

ADDIS ABABA UNIVERSITY
COLLEGE OF HEALTH SCIENCE
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ASSESSMENT AND COMPARISON OF PATTERNS OF MALNUTRITION AND ITS DETERMINANTS BETWEEN INTERNALLY DISPLACED AND INDIGENOUS UNDER FIVE CHILDREN IN AMURU DISTRICT, HORO GUDURU WOLLEGA ZONE, OROMIA REGION, MARCH 2013.

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LIST OF ABBREVIATIONS AND ACRONYMS

AAU- Addis Ababa University

ANC - Antenatal Care

AOR - Adjusted Odds Ratio

CSA - Central Statistic Agency

EDHS- Ethiopia Demographic Health Survey

H/A- Height for Age

HAZ- Height for Age Z-score

IDPs- Internal Displaced Peoples

MDG- Millennium Development Goal

MUAC- Mid Upper Arm Circumstance

NCHS- National Centre Health Statistics

NGO- Non Government Organization

OR- Odds Ratio

USAID- United States Agency for International Development

W/A -Weight for Age

WAZ - Weight for Age Z-score

W/H - Weight for Height

WHZ - Weight for Height Z score

WHO - World Health Organization

ABSTRACT

Introduction - Without proper nutrition, children are susceptible to more frequent and severe childhood illnesses, stunted growth, developmental delays, and death. Previous studies show that the prevalence of undernutrition (stunting, wasting and underweight) is generally higher among children with resettled (internally displaced) families compared to those of permanent residents.

Objective - The objective of this study is to assess and compare nutritional status and identify its determinant factors among internally displaced and indigenous children of age 6-59 months in Amuru District, Horo Guduru Wollega Zone, West Oromia region.

Method - A community based comparative cross sectional study was conducted from March to April 2013. Structured and pre-tested questionnaire was used to collect information on demographic and economic factors and child care practices. Information on anthropometric indices was also collected using well-calibrated weighing scale and height measuring board.

Stratified sampling procedure was employed to select the required households. A total of 891 children, 442 from Internally Displaced Peoples and 449 from Indigenous communities were selected from eight kebeles by systematic sampling techniques.

Data entry was done with Epi info version 3.5.3 which was then exported to SPSS version 20 statistical package for analysis. The 2006 WHO standard was used to convert height and weight measurements into Z-scores. Descriptive statistics and multiple logistic regression analysis were used as appropriate.

Results – A slightly higher percentage of children aged 6-59 months among IDPs had stunting compared to those from Indigenous communities (52.9% versus 51.3%) although the difference was not statistically significant (p - value > 0.05). In contrast, there was a marked difference in the rate of wasting in the two populations (21% among IDPs, 7.1% among indigenous) (p - value < 0.05). Similarly, the percentage of children who were categorized as underweight was much higher among IDPs (36.8%) compared to Indigenous communities (11.8%) (P -value < 0.05). Sex of child (being male), younger children and children who had been on bottle feeding were significantly associated with stunting in both children of IDPs and Indigenous communities. Internal displacement was found to be a significant predictor of wasting [AOR: 95% CI: 2.4 (1.4,

4.1)] and under-weight [AOR: 95%CI: 2.4 (1.4, 3.9)] even after controlling for factors such as age of child, immunization, lack of farming lands, monthly income, parent's education, availability of latrine and not having enough food in the households.

Conclusions and Recommendations -The study revealed that child malnutrition is a major public health challenge in both IDPs and Indegenous communities of Oromia region. However prevalence of underweight and wasting were particularly more pronounced among children of IDPs compared to those of indigenous populations. Factors related to socio-demographic, access to sanitary facilities and health service including being male, younger children, bottle feeding, non-immunized children, not having farming lands, uneducated parents, not having latrine and presence of diarrhea in the two weeks preceding the survey were identified as significant predictors of the three forms of childhood malnutrition (stunting, wasting and under-weight).

Based on the findings of the present survey, we recommend that policy makers consider the status of displacement of communities in priority setting and designing nutrition programs as they exhibit increased vulnerability to undernutrition and its negative consequences.

1. INTRODUCTION

1.1 Background

Without proper nutrition, children are susceptible to more frequent and severe childhood illnesses, stunted growth, developmental delays, and death(1). In 2011, a total 6.9 million children died before reaching their fifth birthday. Almost two thirds (4.4 million) of them died of infectious diseases, nearly all of which were preventable. In developing countries 57 deaths per 1,000 live births – more than 8 times the rate in developed countries (7 deaths per 1,000 live births). In sub Saharan Africa with an under five mortality rate above 100 deaths (109) per 1,000 live births. More than a third of under-five deaths are attributable to undernutrition. The other leading causes of death among children under age five are pneumonia (18% of all under-five deaths); preterm birth complications (14%); diarrhoea (11%); intrapartum related complications during birth (9%); and malaria (7%) (2). Undernutrition encompasses stunting, wasting, underweight and deficiencies of essential vitamins and minerals as one form of the condition known as malnutrition (3).

Globally, the prevalence of stunting has decreased from an estimated 40% in 1990 to 26% in 2011 with an average annual rate of reduction 2.1% per year during this period. High prevalence levels of stunting among children under-five years of age in Africa (36% in 2011) and Asia (27%) remain a public health problem, one which often goes unrecognized. The prevalence of underweight has declined 37% in 1990 to 16% with an average annual rate of reduction of 2.2% per year. If current trends continue, UN regional projections for 2015 indicate that the goal of halving the 1990 underweight prevalence levels is unlikely to be achieved on a global level or in all developing countries. In terms of numbers, an estimated 52 million children under-five years of age, or 8%, were wasted in 2011- an 11% decrease from an estimated 58 million in 1990 (4).

In Ethiopia, 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 and lowest in children under age six months. Wasting, or acute malnutrition, is highest in children age 9-11 months and lowest in children age 36-47 months. The 29 percent of children under age five are underweight and 9 percent are severely underweight. In Oromia, the prevalence of stunting, underweight and wasting is 41.4%, 26% and 9.7% respectively (5).

In many studies the main contribution of socio economic factors, child factors (birth size, breastfeeding duration, immunization status, recent morbidity and child's sex), maternal factors (maternal stature, BMI status, age at first age and education level), environmental health factors, and a household factor to undernutrition varies across the age and sex of child (6-8).

In fact, the Demographic and Health Survey data 2000-2009 from 35 developing countries indicated that rural and urban differences in child nutritional status by age of the child. The rural children score more than a half of a standard deviation lower than urban children on height for age, rural children are less likely to get adequate nutrition because of socioeconomic disadvantage, a reproductive culture supporting earlier marriage and shorter birth intervals, and lack of access to health care (9).

Amuru woreda is one of the woreda located in the Horo Guduru Wollega Zone, Oromia Regional State. It has a total of 6,622 resettler populations which have moved to the area since 2004 G.C. The under five population is estimated to be 1087 (based on 16.4% of the total population). The resettlement programme was done by two phases where 660 households settled in the first batch and 719 households in the second batches. The settlers were previously living in East and West Hararghe zone of Oromiya region.

1.2 Statement of the Problem

Child malnutrition is a major public health problem in Ethiopia; Levels of wasting (acute malnutrition) and stunting (chronic malnutrition) in children aged six to fifty-nine months are among the highest (7). Many malnourished children die because they are vulnerable to repeated attack of disease and infection. Others become malnourished while suffering from infectious disease and are unable to recover. As a result, malnutrition is recognized as the underlying cause of a third of under-five deaths(10).

In Sri Lanka a difference was seen in the prevalence of stunting, wasting and underweight when a comparison was made between the children in the families who were resident and those who were resettled, with the prevalence of undernutrition being higher among the resettled, compared to the resident group (11). Child Acute Malnutrition and Mortality in Populations Affected by Displacement from Ethiopia, Kenya, Sudan and Uganda showed that the average U5MR amongst displaced persons, the local population, and mixed groups was 1.15–1.42

deaths/10,000/day. The effect of displacement was significantly worse for agriculturalists children's survival than for pastoralists (12). Malnutrition in all children displaced from flood is below 3rd centile of WHO growth standard charts in pakistan (13).

Thus, this study will try to determine and compare nutritional status and identify determinant factors of child malnutrition among children 6-59 months internally displaced and indigenous Amuru District, Oromia regional state.

1.3 Rationale of the Study

Childhood malnutrition is a major issue in developing countries that requires intervention (14). Displacement followed by resettlement on populations is likely to have an impact on their nutritional status and their health status in the short-term as well as their work capacity and hence their contribution to national development in the long-term. Monitoring the nutritional status in the displaced people is an important consideration (11).

In this study area, there were about 6,622 internally displaced peoples. All of them were left the original place from west and east hararghe zone of oromia region and were settled in different year of time. Since, there where no published study that describes the differential vulnerability of displaced populations in reference to non-displaced people using a comparative design. This study benefits to as baseline data and identifies internal displacement as one of the factors of undernutrition among displaced populations when compared to indigenous groups of the study area.

Therefore, this study carried out to fulfill the information needs that will help the Government and non-governmental organizations (NGOs) and is expected to give insight that could help inform the feeding and treatment programmes or interventions to improve nutritional status of under five children among displaced populations.

2. LITERATURE REVIEW

2.1 Malnutrition

Malnutrition refers both to undernutrition and overnutrition. Malnutrition is thus health outcome as well as a risk factor for disease and exacerbated malnutrition and it can increase the risk both of morbidity and mortality (15). Malnutrition is an important root of infant and young child mortality. It reduces life span and is associated with more than half of all deaths of children worldwide (16).

The global progress on reducing stunting has been extremely slow. Worldwide, the prevalence of childhood stunting decreased from 39.7% in 1990 to 26.7% (171 million) in 2010, only 13 percentage points a relative decreases in 20 years. This trend is expected to continue and reach a prevalence of 21.8% in 2020. The developing countries have experienced a decrease from 44.4% in 1990 to 29.2% in 2010. The forecast is that this decreasing trend will continue and reach a prevalence of 23.7% in 2020. The Progress is even slower in Africa, which is an overall reduction of just 2% in 20 years from 40.3% in 1990 to 38.2% in 2010. In West Africa, stunting rates have stagnated at 38% (17).

A study conducted in Kenya showed that the prevalence of stunting decreased by 4.6 percentage points from 39.9% in 1993 to 35.3% in 2008-2009. Under weight declined by 2.7 percentage points over the same period, while wasting levels didn't change(18).

In Ethiopia, the prevalence of chronic malnutrition was found to be high in high land children (40.8%) including 7.0% severe stunting as compared to low land children (30.6%) with 10.7% severely stunting. Children living in high land are to be 1.53 times more likely to stunt than those living in low land (19). 43.2%, 49.2% and 14.8% of the total 622 children included in the survey were found to be stunted, under weight and wasted respectively. The highest proportion of stunted children observed in age group 13-24 months (51%), while the lowest was observed for age group 37-59 months. A male children were 1.5 times more likely to be stunted as female children (20).

The global estimate of wasting is 10% (55 million), South –Central Asia is estimated to have the highest prevalence (16%) and numbers affected (29million)(3). Wasting results from a severe, and often sudden, lack of food or disease. With wasting, a child does not consume enough food

or absorb enough to get the calories or nutrition they need, and as a result their body begins to digest muscle to meet the need for protein, minerals and energy (21).

A survey conducted in Bangladesh using Bangladesh Demographic and Health Survey 2007 data revealed that among the study children 3% were severely wasted and another 14% were moderately wasted. For stunting, 16% belonged to the severe category and 25% were moderately stunted. About 11% of the children were found to be severely underweight, while 28% fell into the moderately underweight category. For children belonging to the age groups 10–11 and 12–23 months of age, the likelihood of being wasted was found to be about 1.74 and 1.51 times higher, respectively, than those in the <6 months. Children of secondary and higher educated fathers had 0.79 and 0.51 times lower odds of being underweight than those of fathers who had no education (22).

A survey conducted in vghuan, Vietnam showed that the prevalence of underweight, stunting, and wasting were high, with 31.8% being found to be under weight, 44.3% being found to have stunting and 11.9% showing signs of wasting. The highest proportion of underweight children (44.3%), stunting (57.3%), wasting (17.0%) were observed in children between the ages of 36 and 47 months, 12-23 months and 48-59 months old respectively. Determinants such as the region of residence, the level of the mother's education and the mother's occupation were significantly related to malnutrition of children (23).

A Study conducted in Padampur VDC, Chitwan, Nepal, south Asia showed that the prevalence of stunting, underweight and wasting in Padampur VDC was found to be 22.7%, 37.3% and 25.7% respectively. The multivariate analysis revealed that children's age, occupation of mother and socioeconomic status were significantly related to stunting. As compared to the rich socioeconomic status, children from the poor socioeconomic status were 2.551 times more likely to stunting. Ethnicity, educational level of mother and socioeconomic status were significantly related to underweight (24).

2.2 Causes of Malnutrition

Malnutrition and death in children are the results of a long sequence of interlinked events. It is difficult to base any action on the assessment of those manifestations of malnutrition, but they indicate that the situation is serious and requires investigation.

2.2.1 Immediate Cause

Inadequate dietary intake and disease are the most significant immediate causes of malnutrition. Disease, in particular infectious disease, affects dietary intake and nutrient utilization. In most cases, malnutrition is the combined result of inadequate dietary intake and disease (25).

As a report free life from hunger tackling on child malnutrition revealed that child growing up in South Sudan needs to eat food with the right amount of calories, vitamins and minerals to have a chance to grow up healthy and productive just as much as a child born in Southampton, Stockholm or Seattle. Yet many children in developing countries have diets that consist almost entirely of starchy staple foods, like rice, maize, with few vegetables and little protein (26).

A study in displaced sudanese children showed that the prevalence of malnutrition among children in the camp was high (56.1%). The main reason for this high prevalence of malnutrition is due to lack of proper food. Although children receive an average of 2-3 meals per day but the quality of the food is poor (14).

A survey conducted in Northern Province of Sri Lanka revealed that 14 percent of all children reported having had a cough or cold with fever during the 2 weeks preceding the survey and 5 percent of all children reported to have had diarrhoea. A higher prevalence of both morbidities was reported among children from resident households compared to those that were resettled. Prevalence of both morbidities was higher among the male children (11).

2.2.2 Underlying Cause

These underlying causes can be numerous and are usually interrelated. Most of them can be considered as the insufficient fulfilment of specific basic needs of children and women. In order to simplify analysis in this study, the underlying causes may be grouped into three main clusters: poor basic health services and unhealthy environment; household food insecurity; and inadequate maternal and child care.

Child and mother care practices

A survey conducted in Northern Province of Sri Lanka revealed that Percentage of low birth weight children was higher (17.8 percent) among those in the resident households compared to the resident population (14.5 percent). The infant and young feeding practices for all under five children 93 percent were given solid, semi solid or soft food for consumption. The Children in the age groups of <6, 6-11 and 12-23 months who were given solid, semisolid or soft foods were 10.7, 73.0 and 89.7 percent respectively. Of all children, 33 percent were given a food item using a bottle with a nipple with this percentage being higher among the original households (36 percent) (11).

A survey conducted in Vghean, Vietnam showed that the risk of being underweight, stunted and wasted was 5.9 times, 3.7 times and 3.9 times higher for children who were exclusively BF for <6 months than for children who were exclusively BF for ≥ 6 months, respectively (23).

A study conducted in Ethiopia revealed that the risk for SAM was independently associated with lack of exclusive breast-feeding for the first six months of life and late initiation of complementary diet after the effects of other significant risk factors were controlled for. A statistically significant difference in knowledge on the recommended duration of breastfeeding and on the appropriate time of initiating complementary diet between the caregivers of the severely malnourished children and the controls was observed (27).

Access to water and sanitation

About 46 percent of the households use water from unsafe sources. The percentage of rural households that do not have access to safe sources of water is higher (about 66 percent) than that for urban households (about 17 percent). Availability of safe sanitation facilities is even more limited. While about 39 percent of the households use pit latrines or flush toilets, the percentage is much smaller in rural (about 15 percent) than urban areas (72 percent) (7).

2.2.3 Basic Cause

The basic causes of malnutrition in society relate to both the historical background of the society and factors external to the society. The inefficient uses of technology, combined with harsh

ecological conditions, are common basic causes (25). This study will emphasize on socio economic and livelihood factors.

Livelihood

A survey conducted in Northern Province revealed that those in the resettled households were more likely to be daily wage labourers or farmers, and less likely to be a salaried employee or a skilled worker, compared to the original residents. The likelihood of being underweight was also found to be 5.3 times higher among children whose mothers are laborers, 5.9 times higher among children whose mothers are farmers and 4.9 times higher among children whose mothers are housewives than children who have a mother who works in an office (11, 23). Children of household having poor socioeconomic status were almost three times more at risk of being stunted, about eight times more at risk of underweight and about sixteen times more at risk than the children of household having rich socioeconomic status population (24).

In India various socioeconomic and demographic variables associated with undernutrition. Underweight was observed to be significantly associated with religion, age-groups, literacy status of mother, and morbidities during previous fortnight. Wasting was observed to be significantly associated with age-groups, literacy status of father, HH wealth index, and history of morbidities during the preceding fortnight (28). The Children who were underweight is 1.5 times more likely to have consanguineous parents as compared to normal children (29).

In Ethiopia, the significant variation by residence those urban residents HHs were 6.5 times more likely to get above 500 birr in a month than rural residents. Farm land ownership in the rural area was 56.5% and 68% of these land owners had 0.5 or less hectare area. Animal ownership was 48.4% (34.4% in urban and 56.5% in rural) and urban residents are 2.5 times more likely to lack animal than rural residents (30).

Thus, the immediate causes affect individuals, the underlying causes relate to families, and the basic causes are related to the community and the nation (31). See the Annex 1, the conceptual framework cause of child malnutrition.

2.3 Displacement and undermalnutrition

A survey conducted in the Horn of Africa, 1997–2009 on the Child Acute Malnutrition and Mortality in Populations Affected by Displacement from Ethiopia, Kenya, Sudan and Uganda showed that IDPs had higher Global Acute Malnutrition (GAM) (15.1%) compared to refugees (12.0%, $p < 0.05$). Grouping both IDPs and refugees as displaced populations; GAM prevalence was 16.5% in pastoralists compared with 7.2% in agriculturalists, and the difference is similar to the local populations (18.3% pastoralists vs. 9.0% agriculturalist) (12). Acute malnutrition rates among 904 Internally Displaced People (IDP) children, 956 Non displaced people (NDPs) children living in a village, 901 NDP children living in a town aged 6 to 59 months 20.6%, 16.4% and 10.1% respectively. High mortality rate among IDPs and an elevated prevalence of wasting not only in IDP camps but also in villages located in the same region (32, 33).

Malnutrition was found to be more common in female as compared to male children due to gender discrimination in our male dominated society. 16 male children (40%) and 25(42%) female malnourished children had a history of being dewormed, while 24 male (60%) and 35 female (58%) children with malnutrition had no history of being dewormed in the last 6 months (34). There was no significant association of expected risk factors (last month diarrhoea, last month fever, artificial bottle feeding, absence of parents, parents' educational levels and vaccination) with malnutrition using univariate and multivariate analysis (14). In Pakistan, malnutrition in children displaced from flood of all children studied below 3rd centile of WHO growth standard charts (13). A number of risk factors may increase measles transmission, morbidity and mortality in populations displaced by disasters (35). Measles is a significant public health concern in displaced populations (8).

A study conducted in Uganda showed that high prevalence of global stunting of 52.4%, and global acute malnutrition 6.0% in the IDP settings. The prevalence of both global acute malnutrition and stunting were higher in the age groups 6-12 months and 13-24 months compared to the rest of the age groups. Being a male child was significantly associated with chronic malnutrition (8).

3. OBJECTIVE

3.1 General Objective

- ✓ To assess and compare nutritional status and its determinants among internally displaced and indigenous children of age 6-59 months living in Amuru District, Horo Guduru Wollega Zone, West Oromia.

3.2 Specific Objectives

- ✓ To determine the nutritional status of internally displaced and indigenous children 6-59 months of age in the Amuru District.
- ✓ To compare nutritional status of internally displaced and indigenous children 6-59 months of age in the Amuru District.
- ✓ To identify determinant factors of malnutrition among internally displaced and indigenous children 6-59 months of age in the Amuru District.

4. METHODS AND MATERIALS

4.1 Study Design

A comparative cross sectional community based study design was conducted among internally displaced and indigenous (non-displaced) under five children.

4.2 Study Area and Period

The study was conducted from March to April, 2013 in Amuru district, Horo Guduru Wollega Zone, Oromia Regional State, Western Ethiopia. The district is the remotest in the zone which borders Jarte jardaga district of H/G/Wollega Zone in Oromia Regional State in the West and Amhara Regional State in the North. Opora is the capital town of Amuru district which is located 399km and 72km away to the west of Addis Ababa and from zone town respectively. The total population of the Amuru district in 2012 is 65,775 (CSA, projected from 2007 census) out of which 10,787(16.4%) are under five children.

The district has 24 kebeles. Some of the displaced populations are settled before six years and the others in the last two years. They left their original place in West and East Hararghe Zone of Oromiya because of three main reasons; absence of land farm, drought and climate change. They were settled in kubsuma, chidati and Harari Jarso kebeles of Amuru district and its total populations were 6,622. The indigenous populations (estimated at 59,153) mainly reside in the rest of the 21 kebeles. The majority of the population depends on agricultural lands to cultivating. The district mainly experiences sub-tropical (W/Dega) and temperate (Dega) types of climatic conditions. The altitude ranges from 860m to 2657m above sea level. Teff, wheat, barley, maize, millet and sorghum from cereals; horse beans, peas and haricot beans from pulses are important crops grown in the district. The health systems for Amuru district is represented by three public health centers and 24 health posts.

The Amuru woreda was selected purposively for this study among the ten districts in Horo Guduru Wollega Zone because many of the internally displaced people live in the area.

4.3 Study Population

4.3.2 Sources Population: All children (6-59 months) living in Amuru District.

4.3.2 Study Population: All children (6-59 months) in both indigenous group and internally displaced households during the time of survey.

4.4 Inclusion and Exclusion Criteria

4.4.1 Inclusion Criteria

- Children 6-59 months who were living in both non-displaced and internally displaced selected households

4.4.2 Exclusion Criteria

- Children outside the age range of 6-59 months and
- Children who were ill/severely sick during the time of survey were excluded from the study.

4.5 Sample Size and Determination

The sample size was calculated using two population proportion formula using the following assumptions;

$$\frac{(Z_{1-\frac{\alpha}{2}} \sqrt{2P(1-P)} + Z_{1-\beta} \sqrt{P_1(1-P_1) + P_2(1-P_2)})^2}{(P_2 - P_1)^2}$$

- P1- Prevalence of stunting among indigenous (non-displaced)-taken as 41.4% - prevalence figure for the Oromia region according to EDHS 2011.
- P2- Prevalence of stunting among internally displaced - 51.4%- assuming a 10 % difference of between the two groups show public health significance effect.
- Confidence level or $(1-\alpha) = 95\%$,
- Power $(1-\beta) = 80\%$
- P1: P2 – 1:1

Sample size is computed as $n_1 = n_2 = 409$

Adding a 10% allowance for possible non-response during the actual survey, the final sample was calculated $900 - n_1$, internally displaced populations = 450; and $n_2 = 450$, Indigenous (non-displaced) populations.

4.6 Sampling Procedures

The 24 kebeles of Amuru district were stratified into two; internally displaced and indigenous peoples based on resettlement status. From internally displaced populations all three kebeles were included in the survey while the five rural kebeles were selected by simple random sampling method from indigenous populations.

The final sample was allocated based on population proportion to size in both groups while systematic sampling method was applied to select households. The first study participant was selected by lottery method from the first five households after reaching the centre of the kebele. Whenever, there are two or more eligible children in the selected household only one child was selected by lottery method. If the selected household has no children 6-59 months the data collector passed to the next household.

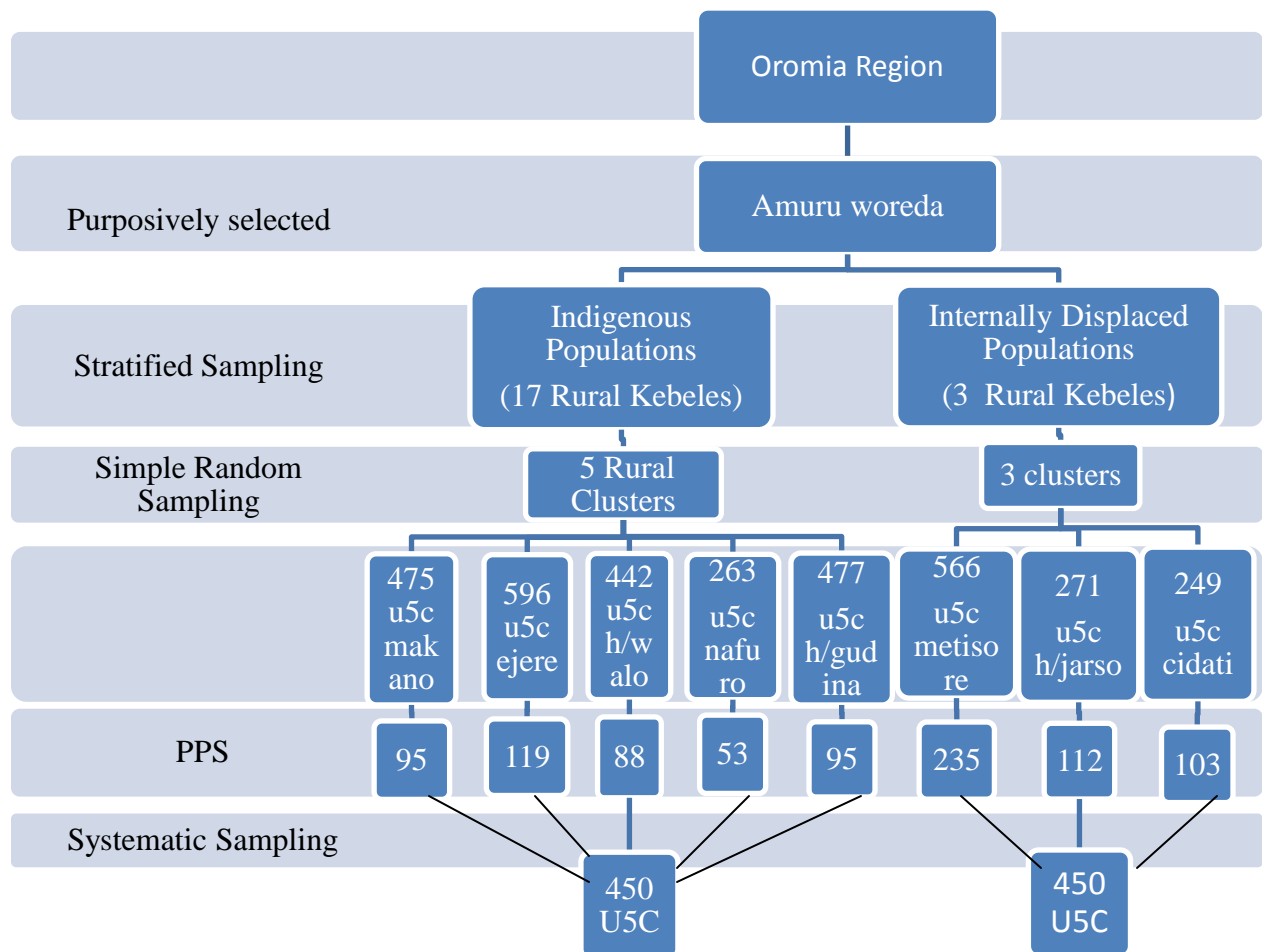


Figure 1, Schematic Presentation of the Sampling Procedure

4.7 Data Collection

Data was collected using interviewer administered questionnaires and anthropometric measurement tools. The questionnaire was adopted from reading relevant literatures, EDHS 2011 and World Health Organization reports. The questionnaire was prepared in English and translated to Afan Oromo - the dominant language of the study area; and back to English by two experts who were fluent in both languages. The Afan Oromo questionnaire was back translated to see consistency. The questions were grouped and arranged according to the specific objectives that they address. The questionnaires were contained socio-demographic, maternal, child, economic and environmental health factors and anthropometric measurement.

The data was collected by eight unemployed diploma nurses who have been certified in Centre of Competence (COC) examination. One BSC nurse and the principal investigator was supervisor for data collection. A three-day intensive training was given which covered; the study objectives, a thorough review of the questionnaire, interview techniques (including research ethics), and anthropometric measurements.

Mothers were interviewed about occurrence of illness during the two weeks preceding the survey and history of taking vitamin A supplementation and deworming tablets in the 6 months before the study. Vaccination status of children was checked by observing immunization card. BCG vaccination was checked by observing scar on right (left) arm of the child.

Age: was recorded with the help of a local calendar of events /known events monthly or annually circulated. If the age could not be ascertained only the children between 65 and 110 cm was included in the survey.

Weight: Children were weighed with light clothes and with out shoes using a 25 kg saltar weighting scale and recorded the weight to the nearest 0.1kg.

Height: Each child was measured using a height board and recorded height to the nearest 0.5cm. A child less than 85 cm in height was measured lying down. Children equal to or more than 85 cm was measured standing up.

Mid upper arm circumference (MUAC): This was measured to the nearest 0.1cm. The MUAC was measured the midpoint of the child's left upper arm by measuring tape.

Oedema: children with bilateral oedema on the lower limbs were recorded as having nutritional oedema.

The Status of family was recorded as internally displaced and indiginous people.

4.8 Operational Definitions

Internally displaced: Someone who left his/her original home because of loss of land, drought and climate change; settled and lives more than 6 months in the new place

Indigenous: Naturally existing in a place rather than arriving from another place and also someone who lives more than 6 months in the original resident.

4.9 Study Variables

Dependant variables

- Stunting (Yes, No)
- Wasting (Yes, No)
- Underweight (Yes, No)

Independent variables

- Socio-demographic factors (age, sex, education)
- Economic factors (monthly income, housing type, land farm, means of livelihood)
- Child factors (Morbidity status, Immunization status)
- Behavioral factors (bottle feeding, breast feeding)
- Environmental health factor (availability of latrine, ways of treating drinking water)
- Internal displacement

4.10 Data Processing

The questionnaires were checked for completeness manually and the data entry and analysis was carried out by using EPI Info version 3.5.3 and SPSS version 20 softwares respectively. The 2006 WHO standard reference was utilized to convert height and weight measurements into Z-scores of the H/A, W/H and W/A indices considering age and sex of the children. Odds Ratio and Multivariate logistic regression analysis were used to show the strength of the association and control for potential confounders of undernutrition respectively.

4.11 Data Quality Management

The data collection tools were prepared by considering the culture, values and language of the study subjects. Training manual and data collection guide was prepared and given to all data collectors and supervisor. Apart from the 3 days training to data collectors and supervisors, the supervisor assessed on the randomly selected questionnaires collected by the data collectors and practice on how to check the actual data collection procedures.

The questionnaires were pre tested in neighbor Jarte woreda before data collection started to see the accuracy of responses and to estimate time needed. Double data entry was implemented and backup was kept in a daily base and the data was put in a secured place and handled by principal investigator.

4.12 Ethical Considerations

Ethical clearance was obtained from Addis Ababa University, School of Public Health Research Ethics Committee. Official letter of co-operation was written to Horo Guduru Wollega zone and Amuru district administrative health office. Written letter was obtained from zonal health bureaus and woreda health administration office to conduct the study. Every procedure to conduct the study was clearly explained to families/ care takers of selected household and their individual verbal consent was obtained for the study. The study participants were informed that they have full right to discontinue at any time and refuse to participate in the study.

Confidentiality of the information was assured by giving code for each study participant and privacy maintained through out the procedure. Families whose children were sick/ malnourished were advised to take the child to the near by health facility.

4.13 Dissemination of Results

The findings of the study will be submitted to the School of Public Health, Addis Ababa University and will be disseminated to concerned government offices including, - Oromia Regional Health Bureau, Horo Guduru Wollega Zone Health Office, Amuru District Adiminnistrative Health Office, and NGOs working on the area.

5. RESULTS

5.1 Socio demographic and economic profile of respondents

From a total of 900 subjects who participated in the study, complete response was obtained for 891 (99%) among internally displaced (442 children aged 6-59 months) and indigenous community (449 children aged 6-59 months). From the 442 internally displaced children aged 6-59 months 295(66.7%) and 147(33.3%) resettled in the study area were three and nine years ago respectively.

As indicated in Table 1, female headed households constituted 8.6 % (11.1% - IDPs and 6.2% indigenous) and 745(83.6%) of respondents were married in both groups. Average (mean) family size was 1.5 and 1.6 for internally displaced and indigenous people respectively (p-value < 0.001). There was a marked difference in religion: majority of respondents among IDPs identified themselves as Muslims 321(72.6%) compared to the study participants of indigenous groups 69(15.4%) (P-value <0.001). Majority of respondents 440 (99.5%) and 423(94.5%) identified themselves as ethnic Oromo; the rest 2(0.5%) among IDP and 26(5.8%) among indigenous groups identified themselves as Amhara.

The majority of parents in the IDPs were found to be illiterate 365 (83.1%) compared to the parents in the indigenous reported as illiterate 163(37.9%) (p-value-<0.001); while the majority of those who had primary (34.9%) and secondary and above (27.3%) parental education level was found among indigenous communities compared to the primary(13.9%) and secondary and above (3%) educational level of parents among internally displaced groups.

The occupations of the father of the IDP households were farming 433(98%), government employer 3(0.7%), daily laborer 3 (0.7%) compared to the indigenous group farming 393 (87.5%), government employer 27(6%), merchants 5(1.1%), private organization employer 1(0.2) daily laborer 4(0.9%). Not having of animals and farming lands for internally displaced people [OR: 18.8(12.8, 27.8)] were found to be 18.8 and 6.3 times higher than indigenous group [OR: 6.3(4.7,8.5)]. About 308 (71.1%) of the IDP HH earning monthly income less than 200 Ethiopian birr were found to be less as compared to Indigenous group of 3324(74.3%).

Table 1; Socio-demographic and Economic characteristics of the respondents in Amuru Woreda, Horo Guduru Wollega Zone, 2013

Variables	IDPs		Indigenous		Total (n, %)	p-value
	(n,	%)	(n,	%)		
HH head						
Male	393	88.9	421	93.8	814(91.4)	0.01
Female	49	11.1	28	6.2	77(8.6)	
Marital status						
Married	348	78.7	397	88.4	745(83.6)	0.2
Never	77	17.4	23	5.1	100(11.2)	<0.001
Divorced/widowed	17	3.8	29	6.5	46(5.2)	
Family size						
-<=5	208	47.1	146	32.5	354(39.7)	<0.001
-6-15	234	52.9	303	67.5	537(60.3)	
No.of U5C in HH						
1	382	86.4	408	90.9	329(36.9)	<0.001
2-5	60	13.6	41	9.1	562(63.1)	
Religion						
Muslim	321	72.6	69	15.4	390(43.8)	<0.001
Others	121	27.4	380	84.6	401(56.2)	
Ethnicity						
Oromo	440	99.5	423	94.2	863(96.9)	<0.001
Amara	2	0.5	26	5.8	28(3.1)	
Parental education level						
Illiterate	365	83.1	164	37.9	529(60.7)	<0.001
Primary (1-8)	61	13.9	151	34.9	212(24.3)	
Secondary and above	13	3	118	27.3	131(15)	
Occup. of mother						
Farmer	424	95.9	433	96.4	857(97.4)	<0.02
Others	17	3.8	6	1.3	23(2.6)	
Occup. of father						
Farmer	433	98	393	87.5	826(98.6)	0.07
Others	3	0.7	9	2	12(1.4)	
Ownership of animals						
Yes	164	37.1	412	91.8	576(64.6)	<0.001
No	278	62.9	37	8.2	315(35.4)	
Ownership of lands						
Yes	142	32.1	337	75.1	479(53.8)	<0.001
No	300	67.9	112	24.9	412(46.2)	
Monthly income						
≤200	308	71.1	324	74.3	632(72.7)	0.41
>=201	125	28.9	112	25.7	237(27.3)	

5.2 Child characteristics and Caring practices

As illustrated Table: 2, from internally displaced groups of study participant 225(50.9%) and 217(49.1%) were male and female respectively. 242(53.9%) and 207(46.1%) of children from indigenous were male and female respectively. Majority of children 148(33.5%) aged between 24-35 months among internally displaced and children of 140(31.2%) aged between 12-23 months among indigenous groups were included in the present study. 74(16.7%) first birth, 247(55.7%) second to fourth birth and 121(27.4%) fifth to twelfth birth order of children were included from indigenous group.

Home delivery from internally displaced people was found to be 2.4 times higher than from indigenous group [OR; CI 95% 2.4(1.3, 4.2)]. Children of 39.8% (23.5% - IDPs and 55.9%-indigenous) of households were initiated first food as cow's milk. 99(22.4%) of children aged 6-59 months started sugar solution as first food from IDPs was higher compared to indigenous 26(5.8%). Diarrhea was the commonest morbidity among children of aged 5-59 months of both groups. 95(21.5%) and 23(5.1%) of children from IDPs and indigenous children had history of diarrhea in the two weeks preceding the survey respectively.

According to the mothers information 93(21.8%) and 98(22.5%) less than 12 months, 7(1.6%) and 3(0.3%) between 12-24 months and 326(76.5%) and 334(76.8%) were had breast fed from IDPs and indigenous respectively. Majority of children 200(45.2%) from internally displaced people were usually treated at home; where as the majority of children 426(94.9%) from indigenous community were taken to health institution for health care services.

Table 2; Child characteristics and Care practices of respondents in Amuru Woreda, 2013

Variables	IDPs		Indigenous		Total (n, %)	p-value
	(n,	%)	(n,	%)		
Child sex						0.37
Male	225	50.9	242	53.9	467(52.4)	
Female	217	49.1	207	46.1	424(47.6)	
Child's age						
6-11 months	61	13.8	48	10.7	109(12.2)	0.04
12-23 months	90	20.4	140	31.2	230(25.8)	0.71
24-35 months	148	33.5	112	24.9	260(29.2)	0.01
36-47 months	109	24.7	101	22.5	210(23.6)	0.11
48-59 months	34	7.7	48	10.7	82(9.2)	
Birth order						
1	74	16.7	49	10.9	123(13.8)	
2-4	247	55.9	198	44.1	445(49.9)	0.35
5-12	121	27.4	202	45	323(36.3)	< 0.001
Place of delivery						
Home	423	95.7	405	90.2	828(92.9)	0.002
Health facility	19	4.3	44	9.8	63(7.1)	
Immunized						
Yes	430	97.3	447	99.6	877(98.4)	
No	12	2.7	2	0.4	14(1.6)	0.01
Vit.A suppl. Last 6 months						
Yes	425	96.2	237	52.8	662(74.3)	< 0.001
No	17	3.8	212	47.2	229(25.7)	
Deworming last 6 months						
Yes	318	71.9	144	32.1	462(51.9)	< 0.001
No	124	28.1	305	67.9	429(48.1)	
Diarrhea last 2 weeks						
Yes	95	21.5	23	5.1	118(13.2)	< 0.001
No	347	78.5	426	94.9	773(86.8)	
Fever last 2 weeks						
Yes	73	16.5	33	7.3	106(11.9)	< 0.001
No	369	83.5	416	92.7	785(88.1)	
Resp. disease last 2 weeks						
Yes	84	19	29	6.5	113(12.7)	< 0.001
No	358	81	420	93.5	778(87.3)	
Bilateral oedema						
Yes	16	3.6	5	1.1	21(2.4)	0.02
No	426	96.4	444	98.9	870(97.6)	
First food started						
Cow's milk	104	23.5	251	55.9	355(39.8)	< 0.001
Sugar solution	99	22.4	26	5.8	125(14)	0.56
Axmiet	36	8.1	106	24.5	142(16.5)	< 0.001
Pouirage	203	45.9	62	13.8	265(29.7)	
Bottle feeding						
Yes	248	56.1	235	52.3	483(54.2)	0.25
No	194	43.9	214	47.7	408(45.8)	
Duration of BF						
< 24 months	185	43.4	157	36.1	342(39.7)	0.02
≥ 24 months	241	56.6	278	63.9	519(60.3)	

5.3 Maternal characteristics and Health services utilization

As shown in table 3; there was a similar age composition mothers in both groups. Most mothers 310(70.1%) and 287(64.1%) from both IDPs and indigenous were aged between 26-35 years. Average (Mean) age of mothers from internally displaced people was evaluated 29.1(SD 4.9) years compared to mother's age from indigenous 30.7(SD 5.2) years. A marked difference was seen in those mothers gave birth at age less or equal to 18 years from both groups. 250(56.6%) from internally displaced people of mothers who gave birth at age less or equal to 18 years were found to higher than mothers who gave birth at age ≤ 18 years from indigenous group [p-value < 0.001]. Majority of 280(63.3%) from IDPs were not attended health facility for ANC visit; while majority of mothers 301(67%) were followed ANC visit from indigenous group. Majority of 67.9% maize and 40.8% teff were recorded as staple food from IDPs and indigenous people respectively.

Table 3; Maternal characteristics and health services utilization of respondents in Amuru Woreda, 2013.

Variables	IDPs		Indigenous		Total no. (%) (n , %)	p-value
	(n , %)	(n , %)	(n , %)	(n , %)		
Mother's age						
16-25 years	83	18.8	80	17.9	163(18.3)	0.024
26-35 years	310	70.1	287	64	597(67.1)	0.004
36-49 years	49	11.1	81	18.1	130(14.6)	
Age at first birth						
≤ 18 years	250	56.6	51	11.4	301(33.8)	< 0.001
19-30 years	192	43.4	398	88.6	590(66.2)	
ANC visit						
Yes	162	36.7	301	67	463(52)	
No	280	63.3	148	33	428(48)	< 0.001
FP ever used						
Yes	223	50.5	192	42.8	415(46.6)	
No	219	49.5	257	57.2	476(53.4)	0.022

5.4 Environmental conditions

As indicated in table 4, in this study 422(47.4%) of children households were used source of drinking water an unprotected spring in both IDPs and indigenous groups. Not having latrine from internally displaced people was 12.6 times higher than those not having latrine from indigenous group [OR: 12.6(6.5, 24.6)]. Open field waste disposal was significantly higher among IDP 181(41%) compared to indigenous people 85(18.9%) (P- Value <0.001).

Table 4; Environmental characteristics IDPs and Indigenous for Amuru Woreda in H/G/Wollega Zone, 2013

Variables	IDPs		Indigenous		Total (n, %)	p-value
	(n,	%)	(n ,	%)		
Source of drinking water						
Unprotected spring	266	60.2	156	34.7	422(47.4)	< 0.001
Others	176	39.8	293	65.3	189(21.2)	
Amount of water/day						
≤ 20 litres	165	37.3	41	9.1	206(23.1)	< 0.001
> 20 litres	277	62.7	408	90.9	685(76.9)	
Treat drinking water						
Yes	149	33.7	43	9.6	192(21.5)	< 0.001
No	293	66.3	406	90.4	699(78.5)	
Latrine availability						
Yes	343	77.6	439	97.8	782(87.8)	
No	99	22.4	10	2.2	109(12.2)	< 0.001
Disposing garbage						
Open field disp.	181	41	85	18.9	266(29.9)	< 0.001
Pit	215	48.6	186	41.4	401(45)	< 0.001
Composting	4	0.9	28	6.2	32(3.6)	0.23
Burning	442	9.5	150	33.4	192(21.5)	
Presence of windows						
Yes	45	10.2	386	86	431(48.4)	
No	397	89.8	63	14	460(51.6)	< 0.001

5.5 Nutritional status

The prevalence of stunting was found to be 52.9% among IDPs (32.6 % severe stunting) as compared to Indigenous children 51.3 % (26.5 % severe stunting). The prevalence of acute malnutrition/wasting/ was found to be higher among IDPs children 21% (12.4% severe wasting) as compared to Indigenous children 7.1% (2.3% severe wasting) [OR 3.5(2.3, 5.4)]. Even, after it had been controlling for lack of farming land, bottle feeding, religion, diarrhea last two weeks and availability of latrine children living in the IDP group was more likely to be wasted than those children live in indigenous community [AOR 2.4(1.4, 4)]. The figures for under-weight and severe under-weight were 36.8% and 19.7% for IDP and 11.8% and 3.1% among Indigenous groups respectively. Children living among IDPs were more likely to be under-weight than those children in Indigenous communities (36.8% Vs 11.8%; P-value < 0.001) (See figure 2). MUAC measurements were found to be 32.1% of malnourished (12.8% severe malnourished) among both IDPs and Indigenous groups.

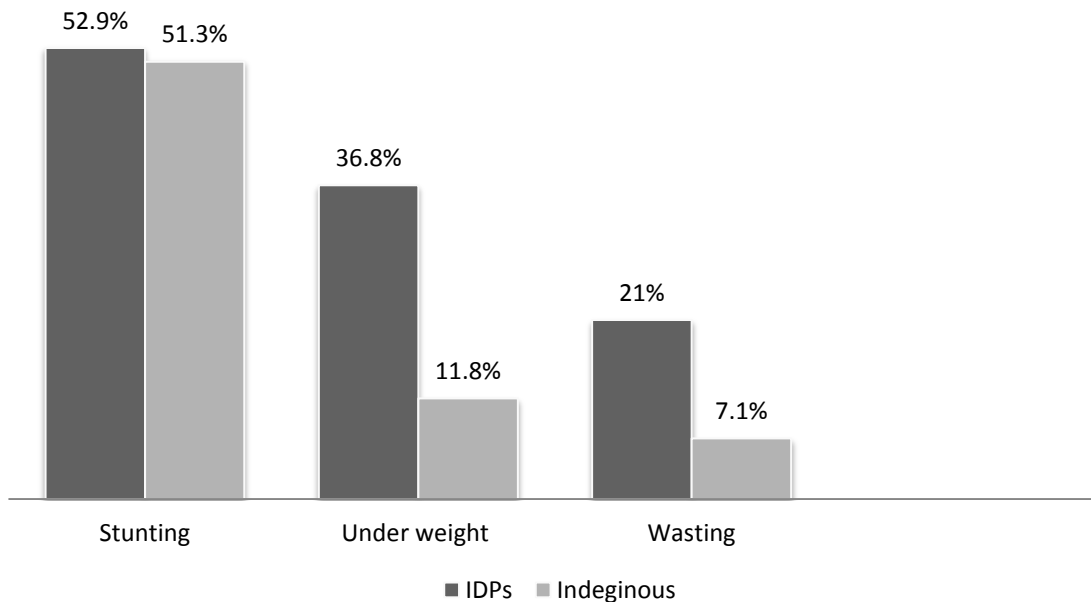


Figure 2; the prevalence of stunting, under weight and wasting of Internally displaced people and Indigenous group of Amuru Woreda, 2013.

5.5 Determinants of nutritional status

5.5.1 Determinants of stunting

As illustrated in table 5, Male children and children of age [12-23 and 24-35 months] were more significantly associated with stunting. The prevalence of stunting among male was 1.5 times higher than female children in both groups of internally displaced people and indigenous community [OR: 1.46 (1.10, 1.93)]. Stunting, or chronic malnutrition, is highest in children age 36-47 months and lowest in children age 48-59 months (11.9%). Children age of 12-23 and 24-35 months were 0.4 and 0.4 times less likely to be stunted compared to those children aged between 48-59 months of two populations [OR:0.44(0.25, 0.77) and OR:0.44(0.26, 0.76)] respectively) after controlling for sex of children, parental education, immunization status, place of delivery and presence of diarrhea . The prevalence of three forms of malnutrition by age group is explained in figure three. (See figure 3)

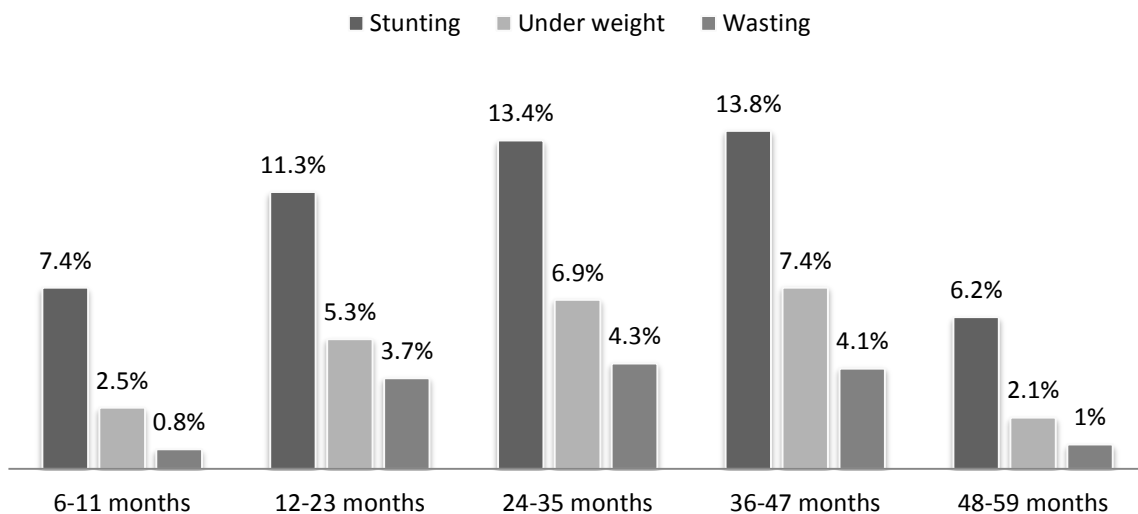


Figure: 3, prevalence of stunting, underweight and wasting by age group of children among child malnutrition (Stunted, Underweight and Wasted) of Amuru Woreda, 2013.

The prevalence of stunting was 1.4 times higher in children who used bottle feeding than those who didn't use bottle feeding OR [1.4(1.07, 1.87)]. Even, after controlling factors for sex of child, diarrhea in last two weeks, place of delivery, monthly income and paternal education bottling feeding children were significantly associated with stunting AOR [1.3(1.01, 1.8)].

However, in multiple logistic regression analysis of sex of child (being male) [AOR: 95%: 1.5(1.1, 2)], child's aged between 12-23 months and 24-35 months [AOR: 95%CI: 0.5(0.3, 0.8) and 0.5(0.3, 0.8)], bottle feeding practices [AOR: 95%CI: 1.3 (1.01, 1.8)] and home delivery

[AOR: 95%CI: 2(1.1, 3.9)] were significantly associated with stunting among children 6-59 months of IDPs and Indigenous communities.

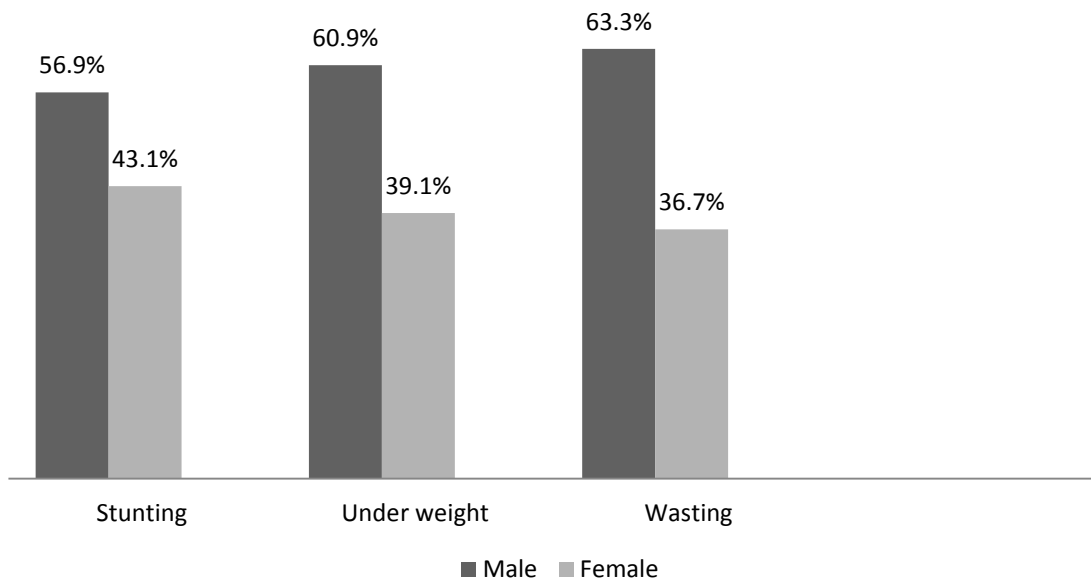
Table .5 Multiple Binary logistic regression analysis of selected variables of Stunting in Amuru woreda IDPs and Indigenous communities, H/G/W/ zone, Oromia Region, 2013.

Variables	Stunting		COR (95%CI)	AOR (95%CI)
	Yes (n, %)	No (n, %)		
Residence (N=806)				
IDPs	218(52.9)	194(47.1)	1.06(0.8, 1.4)	0.7(0.5, 1.1)
Indigenous	202(51.3)	192(48.7)	1	1
No.of U5 children(N=806)				
<=2	363(51.1)	347(48.9)	1	1
>=3	57(59.4)	39(40.6)	1.4(0.9, 2.1)	1.4(0.9, 2.3)
Parental education level (N=790)				
Illiterate	259(53.2)	228(46.8)	1.3(0.9, 1.9)	1.2(0.8, 1.9)
Primary educ.	98(51.6)	92(48.4)	1.2(0.8, 1.9)	1.2(0.7, 1.9)
Secondary and above	53(46.9)	60(53.1)	1	1
Monthly income (N=786)				
≤ 200	293(50.4)	288(49.6)	1	1
≥ 201	115(56.1)	90(43.9)	1.26(0.9, 1.7)	1.2(0.8, 1.8)
Child's sex N-806				
Male	239(56.6)	183(43.4)	1.5(1.1, 1.9)*	1.5(1.1, 2)*
Female	181(47.1)	203(52.9)	1	1
Child's age N=806				
6-11 months	60(63.8)	34(36.2)	0.9(0.5, 1.7)	1.1(0.6, 2.2)
12-23 months	91(45.3)	110(54.7)	0.4(0.3, 0.8)*	0.5(0.3, 0.8)*
24-35 months	108(45.2)	131(54.8)	0.4(0.3, 0.8)*	0.5(0.2, 0.7)*
36-47 months	111(56.9)	84(43.1)	0.7(0.4, 1.2)	0.7(0.4, 1.2)
48-59 months	50(64.9)	27(35.1)	1	1
Place of delivery N=806				
Home	397(52.9)	354(47.1)	1.6(0.8, 2.7)	2(1.1, 3.8)*
Health facility	23(41.8)	32(58.2)	1	1
Mother's age N=805				
16-25 years	88(59.1%)	61(40.9%)	1.58(0.98,2.57)	1.76(1.02,3)*
26-35 years	272(51.1%)	260(48.9%)	1.15(0.77,1.70)	1.2(0.8,1.8)
36-49 years	59(47.6%)	65(52.4%)	1	1
Diarrhea last 2 weeks N=806				
Yes	62(56.4)	48(43.6)	1.2(0.8, 1.8)	1.3(0.8, 2)
No	358(51.4)	338(48.6)	1	1
Fever last 2 weeks N=806				
Yes	51(52)	47(48)	0.9(0.6, 1.5)	0.9(0.5, 1.6)
No	369(52.1)	339(47.9)	1	1
Bottle feeding				
Yes	242(56.1)	189(43.9)	1.4(1.07, 1.8)*	1.3(1.01, 1.8)*
No	178(47.5)	197(52.5)	1	1
Latrine availability N=806				
Yes	361(51.1)	345(48.9)	1	1
No	59(59)	41(41)	1.4(0.8, 2.1)	1.4(0.9, 2.2)

* shows significant association

5.5.2 Determinants of wasting

As described in table 6, the prevalence of wasting was 3.5 times higher among IDP children [OR: 95%CI: 3.5 (2.3, 5.4)] compared to those in Indigenous communities. Internal displacement was significantly associated with wasting [AOR: 95%CI: 2.4(1.4, 4)] after controlling for monthly income, ownership of lands, availability of latrine and presence of diarrhea in the two weeks survey. Male children are more likely to be wasted (63.3%) than female children (36.7%). Male children were 1.5 [95%CI: 1.5 (1.1, 1.9)] and 1.6 [95%CI: 1.6 (1.2, 2.2)] times more likely to be stunted and under-weight than female children of both groups (IDPs and Indigenous communities) respectively. The level of stunting, wasting and underweight by sex category were compared among both groups. (See the below Figure 4)



Figure; 4 Prevalence of stunting, under weight and wasting by sex among IDPs and Indigenous communities of Amuru Woreda, 2013.

Wasting was significantly higher among children who were not immunized compared to immunized children [OR; 3.54(1.16, 10.76)]. The prevalence of wasting was found to be 2.8 times higher in households hadn't agricultural lands than those households did have farm lands [OR: 2.8(1.8, 4.3)]. While adjusted the other factors related to having agricultural lands was significant association with wasting [AOR: 2.0(1.2, 3.25)].

Table ; 6 Multiple Binary logistic regressions analysis of selected variables of Wasting in Amuru woreda IDPs and Indigenous communities, H/G/W/ zone, Oromia Region, 2013

Variables	Wasting		COR (95%CI)	AOR (95%CI)
	Yes (n, %)	No (n, %)		
Residence N=863				
IDPs	89(21)	335(79)	3.5(2.3, 5.4)*	2.4(1.4, 4)*
Indigenous	31(7.1)	408(92.9)	1	1
Marital status				
Married	94(13%)	631(87%)	1	1
Never	15(16.1%)	78(83.9%)	1.3(0.7, 2.3)	1.2(0.6, 2.1)
Divorced/widowed	10(27.8%)	26(72.2%)	2.6(1.2, 5.5)*	2.8(1.3, 6.3)*
Parental education level(N=845)				
Illiterate	89(17.5)	421(82.5)	2.5(1.3, 4.9)*	1.7(0.8, 3.7)
Primary(1-8)	19(9.2)	187(90.8)	1.2(0.5, 2.7)	1.1(0.5, 2.6)
Secondary and above	10(7.8)	119(92.2)	1	1
Ownership of Agri. land				
Yes	39(8.4)	424(91.6)	1	1
No	81(20.2)	319(79.8)	2.8(1.8, 4.2)*	2(1.2, 3.2)*
Child sex N=863				
Male	76(16.8)	377(83.2)	1.7(1.1, 2.5)*	1.6(1.03, 2.4)*
Female	44(10.7)	366(89.3)	1	1
Child's age N=863				
6-11 months	7(6.4)	102(93.6)	0.5(0.2, 1.5)	0.5(0.2, 1.4)
12-23 months	32(13.9)	198(86.1)	1.3(0.6, 2.8)	1.2(0.5, 2.7)
24-35 months	37(15.4)	204(84.6)	1.4(0.6, 3.1)	1.2(0.5, 2.6)
36-47 months	35(17.2)	168(82.8)	1.6(0.7, 3.6)	1.5(0.7, 3.5)
48-59 months	9(11.2)	71(88.8)	1	1
Receiving immunization at least one				
Yes	115(13.5)	734(86.5)	1	1
No	5(35.7)	9(64.3)	3.5(1.2,10.7)*	10.6(2.1, 53)*
Diarrhea last 2 weeks N=863				
Yes	24(21.4)	88(78.6)	1.9(1.2, 3)*	1.2(0.7, 2.1)
No	96(12.8)	655(87.2)	1	1
Fever last 2 weeks				
Yes	17(16.7)	85(83.3)	1.3(0.7, 2.2)	0.8(0.4, 1.6)
No	103(13.5)	658(86.5)	1	1
Bottle feeding				
Yes	61(13.2)	402(86.8)	0.8(0.6, 1.3)	0.9(0.6, 1.6)
No	59(14.8)	341(85.2)	1	1
Latrine availability=863				
Yes	96(12.6)	663(87.4)	1	1
No	24(23.1)	80(76.9)	2(1.2, 3.4)*	1.4(0.8, 2.5)

* shows significant association

5.5.3 Determinants of Underweight

As indicated in table 7, the prevalence of under weight was 4.3 times higher among internally displaced children compared to the indigenous group [OR; 95%CI: 4.3(3.0, 6.1)]. After adjusted the other related factors the association was significant with under weight (AOR: 2.37(1.43, 3.93)). Children having bilateral oedema on legs were 3.5 times likely to be under-weight than those children haven't oedema on the both legs among internally displaced and indigenous [OR; 3.57(1.4, 8.5)].

Parent's education, parents who were illiterate was significantly associated with under-weight than those children had parents secondary and above educational level [OR; 3(1.7, 5.2)]. The illiterate parents of children were 3 times more likely to be under-weight compared to those parents who have had secondary and above educational level. Even, after controlling for monthly income, ownership of agricultural lands, sex of child and age of mother the paternal education level was significantly associated with under-weight [AOR; 2.7(1.5, 4.7)].

However, in the multiple logistic regression analysis of religion [AOR; 1.8(1.22, 2.79)], parental education level [AOR; 1.54(1.09, 2.18)], households haven't latrine [AOR; 1.6 (1.03, 2.6)], bilateral oedema [AOR; 2.9(1.2, 7.5)], sex of child [AOR; 1.6(1.2, 2.2)] and internal displacement [AOR; 2.4(1.4, 3.9)] were associated significantly with under weight among IDPs and Indigenous communities.

Table ; 7 Results from binary logistic regression analysis of determinants of Underweight in Amuru woreda, Horo Guduru Wollega zone, Oromia Region, 2013.

Variables	Underweight		COR (95%CI)	AOR ((95%CI)
	Yes (n, %)	No (n, %)		
Residence				
IDPs	162(36.8)	278(63.2)	4.3(3.0, 6.1)*	2.4(1.4, 3.9)*
Indigenous	53(11.8)	395(88.2)	1	1
Religion				
Muslim	136(35.1)	251(64.9)	2.9(2.1, 3.9)*	1.8(1.2, 2.8)*
Other	79(15.8)	422(84.2)	1	1
Paternal education				
Illiterate	156(29.7)	370(70.3)	3(1.7, 5.2)*	2.7(1.5, 4.7)*
Primary (1-8)	40(18.9)	172(81.1)	1.7(0.9, 3.1)	1.5(0.8, 2.9)
Secondary and above	16(12.2)	115(87.8)	1	1
Ownership of Agri. land				
Yes	77(16.1)	400(83.9)	1	1
No	138(33.6)	273(66.4)	2.7(1.9, 3.8)*	1.3(0.7, 2.3)
Child sex				
Male	131(28.2)	334(71.8)	1.6(1.2, 2.2)*	1.6(1.2, 2.2)*
Female	84(19.9)	339(80.1)	1	1
Child's age				
6-11 months	22(20.2)	87(79.8)	0.8(0.4, 1.6)	0.8(0.4, 1.5)
12-23 months	47(20.4)	183(79.6)	0.8(0.4, 1.5)	0.7(0.4, 1.5)
24-35 months	61(23.5)	199(76.5)	0.9(0.5, 1.7)	0.7(0.4, 1.4)
36-47 months	66(31.6)	143(68.4)	1.5(0.8, 2.6)	1.3(0.7, 2.6)
48-59 months	19(23.8)	61(76.2)	1	1
Birth order (N=888)				
1	38(31.1)	84(68.9)	2.1(1.3, 3.3)*	1.7(0.9, 3.07)
2-4	120(27)	324(73)	1.7(1.2, 2.4)*	1.5(1.04, 2.3)*
5-12	57(17.7)	265(82.3)	1	1
Latrine availability				
yes	173(22.2)	607(77.8)	1	1
No	42(38.9)	66(61.1)	2.2(1.5, 3.4)*	1.6(1.03, 2.6)*

*** shows significant association**

6. DISCUSSION

The study revealed a relatively high prevalence of child malnutrition (Stunting, Wasting and Underweight) among internally displaced groups compared to indigenous group of Amuru Woreda. The prevalence of stunting was particularly similar among internally displaced people and indigenous people indicating both populations suffer from chronic undernutrition. In contrast, the level of wasting was significantly higher among IDP children (21%) compared to indigenous children (7.1%). Similarly, underweight was significantly higher among IDP children (36.8%) compared to indigenous children (11.8%) (p -value < 0.05) which is indicative of the higher burden of the acute/mixed form of undernutrition facing the internally displaced population.

The prevalence of stunting was higher compared to the figure for Oromia region from the National Demographic Health Survey in 2011 (52% versus 41.4%) (5), but the result among IDPs similar to that in Gulu district of Northern Uganda (53% versus 52.4%) (8).

The study highlighted that wasting is higher among IDPs compared to survey results from Gulu district of Northern Uganda (21% versus 6%) (8) and the Horn of Africa (15.1%) in a similar setting. This might be due to continued conflict and war in the northern Uganda and horn of Africa because of political differences.

The observed prevalence of wasting among internally displaced group was comparable to results from a study among internally displaced children living in the Ouaddai and Salamat regions of Eastern Chad (21% versus 20.6%) but the level of wasting among indigenous (non-displaced) children is lower compared to the figure from Eastern Chad (7.1% versus 16.4%) (33) and Horn of Africa (7.1%, 13.5%) (12) in a similar setting.

The figure for under-weight among IDPs children in the present study was also comparable to findings from a survey among displaced children in Sudan (37% Versus 38%) (14).

The findings regarding possible determinants of malnutrition were generally consistent with various studies in Ethiopia as well as other developing countries (17, 19, 30).

Our survey revealed that indicate that male children are more likely to be stunted than their female counterparts in both displaced and indigenous communities [OR: 95%CI: 1.5(1.1, 1.9)].

Being a male was also significantly associated with wasting and underweight among internally displaced and non-displaced groups ([OR: 95%CI: 1.7(1.1, 2.5)] and [OR: 95% CI: 1.6(1.2, 2.2)] respectively) which is consistent with results of several prior studies (5, 6, 18, 20). This might be due to male children less than two years have more common to infect than female children and culture dietary intake differences. But contrary with another study which indicated that female children are more likely to be stunted than males (34).

In general, the prevalence of stunting increases as the age of child increases with the highest prevalence of chronic malnutrition found in the age group 48-59 months(64.9%). As expected, children who had been on bottle feeding were significantly more likely to have stunting [OR; 1.4(1.1, 1.9)] among both groups which is in agreement with a study done in Ethiopia (20).

In the logistic regression analysis male children, younger children, bottle feeding and younger maternal age (16-25 years) were identified as significant predictors of stunting among IDPs and indigenous children.

The findings indicate that the highest prevalence of wasting was found to be in children age of 36-47 months (17.2%) and lowest in children age of 6-11 months (6.4%) among IDPs and Indigenous groups.

As expected, children from families that do not have land to cultivate were found 2.8 and 2.6 times more likely to be wasted and under weight than those who have farming lands among IDPs and Indigenous societies [OR: 95%CI: 2.8(1.8, 4.2)] and [OR: 95%CI: 2.6 (1.9, 3.6)] respectively. This might be due to majority of occupation of father were farming while they haven't access to cultivate lands because of they immigrants to the study area. In contrary, the study done in Ethiopia and other country revealed that not having land to cultivate was not significantly associated with wasting and underweight(24, 36). But not having land to cultivate was not statistically associated with figure of stunting in this study.

Diarrhea was the commonest morbidity among children (21.4%), followed by fever (16.7%) among IDPs and indigenous communities. The level of wasting was significantly higher among children who had diarrhea in the last two weeks survey compared to children hadn't diarrhea during the preceding two weeks [OR: 95%CI: 1.9 (1.2, 3)] which study finding in line with India survey(28).

In the logistic regression analysis male children, parents who were uneducated, being divorced and widowed of marital status, non immunized children, children who had diarrhea in the two weeks preceding the study, not having land to cultivate and lack of latrine availability households were identified as significant predictors of wasting among internally displaced and indigenous children.

The findings revealed that the highest proportion of underweight children (31.6 %) is in the age group 36-47 months which is consistent with a study done in Vghean, Vietnam (23).

From the literature it is obvious that parental education is one of the most important factors for child malnutrition (Stunting, Wasting and under-weight). This study indicated that parent's education of the children was significantly associated with wasting and under-weight compared to educated parents. Children of uneducated parents have a higher likelihood of being underweight. Children from uneducated parents (illiterate) had three times higher odds of being underweight than those of parents who had primary and secondary and above educational level [OR; 3(1.7, 5.2)]. The risk of wasting was 2.5 times higher among children whose parents were illiterate as compared with children whose parents had secondary and above educational level [OR; 2.5(1.3, 4.9)] which study finding in line with the study done in Bangladesh (22) and other related studies (19, 23, 24, 28).

The risk of wasting and under-weight among children 6-59 months was significantly associated with the availability of latrine. It was observed that children whose households haven't latrine were 2 and 2.2 times more likely to be wasted and under-weight compared to those who have latrine [2.07(1.25, 3.42)] and [2.23(1.46, 3.40)] respectively.

In the logistic regression analysis male children, parents who were uneducated, not having agricultural lands and lack of latrine availability of households children were identified as significant determinants of underweight among internally displaced and indigenous communities.

7. STRENGTHS AND LIMITATIONS OF THE STUDY

Strengths

- A Comparative design used to examine the difference in patterns of undernutrition between internally displaced and indigenous under-five children.
- The study produced baseline information among displaced populations that can be used for designing context specific nutrition programs.
- The study used health professional for data collectors to keep reliability and accuracy of the anthropometric measurements.

Limitations

- The study used a cross-sectional which not assessed cause and effect relationship.
- It is difficult to attribute the difference in nutritional status only to their migration status although effort has been made to control for potential confounders.
- The study did not assess dietary intake which is one of the proximal risk factors for undernutrition.

8. CONCLUSIONS

In this study, it was found that child malnutrition is a major public health challenge in both IDPs and Indigenous communities of oromia region. The level of stunting, wasting and underweight among internally displaced was higher than children among indigenous groups.

Factors related to chronic malnutrition include; male children, younger children, bottle feeding and younger maternal age (16-25 years) among internally displaced and indigenous children.

For wasting, male children, non immunized children, uneducated parents and lack of land farming were found to be significant determinant of factors in the multiple binary logistic regression analysis among in IDPs and Indigenous communities living in this study area.

Sex of child (being male), uneducated parents and lack of availability of latrine were significant predictors of under weight among IDPs and indigenous children.

9. RECOMMENDATIONS

1. to Policy Makers/Program managers

- ✓ Based on the findings of this and other studies, policy makers need to consider internal displacement as one of the key factors in priority setting and designing nutrition programs.
- ✓ Oromia Regional Health Bureau should intensify efforts to improve the nutritional status of Amuru woreda especially children among internally displaced setting.
- ✓ It is essential to conduct rapid assessment and identify people who need to be enrolled in supplementary feeding or therapeutic feeding programmes and launch such programs on a timely manner whenever there is significant displacement of people.
- ✓ Strengthen nutrition education activities in the districts, focusing on the improvement of the quality of food prepared from locally available foods.

2. Non-Governmental Organizations/Civic societies

- ✓ It's important to pay special attention on access to improving sanitation facilities to limit the bad health consequences.

3. Further research

- ✓ Further researches should investigate the reasons behind increased vulnerabilities among some segments of the displaced and indigenous populations (for example, male children, younger children).

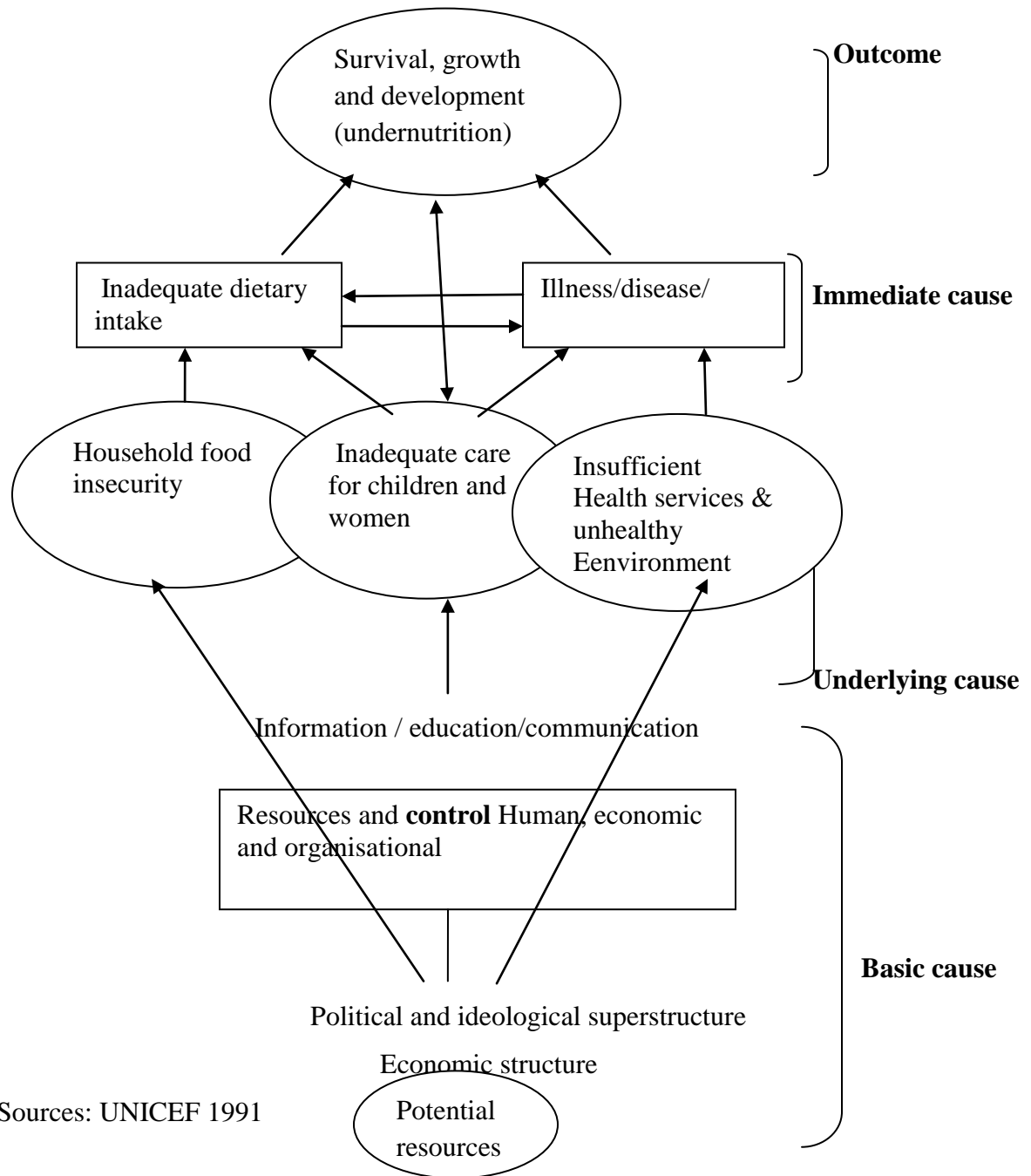
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11. ANNEXES

Annex -1: The Conceptual Framework Causes of Child Malnutrition



Sources: UNICEF 1991

Annex-2: Informed Consent form

Participant Information sheet and informed consent form

My name is _____. I am working with Geleta Asebe who is doing a research as partial fulfillment for the requirement of Masters Degree in Public Health at Addis Ababa University. Thus, today I came to visit your house to collect data which is related to malnutrition patterns and its determinants between internally displaced and indigenous under five children in your woreda. The objective of this study is to assess and compare nutritional status and its determinants among internally displaced and indigenous children under five in Amuru woreda. The questionnaire may take 15-20 minutes. The questionnaire will contains demographic, maternal, child, dietary intake, economic and environmental health factors and anthropometric measurement. By participating and providing information in this study does not expose to risk and also will not get direct benefit. If you feel uncomfortable with the data collection process, you will have full right to refuse or stop at any time. All the information and anthropometric measurement will be used by code and kept confidential.

Do I have your permission to proceed? 1. Yes 2. No

Informed consent certified by:

Interviewer name _____ signature _____ Date _____

Interviewer code _____ kebele name _____ Household No. _____

Residence (living area): 1. rural indigenous

2. Internally Displaced area

Result: 1. Completed 2. Partially completed 3. Refused 4. Not available 86.Others (Specify

Checked by Supervisor's: Name _____ signature _____ Date _____

If you have any questions, comments and concerns about this research welcome at any time by the given address below. Principal investigator: Geleta Asebe, Address: shambu town
Tel: 0912296691, e mail galoasebe78@gmail.com

Annex- 3: English Version Questionnaire

Title: Assessment and comparison of malnutrition patterns and its determinants among internally displaced and indigenous under five children living in the Amuru district, Horo Guduru Wollega Zone, Oromia region, Ethiopia

1. Socio demographic and economic factors

No _	Question	Response	Skip to/Remark
001	What is the sex of the HH head?	1. Male 2. Female	
002	What is your marital status?	1.Single 2.Married 2.Widowed 3.Divorced 86.Other _____	
003	(Family size)How many persons live in this household?	In number _____	
004	How many under five children live in the HH?	In number _____	
005	What is your religion?	1.Orthodox 2.Muslim 3. Protestant 4. Catholic 86. Others(specify)	
006	Ethnicity	1. Oromo 2.Amara 3. Tigre 4. Gurage 86. Others (specify)	
007	What is your education level (mother)?	1. Illiterate 2. Able read and write 3. 1-6 4 7-8 5.9-12 6.greater than 12	
008	What is your husband education level?	1. Illiterate 2. Able read and write 3. 1-6 4 7-8 5.9-12 6. > 12 th grade	
009	What would you say, is your family indigenous or internally displaced people?	1.indigenous 2.internally displaced people	If no, skip to 11
010	If internally displaced, What is your displaced year from original place?	In year_____	
2.1 livelihood/income			

011	How many household members are currently earning an income?	_____ members	
012	Occupation of mother (More than one answer is possible)	1. Housewife 2. Farmer 3. Merchant/Trade 4 Private Organization employee 5. Government employee 6. Daily laborer 86. Other (specify	
013	Occupation of father (More than one answer is possible)	1. Farmer 2. Government employee 3. Merchant/Trade 4. Private Org. employee 5. Daily laborer 86. Other (specify)	
014	Do you have livestock, herd or farm animal?	1. Yes 2. No	If no, skip to 222
015	If yes, how many? - Milk cow, Oxen and bulls? - Goat? - Sheep? - Chicken? - Horse, donkey, mule? In total?	_____ number _____" _____" _____" _____" _____"	
016	How many agricultural lands do you have?	1. Do not have 2. _____(local unit) (Qarxe or Hacter) 99. Do not know/not sure	
017	Monthly income of the HH(on average)	_____Birr	
Part 3. Child characteristics			
018	Child's sex	1. Male 2. Female	
019	Child's age	_____ Months	
020	Birth order	_____ th	

021	Place of delivery	1.Home 2.Health facility 86. Other (specify)	
022	Type of birth	1. Single 2. Twins	
023	Gestational age at birth	_____Months	
024	Was your child weighed at birth	1. Yes 2. No	If no, skip to 309
025	How much was the weight?	_____ Grams (card/recall?)	
026	Does the child ever been immunized?	1. Yes 2. No	If no, skip to 312
027	Vaccines received (See card, if no card available ask them to recall) (More than one answer is possible)	1. BCG only (See Scar) 2.opv-1,2,3 3. penta-1,2,3 4. pcv-1,2,3 5. Measles 6. No card found	
028	Vit. A supplementation in the past six months?	1. Yes 2. No 99. Don't know/not sure	
029	Did your child get a de worming tablet in last 6 months?	1. Yes 2. No 99. Don't know/not sure	
030	Has the child had diarrhea in the last two Weeks?	1. Yes 2. No 99.Do not know/not sure	
031	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	
032	Presence of respiratory disease in the last two weeks	1. Yes 2. No 99. Do not know/not sure	
033	Has the child get sick with measles in the last Year?	1. Yes 2. No 99. Do not know/not sure	
034	Has the child Oedema?	1. Yes 2. No	
Part 4 .child caring practices			
035	Did you ever breast fed the child (NAME)?	1. Yes 2. No	If yes, skip 403
036	If no, reason for not breastfeeding?	Reason_____	
037	How long after delivery child was put to	1.With in one hour of delivery	

	breast feed?	2. With in the first 8 hour of delivery 3. After 2-3 days 4. Seven days later 99. Don't know/not sure/	
038	Did you squeeze out and throw the first milk?	1. Yes 2. No	
039	Are you still breastfeed? (for children < 2yrs)	1. Yes 2. No	If no, skip 410
040	How many times in the last 24 hours you breastfeed?	_____ Times	
041	Do you breast feed in the night?	1. Yes 2. No	
042	For How many months did you exclusively breast-feed the child?	_____ months 99. Don't know /not sure/	
043	At what age did you start to give food in addition to your breast milk?	_____ in months	
044	What is the first food you used to feed the child?	1. Cow's milk 2. Sugar solution. 3. Axmiet/Bula 4. pourage 86. Other (specify)	
045	What do you use to feed the child?	1. Bottle 2. Cup 3. Spoon 86. Other (specify)	
046	For How many months did you breast-feed the child?	_____ in months	
047	How did you usually treat your child when get sick?	1. Usually home treatment 2. Taking to traditional healers 3. Taking to Health institution 86. Other (Specify)	
Part 5. Maternal characteristics and health services utilization			
048	Mother's age in years	Year completed _____	
049	Age at first birth	_____ Years	
050	Age when the youngest child was born	_____ years	

051	Total number of children ever born?	In number _____	
052	Pre-pregnancy weight (of the last pregnancy)	In kilogram_____	
		99. Do not know/not sure/	
053	During pregnancy or lactation, did you consume extra food? (the child under the study)	1. Yes 2. No	
054	Health status during the pregnancy	1. Good 2. Not good/sick	
055	Did you visit health facility for ANC?	1. Yes 2. No	
056	Have you ever used family planning methods	1. Yes 2. No	If no, skip to 513
Dietary information and Food security			
057	Where do you get your main source of food?	1. Own production 2. Bought 3.borrowed 4.free food(from NGO or Gov't)	
058	What is the staple food of the household?	1. Wheat 2.maize 3.teff 4. Peanuts 5.barley 6.sorghum 7.cassava 8.other	
059	In the past four weeks, did you worry that your household would not have enough food?	1.yes 2.no	
060	Has your child participated in a supplementary feeding program within the past twelve months?	1.Yes 2.No	
6.Environmental condition			
061	What is your main source of drinking water?	1. River 2. Un protected spring. 3. Protected spring 4. Private well 5. Public taps 6. Other (specify	
062	Amount of water used in the household daily?	In liters_____	
063	Do you treat your drinking water?	1. Yes 2.No	
064	How long does it take you to go and come back to fetch water?	In minutes_____	

065	Do you have latrine?	1. Yes 2. No	If no skip to 807
066	Type of latrine you use? (Observation)	1. Traditional pit latrine 2. Ventilated improved pit latrine (VIP) 86. Other (specify)	
067	How do you dispose garbage?	1. Open field disposal. 2. In a pit 3. Composting 4. Burning 86. Other (specify)	
068	Type of House (Observation)	1.Tukul/thatched 2. Corrugated Iron Sheet 86. Other(Specify)	
069	Presence of windows (Observation)	1. Yes 2. No	
070	How many rooms for use by the member of your household? (Excluding kitchen and store)	_____ in Number	
7. Anthropometrical measurement			
071	Child's length/height ;	_____._____cm	
072	Child's weight;	_____._____kg	
073	MUAC in cm	_____cm	

Annex-4: Afan Oromo Version Questionnaire

Waraqaan gaafii kun kan qopha'e ragaa sadarkaa hir'ina nyaata da'immaan fi sababoota hir'ina kana fidaan addaa baasuuf mana manatti funaanamu, Aanaa Amuru, Godina Horo Guduru Wallagaa, Naannoo Oromiyaatti.

Unka fi Wali galtee Nama qorannoo kana irraatti hirmaatu

Lakkoofsa waraqaa gaafii_____

Aanaa_____Ganda_____

Maqaan koo _____ jedhama. Ani yuniveersitii finfinneetti qorannoo isaanii hojjechaa kan jiraan obboo Galataa Assabaa Hinkosa faanan hojedhaa. Qorannoon kun kan qopha'ee barumsa digirii lammaaffaa isaanii xumuruuf hojjechuu waan qabaniifi dha. Egaa har'a gara mana keessani kanan dhufeef raga qorannoo kana gaggeessuufii barbachisaan fuunanachuufii dha. kaayyoon qorannoo kana bay'ina ijoollee hir'ina nyaata qaban baruu fi sababoota hir'ina nyaata kana fidan adda baasuu dha. Gaaffiilleen qorannoo kana waa'ee hawaasumaa, dinagdee, haala haadhaa, haala ijoollee, qulqullina naannoo fi dheerina ykn hojjaa, ulfaatina fi irree mucaa saafaruu qabateera. Qorannoo kana keessatti hirmachuu keessaniif miidhaan sin irraa ga'u hin jiru. Fayyidaa adda ta'es hin argatan, garuu raga fi yaadni keessan qorannoo kanaaf gumaacha guddaa qaba. Yoo qorannoo kana keessatti hirmachuu hin barbaanne ta'ee dhiissuuf ykn erga jalqabdanis dhaabuuf mirga guutuu qabdu. Ragaa fi yaadni keessan iccitiin ni qabama rakkina tokkof illee sin hin saaxilu.

Gaaffiillee qorannoo kanattiif deebiin keessaan bu'aa qabeessaa ta'ussaa ergaa hubattan qorannoo kana keessatti hirmaachuudhaaf fedha qabduu? 1. Eeyyee 2. Lakki

Gaaffii fi deebii kana xumuruuf daqiiqaa 15-20 nutti fudhachuu ni danda'a. Mallattoon nama raga fuunannuu ,namni gaafatamuu kun jechaan waligaluu isaa ibsu mirkanneessaa

Maqaa nama raga funannuu _____ mallattoo _____ guyyaa_____

Koodii nama raga funannuu _____ maqaa ganda _____ lakk.mana_____

Sa'a itti jalqabdee _____ sa'a itti xumurtee _____

Firii: Ragaan funanmee: 1. Guutumatti guutuu dha 2. Walakkaa dha

3. Ni didan 86 .kan biraa (ibsi)

Hordoffii kan gaggeessu: maqaa_____mallattoo_____guyyaa_____

Maqaan qoraataa qoorannoo kana Galataa Assabaa, teessoon magaala shambu, bilbilla0912296691- E-mail galoasebe78@gmail.com

Kutaa tokkooffaa: waa'ee haawasummaa fi dinagdee

Lakk	Gaaffii	Deebii	Darbuu/yaada
001	Abbaa mana/mana kan bulchuu?	1. dhiira 2. Dhala	
002	Haalli fuudha fi heerumaa keessan maalii?	1.Kan Hin fuunne/ heerumne 2.Kan fuudhe/heerumte 3.Kan jala du'e/duute 4. Wal hiikneera 86. kan biraa(ibsi)	
003	Baay'ini maatii keessanii meeqa?	lakk_____	
004	Daa'imni waggaa shani gadi mana keessan keessaa jiraan meeqa?	lakk _____	
005	Amantiin keessan maalii?	1.Ortodoksii 2.Musilima 3.Protestantii/pheenxee/ 4.katoolikii 86. kan biraa(ibsi)-----	
006	Qomoon keessan maalii?	1. Oromoo 2.Amara 3. Tigiree 4. Guragee 86. kan biraa(ibsi)_____	
007	Sadarkaan barumsa keessan maalii (haadha mana)?	1. Hinbaranee 2.duubbisuu fi barreessuu danda'a 3. 1-6 4. 7-8 5.9-12 6. > 12 7. Kan biraa(ibsi)_____	
008	Sadarkaan barumsa abbaa mana keessaan maalii?	1. Hinbaranee 2.duubbisuu fi barreessuu danda'a 3.1-6 4. 7-8 5.9-12 6. > 12 7. Kan biraa(ibsi)_____	
009	Maatiin keessaan isaa kami keessatti	1. Jiratotta Qubatotta hin taanee	Qubatota yoo

	ramadamuu?	2.Qubatotta	ta'e gara lakk.10tti darbi
010	Quubatotta yoo tattan, Erga bakka kana jiraachuu egaltan waggaa meeqa?	lakk_____	

2.1 Haala Jireenya fi Galii

011	Mana keessan keessaa namni hojii hojjetu meeqaattu galii qaba?	Lakk._____	
012	Hojiin haadha mana maalii?	1. qottee bulaa 2. Daldala 3. biiroo/jarmiya hojii dhunfaa 4.hojjetuu mootummaa 5. hojjetu guyyaa 86. kan biro (ibsi)_____	
013	Hojiin abbaa mana maalii?	1. qottee bula 2. hojjettaa mootummaa 3. daldala 4. biiroo/jarmiyaa hojii dhunfaa 5. hojjettaa guyyaa 86. kan biro(ibsi)_____	
014	Horii mana qabduu?	1. Eeyyee 2. Lakki	Lakkii,yoo ta'e lak.016tti darbi
015	Horii mana meeqa meeqa qabdu? - Loon/sawaa? - re'ee? - Hoolaa? - Indaqoo/lukkuu? - Fardaa? - Gangee? - Haree? Waligalattii	Lakkoofsan_____ ” _____ ” _____ ” _____ ” _____ ” _____ ” _____ _____	
016	Lafa qonnaa hagam ta'u qabdu?	1. hin qabnu	

		2. _____ Qarxii/heektaaran 99. hin beeku	
017	Walumagala tilmaman galiin mana keessanii ji'an argamu meeqa?	qarshii_____	
Kutaa lammaffaa:Haala Daa'imma			
018	Saalli mucaa maalii?	1. dhiiraa 2. Dhala	
019	Umuriin mucaa meeqa?	ji'an_____	
020	Muca meeqa keessannitti?	_____ ffaa	
021	Muca keessan eessaatti deessan?	1.mana jireenya 2.mana yaala 86. kan bira(ibsi)_____	
022	Gosni dhaloota?	1.tokko/baqee 2.lakkuu	
023	Ji'a meeqa deessee?	Ji'an_____	
024	Yeroo deessee ulfaatni isaa/ishee madalameera?	1. Eeyyee 2. Lakki	Lakki,yoo ta'e lak.026tti darbi
025	Yoo madaalamee ta'e ulfaatni isaa/ishee meeqa ture?	Giraman_____kaardii/ yaadachuun/	
026	Taalalli fudhate/fudhatteera?	1.Eeyyee 2.Lakki	Lakki,yoo ta'e lak.028tti darbi
027	Taalalii fudhatee/fudhatte isaa kami? (kaardii ilaali, yoo kaardiin hin jiraanee yaadachuun) (deebii tokko oli ni dannda'ama)	1. BCG qofa 2. opv-0, 1, 2, 3 (lakk. Doozii_____) 3.penta-1 ,2, 3 4.pcv-1,2,3 5. gifiraa 6. kaardiin hin jiru	
028	Vit. A ji'a ja'a darbee keessatti fudhaate/tte beeka /tti?	1. Eeyyee 2. Lakki	
029	Ji'a ja'a darbee keessatti qoricha ramoo garaa fudhaateera/ttetti?	1. Eeyyee 2. Lakki	
030	Torban laman darbani keessatti mucaan keessan garaa kaasa qaba/qabdi ture?	1. Eeyyee 2. Lakki	
031	Torban laman darbani keessatti mucaan	1. Eeyyee	

	keessan dhukkuba dhaqna guba qaba ture?	2. Lakki	
032	Torban laman darbani keessatti mucaan keessan dhukkuba quufasiisa/haaqe jira ture	1. Eeyyee 2. Lakki	
033	Waggaa darbe keessatti mucaan keessan dhukkuba gifira dhukkubasatte/te ture?	1. Eeyyee 2. Lakki	
034	Dhiita'uun miila muca laman irraa jiraa?	1. Eeyyee 2. Lakki	
Kutaa saddaffaa:Haala Qaabinsa Mucaa			
035	Mucaa keessan kana harmaa hoosistanituu (maqaa)?	1. Eeyyee 2. Lakki	Yooeeyyeta'e lak.037tti darbi
036	Yoo hin hoosifne ta'e maaliif?	Sababa _____	
037	Mucaan dhalatee/tte hamami turtanii harmaa keessan hoosisuu egaltan?	_____ (daqiiqaa,sa'atti fi guyyaattin) 99. Hin beeku	
038	Aannani jalqaba elmittani ykn dhangalastanii ni gaatu?	1. Eeyyee 2. Lakki	
039	Hanga ammatti mucaa keessan harmaa hoosisaa jirtuu? (mucaa waggaa lama gadii)	1. Eeyyee 2.Lakki	Yoo lakki ta'ee gara 40tti darbi
040	Sa'a 24 keessatti al-meeqa hoosistaan?	Ala_____	
041	Halkan harmaa ni hoosistuu?	1. Eeyyee 2. Lakki	
042	Harmaa keessan qofa hanga ji'a meeqaatti hoosiftan?	Ji'a_____ 99. hin beeku/hin yaadadhu	
043	Umurii meeqa irratti mucaa keessaniif nyaata dabalataa kennu egaltani?	Ji'an_____	
044	Nyaatni jalqaba nyaachisuu egaltan isaa kami?	1. Aannan sawwa 2. Bulbula sukaraa 3. Aximixi 4.marqaa 86. Kan biroo(ibsi)_____	
045	Mucaa nyaachisuuf meeshaa akkamii fayyadamtuu?	1. xuuxxoo 2."Buurcuqoo"/butulee/ 3. faal'aana/mankaa/ 86. kan biroo(ibsi)_____	

046	Harmaa keessan hanga umurii meeqaatti hoosistanii?	Ji'an _____ 99. hin beeku/hin yaadadhu	
047	Mucaan keessan yeroo dhukkubsatu /ttu akkamin yaalchifattuu	1. Yeroo baay'ee manumaatti yaalaana 2. Yaaltottaa aadaa bira geessuun 3. Dhaabbattaa/buufata fayyaa geessuun 86. kan biro(ibsi)_____	
Kutaa araffaa: haala fi itti fayyadamuu fayyaa haadha			
048	Umurii waggaan meeqa?	Waggaa _____ xumure	
049	Waggaa itti mucaa isaa/ishee jalqabaa deesse	Waggaa _____ tti	
050	Waggaa itti mucaa ishee/isaa quuxusuu deessan	Waggaa _____ tti	
051	Baayi'anni ijoollee hanga ammatti deessan meeqa?	Lakkoofsan _____	
052	Osoo mucaa keessan hin ulfaahini dura ulfatni keessan meeqa ture? (mucaa isaa qooratamuu)	Kilogirama _____ 99. hin beeku/hin yaadadhuu/	
053	Yeroo mucaa keessan ulfaa ykn hoosifan nyaata dabalataa/addaa/ nyaatu? (mucaa qooratamuu)	1. Eeyyee 2. Lakki	
054	Haalli fayyummaa keessan yeroo ulfa akkamii turee? (mucaa isaa qooratamuu)	1. gaarii 2. Gaarii mitti/na dhukkuba ture	
055	Hordooffii ulfaaf mana yaalaatti goottan turee?	1. Eeyyee 2. Lakkii	
056	Tooftalee karoora maatii fayyadamtani beektuu?	1. Eeyyee 2. Lakkii	
Waa'ee nyaataa			
057	Nyaata keessanif kan ta'u eessaa argatuu?	1. Ofii omishuudhaan 2. bituudhaan 3. liqeefachuudhaan 4. Tola kafalti malee	
058	Nyaatni mana keessaan keessaa yeroo baay'ee nyaatamuu isaa kami?	1. Qamaddii 2. Boqolloo 3. xaafii 4. Ocholonii 5. Garbuu 6. Mishinga 7. Other	
059	Torbee araffan darban keessatti mana keessaa nyaata gaha dhabdani beektuu?	1. Eeyyee 2. lakkii	
060	Waggaa darbee keessatti mucaan keessaan sagantaa hiri'ina nyaataf kennamuu keessaa seentee beektii?	1. Eeyyee 2. Lakkii	

Kutaa shanaffaa:waa'ee haalaa naannoo			
061	Maddi bishaan dhugaatii keessanii eessaa?	1. Laga 2. Burqaa itti hin ijaaramne. 3. Burqaa itti ijaarame. 4. Bishaan boollaa 5. boonoo 96. kan biro(ibsi	
062	Baay'ina bishaan guyyaatti fayyadamtan?	liitiraan_____	
063	Bishaan dhugaatii yaaltanii dhugduu?	1. Eeyyee 2. Lakkii	
064	Bishaan waraabdanii fiduuf hagam isinitti fudhataa?	daqiiqaadhaan_____	
065	Mana fincaanii ni qabduu?	1. Eeyyee 2. Lakkii	Lakkii yoo ta'e lak.067 darbi
066	Gosa mana fincaanii? (ilaalutiin)	1.Boolla fincaani kan aadaa 2. Ventilated improved pit latrine (VIP) 86. Kan biro (ibsi)_____	
067	Haalli kosii goggogaa itti gatan akkamii?	1. Bakkeetti. 2. Boollaatti 3." Compost" gochuun 4. gubuuttin 96. kan biro (ibsi)	
068	Gosti mana jireenya keessan maalii? (ilaaluun)	1. Mana chita 2. Qorqoroo 86. kan biro (ibsi)_____	
069	Manni jireenya keessan foodaa qabaa?	1. Eeyyee 2. Lakkii	
070	Mana jireenya keessaan kutaa meeqaa qabaa? (kushina fi kuusaa meeshaan alatti)	Kutaa_____	
7. Anthropometrical measurement			
071	Dheerina /hojja daa'ima;	seentimetiraan_____.____	
072	Ulfaatina daa'ima;	kilogiraaman_____.____	
073	Maadalli "MUAC" daa'ima	ceentimetiraan_____	

Galatoomaa!!! Nagaan taha

DECLARATION

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

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Place Addis Ababa, Ethiopia

Date of submission _____

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

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Signature _____

Date _____



**ADDIS ABABA UNIVERSITY, COLLEGE OF HEALTH SCIENCES
SCHOOL OF PUBLIC HEALTH**

**ASSESSMENT AND COMPARISON OF PATTERNS OF
MALNUTRITION AND ITS DETERMINANTS BETWEEN INTERNALLY
DISPLACED AND INDIGENOUS UNDER FIVE CHILDREN IN AMURU
DISTRICT, HORO GUDURU WOLLEGA ZONE, OROMIA REGION,
ETHIOPIA.**

BY: Geleta Asebe (BSc)

ADVISOR: Solomon Shiferaw (MD, MPH)

**A THESIS SUBMITTED TO THE SCHOOL OF PUBLIC HEALTH,
COLLEGE OF HEALTH SCIENCES, ADDIS ABABA UNIVERSITY AS
PARTIAL FULFILMENT OF THE REQUIRMENTS FOR THE DEGREE OF
MASTER OF PUBLIC HEALTH**

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