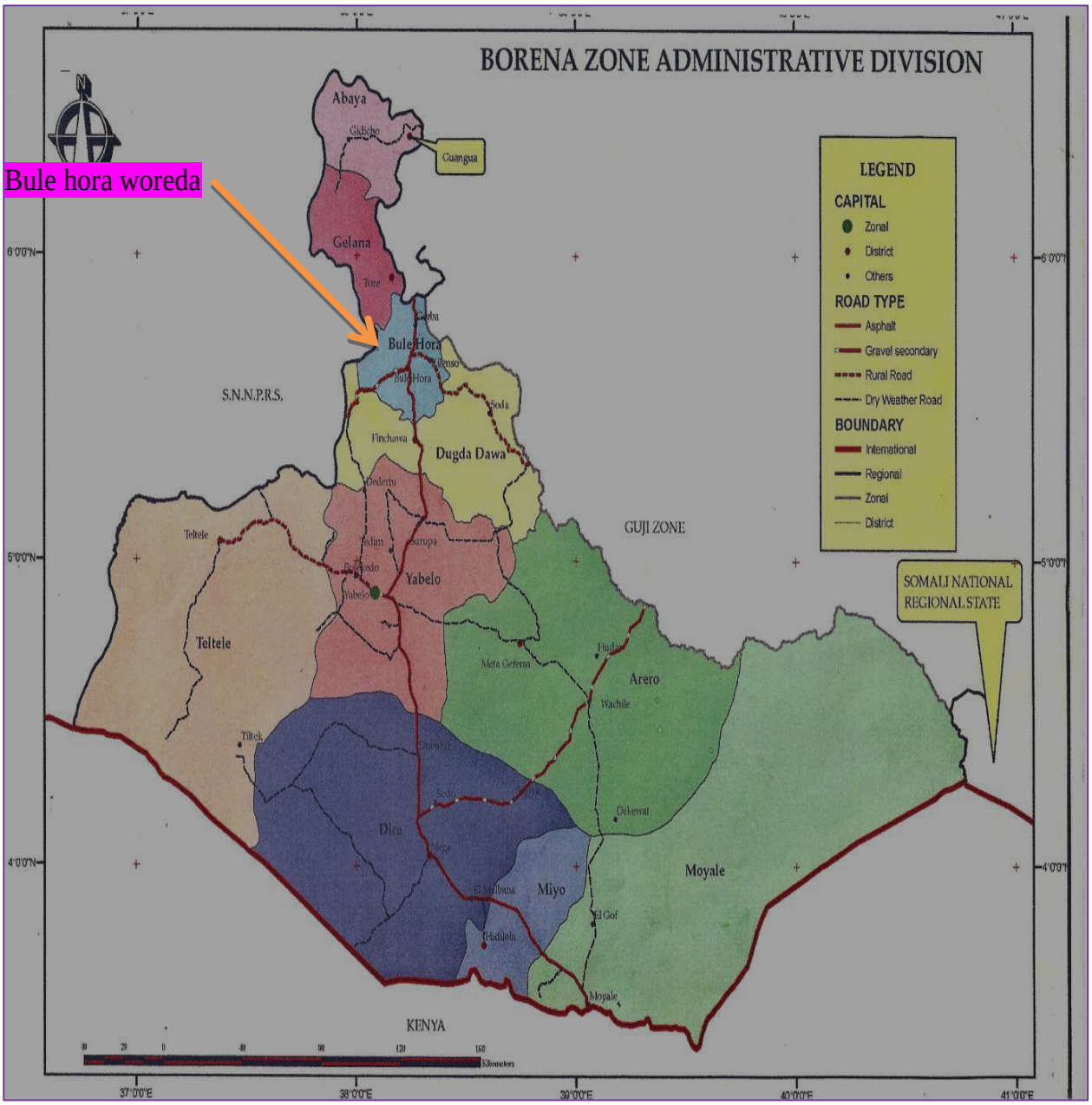
407	Health status during the pregnancy	1. Good 2. Not good/sick	
408	Did you visited health facility for ANC?	1. Yes 2. No	If no, skip to 411
409	At what months of the pregnancy you started ANC?	At _____ months 99. Don't know/not sure	
410	How many times you visited health facility for ANC during the pregnancy?	_____ times	
411	Do you know about family planning?	1. Yes 2. No	If no skip to 415
412	Have you ever used family planning methods?	1. Yes 2. No	If no, skip to 415
413	Which method have you ever used? (More than one answer is possible)	1. Pills 2. Depo-Provera 3. Norplant 4. condom 96. other (Specify)	
414	Do you use it now?	1. Yes 2. No	
415	When do you usually wash your hands? (More than one answer is possible)	1. After latrine use 2. Before preparing food 3. Before serving food 4. After cleaning child feces 96. Other (specify)	
416	How do you wash your hand?	1. Using water only 2. Using soap some times 3. Using soap always 4. Using ash some times	
417	What do you think your child physically looks?	1. Thin 2. Tall 3. Heavy 4. Normal 5. Small	
418	For how long do you think should a child exclusively be breast-fed?	In months_____	
PART FIVE: ENVIRONMENTAL CONDITIONS			
501	What is your main source of drinking water?	1. River 2. Pond 2. Un protected spring. 3. Protected spring. 4. Private well 5. Public tap 96. Other (specify)	
502	Amount of water used in the household daily	In liters_____	
503	How long does it take you to go and come back to fetch water?	In minutes_____	
504	Do you treat water in any way to make it safer?	1. Yes (Specify) _____ 2. No	
505	Do you have latrine?	1. Yes 2. No	If no skip to 507

506	Type of latrine you use? (Observation)	1.Private pit / wooden slab 2. Private slab / cement slab 3. Shared latrine/wooden slab 3. Shared VIP latrine 96. Other (Specify)	
507	How do you dispose garbage?	1. Open field disposal. 2. In a pit 3. Common pit 4. Composting 5. Burning 96. Other (specify)	
508	Type of House (Observation)	1.Tukul/thached 2. Corrugated Iron Sheet 96. Other(Specify)	
509	How many rooms for use by the member of your household? (Excluding kitchen and store)	____ in Number	
510	Type of house floor (Observation)	1. Earth /Soil/. 2. Cement/Brick 3. Wooden/Bamboo 4. Ceramic 96. Other(Specify)	
511	Floor area of the house per person	____Km^2	
512	Presence of windows (Observation)	1. Yes 2. No	If no ,skip to 514
513	If yes, how many?	1. One 2. ≥ Two	
514	Do you have separate room which is used as Kitchen?	1. Yes 2. No	
515	If you have livestock, do you have separate room for them?	1. Yes 2. No	
516	What type of fuel do you mainly use for cooking?	1. Wood 2. Kerosene 3. Electricity 4. Animal dung 96. Other(specify)	

Anthropometrical measurements

Child weight in kilogram_____

Child height in centimeters_____

MUAC measurement in centimeters _____

Annex-3-Map of Bule Hora Woreda