

SMART+ Survey Report

REACH, Feb-2024, Alinoor

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Full Smart

Validated

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2. Acronyms

AFI	Acute Febrile Illness
ARI	Acute Respiratory Infection
CDR	Crude Death Rate
CI	Confidence Interval
CLTS	Community-Led Total Sanitation
CMAM	Community Management of Acute Malnutrition
CSI	Coping Strategy Index
DEFF	Design Effect
DRMB	Disaster Risk Management Bureau
DRMC	Disaster Risk Management Commission
EBF	Exclusive Breastfeeding
ENA	Emergency Nutrition Assessment
FCS	Food Consumption Score
FCS	Food Consumption Score
FEWSNET	Famine Early Warning Systems Network
GAM	Global Acute Malnutrition
HAZ	Height-for-Age Z-score
HH	Household
IPC	Integrated Food Security Phase Classification
IYCF	Infant Young Child Feeding
LAP	Liban Agropastoral Livelihood Zone
MAD	Minimum Acceptable Diet
MAM	Moderate Acute Malnutrition
MDD	Minimum Dietary Diversity
MMF	Minimum Meal Frequency
MUAC	Mid/Upper Arm Circumference
ORS	Oral Rehydration Solution
OTP	Outpatient Therapeutic Program
PLW	Pregnant and Lactating Women
PPS	Probability Proportion to Size
PSNP	Productive Safety Net Program
PSU	Primary Sampling Unit

rCSI	Reduced Coping Strategy Index
RENCU	Regional Emergency Nutrition Coordination Unit
SAM	Severe Acute Malnutrition
SBCC	Social Behavior Change Communication
SMART	Standardized Monitoring and Assessment for Relief and Transitions
SOP	Standard Operating Procedures
TSFP	Targeted Supplementary Feeding Program
U5DR	Under Five Death Rate
UNICEF	United Nations Children's Fund
WASH	Water, Sanitation and Hygiene
WHO	World Health Organization
WHZ	Weight-for-Height Z-score

3. Executive Summary

Introduction

The SMART+ Nutrition Survey was conducted by the REACH Initiative in the lowland areas of the Arsi zone, located in the Oromia region. Thirteen districts were assessed as part of the survey, namely Gololcha, Shenen Kolu, Jeju, Merti, Roobee, Chole, Aseko, Dodota, Amigna, Seru, Bele Gesgar, and Ziway Dugda. The survey was carried out from March 29 to April 9, 2024, which coincided with the belg season, which is the shorter rainy season. The **primary objectives** of the survey were to assess the nutritional status of children aged 6-59 months, crude mortality, and under-five mortality. Additionally, the morbidity patterns of children, infant and young child feeding practices (IYCF) for children aged 0-23 months, and the household food security, water sanitation, and hygiene situations, as well as the nutrition status of women of reproductive age, including pregnant and lactating women, were also assessed in the thirteen districts of the Arsi zone.

Methodology

A cross-sectional household survey was conducted in thirteen districts of the lowland Arsi zone. The purpose of the survey was to collect representative data on nutrition, mortality, food security, livelihood, and WASH indicators. The survey utilized a two-stage cluster sampling method based on the SMART methodology to ensure accurate results. In the first stage, the required number of clusters was randomly selected using probability proportional to size (PPS). This method ensured that every household had an equal chance of being chosen, regardless of the population size of the village. The clusters were defined as Gare, which is the lowest level of the village/kebele and can contain a maximum of 30 households. In the second stage, households within each selected cluster were chosen using a simple random sampling method. The sample size for the survey was calculated using the SMART+ integrated platform, considering parameters such as estimated prevalence, average household size, design effect, desired precision, percentage of children, and non-response rate. Based on these calculations, a total sample size of 921 households (including 591 children) was estimated to provide a representative sample. Using the SMART+ integrated platform, 84 clusters were randomly chosen, and each selected cluster included 11 households, regardless of the number of children interviewed. In the end, 80 clusters (95% of the planned clusters) were surveyed, resulting in data from 869 households with 783 children (aged 6-59 months). The non-response rate at the household level was 0.9%.

Child Nutritional Status Outcomes			
Indicator	Denominator (N)	Numerator (n)	Result (95% CI)
GAM prevalence among children 6-59 months per WHZ < -2SD*	772	42	5.4% (3.6%, 8.1%)
SAM prevalence among children 6-59 months per WHZ < -3SD	772	2	0.3% (0.1%, 1.0%)

Table 3-1: Summary of Findings

Child Nutritional Status Outcomes				
Indicator	Denominator (N)	Numerator (n)	Result (95% CI)	
GAM prevalence among children 6-59 months per MUAC <125 mm	779	40	5.1% (3.4%, 7.6%)	
SAM prevalence among children 6-59 months per MUAC <115 mm	779	10	1.3% (0.7%, 2.3%)	
Combined GAM prevalence among children 6-59 months per WHZ < -2SD or MUAC <125 mm	779	69	8.9% (6.4%, 12.2%)	
Combined SAM prevalence among children 6-59 months per WHZ < -3SD or MUAC <115 mm	779	12	1.5% (0.8%, 2.8%)	
Stunting among children 6-59 months per HAZ < - 2SD	745	303	40.7% (36.2%, 45.3%)	
Severe stunting among children 6-59 months per HAZ < -3SD	745	117	15.7% (13.0%, 18.8%)	
Underweight among children 6-59 months per WAZ < -2SD	772	167	21.6% (17.9%, 25.9%)	
Severe underweight among children 6-59 months per WAZ < -3SD	772	36	4.7% (3.2%, 6.8%)	
Crude Mortality Rate	4,882	12	0.26 (0.15, 0.47)	
Under 5 Mortality Rate	853.5	1	0.13 (0.02, 0.73)	
Mean FCS	872		41.74 (38.9, 44.6)	
Mean Reduced Coping Strategy Index (rCSI)	872		13.25 (11.2, 15.3)	
Moderate hunger	872	270	31.0% (24.8%, 37.9%)	
Severe hunger	872	10	1.1% (0.4%, 3.4%)	
Protected/treated water source	872	470	53.9% (43.8%, 63.7%)	
Un-protected/un-treated water source	872	402	46.1% (36.3%, 56.2%)	

Child Nutritional Status Outcomes				
Indicator	Denominator (N)	Numerator (n)	Result (95% CI)	
Improved sanitation facilities	872	109	12.5% (8.5%, 18.0%)	
Unimproved sanitation facilities	872	763	87.5% (82.0%, 91.5%)	
Vitamin A supplementation coverage	783	521	66.5% (58.9%, 73.4%)	
Deworming coverage	656	223	34.0% (28.2%, 40.3%)	
Measles vaccination coverage (children aged 9-59 months)	728	567	77.9% (70.7%, 83.7%)	
Early Initiation (0-23 months)	324	246	75.9% (68.5%, 82.0%)	
Exclusive breastfeeding under 6 months	94	59	62.8% (52.9%, 71.7%)	
Minimum dietary diversity (6-23 months)	230	34	14.8% (10.2%, 21.0%)	
Minimum meal frequency (6-23 months)	230	73	31.7% (23.7%, 41.0%)	
Minimum acceptable diet (6-23 months)	230	19	8.3% (4.9%, 13.6%)	
Prevalence of MUAC < 230mm (Non-Pregnant, Non- Lactating Women)	571	195	35.8% (31.4%, 40.6%)	
Prevalence of MUAC < 230mm (Pregnant, Lactating Women with an Infant Less Than 6 Months)	245	92	37.6% (31.4%, 44.1%)	
Skilled Delivery	682	249	36.5% (31.1%, 42.3%)	

Summary findings	Recommendations ¹
 Summary findings Nutrition status of children 6-59 months The prevalence of GAM among children aged 6-59 months, as defined by WHZ < - 2SD, was 5.4%. According to the classification by WHO/UNICEF, this falls into the medium category. However, it is important to note that there were pockets of malnutrition within the region, particularly in Shenen Kolu district, where the GAM prevalence reaches 11.6%, indicating a high level of acute malnutrition in that area. Stunting among children 6-59 months per HAZ < -2SD was 38% which is very high according to WHO/UNICEF classification. Nutrition status of women of reproductive age 35.8% of the Non-Pregnant, Non-Lactating 	 Recommendations¹ Immediate Address the pockets of acute malnutrition identified, particularly in Shenen Kolu district, through targeted interventions such as community management of acute malnutrition (CMAM) programs and nutrition education/IYCF. Implement systematic nutritional screening for pregnant and lactating women during antenatal care visits and postpartum follow-ups, providing targeted counseling on dietary diversity, micronutrient supplementation, and optimal feeding practices. Intermediate Promote maternal dietary diversity through the cultivation and consumption of locally available nutrient-rich foods, emphasizing the inclusion of fruits, vegetables, legumes, nuts, and animal-source foods in daily meals. Long term Invest in early childhood development programmes that promote holistic child development, including nutrition, health, education, and psychosocial support, to mitigate the long-term impacts of stunting on cognitive and
 Stunting among children 6-39 months per HAZ < -2SD was 38% which is very high according to WHO/UNICEF classification. Nutrition status of women of reproductive age 	 vegetables, legumes, nuts, and animal-source foods in daily meals. Long term Invest in early childhood development programmes that promote holistic child development, including nutrition, health, education, and psychosocial support, to mitigate
• 35.8% of the Non-Pregnant, Non-Lactating Women aged 15-49 years were under nourished or had a MUAC < 230mm.	 the long-term impacts of stunting on cognitive and physical development. Promote women's empowerment and gender equality through education, economic opportunities, and decision-making autonomy, addressing social and
• 37.6% of the Pregnant Women and Lactating Women with an Infant less than 6 Months were under nourished or had the MUAC < 230mm.	 eventsion-making autonomy, addressing social and cultural barriers that restrict women's access to resources and control over their own health and nutrition. Strengthen health systems to ensure comprehensive maternal and child health services, including access to skilled birth attendance, postnatal care, and family planning services, to support maternal and child wellbeing throughout the reproductive lifecycle.

 Table 3-2: Recommendations

¹ Developed in consultation with program/humanitarian actors.

Summary findings	Recommendations ¹			
	• Implement social behavior change communication strategies (SBCC) to address basic causes of malnutrition.			
 The mean FCS for the surveyed population was acceptable with possibility of deterioration. Most households (62.2%) fell under the category of acceptable food consumption score, while 24.4% fell into the borderline category indicative of IPC AFI Phase 3. Most (57.7%) surveyed households, reportedly experienced no hunger according to the Household Hunger Score. However, 31% experienced moderate hunger and 1.1% severe hunger. With 21.8% of households in Phase 3 and 1.1% in Phases 4-6, this indicates an IPC AFI Phase 3 (Crisis). 	 Immediate Food assistance programs should be implemented. This can include food distribution initiatives, cash transfer programs especially for Shenen Kolu, Jeju, and Seru woredas that are at risk of deteriorating into IPC AFI Phase 3 if conditions worsen. Intermediate Livelihood support programs to enhance household resilience and income generation opportunities in the above three districts. Community-based initiatives such as community gardens, livestock rearing projects, and food preservation and storage practices can empower communities to address food insecurity at the grassroots level. 			
	• Strengthening monitoring and early warning systems for food security can help identify and respond to emerging crises before they escalate.			
 WASH 53.9% of HHs had access to safe/improved water for drinking and cooking. Only 12.5% of HHs had access to improved sanitation facilities. This indicates challenges for the population, and a risk of outbreak of diseases affecting malnourished children. 	 Immediate Rehabilitation and maintenance of existing water sources. Launch intensive awareness campaigns focusing on the importance of improved sanitation facilities and proper hygiene practices, targeting both urban and rural communities. Intermediate Invest in infrastructure development projects to expand access to safe water sources and improve sanitation facilities, with a focus on underserved rural and periurban communities. Implement community-led total sanitation (CLTS) programs to empower communities to take ownership of improving sanitation practices and constructing household latrines, fostering a sense of collective responsibility. 			

Summary findings	Recommendations ¹
	• Conduct training programs for local authorities, community leaders, and health workers on WASH management, maintenance, and hygiene promotion.
 Health Two-third of children aged 6-59 months were supplemented with Vitamin A and three quarters of children 9-59 months were vaccinated against measles. However, only one-third of children were dewormed. Prevalence of fever and diarrhea in the two weeks preceding the survey for children aged 6-59 months was less than 20%. Less than 40% of children with ARI, fever and diarrhea sought treatment indicating poor health seeking behavior. More than a third (36.5%) of women were attended by a skilled attendant at delivery. Vitamin A coverage was below the UNICEF threshold of 70%. Similarly, measles vaccination coverage was below the recommended herd immunity threshold of 95%, 	 Immediate Intensify outreach programs to increase coverage of vitamin A supplementation, deworming, and measles vaccination among children aged 6-59 months, particularly targeting underserved and remote communities. Strengthen integrated management of childhood illness programs (IMCI) Intermediate Improve the readiness of health facilities to diagnose and treat childhood illnesses by ensuring availability of essential medicines, diagnostic tools, and trained healthcare personnel. Implement behavior change communication strategies targeting caregivers to promote appropriate treatment-seeking behavior for childhood illnesses, emphasizing the importance of early recognition and prompt management.
 IYCF Early initiation of breastfeeding for children 0-23 months was 75.9%. Exclusive breastfeeding for children under 6 months of age was 62.8%. Continued breastfeeding for children aged 12-23 months was 81.6%. Minimum dietary diversity (MDD) for children aged 6-23 months was 14.8%, indicating a high risk of deterioration of acute malnutrition. Minimum meal frequency (MMF) for children aged 6-23 months was 31.7%, indicating a medium risk of deterioration of acute malnutrition. Minimum acceptable diet for children aged 6-23 months was 8.3%, <i>indicating a very high risk of deterioration of acute malnutrition</i>. 	 Immediate: Strengthen antenatal care services to provide comprehensive counseling on the importance of skilled delivery, early initiation of breastfeeding and exclusive breastfeeding during the first 6 months of life. Engage community health workers and volunteers to conduct home visits and community outreach activities to promote optimal feeding practices. Intermediate: Establish and support breastfeeding support groups or mother-to-mother support networks to provide peer counseling, practical support, and encouragement for breastfeeding mothers. Provide regular training and capacity-building sessions for healthcare providers on IYCF counseling. Implement community-based interventions to promote skilled delivery, dietary diversity, including the introduction of locally available nutrient-rich foods, fruits, vegetables, and animal-source foods in the diets of children aged 6-23 months.

Summary findings	Recommendations ¹
	Long Term:
	 Integrate IYCF counseling and support services into routine maternal and child health programs at healthcare facilities. Implement social behavior change communication strategies (SBCC) targeting caregivers to promote optimal feeding practices for under two children.

4. Introduction

4.1. Organization

REACH Initiative was formed in 2010 as a joint initiative of IMPACT Initiatives (IMPACT) (a Geneva-based think-and-do-tank), its sister organization, the INGO Agency for Technical Cooperation and Development (ACTED), and United Nations Operational Satellite Applications Programme (UNOSAT), to promote and facilitate the development of information products that enhance the humanitarian community's decision-making and planning capacity. REACH is responsible for supporting humanitarian coordination mechanisms through non-proprietary information shared across organizations.

4.2. Background Information

Arsi is in the southern part of Ethiopia, bordered by Bale Zone to the south, West Arsi Zone to the southwest, East Shewa Zone to the northwest, Afar Region to the north, and West Hararghe Zone to the east. It has an area of 19,825.22 km2 and is divided into 25 districts (woredas). As of mid-2022, the population was estimated to be $3,894,248^2$. The two largest ethnic groups in the region are the Oromo (84.15%) and the Amhara (14.3%). All other ethnic groups make up 1.55% of the population. Most of the people in Arsi speak Oromiffa as their first language (81.38%), followed by Amharic (17.76%). The remaining 0.86% speak various other primary languages. The dominant religions in the region are Islam (58.1%), Ethiopian Orthodox Christianity (40.01%), and Protestantism (1.43%)³.

The Arsi zone is divided into four livelihood zones, located in both lowland and highland areas:

• The Robe, Chole, Seru and Sude (RCS) zone, situated in the lowlands, is characterized by rolling plains and a self-sufficient economy. It experiences two rainy seasons: afrasa,

² Population Size by Sex, Area and Density by Region, Zone and Wereda: July 2022. Ethiopian Statistics Service. 2022

³ Census 2007 Tables: Oromia Region Archived November 13, 2011, at the Wayback Machine, Tables 2.1, 2.4, 2.5, 3.1, 3.2 and 3.4.

from March to May, and gana, from June to August. Both seasons are utilized for cultivating cereal crops and pulses. The gana harvest is generally larger than the afrasa harvest, although the production of pulses is higher during afrasa. Households across all wealth groups grow and sell maize, wheat, barley, sorghum, teff, beans, and peas⁴.

- The Rift Valley Maize & Haricot Bean (RVM) zone is situated in the central Rift Valley and is known for its food crop production and livestock rearing. It is a food deficit zone but has good market access. The primary food crops grown in this zone are maize, wheat, and teff, with wealthier households also growing small amounts of haricot beans for sale. Crop production in this zone is entirely rain-fed and relies on the gana rains from June to September⁵.
- The Charcher/Gololcha Coffee, Chat & Maize (CGC) zone is primarily a subsistence economy centered around coffee, chat, and maize. This zone consistently faces chronic food deficits, and all households rely on the market. Poorer households purchase about half of their food requirements, with sorghum and maize being the main cereals bought. For income, poorer households engage in local labor, sell small amounts of cash crops (such as chat), sell food crops (especially maize), and sell sheep and eggs. Wealthier households rely on income from selling sheep and cattle, as well as selling food and cash crops (coffee and chat), and butter⁶.
- Arsi-Bale Wheat, Barley, and Potato (ABW) is one of the most fertile areas in the Oromia region and has no history of food insecurity. Due to its surplus production, there has been no need for emergency food assistance or the Productive Safety-net Program (PSNP). Even poorer households in this zone can rely more on their own crop production to meet their annual food needs. The optimal annual rainfall in this zone allows for the cultivation of various crops including wheat, barley, Irish potato, beans, and peas. This livelihood zone is one of the few areas in the Oromia Region where mechanized agriculture is practiced alongside traditional ox-plow cultivation. Middle and wealthier households rent land from poorer households to maximize their crop production. The main livestock in this zone are cattle and sheep, and poorer households work on the land of wealthier households⁷.

The Meher seasonal assessment and joint prioritization process have determined that 10.4 million people will require food assistance on an annual basis⁸. Most of these individuals, around 80 percent, reside in highland areas, while the remaining 20 percent are in lowland areas. The drought in the highlands of Ethiopia, exacerbated by the El-Niño phenomenon, has had a significant impact on agricultural output, resulting in poor harvests and production losses⁹. In the

- ⁸ Oromia Region Meher 2023 Multi-Agency Assessment Report.
- ⁹ ETHIOPIA Situation Report, OCHA. February 2024.

⁴ Ethiopia Livelihood Baseline: Oromia Region. Robe, Chole, Seru and Sude (RCS) Livelihood Zone. October 2017.

⁵ Ethiopia Livelihood Baseline: Oromia Region. Rift Valley Maize & Haricot Bean (RVM) Livelihood Zone. September 2017.

⁶ Ethiopia Livelihood Baseline: Oromia Region. Charcher/Gololcha Coffee, Chat & Maize (CGC) LZ November 2017

⁷ Ethiopia Livelihood Baseline: Oromia Region. Arsi-Bale Wheat, Barley and Potato Livelihood Zone (ABW). September 2017

Arsi zone, the Meher season is typically marked by normal to above-normal rainfall that is evenly spread out. Specifically, Chole and Golocha woredas have reported instances of flooding and landslides, whereas Shanen Kolu woreda has experienced prolonged periods of drought. As of September 2023, there were 213,312 individuals benefiting from the PNSP program, and emergency food assistance has been provided to 59,062 internally displaced persons (IDPs). In addition, according to the World Bank memorandum, 17% of the zone is exposed to malaria, and none to Tsetse fly.¹⁰

4.2.1. Survey Area

The SMART+ Survey was conducted in the lowland areas of the Arsi zone, located in the Oromia region. According to a May 24, 2004, World Bank memorandum, 4% of the inhabitants of Arsi have access to electricity. This zone has a road density of 45.0 kilometres per 1000 square kilometres (compared to the national average of 30 kilometres)¹¹, the average rural household has 1.2 hectare of land (compared to the national average of 1.01 hectare of land and an average of 1.14 for the Oromia Region) and the equivalent of 1.1 heads of livestock. 16.5% of the population is in non-farm related jobs, compared to the national average of 25% and a regional average of 24%. Concerning education, 84% of all eligible children are enrolled in primary school, and 22% in secondary schools¹².

¹⁰ World Bank, Four Ethiopias: A Regional Characterization (accessed 17 May 2024).

¹¹ Ethiopia - Second Road Sector Development Program Project", p.3 (World Bank Project Appraisal Document, published 19 May 2003).

¹² Comparative national and regional figures come from the World Bank publication, Klaus Deininger et al. "Tenure Security and Land Related Investment", WP-2991 Archived 2007-03-10 at the Wayback Machine.

	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct
Rainy/Dry Seasons					be	belg		krei krei		kremt		
Livestock												
Cattle												
conceptions												
births												
milk production												
Goats/Sheep					,					,		
conceptions												
births									ĺ			
milk production												
Livestock migration - average year												
Livestock migration - bad year									ĺ			
Livestock disease									ĺ			
Livestock sales												
Crops												
Coffee												
Chat												
Wheat												
Teff												
Sorghum												
Maize												
Chick pea												
Other Income												
Agricultural labour peak												
Firewood sales												
Building material sales												
Relief distributions												
Stress & High Expenditure Periods												
High staple prices												
Festival season												
Human diseases												
Lean season												
Legend	Lar	nd prepa	aration	So	wing	We	eeding	Gre	een han	vest	Ha	rvest

Figure 1: Seasonal Calendar for Arsi Zone¹³

Survey Population

The target population for this survey is General population. The thirteen survey districts are part of the lowland zone and are spread across three livelihood zones: Robe, Chole, Seru and Sude (RCS), Rift Valley Maize & Haricot Bean (RVM), and Charcher/Gololcha Coffee, Chat & Maize (CGC).

¹³ Ethiopia Livelihood Baseline: Oromia Region

4.2.2. Humanitarian Assistance

In Arsi Zone, several ongoing programs are addressing various needs within the community. These include emergency food assistance, the Productive Safety Net Program (PNSP), and shock response relief programs by Oromia regional government. As of September 2023, the emergency food assistance program benefited a total of 59,062 beneficiaries, while the PNSP supports 213,312 beneficiaries, and the shock response relief program aids 45,868 beneficiaries.

The shock relief programs offer a range of support measures, including cash transfers for Pregnant and Lactating Women (PLWs), livestock assistance, provision of Water, Sanitation, and Hygiene (WASH) Non-Food Items (NFIs), and start-up capital for entrepreneurial endeavors.

Moreover, health facilities in the area are actively implementing Community-Based Management of Acute Malnutrition (CMAM) programs, contributing to improved health outcomes among the population.

4.2.3. Health and Safety Situation Update

In certain parts of Arsi, accessibility (humanitarian access, movement between woredas) was partially hindered by insecurity particularly in Sinbite Finco and Gure Tabino of Jeju woredas and F/jawwii of Merti Woreda. Although Arsi has not been affected by cholera or other outbreaks of disease, neighbouring zones like West Arsi and West Hararge have been affected.¹⁴

4.3. <u>Survey Type</u>

• The survey type used was a Full Smart+ survey.

4.4. Survey Timing

- The survey was carried out from March 29 to April 9, 2024, which coincided with the belg rainy season which is the short rainy season.
- The survey lasted for 18 day(s) including training days and piloting.

4.5. <u>Type of Setting</u>

This survey took place in the Rural of Arsi Zone, Ethiopia. This survey was conducted in the Arsi Administration Zone, specifically in 13 districts: Robe, Chole, Seru, Bele, Amigna, Ziway-Dugeda, Dodota, Sire, Jeju, Aseko, Merti, Gololcha, and Shanan Kolu. These districts are part of the lowland zone and are spread across three livelihood zones: Robe, Chole, Seru and Sude (RCS), Rift Valley Maize & Haricot Bean (RVM), and Charcher/Gololcha Coffee, Chat & Maize (CGC).

The RCS zone is self-sufficient due to its diverse agricultural profile and two productive seasons, sustaining a balanced economy that is not heavily dependent on external markets for inputs or selling produce. In contrast, the RVM zone, facing food shortages, relies on good market access and concentrates on a few staple crops during its crucial rainy season. Lastly, the CGC zone is

¹⁴ Ethiopia Health Cluster Bulletin (January 2024) - Ethiopia | ReliefWeb

the most at risk, experiencing chronic food deficits and heavily depending on the market for food security. This zone operates with a subsistence economy, where even wealthier households are not adequately shielded against shortages. By conducting the survey in these lowland districts within the three livelihood zones, we will be able to obtain a comprehensive and representative picture of nutrition, mortality, and food security in the Arsi Zone.

4.6. Survey Location

The survey took place in Arsi Zone, Ethiopia. A total of thirteen lowland woredas were selected, then kebeles were selected under each woreda, followed by zones under each kebeles and then the Gari under each zone where households were selected.



Figure 2: Map of woredas where the SMART+ was conducted.

4.7. Excluded Areas (if applicable)

Only the lowland woredas in the lowland were included in this survey in consultation with Oromia ENCU. This decision was made since the highland woredas, which were not included, are generally surplus-producing areas with lower malnutrition rates. Additionally, Sude was also excluded due to security constraints.

5. Survey Goal and Objectives

5.1. Survey Goal and Primary Objective

The overall objective of the SMART Survey is to assess the nutritional situation and retrospective mortality rates and the possible factors contributing to acute malnutrition in Arsi Zone. The results will be used to provide information management support to the nutrition cluster and partners to support evidence-based decision making.

5.2. Specific Survey Objectives

- To estimate the prevalence of acute malnutrition (Weight for Height and by MUAC), stunting (Height for Age) and underweight (Weight for Age) among children (boys and girls) aged 6 59 months in Arsi zone.
- To assess the nutritional status of women of reproductive age (15-49 years) by MUAC in Arsi Zone.
- To estimate the coverage of institutional delivery/skilled delivery in Arsi Zone.
- To estimate retrospective Crude Mortality Rate (CMR) and Under 5 Mortality Rate (U5MR) in Arsi zone.
- To assess food consumption gaps in Arsi zone using the following indicators: reduced coping strategy index (rCSI), household hunger scale (HHS) and household food consumption score (FCS).
- To estimate the coverage of Vitamin A supplementation for children 6-59 months in Arsi Zone.
- To estimate the coverage of measles vaccination for children 9-59 months in Arsi Zone.
- To estimate the coverage of deworming treatment for children 24-59 months in Arsi Zone.
- To assess childhood morbidity and health seeking behaviors among children aged 6-59 months two weeks prior to the survey in Arsi Zone.
- To assess selected infant and young child feeding indicators among children 0-24 months; Exclusive Breast Feeding (EBF), Ever breastfed (EvBF), Mixed milk feeding (MixMF9, Continued Breast Feeding (CBF), Minimum Dietary Diversity (MDD), Minimum Meal Frequency (MMF), and Minimum Acceptable Diet (MAD) in Arsi Zone
- To assess the WASH situation in Arsi Zone. (Main water source, distance/time to water source, water treatment status, access to latrine)
- To formulate practical interventions and recommendations to inform nutrition programming in Arsi Zone.

5.3. Survey Justification

The Arsi Zone, located in the Oromia region and consisting of 25 districts, shows a contrast in terms of nutrition and food consumption. While Seru and Shenen Kolu are categorized as priority 1, most districts are classified under priority 2 and above according to the hotspot classification approved in August 2023¹⁵. Following thorough consultations with the Emergency Nutrition Coordination Unit (ENCU) and analysis of health facilities' reports, REACH, in collaboration with the Regional Emergency Nutrition Coordination Unit (RENCU), chose 14 lowland woredas for the SMART+ survey. This decision was based on the understanding that the remaining highland woredas generally have a surplus of food production and lower rates of malnutrition. The selected woredas collectively report an annual Severe Acute Malnutrition (SAM) admission of 14,759 cases. This targeted selection of woredas is crucial, particularly due to the lack of recent surveys on nutrition, mortality, food security, health, and WASH in the Arsi Zone, despite some districts being affected by drought. The current SMART+ survey is expected to fill these information gaps, providing essential data to assist the nutrition cluster and partners in making well-informed, evidence-based decisions. By focusing on the lowland woredas, the survey aims to establish a strong baseline data, offering insights into the entire zone, thus facilitating a targeted response in areas where it is most needed.

6. Methodology

6.1. Survey Design

6.1.1. Sample Size

Based on the provided context, the following assumptions were used to calculate the sample size in terms of the number of children, which was then converted into the number of households to be surveyed. All calculations were performed using SMART+ platform. The sample size calculation takes the proxy indicator anthropometry into account. The maximum sample size obtained was the anthropometry sample size calculation, and this was considered the final sample size, with 921 households. The parameters for calculating the sample size are detailed in the tables below.

Parameters for Anthropometry	Value	Assumption and Source
Estimated prevalence of GAM (%)	11.5%	The March 2023 national food and nutrition strategy baseline survey for the Oromia region indicated a 9% prevalence of wasting, while a 2019 IHME* estimate for the Arsi Zone was slightly lower at 8.9% (CI: 6.4-12.4%). To account for possible deterioration, we have cross-referenced these sources and set a cautious estimate at 11.5%.
Desired precision	± 3.50	Based on Standard Operating Procedure (SOP) for SMART Surveys in Ethiopia (Nov 2020). Recommends a desired precision of $\pm 3.5\%$ for estimated GAM of 10-15%

Table 6-2: Sample Size Calculation of Anthropometry

¹⁵ Hotspot Woredas classification. August 2023

Parameters for Anthropometry	Value	Assumption and Source
Design effect (DEFF)	1.70	The woredas included in the survey spread across three different livelihood zones.
Children to be included	591.00	
Average household (HH) size	5.00	Recommended by Arsi zone and projected from Census 2007
% Children 6-59 months	15.0%	Oromia regional health bureau 2021 conversion factor
% Non-response rate	5.0%	Anticipated non-response rate based on the recent surveys conducted in Oromia region
Households to be included	921.00	Minimum sample size-Households to be surveyed.

Parameters for Mortality	Value	Assumption and Source
Estimated mortality rate/10,000/day	0.50	Assumed a baseline CMR of 0.5 deaths/10,000/day as there are no data on mortality
Desired precision/10,000/day	± 0.30	Based on 2020 Ethiopia SOP for SMART Surveys
Design effect	1.70	The woredas included in the survey spread across three different livelihood zones
Recall period in days	93	The default value is used. To be adjusted during training
Population to be included	4,247.00	Population
Average household (HH) size	5.00	Recommended by Arsi zone and projected from Census 2007
% Non-response rate	5.0%	Anticipated non-response rate based on the recent surveys conducted in the Oromia regions
Households to be included	894.00	Households to be included

Table 6-3: Sample Size Calculation of Mortality

6.1.2. Sampling Method

This survey applied a two-stage cluster sampling using the SMART methodology with the clusters (primary sampling unit) being selected using the probability proportional to population size (PPS). Stage one sampling involved the sampling of the clusters to be included in the survey while the second stage sampling involved the selection of the households from the sampled cluster. For this assessment, a cluster is defined as the smallest unit in the woreda, which in this case it is a Gari.

6.1.3. Second Stage Sampling Method (if applicable)

At second stage, households were selected using the simple random sampling within the cluster. In each area, the households list was updated during data collection in collaboration with kebele leaders. The survey team provided a number to each house. The team selected households to be interviewed using random generator number mobile app (RGN) according to the target number of households per cluster, which was 11 HHs, regardless of the number of children interviewed. First zones were selected using PPS and then Gari selected using simple random if the HHs in each Gari are almost equal or PPS if the HHs in each Gari varied. Then, the teams randomly selected a number within a range of one to the total number of households, using a random number generator (RGN) in each Gari. This number determined the specific area within the segment that would be surveyed. The survey aimed to include 921 households and 521 children under the age of five.

6.1.4. Sampling Procedure – Cluster Sampling

Population data was initially collected at the district level by REACH field officers one week before the training, and then triangulated with Data for good at Meta population density information¹⁶. This data collection occurred at both the kebele and zonal levels. During the training phase, all kebeles and zones were verified for security and accessibility with the assistance of local authorities and enumerators from the respective localities. Subsequently, a final clean sampling frame was obtained.

Using the SMART+ platform, a total of 84 clusters were randomly selected based on the Probability to Population Size (PPS) technique. This approach ensured that every household in the 13 lowland districts of the Arsi zone had an equal chance of being chosen, irrespective of zone size. Three clusters were not visited due to security constraints, and they were not replaced as the surveyed clusters exceeded 90%.

In instances of empty households or were abandoned, replacements were not made, as nonresponse was factored into the sample size calculations. However, households with absent children were revisited at the end of the day, and if still absent during the second visit, their absence was recorded in the cluster control form.

Initially, zones were selected using the PPS method, and then Garis were chosen using simple random sampling if the number of households in each Gari was nearly equal, or using PPS if there was variability in the number of households per Gari. Subsequently, teams randomly selected a number within the range of one to the total number of households in each Gari using a random number generator (RGN).

¹⁶ Ethiopia: High Resolution Population Density Maps + Demographic Estimates - Humanitarian Data Exchange (humdata.org)

6.1.5. Training, Team Composition, and Supervision

The SMART+ survey was conducted by seven survey teams, each comprised of a team leader, an interviewer, a measurer, and an assistant measurer. Most of the enumerators had a background in health with a minimum qualification of a bachelor's degree. The team leader was responsible for overseeing day-to-day field supervision, supporting tablet filling, household selection, and assisting with anthropometric measurements. Daily monitoring was conducted to verify the accuracy and consistency of data through regular field visits, cross-checking, and plausibility testing via the SMART+ platform. Additionally, two survey managers and one local supervisor provided supervision and oversight of the field team, ensuring the overall management of the survey.

Before commencing field data collection, the survey team underwent five days of SMART methodology training, followed by one day of piloting. They were trained by two SMART-certified managers. The SMART training tools and presentations were customized to align with the survey's objectives and were utilized throughout the training sessions. Topics covered during the training included survey objectives, household selection strategies, demonstration and standardization of anthropometric measurements, data collection techniques, interview skills through group work, and questionnaire field testing. A total of 21 households were piloted during the field-testing phase, and feedback was provided to ensure that proper data collection procedures were followed before initiating the actual data collection process.

6.1.6. Data Analysis

Data collection was conducted using smartphones equipped with the SMART Collect application. Daily feedback on the quality of the data was provided to the survey teams by the Survey Manager, who also offered support on enhancing the quality of the measures based on plausibility checks. The SMART+ platform was utilized to automatically analyze anthropometric data and additional indicators. During the analysis process, any data flagged using SMART flag criteria was removed to ensure accuracy and reliability. Furthermore, quality checks were performed for the food security indicators, and daily feedback was provided accordingly.

7. Indicators: Definition, Calculations, and Interpretation

7.1. Overview of Indicators

The survey conducted utilized a range of standardized integrated SMART indicators to comprehensively assess various aspects of health, nutrition, WASH and food security within the surveyed population of Arsi Zone, Ethiopia. These indicators covered household, child, and women's health, providing valuable insights into the overall status of the community.

At the household level, malnutrition and mortality rates were examined to understand the general health outcomes across the total population. Additionally, food security indicators such as the Food Consumption Score (FCS), Reduced Coping Strategy Index (rCSI), and Household Hunger Scale (HHS) were assessed, shedding light on the adequacy of food access and diversity within households. Moreover, water, sanitation, and hygiene (WASH) indicators were evaluated to gauge access to safe drinking water and improved sanitation facilities, crucial factors for maintaining health and nutrition.

For children aged 6-59 months, anthropometric measurements were taken to assess nutritional status. Health interventions such as Vitamin A supplementation coverage, deworming coverage, and measles vaccination coverage were also measured to evaluate the effectiveness of preventive health measures. Additionally, episodes of Acute Respiratory Infection (ARI), diarrhoea, and fever were recorded, along with care-seeking behaviors and utilization of appropriate treatments during these episodes. Furthermore, Infant and Young Child Feeding (IYCF) indicators provided insights into feeding practices and nutritional adequacy among infants and young children aged 0-23 months.

Women's health indicators focused on anthropometry, particularly Mid-Upper Arm Circumference (MUAC) measurements, to assess the nutritional status of women aged 15-49 years. Additionally, skilled attendant delivery rates were examined to understand access to safe childbirth practices and maternal health services.

Indicator	Target Population
Household Indicators	
Mortality	
Mortality	Total population
Food Security	
Food Consumption Score (FCS)	Total population
Reduced Coping Strategy Index (rCSI)	Total population

Table 7-4: Standardized Integrated SMART Indicators

Indicator	Target Population
Household Hunger Scale (HHS)	Total population
WASH	
Access to safe/improved water for drinking and cooking	Total population
Access to improved sanitation facilities	Total population
Child Indicators	
Anthropometry	6-59 months
Vitamin A supplementation coverage	6-59 months
Deworming coverage	12-59 months
Measles vaccination coverage	9-59 months
Episode of ARI, and care-seeking for children with ARI	6-59 months
Episode of diarrhoea, care-seeking for children with diarrhoea, and use of ORS and Zinc during an episode of diarrhoea	6-59 months
Episode of fever and care-seeking for children with fever	6-59 months
IYCF (EvBF, EIBF, EBF2D, EBF, MixMF, CBF, ISSSF, MDD, MMF, MMFF, MAD, EFF, SwB, UFC, ZVF, BoF)	0-24 months
Women Indicators	
Anthropometry (MUAC)	15-49 years
Health (skilled attendant delivery)	15-49 years

7.2. Anthropometric Indicators

The survey conducted comprehensive assessments of the nutritional status of children aged 6-59 months using various anthropometric indicators. These included Mid-Upper Arm Circumference (MUAC), Weight-for-Height Z-score (WHZ), Height-for-Age Z-score (HAZ), and Weight-for-Age Z-score (WAZ). MUAC measurements were employed to determine acute malnutrition status, with specific thresholds established for different categories. Children with a MUAC measurement greater than 125 mm were classified as having no malnutrition, while those with a measurement of 125 mm or less fell under the category of Global Acute Malnutrition (GAM). Within the GAM, further differentiation was made between Moderate Acute Malnutrition (MAM), defined as MUAC between 115 mm and 125 mm, and Severe Acute Malnutrition (SAM), indicated by MUAC below 115 mm.

In addition to MUAC, WHZ was utilized to assess acute malnutrition and overweight status. The criteria for WHZ categories were delineated, with thresholds for normal, undernutrition, and overweight conditions. Similarly, HAZ measurements were employed to evaluate stunting, with specific cut-off points set to distinguish between normal, moderate stunting, and severe stunting.

Finally, WAZ was utilised to assess underweight status, with criteria established to differentiate between varying degrees of undernutrition.

These anthropometric indicators provided a comprehensive framework for assessing the nutritional status of children in the surveyed population. By utilising multiple indicators, the survey aimed to capture a holistic picture of nutritional status, encompassing acute malnutrition, chronic malnutrition, and underweight. The use of standardised cut-off points for each indicator enabled consistent interpretation of the data and facilitated comparisons across different populations and contexts.

Nutritional Status	Definition
No malnutrition	125 mm > MUAC
Global Acute Malnutrition (GAM)	$125 \text{ mm} \le \text{MUAC}$
Moderate Acute Malnutrition (MAM)	$115 \text{ mm} \le \text{MUAC} \le 125 \text{ mm}$
Severe Acute Malnutrition (SAM)	MUAC < 115 mm

 Table 7-5: MUAC cut off points for children 6-59 months.

Table 7-6: Cut off points for the WHZ index expressed in Z-score, WHO Standards

Nutritional Status	Definition
No undernutrition	WHZ \geq -2 and no oedema
Global Acute Malnutrition (GAM)	WHZ < -2 or bilateral oedema (or both)
Moderate Acute Malnutrition (MAM)	$(-3 \le WHZ \le -2)$ and absence of bilateral oedema
Severe Acute Malnutrition (SAM)	WHZ < -3 or bilateral oedema (or both)
Overweight	WHZ > 2 and no oedema
Moderate overweight	$(2 < WHZ \le 3)$ and no oedema
Severe overweight	WHZ \geq 3 and no oedema

Table 7-7: Cut off points for the HAZ index expressed in Z-score, WHO Standards

Nutritional Status	Definition
Not stunted	$HAZ \ge -2$
Stunted	HAZ < -2
Moderate stunting	$-3 \le HAZ < -2$
Severe stunting	HAZ < -3

Table 7-8:	Cut off points	or WAZ Index	expressed in Z-score	s, WHO Standards
	r r			~, ~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~

Nutritional Status	Definition
Not underweight	WHZ \geq -2
Global underweight	WAZ < -2
Moderate underweight	$-3 \le WAZ < -2$
Severe underweight	WAZ < -3

7.3. Mortality

All visited households, including those without children aged 6–59 months, were surveyed for retrospective mortality statistics. A 90-day recall period was employed. Using individual mortality questionnaires, the following data were collected:

- Total number of persons residing in the household
- Number of children under the age of five
- Number of people who left the household during the recall period (total and children under the age of five)
- Number of individuals who joined the household during the recall period (total and children under five years)
- Number of births in the household during the recall period
- Number of deaths and reason for death.

7.4. <u>Other Indicators (Immunization, Food Security Infant and Young Child</u> <u>Feeding)</u>

In addition to anthropometric indicators, the survey incorporated several other key indicators to assess various aspects of household food security and child nutrition. These additional indicators provided valuable insights into dietary diversity, coping strategies during times of food scarcity, and household hunger levels.

The Minimum Acceptable Diet (MAD) indicator was utilized to evaluate the proportion of children aged 6-23 months who received a minimum acceptable diet according to WHO guidelines. This indicator considers the diversity of food groups consumed by children, as well as the frequency of feeding, to assess whether dietary needs are being met adequately.

The Reduced Coping Strategy Index (rCSI) was employed to measure the extent to which households' resort to coping strategies during periods of food insecurity or economic hardship. This index captures the variety and severity of coping mechanisms adopted by households to mitigate the impact of food shortages, such as reducing meal portions or borrowing food or money.

The Household Hunger Scale (HHS) provided a quantitative assessment of household hunger levels, capturing the frequency and severity of experiences related to food insecurity within the household. This scale evaluates the occurrence of specific hunger-related events, such as going to bed hungry or skipping meals, to gauge the severity of household food insecurity.

The Food Consumption Score (FCS) was utilized to assess the adequacy of household food consumption based on a standardized scoring system. This indicator considers the diversity of food items consumed by households over a defined period, as well as the frequency of consumption, to evaluate overall food security status.

1 – None 2 – Stressed 3 – Crisis 4 – Emergency 5 – Catastrophe 1 to 2 0 3 4 5 to 6 Reference, stable Reference, but unstable > Reference and increasing Significantly > reference Far > reference 5 to 20 0 to 4 ≥ 21 HDDS 3 to 4 5 to 12 0 to 2 35 to 112† 13 to 34.5‡ 0 to 12.5

Table 7-9: Recommended indicators range for food security

* The standard FCS-based food consumption categories are: < 21 = "Poor," 21–35 = "Borderline," and > 35 = "Acceptable." In areas where oil and sugar are regularly consumed, the thresholds are adjusted as follows: < 28 = "Poor," 28–42 = "Borderline," and > 42 = "Acceptable." † 42 to 112 for populations consuming oil and sugar daily. ‡ 13 to 41.5 for populations consuming oil and sugar daily.

8. Questionnaire

The SMART+ standard questionnaire encompassed a comprehensive set of indicators covering various domains as mentioned in the previous section.

To ensure the effectiveness and reliability of data collection, the survey team conducted a pretest of the questionnaire in Afaan Oromo, as it is the main local language spoken in the surveyed communities. This pre-testing phase was crucial in evaluating the clarity and understandability of the questions from the perspective of the respondents. By administering the questionnaire in the local language, the team aimed to facilitate clear communication and accurate interpretation of the questions, thereby enhancing the quality and reliability of the data collected.

The pre-testing process allowed the survey team to identify any potential ambiguities or challenges in question comprehension, enabling them to refine and adjust the questionnaire accordingly. This iterative approach to questionnaire development ensured that the final instrument was culturally appropriate, linguistically accessible, and effectively captured the information needed to achieve the survey objectives.

9. Limitations

Most respondents (67%) did not have official documentation for age verification. We relied on event calendars for age estimation, which was hindered by poor maternal recall. Consequently, this method impacted the accuracy of age estimation and, consequently, the assessment of stunting prevalence. Thus, stunting, should be estimated at 1 standard deviation which is 38% and interpreted with caution.

10. Survey Findings

10.1. Survey Sample

For anthropometry data, the survey sample included 80 out of the planned 84 clusters, achieving a coverage of 95%. In terms of households, 555 out of the planned 921 were surveyed, representing 60% of the intended sample for the anthropometry data. In addition, 783 children were surveyed out of the planned 591, exceeding the target by 133%.

Regarding demographic characteristics, the survey covered 869 households, with an average household size of 5.62 individuals. Approximately 68.4% of surveyed households included children under the age of five, with an average of 18.3% of the total population falling within this age group. The birth rate was estimated at 0.99, while the in-migration and out-migration rates were 2.31 and 4.45, respectively. The population distribution by gender indicated that females constituted 48.8% of the population, slightly lower than males at 51.2%.

Non-response rates were minimal, with household and child non-response rates recorded at 0.9% and 0.5%, respectively. The population age and sex pyramid depicted a relatively balanced distribution across age groups and genders, with no significant deviations. Among children aged 6 to 59 months, the distribution showed a slight predominance of boys over girls, particularly in the age groups of 6 to 17 months and 42 to 53 months, with ratios slightly above 1. Overall, the survey sample achieved comprehensive coverage across demographic variables, ensuring robust data collection for analysis and interpretation.

Indicator	Value
Number of clusters planned	84
Number of clusters surveyed	80
% clusters of planned	95%
Number of households planned	921.1
Number of households surveyed	555
% households of planned	60%
Number of children planned	590.7
Number of children surveyed	783
% children of planned	133%

Table 10-9: Proportion of Household and Child Sample Achieved (Anthropometry Data)

 Table 10-10: Demographic Summary (Mortality Data)

Indicator	Value	95% CI
Number of HHs surveyed	869	
Number of clusters surveyed	81	

Indicator	Value	95% CI
Number of HHs surveyed with children under five	594	
% of HHs surveyed with children under five	68.4%	
Average household size	5.62	(5.38, 5.85)
Mid Interval Population Size	4,882.0	(4,648.4, 5,115.6)
Percentage of children under five	18.3%	(16.9%, 19.8%)
Birth Rate	0.99	(0.72, 1.37)
In-migration Rate (Joined)	2.31	(1.72, 3.11)
Out-migration Rate (Left)	4.45	(3.60, 5.49)
Female % of the population	48.8%	(47.5%, 50.0%)
Male % of the population	51.2%	(50.0%, 52.5%)

Table 10-11: Non-Response Rates (NRR)

Level	Consented or Measured	Refused	Absent	Sample Non- Response Rate
Household	872	0	8	0.9% ^a
Children under 5	779		4	0.5% ^b

^aThe household non-response rate (NRR) is defined as the number of households not interviewed out of all households selected for interview. The formula for HH NRR is (total HH refused + total HH absent) / (total HH consented + total HH refused + total HH absent).

^bThe child non-response rate (NRR) is defined as the number of unmeasured children out of all eligible children. The formula for the child NRR is (total eligible children absent) / (total eligible children measured + total eligible children absent).



Figure 10-1: Population Age and Sex Pyramid

Table 10-12: Distribution of age and sex among children 6-59 months (SMART exclusions)

Age (Months)	Boys		Girls		Total		Ratio
	n	%	n	%	n	%	Boy:Girl
6 to 17	96.0	24.4%	77.0	19.8%	173.0	22.1%	1.25
18 to 29	90.0	22.8%	84.0	21.6%	174.0	22.2%	1.07
30 to 41	80.0	20.3%	109.0	28.0%	189.0	24.1%	0.73
42 to 53	95.0	24.1%	90.0	23.1%	185.0	23.6%	1.06
54 to 59	33.0	8.4%	29.0	7.5%	62.0	7.9%	1.14
Total	394.0	100.0%	389.0	100.0%	783.0	100.0%	1.01

10.2. Data Quality

The data quality resulting from the survey indicates generally acceptable standards. In terms of anthropometric indicators among children aged 6-59 months, the standard deviation (SD) was within reasonable ranges except for the Height-for-age which showed slightly higher range since close to 70% of children had no proof of birth dates or birth certificates.

• For weight-for-height, the design effect for this indicator was 1.88, indicating some clustering effect but still within an acceptable range. However, there were six instances where Z-scores were not available, and five cases where Z-scores were out of range, indicating some data completeness and accuracy issues.

- Similarly, for weight-for-age, the design effect for this indicator was 1.84, again suggesting some clustering effect. Four cases had missing Z-scores, and seven cases were out of range.
- Height-for-age showed a design effect for this indicator was 1.59, suggesting a moderate clustering effect. However, there were five instances of missing Z-scores, and thirty-three cases where Z-scores were out of range, indicating potential data completeness and accuracy issues.

Table 10-13: Mean Z-scores, Design Effects, Missing and Out-of-Range Data of	f
Anthropometric Indicators among Children 6-59 months (SMART exclusions)	

Indicator	N	Mean z-scores ± SD	Design effect (z-score < -2)	Z-scores not available*	Z-scores out of range
Weight-for-Height	772	-0.39 ±0.98	1.88	6	5
Weight-for-Age	772	-1.21 ±1.00	1.84	4	7
Height-for-Age	745	-1.69 ±1.21	1.59	5	33

10.3. Prevalence of Acute Malnutrition

The prevalence of acute malnutrition based on WHZ and/or oedema indicated that GAM was 5.4%, with 5.2% classified as Moderate Acute Malnutrition (MAM) and 0.3% as Severe Acute Malnutrition (SAM). When disaggregated by sex, similar prevalence rates were observed among boys and girls. WHZ tends to be more sensitive to identify boys with SAM than girls. MUAC and WHZ showed gender bias, with MUAC identifying more girls, and WHZ identifying more boys with acute malnutrition, the gender effect was strongest for MUAC¹⁷. Notably, no children were identified with kwashiorkor or marasmic kwashiorkor.

Furthermore, the prevalence of acute malnutrition was also assessed based on MUAC and/or oedema. The findings revealed GAM of 5.1%, with 3.9% classified as moderate acute malnutrition and 1.3% as severe acute malnutrition. When examining combined GAM and SAM, the prevalence was reported to be 8.9% and 1.5%, respectively.

Among the age groups surveyed, children aged 42 to 59 months had a higher prevalence of wasting, with 8.2% of children aged 42 to 53 months and 8.1% of children 54 to 59 months classified as wasted (WHZ < -2). These findings suggest that older children may be more vulnerable to acute malnutrition, warranting targeted interventions to address this issue.

¹⁷ Wieringa, F.T., Gauthier, L., Greffeuille, V., Som, S.V., Dijkhuizen, M.A., Laillou, A., Chamnan, C., Berger, J. and Poirot, E., 2018. Identification of acute malnutrition in children in Cambodia requires both mid upper arm circumference and weight-for-height to offset gender bias of each indicator. Nutrients, 10(6), p.786.

The mean Z-score was -0.39 \pm 0.98. That indicates a distribution slightly below the global WHO reference curve, suggesting a marginally higher prevalence of acute malnutrition within the surveyed population.

Of the 5.4% of children 6-59 months found to be in GAM, slightly more cases were identified based on WHZ (42%) compared to MUAC (39.1%). Regarding SAM, most cases were identified based on MUAC at 83.3%, followed by cases identified through WHZ at 16.7%. This suggests a slightly higher prevalence of acute malnutrition based on WHZ for GAM, while MUAC appears to be a more sensitive indicator for identifying SAM.

Table 10-14: Prevalence of Acute Malnutrition by WHZ (and/or oedema) by Severity a	and Sex
among Children 6-59 months (SMART exclusions), WHO 2006 Reference	

Indicator	All	Boys	Girls
	(N=772)	(N=389)	(N=383)
No undernutrition	(730) 94.6%	(367) 94.3%	(363) 94.8%
	(91.9%, 96.4%)	(90.6%, 96.7%)	(92.0%, 96.6%)
Prevalence of global acute malnutrition (<-2 z-	(42) 5.4%	(22) 5.7%	(20) 5.2%
score and/or oedema)	(3.6%, 8.1%)	(3.3%, 9.4%)	(3.4%, 8.0%)
Prevalence of moderate acute malnutrition (<-2 to \geq -3 z-score)	(40) 5.2%	(20) 5.1%	(20) 5.2%
	(3.4%, 7.8%)	(2.9%, 9.0%)	(3.4%, 8.0%)
Prevalence of severe acute malnutrition (<-3 z-	(2) 0.3%	(2) 0.5%	(0) 0.0%
score and/or oedema)	(0.1%, 1.0%)	(0.1%, 2.1%)	(0%, 0%)

Table 10-15: Prevalence of Acute Malnutrition per WHZ and/or Oedema by Severity and Ag	ge
Group (SMART exclusions)	

Age (Months)	Ν	No wasting $(WHZ \ge -2)$		Wasting (WHZ < -2)		Moderate wasting (-3 ≤ WHZ < -2)		Severe wasting (WHZ < -3)		Oedema	
		n	%	n	%	n	%	n	%	n	%
6 to 17	169	159	94.1%	10	5.9%	8	4.7%	2	1.2%	0	0.0%
18 to 29	171	164	95.9%	7	4.1%	7	4.1%	0	0.0%	0	0.0%
30 to 41	186	181	97.3%	5	2.7%	5	2.7%	0	0.0%	0	0.0%
42 to 53	184	169	91.8%	15	8.2%	15	8.2%	0	0.0%	0	0.0%
54 to 59	62	57	91.9%	5	8.1%	5	8.1%	0	0.0%	0	0.0%
All	772	730	94.6%	42	5.4%	40	5.2%	2	0.3%	0	0.0%


Figure 10-2: Distribution of WHZ Sample Compared to the WHO 2006 WHZ Reference Curve

Figure 10-3: Mean WHZ by Age Group



	WHZ < -3	WHZ ≥ -3
Presence of Oedema*	Marasmic kwashiorkor 0 (0.0%)	Kwashiorkor 0 (0.0%)
Absence of Oedema	Marasmic 2 (0.3%)	Not severely malnourished 770 (99.7%)

Table 10-16: Distribution of Severe Acute Malnutrition per Oedema among Children 6-59 months (SMART exclusions)

 Table 10-17: Prevalence of acute malnutrition based on MUAC cut off's (and/or oedema) and by sex.

Indicator	All	Boys	Girls
	(N=779)	(N=393)	(N=386)
No malnutrition	(739) 94.9%	(379) 96.4%	(360) 93.3%
	(92.4%, 96.6%)	(93.5%, 98.1%)	(89.3%, 95.8%)
Prevalence of global acute malnutrition (< 125 mm and/or oedema)	(40) 5.1%	(14) 3.6%	(26) 6.7%
	(3.4%, 7.6%)	(1.9%, 6.5%)	(4.2%, 10.7%)
Prevalence of moderate acute malnutrition (< 125 and \geq 115 mm, no oedema)	(30) 3.9%	(13) 3.3%	(17) 4.4%
	(2.5%, 5.9%)	(1.8%, 6.1%)	(2.6%, 7.5%)
Prevalence of severe acute malnutrition (< 115 mm and/or oedema)	(10) 1.3%	(1) 0.3%	(9) 2.3%
	(0.7%, 2.3%)	(0.0%, 1.8%)	(1.2%, 4.3%)

Table 10-18: Prevalence of Acute Malnutrition per MUAC and/or Oedema by Severity and Age Group

Age (Months)	NT	No malnutrition		GAM		MAM		SAM		Oedema	
	N	n	%	n	%	n	%	n	%	n	%
6 to 17	171	146	85.4%	25	14.6%	17	9.9%	8	4.7%	0	0.0%
18 to 29	173	166	96.0%	7	4.0%	7	4.0%	0	0.0%	0	0.0%
30 to 41	188	184	97.9%	4	2.1%	2	1.1%	2	1.1%	0	0.0%
42 to 53	185	181	97.8%	4	2.2%	4	2.2%	0	0.0%	0	0.0%
54 to 59	62	62	100.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
All	779	739	94.9%	40	5.1%	30	3.9%	10	1.3%	0	0.0%

 Table 10-19: Prevalence of combined GAM and SAM based on WHZ and MUAC cut off's (and/or oedema) and by sex.

Indicator	All	Boys	Girls
	(N=779)	(N=393)	(N=386)
Prevalence of combined GAM (WHZ <-2 and/or MUAC < 125 mm and/or oedema)	(69) 8.9%	(30) 7.6%	(39) 10.1%
	(6.4%, 12.2%)	(4.8%, 12.0%)	(7.0%, 14.3%)
Prevalence of combined SAM (WHZ <-2 and/or MUAC < 125 mm and/or oedema)	(12) 1.5%	(3) 0.8%	(9) 2.3%
	(0.8%, 2.8%)	(0.3%, 2.3%)	(1.2%, 4.3%)

*With SMART or WHO flags a missing MUAC/WHZ or not plausible WHZ value is considered as normal when the other value is available

	Global A	Acute Malnutrition (GAM)	Severe Acute Malnutrition (SAM)			
	n	%	n	%		
Oedema	0	0.0% (0%, 0%)	0	0.0% (0%, 0%)		
Both	13	1.7% (0.9%, 3.1%)	0	0.0% (0%, 0%)		
WHZ	29	3.7% (2.3%, 5.9%)	2	0.3% (0.1%, 1.0%)		
MUAC	27	3.5% (2.3%, 5.2%)	10	1.3% (0.7%, 2.3%)		
Total	69	8.9% (6.4%, 12.2%)	12	1.5% (0.8%, 2.8%)		

Table 10-20: Detailed number for combined GAM and SAM

Figure 10-4: Pie Chart of Proportion of Children with GAM by Indicator







10.4. Prevalence of Chronic Malnutrition

The prevalence of chronic malnutrition, as indicated by height-for-age z-score (HAZ) measurements, was notable among children aged 6 to 59 months. Overall, 40.7% of the surveyed children were found to be stunted, with 25.0% classified as moderately stunted and 15.7% as severely stunted. The above estimates should be interpreted with caution, as the age estimation was not very accurate due to the lack of birth certificates for most of the children. When analyzed by sex, a slightly higher prevalence of chronic malnutrition was observed among boys, with 44.2% classified as stunted compared to 37.0% among girls. Additionally, among children aged 18 to 29 months, the prevalence of stunting was highest at 47.2%.

The mean height-for-age z-score (HAZ) of -1.69 ± 1.21 suggests a substantial proportion of children exhibiting stunting in the surveyed population. The distribution of the HAZ sample compared to the WHO 2006 reference curve indicates that children in the surveyed population were shorter than the global reference population, indicating a prevalent issue of chronic malnutrition manifested as stunting.

Table 10-21: Prevalence of Chronic Malnutrition by HAZ by Severity and Sex among	
Children 6-59 months (SMART exclusions)	
	_

Indicator	All	Boys	Girls
	(N=745)	(N=380)	(N=365)
Not stunted	(442) 59.3%	(212) 55.8%	(230) 63.0%
	(54.7%, 63.8%)	(50.0%, 61.4%)	(56.7%, 68.9%)
Prevalence of chronic malnutrition (HAZ < -2 SD)	(303) 40.7%	(168) 44.2%	(135) 37.0%
	(36.2%, 45.3%)	(38.6%, 50.0%)	(31.1%, 43.3%)
Prevalence of moderate chronic malnutrition $(HAZ \ge -3 \text{ to } -2 \text{ SD})$	(186) 25.0%	(98) 25.8%	(88) 24.1%
	(21.4%, 28.9%)	(21.0%, 31.2%)	(19.5%, 29.5%)
Prevalence of severe chronic malnutrition (HAZ < -3 SD)	(117) 15.7%	(70) 18.4%	(47) 12.9%
	(13.0%, 18.8%)	(14.8%, 22.6%)	(9.5%, 17.3%)

Age (Months)	N	No s (HA	tunting $Z \ge -2$)	Stı (HA	unting (Z < -2)	Modera (HAZ)	ate stunting ≥ -3 to <-2)	Sever (HA	e stunting AZ < -3)
		n	%	n	%	n	%	n	%
6 to 17	162	108	66.7%	54	33.3%	33	20.4%	21	13.0%
18 to 29	163	86	52.8%	77	47.2%	46	28.2%	31	19.0%
30 to 41	182	110	60.4%	72	39.6%	43	23.6%	29	15.9%
42 to 53	177	105	59.3%	72	40.7%	41	23.2%	31	17.5%
54 to 59	61	33	54.1%	28	45.9%	23	37.7%	5	8.2%
All	745	442	59.3%	303	40.7%	186	25.0%	117	15.7%

 Table 10-22: Prevalence of Chronic Malnutrition per HAZ by Severity and Age Group (SMART exclusions)

Figure 10-6: Distribution of HAZ Sample Compared to the WHO 2006 WHZ Reference Curve



Height-for-Age z-scores

Figure 10-7: Mean HAZ by Age Group



10.5. Prevalence of Underweight

The prevalence of underweight among children aged 6 to 59 months was assessed using the weight-for-age z-score (WAZ). The survey results revealed that 21.6% of the children were underweight, with 17.0% classified as moderately underweight and 4.7% as severely underweight.

When disaggregated by sex, the prevalence of underweight among boys and girls was comparable, with 22.0% of boys and 21.3% of girls classified as underweight. Similar prevalences of moderate and severe underweight were observed across both sexes.

Analysis by age group indicated variations in the prevalence of underweight. The youngest age group (6 to 17 months) had the lowest prevalence of underweight at 17.8%, while the prevalence increased in older age groups, reaching 30.6% among children aged 54 to 59 months.

The mean weight-for-age z-score (WAZ) of -1.21 ± 1.00 indicates that, on average, children in the surveyed population exhibited a lower weight-for-age compared to the global reference population. This suggests a prevalent issue of undernutrition among the surveyed children.

Table 10-23: Prevalence of Underweight by WAZ by Severity and Sex among Children 6-59
months (SMART exclusions), WHO 2006 Reference

Indicator	All	Boys	Girls		
	(N=772)	(N=391)	(N=381)		
Not underweight	(605) 78.4%	(305) 78.0%	(300) 78.7%		
	(74.1%, 82.1%)	(72.4%, 82.7%)	(73.0%, 83.5%)		
Prevalence of underweight (WAZ < -2 SD)	(167) 21.6%	(86) 22.0%	(81) 21.3%		
	(17.9%, 25.9%)	(17.3%, 27.6%)	(16.5%, 27.0%)		

Indicator	All	Boys	Girls
	(N=772)	(N=391)	(N=381)
Prevalence of moderate underweight (WAZ \geq -3 to -2 SD)	(131) 17.0%	(69) 17.6%	(62) 16.3%
	(14.0%, 20.4%)	(13.8%, 22.3%)	(12.5%, 20.9%)
Prevalence of severe underweight (WAZ < -3 SD)	(36) 4.7%	(17) 4.3%	(19) 5.0%
	(3.2%, 6.8%)	(2.7%, 6.9%)	(2.8%, 8.7%)

 Table 10-24: Prevalence of Underweight per WAZ by Severity and Age Group (SMART exclusions)

Age (Months)	N	Not un	nderweight	Unde (WA	erweight AZ < -2)	Moderate (-3 ≤)	e Underweight WAZ < -2)	Severe (W	Underweight AZ < -3)
		n	%	n	%	n	%	n	%
6 to 17	169	139	82.2%	30	17.8%	22	13.0%	8	4.7%
18 to 29	171	138	80.7%	33	19.3%	29	17.0%	4	2.3%
30 to 41	185	151	81.6%	34	18.4%	26	14.1%	8	4.3%
42 to 53	185	134	72.4%	51	27.6%	38	20.5%	13	7.0%
54 to 59	62	43	69.4%	19	30.6%	16	25.8%	3	4.8%
All	772	605	78.4%	167	21.6%	131	17.0%	36	4.7%

Figure 10-8: Distribution of WAZ Sample Compared to the WHO 2006 WHZ Reference Curve



Figure 10-9: Mean WAZ by Age Group



10.6. Prevalence of Overweight

The prevalence of overweight among the surveyed children, based on weight-for-height zscore (WHZ), was found to be relatively low. Specifically, the survey results indicated that 0.8% of the children were classified as overweight, all of them falling under the category of moderate overweight. No cases of severe overweight were identified in the surveyed population.

When broken down by sex, slightly more girls (1.0%) were classified as overweight compared to boys (0.5%).

Furthermore, the prevalence of overweight remained consistently low across different age groups, with no notable variations observed. However, a slightly higher prevalence was observed among children aged 42 to 53 months, with 1.6% classified as overweight.

 Table 10-25: Prevalence of overweight based on weight for height cut off's and by sex (no oedema) (SMART exclusions)

Indicator	All	Boys	Girls
	(N=772)	(N=389)	(N=383)
Prevalence of overweight (WHZ > 2 SD)	(6) 0.8%	(2) 0.5%	(4) 1.0%
	(0.3%, 1.9%)	(0.1%, 2.1%)	(0.4%, 2.7%)
Prevalence of moderate overweight (WHZ from 2 to 3 SD)	(6) 0.8%	(2) 0.5%	(4) 1.0%
	(0.3%, 1.9%)	(0.1%, 2.1%)	(0.4%, 2.7%)
Prevalence of severe overweight (WHZ > 3 SD)	(0) 0.0%	(0) 0.0%	(0) 0.0%
	(0%, 0%)	(0%, 0%)	(0%, 0%)

Age (Months)	N	Ov (W	erweight THZ > 2)	Moderate Overweight (2 < WHZ ≤ 3)		Moderate Overweight (2 < WHZ ≤ 3)		Sever (V	e Overweight WHZ > 3)
-		n	%	n	%	n	%		
6 to 17	169	2	1.2%	2	1.2%	0	0.0%		
18 to 29	171	1	0.6%	1	0.6%	0	0.0%		
30 to 41	186	0	0.0%	0	0.0%	0	0.0%		
42 to 53	184	3	1.6%	3	1.6%	0	0.0%		
54 to 59	62	0	0.0%	0	0.0%	0	0.0%		
All	772	6	0.8%	6	0.8%	0	0.0%		

 Table 10-26: Prevalence of overweight by age, based on weight for height (no oedema) (SMART exclusions)

10.7. Mortality Results

The mortality results from the survey indicate a relatively low overall mortality rate, with a crude mortality rate (CMR) of 0.26 deaths per 10,000 people per day. When disaggregated by sex, males had a slightly higher mortality rate of 0.30 compared to females at 0.23.

By age group, the mortality rate was highest among adults aged 18 to 49 years, with a CMR of 0.54 deaths per 10,000 people per day. Among children under five, the under-five mortality rate (U5MR) was notably lower, with a rate of 0.13 deaths per 10,000 per day. Both the CMR and the U5MR were below the WHO emergency thresholds of 1/10,000/day and 2/10,000/day respectively.

The reported mortality rates generally exhibited low variability across different age groups and between sexes, with most age groups having mortality rates close to zero. However, there were slight variations, particularly in the older age groups, where individuals aged 65 to 120 years had a higher mortality rate of 1.73 deaths per 10,000 people per day. **Overall, the mortality rates reported from the survey indicate a relatively low mortality burden within the surveyed population.**

Population	Mortality Rate (/10,000/Day)	Design Effect
Overall	0.26 (0.15, 0.47)	1.04
By Sex		
Male	0.30 (0.15, 0.61)	1.00
Female	0.23 (0.10, 0.53)	1.00

Table 10-27: Mortality Rate by Age and Sex with Reported Design Effect

Population	Mortality Rate (/10,000/Day)	Design Effect
By Age Group		
0 to 4	0.13 (0.02, 0.73)	1.01
5 to 11	0.00 (0.00, 5.07)	1.00
12 to 17	0.00 (0.00, 5.07)	1.00
18 to 49	0.54 (0.27, 1.08)	1.11
50 to 64	0.00 (0.00, 5.33)	1.00
65 to 120	1.73 (0.43, 6.39)	1.00

Table 10-28: CMR and U5MR

Population	Unit	Rate (95% CI)
Crude Mortality Rate	deaths per 10,000 people per day	0.26 (0.15, 0.47)
U5 Mortality Rate	deaths per 10,000 children under five per day	0.13 (0.02, 0.73)

10.8. Other Indicator Results

10.8.1. Indicators at the Household Level

Food Security

Food Consumption Score (FCS)

The mean FCS for the surveyed population was 41.74, indicating acceptable food consumption. Most households (62.2%) fell under the category of acceptable food consumption score, while 24.4% fell into the borderline category indicative of IPC AFI Phase 3. Only 13.4% were under the poor consumption score category.

Variable	Mean	95% CI	Obs.	SD	Min	Max		
FCS	41.74	(38.9, 44.6)	872	18.48	6	103		

Table 10-29: Average FCS*

Variable	Mean	95% CI	Obs.	SD	Min	Max

* Maximum FCS is 112 (129.5 if specialized nutritious foods are included).

Table 10-30: Food Consumption Score by Category							
Level	Freq.	Proportion	95% CI				
Acceptable (FCS > 35)	542	62.2%	(54.2%, 69.5%)				
Borderline $(21.5 \le FCS \le 35)$	213	24.4%	(19.4%, 30.3%)				
Poor (FCS ≤ 21)	117	13.4%	(9.1%, 19.4%)				
Total	872	100.0%	-				

* In countries where households have a high sugar and oil consumption (oil and sugar eaten on a daily basis - ~7 days per week), cut-off points of 28 (poor/borderline) and 42 (borderline/acceptable) are usually recommended.

Negative coping strategies and Reduced Coping Strategy Index (rCSI)

The mean Reduced Coping Strategy Index (rCSI) was 13.25 which is medium and indicative of IPC AFI Phase 2 (Stress). A significant portion of the surveyed population resorted to negative coping strategies in the past 7 days. About 64.7% relied on less preferred or less expensive foods, while 46.1% borrowed food or relied on help from friends or relatives. Additionally, 58.9% limited portion sizes at mealtime, and the same percentage reduced the number of meals eaten in a day. Furthermore, 52.6% reduced consumption by adults so children could eat.

Table 10-31: Negative coping strategies used by the surveyed population in the 7 days prior to data collection.

Level	Freq.	Proportion	95% CI
Rely on less preferred and/or less expensive foods	564	64.7%	(57.6%, 71.1%)
Borrow food, or rely on help from a friend or relative	402	46.1%	(39.7%, 52.6%)
Limit portion sizes at mealtime	514	58.9%	(51.9%, 65.6%)
Reduce the number of meals eaten in a day	514	58.9%	(51.8%, 65.8%)
Reduce consumption by adults so children could eat	459	52.6%	(46.0%, 59.2%)

* The total will be over 100% as households may use several negative coping strategies.

Table 10-32: Average rCSI

variable Mean	95% CI	Obs.	SD	Min	Max
Reduced Coping Strategy Index (rCSI) 13.25	(11.2, 15.3)	872	13.81	0	56

* Maximum rCSI is 56

Household Hunger Scale (HHS)

Most (57.7%) surveyed households, reportedly experienced no hunger according to the Household Hunger Score. However, 31% experienced moderate hunger and 1.1% severe hunger. With 21.8% of households in Phase 3 and 1.1% in Phases 4-6, this indicates an IPC AFI Phase 3 (Crisis).

Variable	Median	IQR	Min	Max
Household Hunger Scale	0	[0 - 2]	0	6

* Maximum HHS is 6

	Freq.	Proportion	95% CI		
Little to no hunger in the household	592	67.9%	(60.7%, 74.3%)		
0 HHS = 0	503	57.7%	(50.4%, 64.6%)		
1 HHS = 1	89	10.2%	(7.5%, 13.7%)		
Moderate hunger in the household	270	31.0%	(24.8%, 37.9%)		
2 HHS = 2	80	9.2%	(6.8%, 12.3%)		
3 HHS = 3	190	21.8%	(16.8%, 27.8%)		
Severe hunger in the household	10	1.1%	(0.4%, 3.4%)		
4 HHS = 4	5	0.6%	(0.2%, 2.1%)		
5 HHS = 5	3	0.3%	(0.1%, 1.5%)		
6 HHS = 6	2	0.2%	(0.1%, 0.9%)		
Total	872	100.0%	-		

Table 10-34: Household Hunger Score by Category

WASH

Access to safe/improved water for drinking and cooking

Among the households surveyed, 53.9% reported access to protected or treated water sources, considered safe for consumption. However, 46.1% of households depended on unprotected or untreated water sources. These included surface water (36.6%), unprotected springs (7.8%), rainwater collection (1.1%), and other unprotected sources. Access to safe water is crucial for public health, and while a significant portion of households had access to safe water, there remains a notable proportion relying on potentially unsafe sources. This highlights

the necessity for interventions to improve access to clean and treated water, especially in areas where access is limited or unreliable.

		Freq.	Proportion	95% CI
Prot	ected/treated	470	53.9%	(43.8%, 63.7%)
1	Public tap/standpipe	237	27.2%	(19.2%, 37.0%)
2	Handpumps/boreholes	115	13.2%	(7.7%, 21.7%)
3	Protected well	35	4.0%	(1.8%, 8.5%)
4	Water seller/kiosks	1	0.1%	(0.0%, 0.8%)
5	Piped connection to house (or neighbour's house)	69	7.9%	(4.1%, 14.9%)
6	Protected spring	13	1.5%	(0.7%, 3.3%)
7	Bottled water, water sachets	0	0.0%	(0%, 0%)
8	Tanker trucks	0	0.0%	(0%, 0%)
Un-	protected/un-treated	402	46.1%	(36.3%, 56.2%)
9	Unprotected hand-dug well	4	0.5%	(0.2%, 1.2%)
10	Surface water (lake, pond, dam, river)	319	36.6%	(27.8%, 46.3%)
11	Unprotected spring	68	7.8%	(3.9%, 14.8%)
12	Rainwater collection	10	1.1%	(0.3%, 4.1%)
96	Other unprotected	1	0.1%	(0.0%, 0.8%)
Unk	nown	0	0.0%	(0%, 0%)
98	Don't know	0	0.0%	(0%, 0%)
Tot	al	872	100.0%	-

Table 10-35: Water Quality

Access to improved sanitation facilities

Only a small proportion, 12.5%, reported having access to improved sanitation facilities. Conversely, a significant majority (87.5%) of households relied on unimproved sanitation facilities. These unimproved facilities, often lacking proper sanitation infrastructure or hygiene standards, were predominantly unimproved toilets (87.5%). Access to improved sanitation facilities is crucial for promoting public health and preventing the spread of diseases, highlighting the need for interventions to improve sanitation infrastructure in communities where access remains limited or inadequate.

	Freq.	Proportion	95% CI
Improved	109	12.5%	(8.5%, 18.0%)
1 An improved excreta disposal facility	93	10.7%	(7.3%, 15.3%)
2 A shared family toilet	11	1.3%	(0.6%, 2.8%)
3 A communal toilet	5	0.6%	(0.2%, 1.9%)
Unimproved	763	87.5%	(82.0%, 91.5%)
4 An unimproved toilet	763	87.5%	(82.0%, 91.5%)
Other	0	0.0%	(0%, 0%)
98 Don't know	0	0.0%	(0%, 0%)
Total	872	100.0%	-

Table 10-36: Safe Excreta Disposal

10.8.2. Indicators at individual level – Children 6-59 months

Nutrition and Health

Vitamin A Supplementation

Out of the total surveyed children aged 6 to 59 months, 66.5% were supplemented with Vitamin A. This included 15.6% who had documentation, indicating a formal record of the supplementation received. Additionally, 51.0% of caregivers reported supplementation through recall. On the other hand, 33.5% of children did not receive any vitamin A supplementation.

	Freq.	Proportion	95% CI
Supplementation	521	66.5%	(58.9%, 73.4%)
1 Yes, card	122	15.6%	(10.5%, 22.6%)
2 Yes, recall	399	51.0%	(43.1%, 58.7%)
No supplementation	262	33.5%	(26.6%, 41.1%)
3 No or don't know	262	33.5%	(26.6%, 41.1%)
Total	783	100.0%	-

Table 10-37:

Deworming coverage

Deworming coverage for children aged 24-59 months within the past 6 months was 34%. Conversely, 66% of the children, did not receive deworming treatment in the 6 months prior to data collection. Ensuring adequate coverage of deworming interventions is crucial for promoting the health and well-being of children by mitigating the risks associated with parasitic infections.

Level	Freq.	Proportion	95% CI
No	433	66.0%	(59.7%, 71.8%)
Yes	223	34.0%	(28.2%, 40.3%)
Total	656	100.0%	-

Table 10-38: Deworming coverage for children aged 24-59 months within the 6 months priorto data collection*

* Note that this refers to large-scale campaigns done with mebendazole and/or albendazole.

Measles vaccination coverage

Measles vaccination coverage for children aged 9-59 months was 77.9% while for children aged 9-23 months was 71.4%. This included 22.7% who had documented evidence of vaccination. Among these vaccinated children aged 9-23 months, 8.9% had vaccination documented through a vaccination card. Ensuring high measles vaccination coverage, especially among young children, is crucial for preventing the spread of measles and protecting vulnerable populations from this highly contagious disease.

Table 10	-39: Measles	vaccination	coverage for	r children	aged 9-59	months
Table 10		vaccination	coverage for	cinitaten	agea 7 57	monuns.

	Freq.	Proportion	95% CI
Yes	567	77.9%	(70.7%, 83.7%)
1 Yes, card	165	22.7%	(16.7%, 30.0%)
2 Yes, recall	402	55.2%	(47.9%, 62.3%)
No	161	22.1%	(16.3%, 29.3%)
3 No or don't know	161	22.1%	(16.3%, 29.3%)
Total	728	100.0%	-

Fable 10-40: Measles vaccination c	overage for children	aged 9-23 months
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	Freq.	Proportion	95% CI
Yes	125	71.4%	(61.2%, 79.9%)
1 Yes, card	33	18.9%	(12.1%, 28.1%)
2 Yes, recall	92	52.6%	(42.7%, 62.2%)
No	50	28.6%	(20.1%, 38.8%)
3 No or don't know	50	28.6%	(20.1%, 38.8%)
Total	175	100.0%	-

Morbidity results and health-seeking behaviour

A total of 3.6% of surveyed 6-59 months children exhibited symptoms indicative of ARI in the two weeks prior to data collection, which typically involve cough accompanied by short, rapid breathing or difficulty breathing related to the chest. Fever was reported in 15.7% of the surveyed children, while diarrhea affected 4.3%.

Among the children who experienced diarrhea, 27.7% received ORS, and 25.0% were administered zinc tablets or syrup. Furthermore, 18.8% received both ORS and zinc during their diarrhea episode.

For children with symptoms of ARI, 39.3% sought advice or treatment from a health facility/provider. Similarly, 33.6% children with fever and 36.6% children with diarrhea sought treatment from healthcare facilities or providers.

These findings underscore the importance of timely and appropriate healthcare-seeking behavior in managing childhood illnesses, highlighting areas for potential intervention to improve child health outcomes.

Table 10-41: Prevalence of ARI symptoms, fever and diarrhoea in the two weeks preceding the
survey for children aged 6-59 months.

Level	Freq.	Proportion	95% CI
ARI symptoms*	28	3.6%	(2.0%, 6.2%)
Fever	123	15.7%	(11.7%, 20.8%)
Diarrhoea	112	14.3%	(10.0%, 20.0%)

* Cough accompanied by short, rapid breathing which was chest related or with difficulty breathing which was chest related

Table 10-42: ORS and zinc use during diarrhoea episode for children aged 6-59 months

Level	Freq.	Proportion	95% CI
ORS use during diarrhoea episode	31	27.7%	(19.2%, 38.1%)
Zinc tablet or syrup use during diarrhoea episode	28	25.0%	(15.2%, 38.3%)
ORS and zinc tablet or syrup use during diarrhoea episode	21	18.8%	(11.2%, 29.8%)

Table 10-43: Treatment for ARI symptoms, fever and diarrhoea for children aged 6-59 months

Level	Freq.	Proportion	95% CI
Children with symptoms of ARI	11	39.3%	(18.8%, 64.4%)
Children with fever	41	33.6%	(24.5%, 44.1%)
Children with diarrhoea	41	36.6%	(26.9%, 47.5%)

Level	Freq.	Proportion	95% CI

* Prevalences relate to whether advice or treatment was sought from a health facility/provider (excludes pharmacy, shop and traditional practitioners)

Infant and Young Child Feeding (IYCF) Practices

The data reveals high rates of breastfeeding initiation, with 95.4% of children aged 0-23 months reported to have ever been breastfed. Additionally, 75.9% of infants received early initiation of breastfeeding, while 76.2% were exclusively breastfed for the first 2 days after birth. However, exclusive breastfeeding under 6 months was 62.8% of infants aged 0-5 months. A notable proportion, 11.7%, received mixed milk feeding under 6 months. **Nevertheless, breastfeeding continued to be prevalent, with 81.6% of children aged 12-23 months still being breastfed**.

Regarding complementary feeding practices, the introduction of solid, semi-solid, or soft foods was reported for 50.9% of children aged 6-8 months. However, minimum dietary diversity was relatively low, with only 14.8% of children aged 6-23 months meeting the recommended practice. Similarly, 31.7% of children in the same age group received the minimum required meal frequency. Alarmingly, **only 8.3% of children aged 6-23 months received a minimum acceptable diet.** Egg and/or flesh food consumption was reported for 17.0% of children, while 19.1% consumed sweet beverages. Another concerning finding is that 74.8% of children in this age group did not consume any vegetables or fruits. Regarding other feeding practices, 24.7% of children aged 0-23 months were bottle-fed. This data highlights both the successes and challenges in IYCF practices and underscores the importance of targeted interventions to improve child nutrition and health outcomes.

Indicator	Age range	Freq	Proportion	95% CI	
	Breastfeeding Indicators				
Ever breastfed	0-23 months	309	95.4%	(92.0%, 97.4%)	
Early Initiation	0-23 months	246	75.9%	(68.5%, 82.0%)	
Exclusively breastfed for the first 2 days after birth	0-23 months	247	76.2%	(70.1%, 81.4%)	
Exclusive breastfeeding under 6 months	0-5 months	59	62.8%	(52.9%, 71.7%)	
Mixed milk feeding under 6 months	0-5 months	11	11.7%	(6.9%, 19.1%)	
Continued breastfeeding	12-23 months	102	81.6%	(72.4%, 88.3%)	
Complementary Feeding Indicators					
Introduction of solid, semi-solid or soft foods	6-8 months	28	50.9%	(36.2%, 65.5%)	
Minimum dietary diversity	6-23 months	34	14.8%	(10.2%, 21.0%)	

Table 10-44: Prevalence of Infant and Young Child Feeding Practices Indicators

Indicator	Age range	Freq	Proportion	95% CI
Minimum meal frequency	6-23 months	73	31.7%	(23.7%, 41.0%)
Minimum milk feeding frequency for non-breastfed children	6-23 months	10	26.3%	(13.7%, 44.6%)
Minimum acceptable diet	6-23 months	19	8.3%	(4.9%, 13.6%)
Egg and/or flesh food consumption	6-23 months	39	17.0%	(12.2%, 23.2%)
Sweet beverage consumption	6-23 months	44	19.1%	(14.0%, 25.6%)
Unhealthy food consumption	6-23 months	7	3.0%	(1.3%, 7.0%)
Zero vegetable or fruit consumption	6-23 months	172	74.8%	(67.1%, 81.2%)
	Other Indica	ators		
Bottle feeding	0-23 months	80	24.7%	(19.8%, 30.3%)

10.8.3. Indicators at individual level – Women 15-49 years

Physiological Status and Age

Among women in this age group, 58.5% were non-pregnant and non-lactating. Additionally, 8.3% were reported as pregnant. The rest of assessed women were lactating. Of those, 49.3% were lactating with an infant less than 6 months old and 50.7% were lactating with an infant older than 6 months. The mean age of women in this age range was 27.26 years.

Level	Freq.	Proportion	95% CI
Non-pregnant, non-lactating	571	58.5%	(54.1%, 62.7%)
Pregnant	81	8.3%	(6.3%, 10.8%)
Lactating with an infant less than 6 months	166	49.3%	(40.9%, 57.6%)
Lactating with an infant greater than 6 months	171	50.7%	(42.4%, 59.1%)

Table 10-45: Physiological status for women aged 15-49.

Table 10-46: Women's Age (all women aged 15-49)

Variable	Mean	95% CI	Obs.	SD	Min	Max
Age	27.26	(26.8, 27.8)	979	8.74	15	49

MUAC in women

Among non-pregnant, non-lactating women aged 15-49, 7.7% had MUAC measurements below 210 mm, indicating malnutrition, while the majority, accounting for 92.3%, had MUAC measurements equal to or greater than 210 mm, signifying no malnutrition. However, when the threshold was adjusted to MUAC < 230 mm according to the new national guidelines, **the prevalence of malnutrition increased notably to 35.8%**, while 64.2% of women were found to have no malnutrition.

Conversely, **pregnant women and lactating women with infants under 6 months old** showed a different distribution. In this group, 9.0% had MUAC measurements below 210mm, indicating malnutrition, whereas 91.0% had MUAC measurements of 210mm or above, suggesting no malnutrition. When considering the new MUAC threshold of < 230mm, **the prevalence of malnutrition rose to 37.6%**, with 62.4% not experiencing malnutrition.

Table 10-47: Prevalence of MUAC Malnutrition in Non-Pregnant, Non-Lactating Women (Aged 15-49)

Level	Freq.	Proportion	95% CI
Prevalence of MUAC < 210mm	42	7.7%	(5.8%, 10.2%)
No malnutrition (MUAC \geq 210mm)	502	92.3%	(89.8%, 94.2%)
Prevalence of MUAC < 230mm	195	35.8%	(31.4%, 40.6%)
No malnutrition (MUAC \geq 230mm)	349	64.2%	(59.4%, 68.6%)

Table 10-48: Prevalence of MUAC Malnutrition in Pregnant Women and Lactating Women with an Infant Less Than 6 Months

Level	Freq.	Proportion	95% CI
Prevalence of MUAC < 210mm	22	9.0%	(6.0%, 13.2%)
No malnutrition (MUAC \geq 210mm)	223	91.0%	(86.8%, 94.0%)
Prevalence of MUAC < 230mm	92	37.6%	(31.4%, 44.1%)
No malnutrition (MUAC \geq 230mm)	153	62.4%	(55.9%, 68.6%)

Skilled attendant at delivery

Among the surveyed population, 36.5% reported assistance from a skilled provider. Specifically, 5.4% received assistance from a doctor, while 26.2% were aided by a nurse or midwife. Additionally, 4.8% received assistance from an auxiliary midwife. However, a significant proportion, constituting 63.5%, either received assistance from unskilled providers or had no assistance during delivery. 7.3% were assisted by community health workers, 29.5% by traditional birth attendants, and 8.4% by relatives or friends. Moreover, 7.0% received assistance from other unspecified sources, and 11.3% reported having no one to assist during delivery.

	Freq.	Proportion	95% CI
Skilled provider	249	36.5%	(31.1%, 42.3%)
1 Doctor	37	5.4%	(3.2%, 9.1%)
2 Nurse / midwife	179	26.2%	(21.2%, 31.9%)
3 Auxiliary midwife	33	4.8%	(2.5%, 9.3%)
Other provider or no assistance	433	63.5%	(57.7%, 68.9%)
4 Community health worker	50	7.3%	(3.8%, 13.8%)
5 Traditional birth attendant	201	29.5%	(22.4%, 37.7%)
6 Relative / friend	57	8.4%	(5.6%, 12.2%)
7 Other	48	7.0%	(3.7%, 13.1%)
8 No one	77	11.3%	(6.2%, 19.6%)
Total	682	100.0%	-

 Table 10-49: Assistance During Delivery (Includes Only the Most Recent Birth in the 5 Years Preceding the Survey)

11. Discussion

11.1. Nutritional Status of Arsi Zone

The prevalence of acute malnutrition, as determined by weight-for-height z-score (WHZ) and/or edema, revealed a global acute malnutrition (GAM) rate of 5.4% in children 6-59 months. 5.2% were categorized as moderate acute malnutrition (MAM), and 0.3% as severe acute malnutrition (SAM). Notably, when disaggregated by sex, similar prevalence rates were observed among boys and girl. Based on mid-upper arm circumference (MUAC) and/or edema, the findings indicated a GAM of 5.1%, with 3.9% classified as moderate acute malnutrition and 1.3% as severe acute malnutrition. When combined, the prevalence of GAM and SAM in children 6-59 months was reported to be 8.9% and 1.5%, respectively.

Comparing these findings to previous surveys, we observe relatively similar patterns. For instance, in the Oromia region, a recent SMART survey conducted in East Hararge at the livelihood zone level showed a prevalence of GAM of 5.7% and in the national food and nutrition strategy baseline survey from March 2023, GAM was reported at 9%¹⁸ for Oromia region. However, according to the 2019 Ethiopian Demographic and Health Survey (EDHS)¹⁹, the GAM for Oromia was 4.3%, with SAM at 0.3%.

Assessing these prevalence rates against benchmarks, we utilize the WHO/UNICEF classification for the severity of malnutrition by prevalence thresholds. The prevalence of wasting (WHZ) within the medium range, indicating a substantial but not critical issue. Considering these factors, the prevalence of malnutrition appears typical but with an indicative risk of deterioration, and these findings underscore the importance of ongoing monitoring and preventive interventions to address malnutrition effectively.

11.2. Mortality

The crude mortality rate was 0.26 and the under-five mortality rate was 0.13. Both the CMR and the U5MR were below the WHO emergency thresholds of 1/10,000/day and 2/10,000/day respectively. Compared to other recent SMART surveys conducted in Oromia region, the current survey results show similarity in both crude and under-five mortality rates.

11.3. Determinants of Malnutrition

The nutrition status of children aged 6-59 months reveals a prevalence of global acute malnutrition (GAM) at 5.4%, falling into the medium category according to WHO/UNICEF classification. However, **specific areas like Shenen Kolu district exhibit alarmingly high levels of acute malnutrition, with a GAM prevalence of 11.6%.** Stunting, another critical indicator, affects 38% of children aged 6-59 months, classified as very high according to WHO/UNICEF standards.

Among women of reproductive age, particularly non-pregnant, non-lactating women aged 15-49 years, 35.8% had MUAC measurements below 230mm, indicating malnutrition. A similar trend

¹⁸ Ethiopian Public Health Institute (EPHI) [Ethiopia]. National food and nutrition strategy baseline survey. March 2023

¹⁹ Ethiopian Public Health Institute (EPHI) [Ethiopia] and ICF. 2021. Ethiopia Mini Demographic and Health Survey 2019: Final Report. Rockville, Maryland, USA: EPHI and ICF.

was observed among pregnant and lactating women with infants less than 6 months old, with 37.6% having MUAC measurements below 230mm.

Most households were found to have an Acceptable FCS (62.2%), while 24.4% reportedly had a Borderline FCS, indicative of IPC AFI Phase 3 (Crisis). The mean FCS for the surveyed population was acceptable with possibility of deterioration. Most (57.7%) surveyed households, reportedly experienced no hunger according to the Household Hunger Score. However, 31% experienced moderate hunger and 1.1% severe hunger. With 21.8% of households in Phase 3 and 1.1% in Phases 4-6, this indicates an IPC AFI Phase 3 (Crisis).

Vitamin A supplementation coverage for children aged 6-59 months within the past 6 months was 66.5%, deworming coverage for children aged 24-59 months was 34%, and measles vaccination coverage for children aged 9-59 months was 77.9%. In addition, the prevalence rates for acute respiratory infections (ARI), fever, and diarrhea among children aged 6-59 months remained concerning. Vitamin A coverage in Oromia, according to the 2019 mini-EDHS, was 42%, which is lower than the Arsi zone's 66.5%, but still below the UNICEF threshold of 70%. Similarly, measles vaccination coverage was below the recommended herd immunity threshold of 95%, which is necessary to achieve high population immunity against measles.

Despite relatively better optimal infant and young child feeding (IYCF) practices, there were areas where improvement was needed. While early initiation of breastfeeding and exclusive breastfeeding rates was relatively high at 76.2% and 62.8%, respectively, the percentage of children aged 6-23 months **meeting minimum acceptable diet remains low at 8.3% indicating a very high risk of deterioration of acute malnutrition**. This suggests gaps in nutritional practices that need to be addressed through targeted interventions and awareness campaigns aimed at caregivers and communities.

Moreover, inadequate access to safe water and sanitation facilities further compounds the challenges related to nutrition and health. Only 53% of households had access to safe/improved water for drinking and cooking, while a mere 12.5% had improved sanitation facilities. These figures highlight the urgent need for investments in water, sanitation, and hygiene (WASH) infrastructure to improve health outcomes and mitigate the risk of waterborne diseases that can exacerbate malnutrition.

The prospects for the coming months, particularly in Seru, Gololcha, and Shenon Kolu districts, remain concerning, with projected food security outcomes indicating a crisis status from June to September 2024, according to Fewsnet. Seasonal changes or insecurity may exacerbate existing challenges, further compromising food security, health, and overall well-being.

In conclusion, the data underscores the multifaceted nature of malnutrition, influenced by various factors including food security, IYCF practices, and access to clean water and sanitation. Addressing these challenges requires a comprehensive approach that integrates nutrition-sensitive interventions with efforts to improve food security, promote healthy feeding practices, and enhance access to WASH services.

11.3.1. Additional Indicators

The data on skilled attendance at delivery show that 36.5% of surveyed individuals reported assistance from a skilled provider, which is lower than the Oromia region's average of 43.3%²⁰. While there is notable utilization of skilled providers such as doctors and nurses/midwives, representing 5.4% and 26.2% respectively, there are areas for improvement. The fact that 63.5% either received assistance from other non-skilled providers or had no assistance during delivery highlights gaps in access to quality maternal healthcare services.

This finding intersects with broader health indicators and nutrition status within the population. Adequate prenatal and postnatal care, including skilled attendance at delivery, is crucial for ensuring positive maternal and child health outcomes. However, inadequate access to skilled providers during delivery can lead to complications and adverse outcomes for both mothers and newborns, contributing to the prevalence of maternal and child health issues observed in the region.

The prevalence of acute malnutrition among children and women, coupled with food insecurity and limited access to safe water and sanitation, further emphasizes the importance of comprehensive maternal and child health services. Skilled attendance at delivery is not only essential for ensuring safe childbirth but also for providing critical health education and support to mothers, contributing to improved nutrition outcomes and overall well-being.

Addressing the challenges identified in skilled attendance at delivery requires a multi-faceted approach that includes strengthening health systems, increasing access to skilled healthcare providers, improving infrastructure and facilities, and raising awareness about the importance of maternal healthcare services. By addressing these factors holistically, communities can work towards improving maternal and child health outcomes and reducing the prevalence of malnutrition and related health issues.

12. Conclusion

In conclusion, the prevalence of acute malnutrition, though falling within the medium range according to WHO/UNICEF classification, highlights the need for continued monitoring and preventive intervention to address malnutrition effectively. Furthermore, mortality rates below the WHO emergency thresholds indicate relative stability in terms of health outcomes, but ongoing efforts are needed to address underlying determinants of malnutrition.

The survey findings emphasize the need for a holistic approach to address malnutrition, integrating nutrition-sensitive interventions with efforts to improve food security, promote healthy feeding practices, and enhance access to clean water and sanitation. Looking ahead, the projected outcomes for certain districts signal potential challenges in the coming months, necessitating proactive measures to mitigate risks and support vulnerable populations.

Addressing the complex issue of malnutrition requires collaborative efforts across sectors, including health, nutrition, agriculture, and water and sanitation. By prioritizing interventions that address the underlying determinants of malnutrition and fostering multisectoral partnerships,

²⁰ Ethiopian Public Health Institute (EPHI) [Ethiopia] and ICF. 2021. Ethiopia Mini Demographic and Health Survey 2019: Final Report. Rockville, Maryland, USA: EPHI and ICF.

communities can work towards achieving sustainable improvements in nutrition outcomes and overall well-being.

Annexes

Annex 1 - <u>Cluster Selection</u>

Attach the cluster assignment that is being used for the survey.

Geographical Unit	Population Size	Cluster
Zone1	1915	1
Jenota	2623	2
Zone2	2005	3
Bitayyi	2959	4
Daro temama	1123	RC
Zone3	3222	5
Zone1	2431	6
Zone3	599	7
Zone3	1123	8
Yeedola	2120	9
Zooniin4	1950	10
Dibbee fi Dooranii	3056	11
Cobaa fi Diiloo	2110	12
Gooyaa	2115	13
Gasala	1181	14
Odee	2009	15
Odaa	2522	16
Magaalaa	2005	17
Marfata	1895	RC
2.Sebo inate	3067	18
1.Haro	1423	RC
3.Saqa Ganbeela	1910	19
1.Moyye gado	2565	20
2.Madda	3578	21
2.Mirxii	2100	22

Geographical Unit	Population Size	Cluster
1.Weragu	5019	RC
3.Kofelchisa	2581	23
3.Zonii 3ffaa	1763	RC
Goni Bage	1419	24
Negele	2083	25
Jinga Milab	1111	26
Sire Handode	1390	27
Jiso Kore	1612	28
Bonya Sinkile	4055	29
Baha Biftu	2630	30
Zone 1	3380	31
Zone2	3000	32
Zone3	3110	33
Zone 1	2560	34
Zone3	2569	35
Zone3	3320	36
Zone3	1130	37
Zone2	1398	38
Zone 1	3486	39
Zone3	3287	40
Zone3	2267	41
Zone3	3672	42
Jabala	596	43
Zone-3	1500	44
Qoqobe	1994	45
Bobe	2012	46
Ula Oli	2000	47
oda garoo	3240	48
Biyyoo darba	2109	49

Geographical Unit	Population Size	Cluster
Waffila	3121	50
Burraaysa qinxabali	3353	51
Qurquraa	3114	52
Haroo dheebitti	5680	53
Caffaa Jaalalaa	2533	54
Dugda dheeraa	3605	55
Zone 2	1035	RC
Balad	4841	56
sirrrii	3150	57
Qoroo Ciroota	1000	58
Lodee Hadaa	2275	59
Huluqoo	2121	60
Baadosaa Kuree	1500	61
Batalaa	1930	62
Argiitii	3125	63
Doje	2101	64
Kombolcha	2025	RC
Utamo	2,149	RC
Zone 3	2970	65
Edhira	1150	66
Kekersa	2685	67
Suya	950	68
Dido	2015	69
Olsiki	1456	70
Cira	1260	71
Chawity	438	72
Kara	641	73
L/Lemefo	505	74

Geographical Unit	Population Size	Cluster
Shameda	360	75
Hagiso	495	76
Wererso Jibicho	495	77
Wala	270	78
Rasa Burka	330	79
Ketar	1987	80
Abaasaa	1030	81
Burqaa	1247	82
Gubanee	1554	83
Safaraa	1644	RC
Iftuu	3003	84

Annex 2 - <u>Standardization Test Results</u>

Attach the standardization test results here.

	No. of subjects	TEM	Bias	Bias relative to	Outcome (TEM)	Outcome (Bias)
Individual TEM (intra)						
437.0						
Observer 1	10	0.07	0.01	Median	TEM acceptable	Bias good
Observer 2	10	0.03	0.02	Median	TEM good	Bias good
Observer 3	9	0.06	-0.01	Median	TEM acceptable	Bias good
Observer 4	10	0.04	0.00	Median	TEM good	Bias good
Observer 5	10	0.07	-0.03	Median	TEM acceptable	Bias good
Observer 6	10	0.07	0.02	Median	TEM acceptable	Bias good
Observer 7	10	0.03	-0.02	Median	TEM good	Bias good
Observer 8	10	0.41	-0.08	Median	TEM reject	Bias acceptable
Observer 9	10	0.45	-0.11	Median	TEM reject	Bias poor

	No. of subjects	TEM	Bias	Bias relative to	Outcome (TEM)	Outcome (Bias)
Observer 10	10	0.04	0.01	Median	TEM acceptable	Bias good
Supervisor 1	10	0.13	0.06	Median	TEM poor	Bias acceptable
Team TEM (inter)						
437.0						
enum inter 1st	9x10	0.19			TEM acceptable	
enum inter 2nd	10x10	0.21			TEM acceptable	

 Table 12-51: Bias and Technical Error of Measurement (TEM) Results for Height

	No. of subjects	TEM	Bias	Bias relative to	Outcome (TEM)	Outcome (Bias)
Individual TEM (intra)			_			-
437.0						
Observer 1	10	1.63	0.23	Supervisor	TEM reject	Bias good
Observer 2	10	0.02	-0.13	Supervisor	TEM good	Bias good
Observer 3	10	0.22	-0.16	Supervisor	TEM good	Bias good
Observer 4	10	0.27	0.14	Supervisor	TEM good	Bias good
Observer 5	10	0.23	-0.12	Supervisor	TEM good	Bias good
Observer 6	10	1.38	0.12	Supervisor	TEM reject	Bias good
Observer 7	10	0.17	0.29	Supervisor	TEM good	Bias good
Observer 8	10	0.30	-0.13	Supervisor	TEM good	Bias good
Observer 9	10	0.82	-0.19	Supervisor	TEM poor	Bias good
Observer 10	10	0.53	-0.15	Supervisor	TEM acceptable	Bias good
Supervisor 1	9	0.14	0.09	Median	TEM good	Bias good
Team TEM (inter)						
437.0						
enum inter 1st	10x10	0.85			TEM acceptable	

	No. of subjects	TEM	Bias	Bias relative to	Outcome (TEM)	Outcome (Bias)
enum inter 2nd	10x10	0.64			TEM acceptable	

 Table 12-52: Bias and Technical Error of Measurement (TEM) Results for MUAC

	No. of subjects	TEM	Bias	Bias relative to	Outcome (TEM)	Outcome (Bias)
Individual TEM (intra)						
437.0						
Observer 1	10	1.26	-0.85	Supervisor	TEM good	Bias good
Observer 2	10	0.00	-0.25	Supervisor	TEM good	Bias good
Observer 3	10	3.21	0.25	Supervisor	TEM poor	Bias good
Observer 4	10	1.20	1.10	Supervisor	TEM good	Bias acceptable
Observer 5	10	1.28	-0.70	Supervisor	TEM good	Bias good
Observer 6	10	4.47	-0.65	Supervisor	TEM reject	Bias good
Observer 7	10	1.05	1.45	Supervisor	TEM good	Bias acceptable
Observer 8	10	2.41	-1.85	Supervisor	TEM acceptable	Bias acceptable
Observer 9	10	2.77	1.30	Supervisor	TEM poor	Bias acceptable
Observer 10	10	2.55	-1.05	Supervisor	TEM acceptable	Bias acceptable
Supervisor 1	10	2.20	-0.05	Median	TEM Bias good	
Team TEM (inter)						
437.0						
enum inter 1st	10x10	2.84			TEM poor	
enum inter 2nd	10x10	2.40			TEM acceptable	

Annex 3 - Plausibility Check

Attach the plausibility check here.

Component	Value	Score	Outcome
Flagged data	0.6%	0	Excellent
Overall Sex ratio	p=0.858	0	Excellent
Age ratio(6-29 vs 30-59)	p=0.360	0	Excellent
Dig pref score - weight	4	0	Excellent
Dig pref score - height	5	0	Excellent
Dig pref score - MUAC	5	0	Excellent
Standard Dev WHZ	0.98	0	Excellent
Skewness WHZ	0.00	0	Excellent
Kurtosis WHZ	-0.14	0	Excellent
Poisson dist WHZ-2	p<0.001	5	Problematic
OVERALL SCORE WHZ =		5	Excellent

 Table 12-53: Anthropometry Data Quality Snapshot

Annex 4 - <u>Integrated Questionnaire</u>

Region / State
District
Team number
The number you have typed is outside the expected range (1-99).
Cluster number
The number you have typed is outside the expected range (1-999).
Household number
The number you have typed is outside the expected range (1-99).

Hello my name is ______. I am with ______ [organization/governmental agency]. Please let me introduce you to the other team members: _______ and ______. We are here today to gather household information related to nutrition and _______. If there are any children under 5 in the household, we would like to take some measurements (weight, height, MUAC, oedema / explain) to help determine the overall under 5 nutrition status in \${region} region, district of \${district}. Please note that it is not currently known what actions (if any) will be taken after the results of the survey are finalized. All information will be kept completely confidential. Do you have any questions? May I begin?

Yes (present/agreed)

No (refusal)

Absent

CONSENT REFUSED: Please ensure that Team Leader has explained clearly the objectives of the survey. If the head of household / respondent still refuses, go to end of questionnaire.

CURRENT HOUSEHOLD MEMBERS: Please complete the following questions for each household member who lives in the household.

Press "Add Group" - to add another household member until all members are listed. When listing is complete, press "Do Not Add" to continue with the questionnaire.

Household Members

First Name

Gender

Male

Female

What is the age of the household member \${name} (in completed years)?

Please enter an age in complete years for every household member. You do not need to see proof of age. If age is less than 1 year, record 0.

Age in years must be between 0 and 120.

Did the household member \${name} join the household during the recall period?

EXCLUDE BIRTHS

Yes

No
Was the household member \${name} born during the recall period?
Yes
No
Was the household member \${name} pregnant at the start of the recall period?
Yes
No
Just to confirm, you have mentioned \${numfamily} person(s)/people in the household today?
Yes
No
Warning: In the listing of the current household members, you have recorded \${numfamily} person(s)/people. If the reported number does not match the total number of current household members, please return to the listing and correct the information.
To delete one person, do a long press in the area where an answer for this person is entered, then select "Remove group". All data for that group/person will be deleted.
What is the total number of household members that LEFT this household during the recall period?
MEMBERS WHO LEFT HOUSEHOLD: Please complete the following information for all household members who moved away from the household during the recall period.
Members that have left:
First Name
Gender
Male
Female
What is the age of the household member \${name_left} (in completed years)?

Please enter an age in complete years for every household member. You do not need to see proof of age. If age is less than 1 year, record 0.

Age in years must be between 0 and 120.

Did the household member \${name_left} join the household during the recall period?

EXCLUDE BIRTHS

Yes

No

Was the household member \${name_left} born during the recall period?

Yes

No

Just to confirm, you have mentioned \${numdepart} person(s)/people who moved away from the household during the recall period?

Yes

No

Warning: In the listing of the household members who moved away, you have recorded ${\text{numdepart}}$ person(s)/people. If the reported number does not match the total number of household members that LEFT during the recall period, please return to the total number of household members who moved away and correct the information.

To delete one person, do a long press in the area where an answer for this person is entered, then select "Remove group". All data for that group/person will be deleted.

What is the total number of household members that DIED during the recall period?

MEMBERS WHO PASSED AWAY: Please complete the following information for all household members who died during the recall period.

Members that have died:

First Name

Gender

Male

What was the age of the household member ${\text{member }}$ (in completed years)?

Please enter an age in complete years for every household member. You do not need to see proof of age. If age is less than 1 year, record 0.

Age in years must be between 0 and 120.

Did the household member \${name_death} join the household during the recall period?

EXCLUDE BIRTHS

Yes

No

Was the household member \${name_death} born during the recall period?

Yes

No

What was the cause of the death of ${\text{name_death}}?$

Traumatic

Non-traumatic

Unknown

In which location did the household member \${name_death} died?

In current location

During migration

In place of last residence

Other

Just to confirm, you have mentioned \${numdeath} person(s)/people who died during the recall period?

Yes

No

Warning: In the listing of the household members who died, you have recorded \${numdeath} person(s)/people. If the reported number does not match the total number of household members that DIED during the recall period, please return to the total number of household members who died and correct the information.

To delete one person, do a long press in the area where an answer for this person is entered, then select "Remove group". All data for that group/person will be deleted.

Food Security

Food Consumption Score

How many days over the last 7 days, did members of your household eat the following food items, prepared and/or consumed at home?

READ THE LIST OF FOODS AND DO NOT PROBE. ONLY RECORD THE CONSUMPTION OF SIGNIFICANT QUANTITIES OF FOOD BY THE HOUSEHOLD. WRITE '0' IF NOT CONSUMED IN THE LAST 7 DAYS.

In the past 7 days, how many days did your household eat any cereals such as wheat, corn/maize, barley, buckwheat, millet, oats, rice, rye, sorghum, teff, or any foods made from these such as bread, porridge, noodles, ugali, nshima, pasta. Or any white roots and tuers such as lotus root, parsnip, taro, white potatoes, white yam, white cassava, white sweet potato, or any foods made from roots. Or any other starchy foods such as green bananas or plantains?

RECORD THE NUMBER OF DAYS, FROM 0-7.

Please add acceptable range as 0-7.

In the past 7 days, how many days did your household eat any legumes, nuts and seeds such as dried beans, chickpeas, lentils, or any foods made from these such as hummus, peanut butter?

RECORD THE NUMBER OF DAYS, FROM 0-7.

Please add acceptable range as 0-7.

In the past 7 days, how many days did your household eat any dairy products such as fresh milk, sour milk, infant formula, cheese, kefir, yogurt?

RECORD THE NUMBER OF DAYS, FROM 0-7.

Please add acceptable range as 0-7.

In the past 7 days, how many days did your household eat any meat, fish and eggs (e.g. goat, beef, chicken, pork, blood, fish including canned tuna, snails, and/or other seafood, eggs)?
RECORD THE NUMBER OF DAYS, FROM 0-7.

Please add acceptable range as 0-7.

In the past 7 days, how many days did your household eat any vegetables and leaves such as spinach, cassava leaves, onion, carrot, lettuce, bamboo shoots, cabbage, pepper, tomato, eggplant, zucchini, olives, avocado, cucumber, etc.?

RECORD THE NUMBER OF DAYS, FROM 0-7.

Please add acceptable range as 0-7.

In the past 7 days, how many days did your household eat any fruits including wild fruits and 100% fruit juice made from these (e.g. mango, apricot, peach, apple, banana, coconut flesh, lemon, orange, etc.)?

RECORD THE NUMBER OF DAYS, FROM 0-7.

Please add acceptable range as 0-7.

In the past 7 days, how many days did your household eat any oils and fats added to food or used for cooking (e.g. vegetable / nut oil made from almond, avocado, canola, coconut, cottonseed, groundnut, maize, olive, rapeseed, safflower, sesame, soybean, sunflower/walnut, ghee, butter, margarine, mayonnaise, palm oil -not red palm oil, shortenings, sour cream)?

RECORD THE NUMBER OF DAYS, FROM 0-7.

Please add acceptable range as 0-7.

In the past 7 days, how many days did your household eat any sweets, sweetened soda or juice drinks and sugary foods (e.g. sugar, honey, syrup, soda drinks, chocolates, candies, cookies, sweet biscuits and cakes)?

RECORD THE NUMBER OF DAYS, FROM 0-7.

Please add acceptable range as 0-7.

In the past 7 days, how many days did your household eat any spices, condiments and beverages (e.g. black pepper, salt, chilies, soy sauce, hot sauce, fish powder, fish sauce, ginger, herbs, magi cubes, ketchup, mustard, coffee, tea, milk/cream in small quantities)?

RECORD THE NUMBER OF DAYS, FROM 0-7.

Please add acceptable range as 0-7.

Coping Strategies

EXPLAIN TO THE RESPONDENT THAT THE QUESTIONS APPLY TO ALL HOUSEHOLD MEMBERS AND NOT ONLY TO HIM/HER.

In the past 7 days, how many days did your household rely on less preferred and/or less expensive food due to lack of food or money to buy food?

RECORD THE NUMBER OF DAYS, FROM 0-7.

Please add acceptable range as 0-7.

In the past 7 days, how many days did your household borrow food or rely on help from a friend or relative due to lack of food or money to buy food?

RECORD THE NUMBER OF DAYS, FROM 0-7.

Please add acceptable range as 0-7.

In the past 7 days, how many days did your household reduce the number of meals eaten in a day due to lack of food or money to buy food?

RECORD THE NUMBER OF DAYS, FROM 0-7.

Please add acceptable range as 0-7.

In the past 7 days, how many days did your household limit portion sizes at mealtime due to lack of food or money to buy food?

RECORD THE NUMBER OF DAYS, FROM 0-7.

Please add acceptable range as 0-7.

In the past 7 days, how many days did your household reduce consumption by adults so children could eat, due to lack of food or money to buy food?

RECORD THE NUMBER OF DAYS, FROM 0-7. IN HOUSEHOLDS WITHOUT CHILDREN UNDER 5 YEARS OF AGE, THE ANSWER SHOULD BE '0'.

Please add acceptable range as 0-7.

Household Hunger Scale

EXPLAIN TO THE RESPONDENT THAT THE QUESTIONS APPLY TO ALL HOUSEHOLD MEMBERS AND NOT ONLY TO HIM/HER.

In the past 4 weeks, was there ever no food to eat of any kind in your house because of lack of resources to get food?

Yes

No

How often did this happen in the past 4 weeks?

Rarely (1-2 times)

Sometimes (3-10 times)

Often (more than 10 times)

In the past 4 weeks, did you or any household member go to sleep at night hungry because there was not enough food?

Yes

No

How often did this happen in the past 4 weeks?

Rarely (1-2 times)

Sometimes (3-10 times)

Often (more than 10 times)

In the past 4 weeks, did you or any household member go a whole day and night without eating anything at all because there was not enough food?

Yes

No

How often did this happen in the past 4 weeks?

Rarely (1-2 times)

Sometimes (3-10 times)

Often (more than 10 times)

Water, Sanitation and Hygiène (WASH)

What is the main source of water used by your household for drinking and cooking?

SELECT ONE BUT DO NOT PROMPT WITH RESPONSES. CONSIDER DRINKING AND COOKING WATER ONLY.

Public tap/standpipe

Handpumps/boreholes

Protected well

Water seller/kiosks
Piped connection to house (or neighbour's house)
Protected spring
Bottled water, water sachets
Tanker trucks
Unprotected hand-dug well
Surface water (lake, pond, dam, river)
Unprotected spring
Rainwater collection
Other
Don't know
What kind of toilet/latrine does your household usually use?
DO NOT READ THE ANSWERS. SELECT ONE ONLY.
Flush or pour/flush toilet
Pit latrine with a slab or platform
Pit VIP latrine
Hanging toilet/latrine
Pit latrine without a slab or platform
Open hole
Bucket toilet
No facility, field, bush, plastic bag
Do you share this toilet/latrine with other households?
Yes
No
How many households use this toilet/latrine?

THIS INCLUDES THE SURVEYED HOUSEHOLD. RECORD NUMBER OF HOUSEHOLDS IF KNOWN. RECORD '96' IF PUBLIC TOILET OR '98' IF UNKNOWN

Child Section

Now entering data for child: \${child_name} (\${CHSEX}) with age in years: \${child_age_years}

Do you have an official age documentation for \${child_name}?

The exact date of birth (day, month, year) is recorded from either a birth registration, child health card or EPI card if available.

Yes

No

\${child_name}'s date of birth:

The exact birth date should only be taken from an age documentation showing day, month and year of birth

\${child_name}'s month and year of birth:

IT IS IMPORTANT TO ESTIMATE THE AGE VERY CAREFULLY. Since no age documentation is available, estimate month and year of birth using a local events calendar.

Verify that \${child_name} is \${MONTHS} months old. Remember, if they are older than 59 months; they are not eligible for inclusion, and you should stop here

Warning: In the listing of the current household members, you have recorded that \${child_name} is \${child_age_years} years old.

His/her age in months (\${MONTHS}) should match with the age in completed years.

If the age in months is not matching the age in completed years, go back and correct the previous entries.

Is \${child_name} currently present in the household?

Yes

No

If eligible child is absent, team should revisit the household once before leaving the village to conduct the interview and/or measure the child.

Weight in KG of \${child_name}:

The child must be weighed naked. Remove diapers, necklaces and other items that could increase the weight before measuring. REMINDER: Always record weight with one digit after the decimal point.

Please remeasure child's weight

Was \${child_name} dressed with clothes for the weight measurement?

Yes

No

Height in CM of \${child_name}:

Children younger than 24 months are measured lying down, while standing height is measured in children aged 24 months and older. REMINDER: Always record height with one digit after the decimal point.

Please remeasure child's Height

Record measurement taken: Length or Height

Standing height

Length (lying horizontal on board)

PLEASE, MEASURE LENGTH. Children younger than 24 months are measured lying down. If possible, to abide by the protocol, please retake length measurement and correct the information on measurement taken.

PLEASE, MEASURE HEIGHT. Children aged 24 months and older are measured standing up. If possible, to abide by the protocol, please retake height measurement and correct the information on measurement taken.

MUAC in MM of \${child_name}

Please remeasure child's MUAC

Does \${child_name} have bilateral oedema, that is swelling with pitting oedema in both feet?

Yes

No

Please confirm with the team leader. Does \${child_name} have bilateral oedema?

Yes

No

Please take a picture of the bilateral oedema

MAKE SURE TO ONLY PHOTOGRAPH THE FEET

REMEASURE: \${child_name} (\${CHSEX}) aged \${child_age_years} year(s) must be remeasured

REMEASURE: Do you have an official age documentation for \${child_name}?

The exact date of birth (day, month, year) is recorded from either a birth registration, child health card or EPI card if available.

Yes

No

REMEASURE: \${child_name}'s date of birth:

The exact birth date should only be taken from an age documentation showing day, month and year of birth

REMEASURE: \${child_name}'s month and year of birth:

IT IS IMPORTANT TO ESTIMATE THE AGE VERY CAREFULLY. Since no age documentation is available, estimate month and year of birth using a local events calendar.

REMEASURE: Verify that \${child_name} is \${MONTHS_2} months old. Remember, if they are older than 59 months; they are not eligible for inclusion, and you should stop here

REMEASURE: Weight in KG of \${child_name}:

The child must be weighed naked. Remove diapers, necklaces and other items that could increase the weight before measuring. REMINDER: Always record weight with one digit after the decimal point.

Please remeasure child's weight

REMEASURE: Was \${child_name} dressed with clothes for the weight measurement?

Yes

No

REMEASURE: Height in CM of \${child_name}:

Children younger than 24 months are measured lying down, while standing height is measured in children aged 24 months and older. REMINDER: Always record height with one digit after the decimal point.

Please remeasure child's Height

REMEASURE: Record measurement taken: Length or Height

Standing height

Length (lying horizontal on board)

PLEASE, MEASURE LENGTH. Children younger than 24 months are measured lying down. If possible, to abide by the protocol, please retake length measurement and correct the information on measurement taken.

PLEASE, MEASURE HEIGHT. Children aged 24 months and older are measured standing up. If possible, to abide by the protocol, please retake height measurement and correct the information on measurement taken.

REMEASURE: MUAC in MM of \${child_name}

Please remeasure child's MUAC

REMEASURE: \${child_name} (\${CHSEX}) aged \${child_age_years} year(s) must be remeasured

REMEASURE: Do you have an official age documentation for \${child_name}?

The exact date of birth (day, month, year) is recorded from either a birth registration, child health card or EPI card if available.

Yes

No

REMEASURE: \${child_name}'s date of birth:

The exact birth date should only be taken from an age documentation showing day, month and year of birth

REMEASURE: \${child_name}'s month and year of birth:

IT IS IMPORTANT TO ESTIMATE THE AGE VERY CAREFULLY. Since no age documentation is available, estimate month and year of birth using a local events calendar.

REMEASURE: Verify that \${child_name} is \${MONTHS_3} months old. Remember, if they are older than 59 months; they are not eligible for inclusion, and you should stop here REMEASURE: Weight in KG of \${child_name}:

The child must be weighed naked. Remove diapers, necklaces and other items that could increase the weight before measuring. REMINDER: Always record weight with one digit after the decimal point.

Please remeasure child's weight

REMEASURE: Was \${child_name} dressed with clothes for the weight measurement?

Yes

No

REMEASURE: Height in CM of \${child_name}:

Children younger than 24 months are measured lying down, while standing height is measured in children aged 24 months and older. REMINDER: Always record height with one digit after the decimal point.

Please remeasure child's Height

REMEASURE: Record measurement taken: Length or Height

Standing height

Length (lying horizontal on board)

PLEASE, MEASURE LENGTH. Children younger than 24 months are measured lying down. If possible, to abide by the protocol, please retake length measurement and correct the information on measurement taken.

PLEASE, MEASURE HEIGHT. Children aged 24 months and older are measured standing up. If possible, to abide by the protocol, please retake height measurement and correct the information on measurement taken.

REMEASURE: MUAC in MM of \${child_name}

Please remeasure child's MUAC

Has \${child_name} received a vitamin A capsule in the past 6 months?

CHECK VACCINATION/HEALTH CARD AND SHOW CAPSULE

Yes, card

Yes, recall

No or don't know

Was \${child_name} given any drug for intestinal worms in the last 6 months?

SHOW TABLET

Yes

No

Don't know

Has \${child_name} been vaccinated against measles?

CHECK VACCINATION/HEALTH CARD

Yes, card

Yes, recall

No or don't know

Has \${child_name} had diarrhoea in the past 2 weeks?

CASE DEFINITION: THREE OR MORE LOOSE OR LIQUID STOOLS DURING 24 HOURS (INCLUDING BLOODY STOOLS)

Yes

No

Don't know

Did you seek any advice or treatment for the diarrhoea from any source?

Yes

No

Don't know

Where did you seek advice or treatment?

IF SEVERAL ANSWERS ARE MENTIONED, RECORD THE FIRST PLACE WHERE THE CAREGIVER SEEK ADVICE OR TREATMENT

Public sector: Government hospital

Public sector: Government health center

Public sector: Government health post

Public sector: Mobile clinic
Public sector: Fieldworker
Other public sector
Private medical sector: Private hospital / clinic
Private medical sector: Pharmacy
Private medical sector: Private doctor
Private medical sector: Mobile clinic
Private medical sector: Fieldworker
Other private medical sector
Other source: Shop
Other source: Traditional practitioner
Other source: Market
Other source: Itinerant drug seller
Other
Did you give ORS to \${child_name} when s/he had diarrhoea?
SHOW ORS SACHET
Yes
No
Don't know
Did you give zinc tablets or syrup to \${child_name} when s/he had diarrhoea?
SHOW ZINC TABLET OR SYRUP
Yes
No
Don't know
Has \${child_name} been ill with a fever in the past 2 weeks?

Yes
No
Don't know
Did you seek any advice or treatment for the fever from any source?
Yes
No
Don't know
Where did you seek advice or treatment?
IF SEVERAL ANSWERS ARE MENTIONED, RECORD THE FIRST PLACE WHERE THE CAREGIVER SEEK ADVICE OR TREATMENT
Public sector: Government hospital
Public sector: Government health center
Public sector: Government health post
Public sector: Mobile clinic
Public sector: Fieldworker
Other public sector
Private medical sector: Private hospital / clinic
Private medical sector: Pharmacy
Private medical sector: Private doctor
Private medical sector: Mobile clinic
Private medical sector: Fieldworker
Other private medical sector
Other source: Shop
Other source: Traditional practitioner
Other source: Market
Other source: Itinerant drug seller

Other
Has \${child_name} had an illness with a cough in the past 2 weeks?
Yes
No
Don't know
Has \${child_name} had fast, short, rapid breaths or difficulty breathing in the past 2 weeks?
Yes
No
Don't know
Was the fast or difficult breathing due to a problem in the chest or a blocked or runny nose?
Problem in chest only
Blocked or runny nose only
Both
Other
Don't know
Did you seek any advice or treatment for the illness from any source?
Yes
No
Don't know
Where did you seek advice or treatment?
IF SEVERAL ANSWERS ARE MENTIONED, RECORD THE FIRST PLACE WHERE THE CAREGIVER SEEK ADVICE OR TREATMENT
Public sector: Government hospital
Public sector: Government health center
Public sector: Government health post

Public sector: Mobile clinic
Public sector: Fieldworker
Other public sector
Private medical sector: Private hospital / clinic
Private medical sector: Pharmacy
Private medical sector: Private doctor
Private medical sector: Mobile clinic
Private medical sector: Fieldworker
Other private medical sector
Other source: Shop
Other source: Traditional practitioner
Other source: Market
Other source: Itinerant drug seller
Other
<pre>\${child_name}' has conditions indicating SEVERE ACUTE MALNUTRITION (SAM).</pre>
COMPLETE REFERRAL FORM to the SAM TREATMENT PROGRAM (Do not refer to BSFP)
Have you referred the child for management of severe acute malnutrition services?
Yes
No, already enrolled in a nutrition treatment program
No, there is no nutrition treatment program in place
<pre>\${child_name}' has conditions indicating MODERATE ACUTE MALNUTRITION (MAM).</pre>
COMPLETE REFERRAL FORM to the MAM TREATMENT PROGRAM (Do not refer to BSFP)
Have you referred the child for management of moderate acute malnutrition services?

Yes
No, already enrolled in a nutrition treatment program
No, there is no nutrition treatment program in place
\${child_name}' doesn't have conditions indicating acute malnutrition
Was \${child_name} ever breastfed?
Yes
No
How long after birth was \${child_name} first put to the breast?
Less than 1 hr
Between 1 hr and 23 hrs
24 hrs and more
In the first two days after delivery, was \${child_name} given anything other than breast milk to eat or drink - anything at all like water, infant formula or ritual feeds?
Yes
No
Was \${child_name} breastfed yesterday during the day or at night?
Yes
No
Don't know
Did \${child_name} drink anything from a bottle with a nipple yesterday during the day or at night?
Yes
No
Don't know
Now I would like to ask you about liquids that \${child_name} had yesterday during the day or at night. Please tell me about all drinks, whether \${child_name} had

them at home, or somewhere else. Yesterday, during the day or at night, did \${child_name} receive any of the following?

ASK ABOUT EVERY LIQUID. EVERY QUESTION MUST HAVE AN ANSWER.

IF ITEM WAS GIVEN, SELECT 'YES'. IF ITEM WAS NOT GIVEN, SELECT 'NO'. IF CAREGIVER DOES NOT KNOW, SELECT 'DON'T KNOW'.

Plain water

Yes

No

Don't know

Infant formula

Yes

No

Don't know

How many times did \${child_name} drink formula?

IF 7 OR MORE, RECORD '7'. IF NUMBER OF TIMES NOT KNOWN, RECORD '8'.

Please add acceptable range as 1-8.

Milk from animals such as fresh, tinned or powdered milk

Yes

No

Don't know

How many times did \${child_name} drink milk?

IF 7 OR MORE, RECORD '7'. IF NUMBER OF TIMES NOT KNOWN, RECORD '8'.

Please add acceptable range as 1-8.

Was the milk or were any of the milk drinks a sweet or flavoured type of milk?

Yes
No
Don't know
Yogurt drinks (animal milk-based yogurt drink or drinkable fermented milks such as buttermilk or kefir)
Yes
No
Don't know
How many times did \${child_name} drink yogurt?
IF 7 OR MORE, RECORD '7'. IF NUMBER OF TIMES NOT KNOWN, RECORD '8'.
Please add acceptable range as 1-8.
Was the yogurt or were any of the yogurt drinks a sweet or flavoured type of yogurt drink?
Yes
No
Don't know
Chocolate-flavoured drinks including those made from syrups or powders
Yes
No
Don't know
Fruit juice or fruit-flavoured drinks, including those made from syrups or powders
Yes
No
Don't know
Sodas, malt drinks, sports drinks or energy drinks
Yes

No
Don't know
Tea, coffee, herbal drinks or infusion, including those given as traditional medicine
Yes
No
Don't know
Was the drink or were any of these drinks sweetened?
Yes
No
Don't know
Clear broth or clear soup
Yes
No
Don't know
Any other liquid of any type (e.g. water with added sugar, vegetable juices, coconut water, soy milk or nut milk)
Yes
No
Don't know
Was the drink or were any of these drinks sweetened?
Yes
No
Don't know

Now I would like to ask you about foods that $f(hild_name)$ had yesterday during the day or the night. I am interested in foods ate whether at home or somewhere else. Please think about snacks and small meals as well as main meals. I will ask you about different types of foods, and I would like to know whether your child ate the food even if it was combined with other foods in a mixed dish. Please do not answer "yes" for any food or ingredient used in a small amount to add flavour to a dish. Yesterday, during the day or at night, did $f(hild_name)$

ASK ABOUT EVERY FOOD GROUP. EVERY QUESTION MUST HAVE AN ANSWER.

IF ITEM WAS GIVEN, SELECT 'YES'. IF ITEM WAS NOT GIVEN, SELECT 'NO'. IF CAREGIVER DOES NOT KNOW, SELECT 'DON'T KNOW'.

Any yogurt, other than yogurt drinks?

Yes

No

Don't know

How many times did \${child_name} eat yogurt?

IF 7 OR MORE, RECORD '7'. IF NUMBER OF TIMES NOT KNOWN, RECORD '8'.

Please add acceptable range as 1-8.

Any cereals such as wheat, corn/maize, corn soy blend, barley, buckwheat, millet, oats, rice, rye, sorghum, teff, or any foods made from these such as bread, porridge, noodles, ugali, nshima, paste?

Yes

No

Don't know

Any Vitamin A rich vegetables and tubers such as carrot, pumpkin, squash, red sweet pepper or sweet potatoes that are orange inside?

Yes

No

Don't know

Any white roots and tubers such as lotus root, parsnip, taro, plantains, white potatoes, white yam, white cassava, white sweet potatoes, green bananas, or any foods made from roots and tubers?

Yes
No
Don't know
Any dark green leafy vegetables such as spinach, amaranth, arugula, cassava leaves, kale?
Yes
No
Don't know
Any other vegetables such as cabbage, green pepper, tomato, onion, eggplant, zucchini, avocado, cucumber, lettuce, olives or cauliflower?
Yes
No
Don't know
Any Vitamin A rich fruits such as mango, ripe papaya or cantaloupe melon, apricot (fresh and dried), passion fruit, peach, red palm fruit, red palm pulp?
Yes
No
Don't know
Any other fruits such as apple, banana, coconut flesh, lemon, orange, dates, etc.?
Yes
No
Don't know
Any organ meat or blood-based foods such as liver, kidney, heart?
Yes
No
Don't know
Any sausages, hot dogs, ham, bacon, salami, corned beef, canned meat?

Yes
No
Don't know
Any flesh meat such as beef, goat, lamb, mutton, pork, rabbit, chicken, duck, cane rat, guinea pig, rat, agouti, frogs, snake, insects?
Yes
No
Don't know
Any eggs (eggs from chicken, duck, guinea fowl)?
Yes
No
Don't know
Any fresh, frozen, dried, or canned fish or shellfish such as anchovies, tuna, sardines, shark, whale, roe/fish eggs, clam, crab, lobster, crayfish, mussels, shrimp, octopus, squid, sea snails?
Yes
No
Don't know
Any legumes, nuts, and seeds such as dried peas, dried beans, lentils, peanuts, almonds, sesame, sunflower or any foods made from these such as hummus, peanut butter?
Yes
No
Don't know
Hard or soft cheese
Yes
No
Don't know

Any sweet foods such as chocolates, candies, pastries, cakes, biscuits, or ice cream? Yes No Don't know Any chips, crisps, puffs, French fries, fried dough, instant noodles, etc.? Yes No Don't know Any other solid, semi-solid or soft food? Yes No Don't know Did \${child_name} eat any solid, semi-solid or sof food yesterday during the day or at night? IF 'YES', GO BACK TO PREVIOUS ENTRIES AND RECORD FOOD ITEM(S) Yes No IF YES, PROBE: What kind of solid, semi-solid or soft food did \${child_name} eat? AND MARK FOOD GROUP. How many times did \${child_name} eat any solid, semi-solid, or soft foods yesterday during the day or night? IF 7 OR MORE, RECORD '7'. IF NUMBER OF TIMES NOT KNOWN, RECORD '8'. Please add acceptable range as 0-8. Woman Section Now entering data for woman: \${woman_name} with age in years: \${woman_age_years} Are you pregnant?

Yes
No
Don't know
Are you currently breastfeeding?
Yes
No
Don't know
Is the child you are breastfeeding younger than 6 months old?
Yes
No
Don't know
Who assisted with the delivery of your last child?
PROBE FOR THE TYPE(S) OF PERSON(S) AND RECORD THE HIGHEST TYPE OF PROVIDER FROM THE LIST IF MORE THAN ONE PERSON IS MENTIONED. IF RESPONDENT SAYS NO ONE ASSISTED, PROBE TO DETERMINE WHETER ANY ADULTS WERE PRESENT AT DELIVERY.
No birth (live birth) in the past 5 years
Health personnel: Doctor
Health personnel: Nurse / Midwife
Health personnel: Auxiliary midwife
Health personnel: Community health worker
Other person: Traditional birth attendant
Other person: Relative / Friend
Other
No one assisted
MUAC in MM of \${woman_name}
Please remeasure woman's MUAC

Please take a GPS reading

Push the 'Save GeoPoint' button when the accuracy of the GPS measure is less than 25 m. Avoid taking it inside house or under trees (to make it faster).

If household is absent, team should revisit the household once before leaving the village to conduct the interview.

Please add any relevant comments (OPTIONAL)

I confirm that questionnaire is complete

Yes

No

Annex 5 - <u>Map of Area</u>

Figure 12-10: Survey Area



References

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