AFGHANISTAN

Integrated Nutrition, Mortality, WASH, and Food Security SMART Survey

Final Report

Khost Province, Afghanistan

10th to 21st January 2019

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Acronyms and Abbreviations

AAH	Action Against Hunger
AfDHS	Afghanistan Demographic and health survey
ACTD	Afghanistan Center for Training and Development
BPHS	Basic Package of Health Services
BSU	Basic Sampling Unit
CDR	Crude Death Rate
CSO	Central Statistics Organization
ENA	Emergency Nutrition Assessment
ERM	Emergency Response mechanism
ECHO	European Commission Humanitarian Aids and Civil Protection
FCS	Food Consumption Score
GAM	Global Acute Malnutrition
HH	Household
IYCF	Infant and Young Child Feeding
IEC	Information Education Communication
MUAC	Mid Upper Arm Circumference
MW	Mean Weight
MSF	Medicine sanse of fronteirs
NNS	National Nutrition SurveyPPS
OW	Observed weight
OHPM	Organization for Health Promotion and Management
PPS	Proportional Population to Size
PSU	Primary Sampling Unit
RC	Reserve Cluster
PNO	Provincial Nutrition Officer

rCSI	Reduced Coping Strategies Index
SAM	Severe Acute Malnutrition
SD	Standard Deviation
SMART	Standardized Monitoring and Assessment of Relief and Transition
U5DR	Under five Death Rate
UNICEF	United Nation Children's Fund
WASH	Water Sanitation and Hygiene
WFP	World Food Program
WHZ	Weight for Height Z score
W/H	Weight for height
WHO	World Health Organization

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1. EXECUTIVE SUMMARY

Khost is one of the 34 provinces of Afghanistan, located in the eastern part of the country. To the East, Khost province is bordered by Waziristan and Kwarma from Pakistan. Matoon is the capital of the province.

A nutrition and mortality survey was conducted in Khost Province from the 10 to the 21 January 2019 during the winter season. It was a cross-sectional population-representative survey following the Standardized Monitoring and Assessment of Relief and Transition (SMART) methodology. Report presents the analysis and interpretation of the nutritional status of children under five, the nutritional status of women 15-49 years old, and additional indicators as infant and young child feeding (IYCF) practices, measles immunization coverage, water, sanitation and hygiene (WASH) practices, food security situation, and retrospective mortality rates. The summary of the key findings are presented in Table 1 below.

Table 1. Summary of Findings

Child Nutritional Status by WHO cut-offs	
Indicator	**Prevalence**
GAM prevalence among children 6-59 months per WHZ <-2SD*	9.1% (6.6-12.5 95% CI)
SAM prevalence among children 6-59 months per WHZ <-3SD	1.3% (0.6- 2.7 95% CI)
GAM prevalence among children 0-59 months per WHZ <-2SD	9.9% (7.6-12.9 95% CI)
SAM prevalence among children 0-59 months per WHZ <-3SD	1.6% (0.9- 2.8 95% CI)
GAM prevalence among children 6-59 months per MUAC <125 mm	5.5% (3.8- 8.1 95% CI)
SAM prevalence among children 6-59 months per MUAC <115 mm	1.6% (0.8- 2.9 95% CI)
Combined GAM prevalence among children 6-59 months per WHZ <-2SD or MUAC <125mm	12.0% (9.0-16.0 95% CI)
Combined SAM prevalence among children 6-59 months per WHZ <-3SD or MUAC <115 mm	2.5% (1.5- 4.2 95% CI)
Stunting among children 6-59 months per HAZ <-2SD	26.9%

	(22.4-31.9 95% CI)
Severe Stunting among children 6-59 months per HAZ <-3SD	6.1% (4.2- 8.8 95% CI)
Underweight among children 6-59 months per WAZ <-2SD	16.8% (13.1-21.3 95% CI)
Severe Underweight among children 6-59 months per WAZ <-3SD	3.1% (1.8- 5.0 95% CI)

**GAM and SAM prevalence by any indicator include cases of nutritional oedema*

Nutritional Status of Women	
Indicator	**Result**
Low MUAC among all women 15-49 years per MUAC <230mm	16.1% (13.7-18.5 95% CI)
Low MUAC among pregnant women per MUAC <230 mm	20.7% (14.1-27.3 95% CI)
Low MUAC among lactating women per MUAC <230 mm	12.8% (9.0-16.6 95% CI)
Low MUAC among all pregnant and lactating women per MUAC <230mm	16.8% (13.5-20.1 95% CI)

Infant and Young Children Feeding Practices	
Indicator	**Result**
Initiation of breastfeeding within 1 hour of birth among children 0-23 months	63.8%
Exclusive breastfeeding among infants 0-5 months	85.7%
Continued breastfeeding at 1 year among children 12-15 months	94.7%
Continued breastfeeding at 2 year among children 20-23 months	96.0%

Child Immunization	
Indicator	**Result**

Second dose measles vaccination among children 18-59 months confirmed by vaccination card	14.6%
Second dose measles vaccination among children 18-59 months confirmed by caregiver recall	69.4%
Second dose measles vaccination among children 18-59 months confirmed by vaccination card or caregiver recall	84.0%

Crude and Under Five Death Rate (Death/10,000/Day)	
Indicator	**Result**
Crude Death Rate (CDR)	0.28 (0.16-0.48)
Under five Death Rate (U5DR)	0.32 (0.10-0.97)

Main Drinking Water Source N= 543	Frequency	%
Improved Water Source	526	96.9%
Unimproved Water Source	17	25.6%

Hand washing practices by caregivers N= 897	Frequency	%
Uses soap or ash with water	664	74.0%
Uses only water	233	26.0%

Household Coping Strategies N=543	Frequency	%
Reported insufficient food or money to buy food per 7-day recall	453	22.7%
Relying on less preferred and less expensive foods	80	14.7%
Borrowing food, or rely on help from a friend or relative	81	14.9%
Limiting portion size at mealtimes	36	6.6%
Reducing number of meals eaten in a day	33	6.1%
Restricting consumption by adults in order for small children to eat	26	4.8%

2. INTRODUCTION

Khost is one of the 34 provinces of Afghanistan, located in the eastern part of the country. To the East, Khost province is bordered by Waziristan and Kwarma from Pakistan. Khost Province used to be part of Paktia Province in the past, and the larger region surrounding Khost is still called Loya Paktia ("Greater Paktia"). The city of Maton serves as the capital of Khost province. The population of the province is around 614,584,[1] which is mostly a tribal society.

Figure 1:Khost Province Map (source: Wikipedia)

Khost is located about 150 kilometers South of Kabul. Khost lies on a plateau of minimally 1,000 meters (3,300 ft.) altitude that extends to the East for about 40 kilometers (25 mi) until the Pakistan border. 30 km to the North the peaks start up to 2,500 to 3,000 meters (8,200 to 9,800 ft.) right next to the frontier, while 20 kilometers (12 mi) to the South, near the border, the average is around 1,800 m.

In accordance with the Afghanistan's Nutrition Cluster annual report, Khost province was planned for nutrition need analysis in 2018. Based on the IPC report on 2018, Khost was identified at a second phase, with people living in stress.[2] The province is also host of the IPDs and Refugees from Pakistan Wazirestan area.

Khost has thirteen districts including Khost Matun (capital of the province), Sapiri, Dwa Manda, Nader Shah Kot, Ismail Khail, Mandozai, Tani, Garbaz, Alisher, Sabari, Baak, Zazai Maidan, Musa Khail and Qalandar.

Data collection was conducted in Khost province from 10 Jan to 21st Jan 2019 [The Months Jadi 1397 in Solar Calendar] at winter season. The survey was conducted by the local NGO OHPM with technical support of Action Against Hunger (AAH) and in closecoordination with the MoPH (PND) and their local authorities. The survey covered the entire province, with secure and partially secure villages in the 13districts (.

2.1 Economy and Demography

[1] CSO update population 2018/19

[2] IPC 2018 Report.

Inhabitant's main income sources are related to agricultural farms, collecting pine-nuts and conifer harvests. Meanwhile, numerous families rely on male relatives working abroad, mostly in UAE and Pakistan.
The main language spoken in the province is Pashto. The inhabitants of the province are mostly Sunni Muslim, so the population which is living in the urban and rural was12, 789 and 601, 795.

2.3. Humanitarian Assistance

Ten national and international organizations (including MSF, ACTD, and ARCS) are providing Health services and one national NGO is working for health and nutrition services in the province, OHPM. OHPM and MOPH are providing health services as Basic package of health services (BPHS) and Essential Package of Health Services (EPHS) implementers in the province. In Khost province, there are a total of 42 health facilities, including 1 Provincial Hospital, 12 comprehensive health centers (CHCs and CHCs+), 8 basic health centers (BHCs), 20 health sub-centers (HSCs), and 1 prison health center. From those, 30 HFs have OPD SAM and 18 HFs have OPD MAM (TSFP) delivering nutrition services to malnourished cases. It is notable that 8 others health facilities, 1 hospital (100 beds) and 2 health mobile teams providing health services are managed by different organizations outside of the BPHS/EPHS framework. 1 provincial hospital is providing the EPHS, with support from OHPM and under the MoPH governance.

3. SURVEY OBJECTIVES

3.1 Primary Objective

To investigate the nutritional status of children under five years of age, and women 15-49 years old living in Khost province.

3.2 Specific Objectives

- To estimate the prevalence of undernutrition (Stunting, Wasting, Underweight) among children aged 6-59 months and children aged 0-59 months.
- To estimate Crude Death Rate (CDR) and under-five Death Rate (U5DR).
- To determine core Infant and Young Child Feeding (IYCF) practices among children aged <24 months.
- To estimate second dose measles vaccination coverage among children 18-59 months.
- To determine the nutritional status of women based on MUAC assessment.
- To assess Water, Sanitation, and Hygiene (WASH) proxy indicators households level main drinking water sources and caregiver hand washing practices.
- To assess the food security situation through the Food Consumption Score (FCS) and the Reduced Coping Strategies Index (rCSI).

3.3 Survey Justification

There was a need to investigate the current prevalence of under-nutrition in the province, as the last province-level nutrition survey was conducted in Khost in early 2015.

- The area was selected by the nutrition cluster and Assessment Information Management Working Group AIM-WG) to know the nutrition situation in the districts.
- It was also an opportunity for building the technical capacity of the local partner OHPM.
- The findings of nutrition assessments carried out during 2017 were used as a basis for the 2018 humanitarian response plan. The 2018 nutrition needs analysis using the most recent nutrition assessment information identified 24 priority provinces ; one of those was Khost province.
- Based on the IPC report on 2018, Khost was identified at the second phase of food security.
- The Survey findings will be used to inform future programming in the province.

4. METHODOLOGY

4.1 Sample Size

The household sample size to be surveyed was determined using ENA for SMART software version 2011 (updated 9th July 2015). A two-stage cluster methodology was applied. Villages were the Primary Sampling Unit (PSU) for the proposed survey. The first stage involves the selection of clusters/villages from a total list of villages using the Probability Proportion to Size (PPS) method. This was done before starting the data collection at the office or training hall. The second stage of the methodology involved the random selection of households from a complete and updated list of households. This was conducted at field level. Households were the Basic Sampling Unit (BSU) for the proposed survey. Tables 2 and 3 highlights the parameters used for sample size calculation for anthropometric and mortality surveys.

Table 2: Sample size calculation of anthropometry

Parameters for Anthropometry	Value	Assumption and Source
Estimated prevalence of GAM (%)	**6.5%**	Based on Khost SMART Survey June 2015. GAM prevalence (WHZ) for Khost was estimated at 6.5 % (5.2-8.1 95% CI),
Desired precision	**±2.5**	Based on SMART recommendation and consistent with survey objectives in order to estimate the prevalence.

Design Effect	**1.5**	The population living in the targeted districts was considered to have similar living conditions and access to resources. Nevertheless, access to health facilities was estimated different within the targeted population as some remote areas are not well served by health facilities. Hence, the design effect was estimated at 1.5.
Children to be included	**610**	Minimum sample size-children aged 6-59 months.
Average HH Size	**8.0**	Based on Khost SMART June 2015 the average HHs size was estimated at 8.0
Children under five	**17.3 %**	Based on Khost SMART June 2015

Based on Khost SMART June 2015, the non-response rate is estimated at 10%. Awareness of the population about nutrition assessment was estimated low, with risk of refusal from HH to participate. The survey was also conducted during winter time, period when challenges are faced to reach villagers.

Households to be included	**544**	Minimum sample size-Households were surveyed.

**However all children 0-59 months in each household was measured for additional analyses and indicators*

Table 3: Sample size calculation of mortality

Parameters for Mortality	Value	Assumption and Source
Estimated death rate/10,000/day	0.5	Standard SMART recommended death rate estimation when there is no mortality data available.
Desired precision/10,000/day	±0.3	Based on SMART recommendation
Design effect	1.5	Based on Khost SMART assessment , June 2015
Recall period in days	**117**	Starting point of recall period was 20th September 2018 (29th Sunbula 1397) (Ashura) to the mid-point of data collection, the 15th January 2019 (25th Jadi 1397).
Population to be included	**2,979**	**Population**
Average HH size	**8.0**	Based on Khost SMART June 2015
Non-response rate	**10 %**	Based on Khost SMART Survey June 2015
Households to be included	**414**	Households were included

Based on the SMART methodology, between the calculated anthropometry and mortality sample sizes, the largest sample size was used for the survey. In this case, the larger sample size was 544 households. All additional indicators (women nutritional status, IYCF, immunization coverage, WASH, food security) were collected based on this sample size.

4.2 Sampling Methodology

A two-stage cluster sampling methodology was implemented.

Stage 1: Selection of clusters/villages was conducted using probability proportional to size (PPS) by ENA for SMART software (updated version 9th July 2015). A list of all updated villages was uploaded into the ENA for SMART software where PPS was applied. The list of villages/cluster was gathered from the Basic Package of Health Services (BPHS) providers in consultation with PPHD and local government to finalize the sampling frame. For Khost district (capital of Khost) which is mixed of semi-urban and rural area, the list of clusters was gathered based on the zone/street/Guzar[3](a part of the village) from semi-urban places while a list of villages was gathered from the rural site of the district based on the latest EPI micro-plan. Totally 1669 villages were in the province from those villages 335 were excluded from sampling frame which were insecure and inaccessible[4] it is notable that Gulan camp[5] was also excluded from the total sample size at the beginning. . The villages with large population had a higher chance of being selected than villages with a small population and vice versa. Six Reserve Clusters (RCs) were also selected by ENA software Reserve which was not used any RC in the province. Based on the estimated time to travel to the survey area, select and

[3] Some of the large villages are divided into small parts, each part is called Guzar.

[4] Totally we had 1669 villages in the province, so 335 villages were inaccessible to be surveyed there for these were excluded for our sapling frame.

[5] Gulan camp; refuges from Pakistan Waziristan people

survey the households, it was estimated that each team could effectively survey 11 HHs per day. (544/11=49.4 clusters, rounded up to 50 Clusters),

Table 4: Field work time table.

Total working time	
Time for transportation (round trip)	2 hr (120 min)
Coordination with Village elder and preparation of HH list	0.5 hr (30 min)
Time for break and pray	1 hr (60 min)
Time for interview: how long will last your interview?	15 min
Distance form one HH to another HH	9 min

In each selected village, one or more community member(s) were asked to help the survey teams to conduct the survey by providing information about the village (eg: geographical organization, number of households). In cases of large villages or semi-urban zones/small city in a cluster, the village/zones were divided into smaller segments and a segment was selected randomly (if similar in size) or using PPS to represent the cluster. This division was based on existing administrative units e.g. neighborhoods, zone, Guzar, streets, or natural landmarks like a river, road, or public places like market, schools, and mosques.

Stage 2: The household was defined as "all people eating from the same pot and living together" (World Food Program (WFP) definition). The household was the BSU. In Afghanistan, the term household is often used synonymously with a compound potentially representing more than one household. Hence, the household definition was explained to key informants before updating the household list to identify compounds composed of multiple households in advance.

In this assessment, households were chosen within each cluster using systematic random sampling. 6 teams were engaged during the assessment. The data collection was conducted over 9 days. All households were listed and numbered by the survey team. The 11 households were identified from this enumerated household list using systematic random sampling. The teams were trained on both methods of sampling (simple random sampling and systematic random sampling) and carried materials to assist in selecting the households during data collection. For the semi-urban areas in the province, the teams have taken into account multistoried

buildings as multiple HHs depending on the HH definition. In the case of a multistoried building containing multiple households accidentally counted as one HH during the initial listing process, the enumerators have done another round of randomization to select one HH.

Every household was asked to consent before any data was collected. All children 0 to 59 months living in the selected house were included for anthropometric measurements, including twins and orphans or unrelated children living with the household. Children aged <24 months were included for IYCF assessment.. Households without children were still assessed for household level questions (women nutritional status, WASH, food security, mortality).

Any absent households or households with missing or absent women or children were revisited at the end of the day before leaving the cluster. The missing or absent child not found after multiple visits was not included in the survey. A cluster control form was used to record all household visits and note any missed and absent households. Abandoned HHs were ideally excluded from the total HHs list before surveying began.

4.3 Training, Team composition, and Supervision

Six teams of four members conducted the field data collection. Each team was composed of one team leader, two measurers, and one interviewer. Each team had one female surveyor to ensure acceptance amongst the surveyed households, particularly for IYCF questionnaires. Each female member of the survey team was accompanied by a mahram[6]. The majority of the population speaks and understands the Pashto language; therefore, the survey manager used Pashto to conduct training. The Pashto version of the questionnaire was used on the field. The teams were supervised by AAH, OHPM and PPHD staff.

Figure 2: Picture from survey field.

All surveyors have received a 7-day training on the survey methodology and all its practical aspects; two AAH technical staffs have facilitated the training. A standardization test was conducted over the course of 1 day, measuring 20 children (10 children in the morning and 10 children another afternoon) in order to evaluate the accuracy and the precision of the team members in taking the anthropometric measurements. The teams have conducted a one-day field test in order to evaluate their work in real field conditions.

[6] In most areas of Afghanistan women are always accompanied outside of the home by a male relative called a 'Mahram'.

Feedback was provided to the team about the results of the field test; particularly in relation to digit preferences and data collection method. Refresher training sessions on anthropometric measurements, filling questionnaires and household's selection were organized on the last day of the training by AAH to ensure overall comprehension before going to the field.

A field guidelines document with instructions including household definition and selection was provided to each team member. All documents, such as local event calendar (annex 2), questionnaires (annex 5) or consent forms were translated into Pasto, the local language, for better understanding and to avoid direct translation during the data field collection. The questionnaires were back translated using a different translator and were pre-tested during the field test.

4.4 Data Analysis

Data analysis was conducted using ENA software for SMART for anthropometric and mortality data. The ENA Plausibility Check (annex 3) was used both to monitor data quality during data collection and to assess data quality upon completion. Additional indicators were analysed using Microsoft Excel version 2016. Contextual information gathered in the field was used to complement survey results and strengthen analysis. Interpretation of each result was based on existing global and national thresholds for different indicators.

4. INDICATORS: DEFINITION, CALCULATION AND INTERPRETATION

4.1. Overview of Indicators

The indicators assessed and corresponding target population are presented in Table 4 below.

Table 5: Standardized Integrated SMART Indicators Updated 2018

Indicator	Target Population
Anthropometry	
Acute Malnutrition by WHZ	Children 0-59 and 6-59 months
Acute Malnutrition by MUAC	Children 6-59 months
Acute Malnutrition by Combined (WHZ and/or MUAC)	
Chronic Malnutrition by HAZ	
Underweight by WAZ	
Mortality	
Crude Mortality Rate (CDR)	Entire population
Under Five Mortality Rate (U5MR)	Children under five
IYCF	
Early Initiation of Breastfeeding	Children <24 months

Exclusive Breastfeeding (EBF)	Infants 0-5 months
Continued Breastfeeding at 1 Year	Children 12-15 months
Continued Breastfeeding at 2 Years	Children 20-23 months
Health	
Measles Vaccination (2 doses)	Children 18-59 months
WASH	
Access to improved and unimproved drinking water	Household
Hand washing practices among caregivers (use of soap or ash)	Caregivers of children under five
Proportion of caregivers washing their hands during critical times	
FSL	
Food Consumption Score (FCS)	Household
Reduced Coping Strategy Index (rCSI)	
Food Security Situation (FCS & rCSI)	
Mean consumption of food groups per 7 day recall (from FCS data)	
Women of Reproductive Age & PLW	
MUAC	Women 15-49 years and PLW

4.2 Anthropometric Indicators

Acute Malnutrition

Acute malnutrition in children 6-59 months was expressed by using three indicators. Weight for Height (W/H) and Mid Upper Arm Circumference (MUAC) are described below. Nutritional edema was the third indicator of severe acute malnutrition. Additionally, the prevalence of GAM amongst 0-59 was reported.

Weight-for-height index (W/H)

A child's nutritional status was estimated by comparing it to the weight-for-height distribution curves of 2006 WHO growth standards reference population. The expression of the weight-for-height index as a Z-score (WHZ) compares the observed weight (OW) of the surveyed child to the mean weight (MW) of the reference population, for a child of the same height. The Z-score represents the number of standard deviations (SD) separating the observed weight from the mean weight of the reference population: WHZ = (OW - MW) / SD.

During data collection, the weight-for-height index in Z-score was calculated in the field for each child in order to refer malnourished cases to the appropriate center if needed. Moreover, the results were presented in Z-score using WHO reference in the final report. The classification of acute malnutrition based on WHZ is well illustrated in Table 5.

Table 5: Definition of acute malnutrition according to weight-for-height index (W/H), expressed as a Z-score based on WHO standards

Severe Acute Malnutrition (SAM)
W/H <-3 z-score and /or bilateral oedema
Moderate Acute Malnutrition
W/H <-2 z-score and >= -3 z-score and absence of bilateral oedema
Global Acute Malnutrition (GAM)
W/H <-2 z-score and /or bilateral oedema

Mid Upper Arm Circumference (MUAC)

The mid upper arm circumference does not need to be related to any other anthropometric measurement. It was a reliable indicator of the muscular status of the child and was mainly used to identify children with a risk of mortality. The MUAC is an indicator of malnutrition only for children greater or equal to 6 months. Table 6 provides the cut-off criteria for categorizing acute malnutrition cases.

Table 6: MUAC cut-offs points for children aged 6-59 months

Target Group	MUAC (mm)	Nutritional Status
Children 6-59 months	> or = 125	**No malnutrition**
	< 125 and >= 115	**Moderate Acute Malnutrition (MAM)**
	< 115	**Severe Acute Malnutrition (SAM)**

Nutritional bilateral "pitting" oedema

Nutritional bilateral pitting oedema is a sign of Kwashiorkor, one of the major clinical forms of severe acute malnutrition. When associated with Marasmus (severe wasting), it is called Marasmic-Kwashiorkor. Children with bilateral oedema are automatically categorized as being severely malnourished, regardless of their weight-for-height index. Table 6 below defines the acute malnutrition according to W/H index and oedema.

Chronic Malnutrition

The height-for-age index (H/A)

The height-for-age measure indicates if a child of a given age was stunted also known as chronically malnourished. This index reflects the nutritional history of a child rather than his/her current nutritional status. This was mainly used to identify chronic malnutrition. The same principle was used as for weight-for-height; except that a child's chronic nutritional status was estimated by comparing its height with WHO standards height-for-age curves, as opposed to weight-for-height curves. The height-for-age index of a child from the studied population is expressed in Z-score (HAZ). The HAZ cut-off points are presented in Table 7.

Table 6: Cut offs points of the Height for Age index (HAZ) expressed in Z-score, WHO standards

Not stunted	≥ -2 z-score
Moderate stunting	-3 z-score ≤ H/A < -2 z-score
Severe stunting	< -3 z-score

Underweight

Underweight was a compound index of height-for-age and weight-for-height. It takes into account both acute and chronic forms of malnutrition. While underweight or weight-for-age were used for monitoring the previous Millennium Development Goals, it was no longer use for monitoring individual children, as it cannot detect children who were stunted. Furthermore, it does not detect life-threating acute malnutrition among children. The WAZ cut-off points are presented in the table below.

Table 7: Cut offs points of the Weight for Age index (WAZ) expressed in Z-score, WHO standards

Global underweight	WAZ ≥ -2 z-score
Moderate underweight	-3 z-score ≤ W/A < -2 z-score
Severe underweight	WAZ < -3 z-score

Table 8: Classification for Severity of Malnutrition by Prevalence among Children under Five. [7].

LABELS	PREVALENCE THRESHOLDS (%)		
	WASTING	OVERWEIGHT	STUNTING
Very low	< 2.5	< 2.5	< 2.5
Low	2.5 - < 5	2.5 - < 5	2.5 - < 10
Medium	5 - < 10	5 - < 10	10 - < 20
High	10 - < 15	10 - < 15	20 - <30
Very high	≥ 15	≥ 15	≥ 30

Table 9: Classification of underweight prevalence according to the public health significance for children under 5 years of age

Severity level	Low weight-for-age (underweight)
Low	< 10%
Medium	10-19%
High	20-29%
Very High	≥ 30%

4.3 Mortality

The mortality indicators included all households, regardless of the presence of children. All members of the household was counted, using the household definition.

[7] UNICEF WINS | Issue 24 | 13 December 2018 | Moving to Updated Prevalence Thresholds

a. Crude death rate (CDR)

The number of persons in the total population that dies over specified period of time refers to the Table 3 above for Sample size calculation for mortality surveys

$$CDR = \frac{\text{Nb of deaths x 10000 persons}}{\text{population at mid} - \text{interval x time interval in days}}$$

b. Under-5 death rate (U5DR)

The number of children aged (0-5) years that die over specified period of time Table 2 above for Sample size calculation for mortality surveys. Calculated as:

$$U5DR = \frac{\text{Nb of deaths of U5s x 10000 U5s}}{\text{population of U5s at mid} - \text{interval x time interval in days}}$$

4.4 Infant and Young Child Feeding

The indicators used in the measurement of infant and young child feeding practices asked to the caregivers of children aged <24 months are described as follows.

Timely initiation of breastfeeding

The Proportion of children born in the last 23 months who were put to the breast within one hour of birth. The indicator is calculated by dividing the number of children born in the last 24 months who were put to the breast within one hour of birth by children born in the last 24 months. The denominator and numerator include living children and deceased children who were born within the past 24 months. This indicator is based on historical recall.

Exclusive breastfeeding

Proportion of infants 0-5 months of age who are fed exclusively with breast milk. It is calculated by dividing the number of all infants aged 0–5 months who receive **only** breast milk during the previous day by total infants aged 0-5 months.

Continued breastfeeding at 1 year

Proportion of children 12 – 15 months of age who are fed with breast milk. It's calculated by dividing the total number of children aged 12–15 months who received breast milk during the previous day by total children aged 12–15 months

Continued breastfeeding at 2 years

Proportion of children 20–23 months of age who are fed breast milk. It is calculated by dividing the number of children aged 20–23 months who received breast milk during the previous day by total children aged 20–23 months.

4.5 Immunization

Measles Immunization Coverage

Caregivers of all children 18-59 months was asked if the child received a second dose of measles vaccinations, which was subsequently verified by reviewing the vaccination card, if available. If the vaccination card was not available, then recall of the caregiver option was considered.

4.6. Maternal Nutrition

Women in childbearing age was assessed for their nutritional status based on MUAC measurements. The nutritional status of pregnant and lactating mothers was derived using the MUAC cut-off of 230 mm.

4.7. Water, Sanitation and Hygiene

Water Quality

Household heads was asked, what their current main source of drinking water is. To assess if households are relying on improved or unimproved water sources.

Hand washing practices

Caregivers was asked to demonstrate how they wash their hands to assess the use of soap or ash and water when washing hands.

Caregivers was asked on what occasions they wash their hands to assess hand washing practices at 5 critical moments.

5. FOOD SECURITY

5.1. Food Consumption Score

1. Questions were asked to assess the food groups consumed by the household in the past 7 days to calculate the FCS.

2. Questions were also asked to understand if during the past 7 days, the household did not have enough food to eat, and what coping strategies were used in response to this to calculate the rCSI. The resulting scores are categorized by FCS score as presented in Table 9 below:

Table 10: Food Consumption Score Categories

FCS Category	FCS Score
Poor	0 to 28
Borderline	>28 to 42
Acceptable	>42

5.2. Reduced Coping Strategies Index[8]

The rCSI is used as a proxy indicator for household food insecurity. The rCSI is calculated as the weighted sum of the frequency of a short list of five food-related coping strategies applied in the seven days prior to the survey based on household recall. The strategies are calculated with the following weightings: the recourse to cheaper or less preferred foods 1, reduced portion sizes at meals 1, borrowing food 1, restricting consumption by adults in order for small children to eat 3, and reducing the number of meals 1. The resulting scores are categorized by rCSI score as presented in Table 10 below:

Table 11: Reduced Coping Strategies Index Categories by Score

rCSI Category	rCSI Score
No or low coping	0-9
Medium coping	10-17
High coping	≥18

Food Security Classification

The triangulation of FCS and rCSI categories attempts to better capture household food security. The classification is assessed in the following manner and as presented in Table10 below:

- Households having poor food consumption with high or medium coping strategies and those with borderline food consumption but with high coping are considered as **severely food insecure**.
- Households having poor food consumption with no or low coping strategies, households having borderline food consumption with medium coping strategies and households having acceptable consumption but with high coping strategies are considered as **moderately food insecure**.

[8] Adapted from WFP (2015) *Kabul Informal Settlement (KIS) Winter Needs Assessment FINAL REPORT ON FOOD SECURITY, December 8th, 2015*

- Households having borderline or acceptable food consumption with low or medium coping are considered as **food secure**.[9]

Table 12: Food Security Classification as Assessed by FCS and rCSI

FCS	rCSI		
	High coping	**Medium coping**	**No or low coping**
Poor	Severely food insecure	Severely food insecure	Moderately food insecure
Border line	Severely food insecure	Moderately food insecure	Food secure
Acceptable	Moderately food insecure	Food secure	Food secure

6. LIMITATIONS

- Insecurity was one of the major limitation of the assessment in the province. Due to this issue, AAH team was not able to have direct technical supervision in some clusters.
- The illiteracy and low awareness in health/hygiene, Nutrition especially IYCF of the target population were problematic in involving them for sharing health/nutrition messages.
- Only 19% of the surveyed children had documentation to evidence their exact date of birth; therefore 81% of the children were without exact birth date documentation. Due to the lack of reliable and available documentation of birth, the teams relied on a local events calendar to estimate age. This may have reduced the quality of the collected age data, with possible bias in age determination (and therefore stunting and underweight prevalence).
- As mentioned few percentage of children had vaccination cards but the birth date mentioned by vaccination cards was also wrong in many cases. It was not matching with the exact date of birth of children, representing a challenge for enumerator.

[9] Adapted from WFP (2015) *Kabul Informal Settlement (KIS) Winter Needs Assessment FINAL REPORT ON FOOD SECURITY, December 8th, 2015*

7. SURVEY FINDINGS

7.1. Survey Sample

Overall, the survey assessed 50 clusters, 543 households, 4,030 individuals (1,846 female and 2,184 male), 897 women 15-49 years, 841 children under five, and 760 children 6-59 months. Among the 543 households, the teams attempted to survey, 7 were absent or refused, resulting in a non-response rate of 1.3%. Overall, 98.7% of the planned households were assessed.

Table 13: Proportion of Household and Child Sample Achieved

Number of households planned	Number of households surveyed	% surveyed of planned	Number of children 6-59 months planned	Number of children 6-59 months surveyed	% surveyed of planned
550	543	98.7%	610	760	124.5%

The mortality questionnaire was further designed to gather demographic data and capture in- and out-migration. Household demographics and movement are presented in Table 14 below. The survey findings indicate that the average household size was 7.4 (so close to the 8% estimate at planning stage). 45.8% of the population was female, 54.2% of the population was male, and 21.0% was under five. The observed rate of IN/OUT-MIGRATION 0.04 and 0.41 during the recall period may have been influenced by 117 recall period days.

The nonresponse rate was strongly affected by the security situation and seasonality of area which our result shows high discrepancy with last estimated NRR.

Table 14: Demographic Summary

Indicator	Values
Total number of clusters	50
Total number of HHs	543
Total number of HHs with children under five	505
Average household size	7.4
Female % of the population	45.8%
Male % of the population	54.1%
Children under five % of the population	21.0%
Birth Rate	1.01/10,000/day

In-migration Rate (Joined)	0.04/10,000/day
Out-migration Rate (Left)	0.41/10,000/day

Households were also assessed for residential status. Among the 543 surveyed households, 85.8% were residents of the area, 13.8% were internally displaced, 0.36% were nomads and 0.0 % were refugee.

Table 15: Household Residential Status by Proportion

Residential Status of Households N= 543	Resident	466	85.8%
	IDP	75	13.8%
	Refugee	0	0.0%
	Nomad	2	0.4%

As the age and sex of all household members were assessed, it was also possible to disaggregate the population by sex and five year age interval, as presented in Figure 3 below. The pyramid is wide at the base and narrows towards the apex,

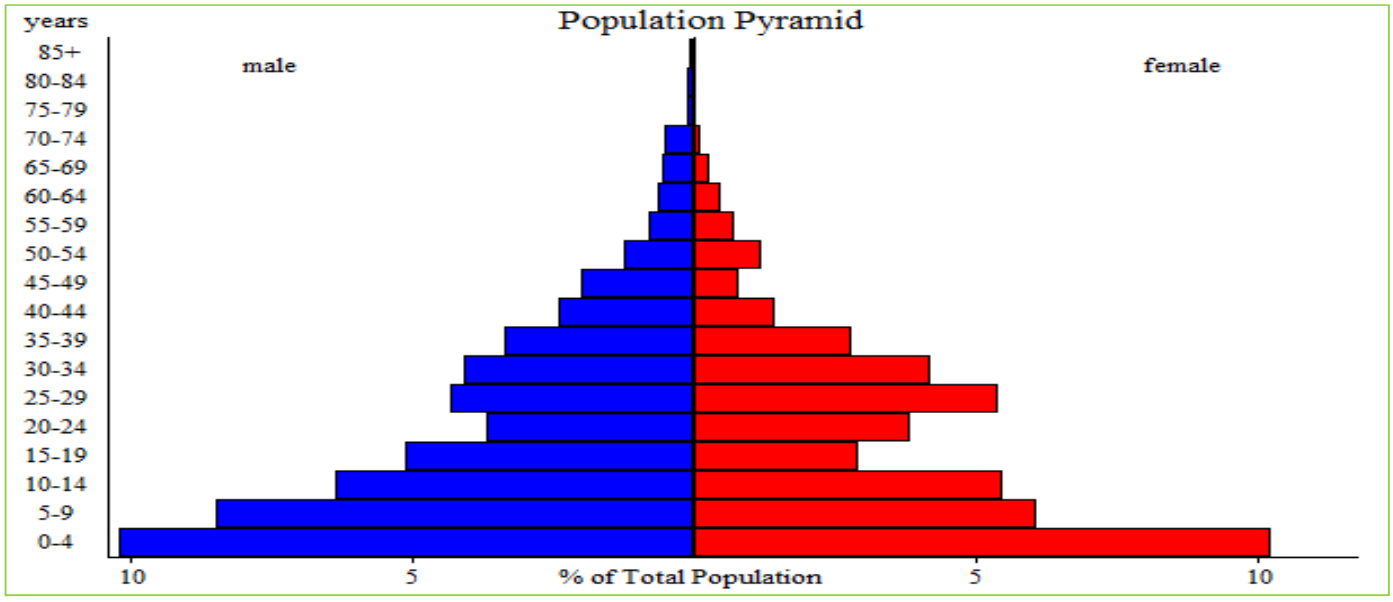


Figure 3: Khost Province Population Pyramid

The surveyed sample of children 6-59 months was 760. The distribution as disaggregated by age and sex are presented in Table 16 below. 54-59 months aged girls are less represented than boy's maybe because of cultural barriers existing in the community with some families not allowing our teams to measure girls. The

overall sex ratio was 1.0, indicating a sample equally represented. 81% children were with no exact birth date.

Table 16: Distribution of Age and Sex of among Children 6-59 months

	Boys		Girls		Total		Ratio
AGE (months)	no.	%	no.	%	no.	%	Boy:Girl
6-17	86	46.7	98	53.3	184	24.2	0.9
18-29	90	45.5	108	54.5	198	26.1	0.8
30-41	114	59.1	79	40.9	193	25.4	1.4
42-53	71	53.4	62	46.6	133	17.5	1.1
54-59	24	46.2	28	53.8	52	6.8	0.9
Total	385	50.7	375	49.3	760	100.0	1.0

7.2. Data Quality

12 children were excluded from WHZ analysis per SMART flags, resulting in an overall percentage of flagged data of 1.6%. It was lower than the SMART Methodology recommendation of less than 5.0% and judged as excellent by the ENA Plausibility Check. The overall WHZ analysis utilized the data from 748 children.

The standard deviation, design effect, missing values, and flagged values are listed for WHZ, HAZ, and WAZ in Table 17 below. The SD of WHZ was 1.06, the SD of HAZ was 1.15, and the SD of WAZ was 1.01, all WHZ, HAZ and WAZ met the normal range (0.8 and 1.2) indicating an adequate distribution of data around the mean and data of excellent quality.

Table 17: Mean Z-scores, Design Effects, Missing and Out-of-Range Data of Anthropometric Indicators among Children 6-59 Months

Indicator	N	Mean z-scores ± SD	Design effect (z-score < -2)	Z-scores not available*	Z-scores out of range
Weight-for-Height*	748	-0.47±1.06	1.90	0	12
Weight-for-Age*	754	-1.01±1.01	2.24	0	6
Height-for-Age	733	-1.26±1.15	2.13	0	27

* contains for WHZ and WAZ the children with edema.

Additional statistical tests administered to study the distribution of the sample included:

- The Skewness coefficient for WHZ was considered of Good quality by the ENA Plausibility Check, suggesting the distribution curve was symmetrical, as demonstrated in figure 3 below.
- The Kurtosis coefficient for WHZ was considered of Excellent quality by the ENA Plausibility Check, suggesting there was no kurtosis.
- The Poisson distribution for WHZ was statistically significant (p=0.006) and considered of Acceptable quality by the ENA Plausibility Check, suggesting there was no observed aggregation of acute malnutrition cases in specific clusters.

The sex ratio between boys and girls 6-59 months was satisfactory at 1 boys/girls (expected value between 0.8 and 1.3) (p=0.717) suggesting that boys and girls were equally represented. The overall sex ratio was considered of Excellent quality by the ENA Plausibility Check.

Age ratio of 6-29 months to 30-59 months: 1.01 (The value should be around 0.85).:
p-value = 0.017 significant difference.
Digit preferences scores for weight 0 (4), height 0 (7), and MUAC 0 (5) were considered of Excellent by the ENA Plausibility Check. The overall ENA Plausibility Check score was 8%, which is considered as a survey of Excellent quality. The complete Khost ENA Plausibility Check report is presented in Annex 3.

7.3. Prevalence of Acute Malnutrition

Acute Malnutrition by WHZ

The prevalence of GAM per WHZ among children 6-59 months in Khost was 9.1% (6.6-12.5 95% CI), as presented in Table 18 below. The nutritional situation is categorized as poor according to WHO threshold.

The prevalence of SAM per WHZ among children 6-59 months was 1.3% (0.6- 2.7 95% CI). According to national cut off 3% , this SAM prevalence is categorized as Acceptable.

There is no statistical difference between boys and girls.

Table 18: Prevalence of Acute Malnutrition by WHZ (and/or oedema) by Severity and Sex among Children 6-59 months, WHO 2006 Reference

Indicators	All n = 748	Boys n = 377	Girls n = 371

Prevalence of global acute* malnutrition (<-2 z-score and/or oedema)	(68) 9.1 % (6.6 -12.5 95% C.I.)	(37) 9.8 % (6.7 - 14.1 95% C.I.)	(31) 8.4 % (5.5 - 12.6 95% C.I.)
Prevalence of moderate acute malnutrition (<-2 to ≥-3 z-score)	(58) 7.8 % (5.6 - 10.6 95% C.I.)	(33) 8.8 % (5.9 - 12.8 95% C.I.)	(25) 6.7 % (4.4 - 10.1 95% C.I.)
Prevalence of severe acute malnutrition (<-3 z-score and/or oedema)	(10) 1.3 % (0.6 - 2.7 95% C.I.)	(4) 1.1 % (0.4 - 2.8 95% C.I.)	(6) 1.6 % (0.7 - 3.5 95% C.I.)

* The prevalence of oedema was 0.0 %

The prevalence of acute malnutrition by WHZ was also assessed among children 0-59 months. The GAM per WHZ was 9.9% (7.6-12.9 95% CI) as presented in Table 19 below. The prevalence of SAM per WHZ among children 0-59 months was 1.6% (0.9- 2.8 95% CI). There is also no difference between boys and girls.

Table 19: Prevalence of Acute Malnutrition by WHZ (and/or oedema) by Severity and Sex among Children 0-59 months, WHO 2006 Reference

Indicators	All n = 816	Boys n = 407	Girls n = 409
Prevalence of global acute* malnutrition (<-2 z-score and/or oedema)	(81) 9.9 % (7.6 - 12.9 95% C.I.)	(42) 10.3 % (7.3 - 14.4 95% C.I.)	(39) 9.5 % (6.7 - 13.4 95% C.I.)
Prevalence of moderate acute malnutrition (<-2 to ≥-3 z-score)	(68) 8.3 % (6.3 - 10.9 95% C.I.)	(37) 9.1 % (6.3 - 12.9 95% C.I.)	(31) 7.6 % (5.2 - 11.0 95% C.I.)
Prevalence of severe acute malnutrition (<-3 z-score and/or oedema)	(13) 1.6 % (0.9 - 2.8 95% C.I.)	(5) 1.2 % (0.5 - 2.9 95% C.I.)	(8) 2.0 % (1.0 - 3.7 95% C.I.)

* The prevalence of oedema was 0.0 %

When disaggregating the data by age group, the group with the highest MAM and SAM was 6-17 months, as presented in Table 20 below. The age group with the lowest MAM was 54-59 months and there was no

SAM case in the age of 30-41 and 42-53 months. However, the difference per age groups is not statistically valid (p-value = 0.594 ; group 6-29 and group 30-59).

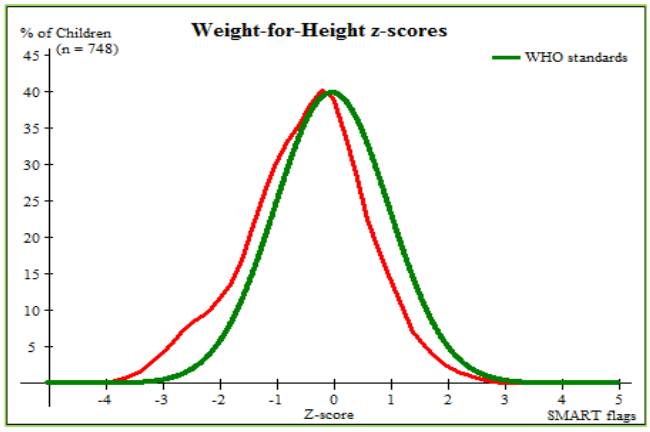
Table 20: Prevalence of Acute Malnutrition per WHZ and/or Oedema by Severity and Age Group

Age (months)	N	Severe wasting* (WHZ <-3)		Moderate wasting (WHZ ≥-3 to <-2)		Normal (WHZ ≥-2)		Oedema	
		N	%	N	%	N	%	N	%
6-17	180	7	3.9	17	9.4	156	86.7	0	0.0
18-29	193	2	1.0	10	5.2	181	93.8	0	0.0
30-41	192	0	0.0	15	7.8	177	92.2	0	0.0
42-53	132	0	0.0	11	8.3	121	91.7	0	0.0
54-59	51	1	2.0	5	9.8	45	88.2	0	0.0
Total	748	10	1.3	58	7.8	680	90.9	0	0.0

**There was not found any case of oedema.*

The WHZ distribution curve (in red) as compared to the WHO 2006 reference WHZ distribution curve (in green) as presented in Figure 3 below demonstrates a shift to the left, suggesting an undernourished population in comparison.

Figure 4: Distribution of WHZ Sample Compared to the WHO 2006 WHZ Reference Curve.



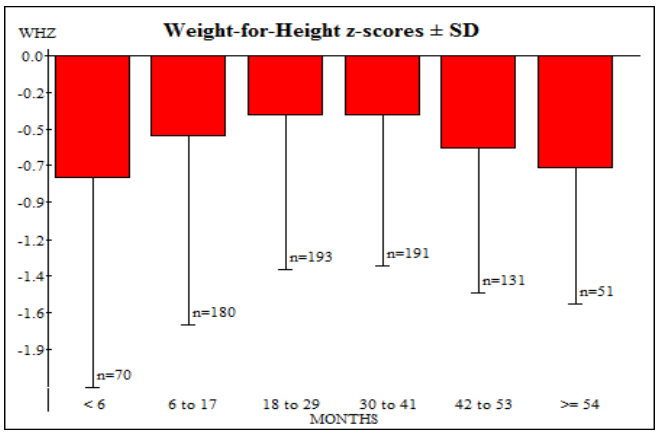


Figure 5: Age Distribution by WHZ ± SD.

Acute Malnutrition by MUAC

The prevalence of GAM per MUAC among children 6-59 months in Khost was 5.5% (3.8- 8.1 95% CI) as presented in Table 21 below. The prevalence of SAM per MUAC among children 6-59 months was 1.6%

(0.8- 2.9 95% CI). Girls are more affected by acute malnutrition according to MUAC criterion than boys (p-value < 0.05).

Table 21: Prevalence of Acute Malnutrition by MUAC (and/or oedema) by Severity and Sex among children 6-59 months.

Indicators	All n = 760	Boys n = 385	Girls n = 375
Prevalence of global malnutrition* (<125 mm and/or Oedema)	(42) 5.5 % (3.8 - 8.1 95% C.I.)	(12) 3.1 % (1.6 - 5.9 95% C.I.)	(30) 8.0 % (5.3 - 11.9 95% C.I.)
Prevalence of moderate malnutrition (< 125 mm to ≥115 mm, no Oedema)	(30) 3.9 % (2.6 - 6.0 95% C.I.)	(10) 2.6 % (1.4 - 4.9 95% C.I.)	(20) 5.3 % (3.2 - 8.7 95% C.I.)
Prevalence of severe malnutrition (< 115 mm and/or Oedema)	(12) 1.6 % (0.8 - 2.9 95% C.I.)	(2) 0.5 % (0.1 - 2.1 95% C.I.)	(10) 2.7 % (1.4 - 5.1 95% C.I.)

**There was not found any case of Oedema.*

When disaggregating the data by age group, the group with the highest MAM and SAM was 6-17 months, as presented in Table 22 below. The age group with no MAM was 54-59 months and the lowest SAM was 18-29 months. Results of this disaggregation suggests that the younger age groups (6-29) are more vulnerable to acute malnutrition than older groups (30-59) according to MUAC criterion (p-value < 0.05).

Table 22: Prevalence of Acute Malnutrition per MUAC and/or Oedema by Severity and Age Group

Age (months)	N	Severe wasting* (MUAC <115 mm)		Moderate wasting (MUAC ≥115 mm and <125 mm)		Normal (MUAC ≥125 mm)		Oedema	
		N	%	N	%	N	%	n	%
6-17	184	8	4.3	18	9.8	158	85.9	0	0.0
18-29	198	1	0.5	9	4.5	188	95.0	0	0.0
30-41	193	2	1.0	2	1.0	189	98	0	0.0
42-53	133	0	0.0	1	0.8	132	99.2	0	0.0
54-59	52	1	1.9	0	0.0	51	98.1	0	0.0
Total	760	12	1.6	30	3.9	718	94.5	0	0.0

There was not found any case of Oedema.

Acute Malnutrition by Oedema

Among all children 0-59 Months, there was no case of bilateral pitting oedema as presented in Table 23 below.

Table 23: Distribution of Severe Acute Malnutrition per Oedema among Children 6-59 Months

	WHZ <-3	WHZ>=-3
Presence of Oedema*	Marasmic kwashiorkor No. 0 (0.0 %)	Kwashiorkor No. 0 (0.0 %)
Absence of Oedema	Marasmic No. 20 (2.6 %)	Not severely malnourished No. 740 (97.4 %)

There was not found any case of oedema.

Table 24: Distribution of Severe Acute Malnutrition per Oedema among Children 0-59 Months.

	WHZ <-3	WHZ>=-3
Presence of Oedema*	Marasmic kwashiorkor No. 0 (0.0 %)	Kwashiorkor No. 0 (0.0 %)
Absence of Oedema	Marasmic No. 32 (3.8 %)	Not severely malnourished No. 809 (96.2 %)

There was not found any case of oedema.

Combined Acute Malnutrition rate

The prevalence of Combined GAM among children 6-59 months in Khost was 12.0% (9.0-16.0 95% CI) as presented in Table 24 below. The prevalence of Combined SAM among children 6-59 months was 2.5% (1.5- 4.2 95% CI). Although there is no globally established threshold for Combined GAM, the combined GAM and SAM prevalence were higher than the ones referring to WHZ or MUAC only. Combined GAM indicator seems to capture more acutely malnourished children.

There is no difference between boys and girls for the GAM or SAM prevalence.

Table 25: Prevalence of Acute Malnutrition by WHZ and/or MUAC and/or oedema by Severity and Sex among Children 6-59 months

Indicators	All N = 1082	Boys n = 526	Girls n = 556
Prevalence of Global Acute Malnutrition (MUAC<125 mm+ WHZ<-2SD)	(90) 12.0% (9.0-16.0 95% CI)	(42) 11.1% (7.6-16.0 95% CI)	(48) 12.9 % (9.1-18.1 95% CI)
Prevalence of Sever Acute Malnutrition (MUAC<115 mm+ WHZ<-3SD)	(19) 2.5% (1.5- 4.2 95% CI)	(6) 1.6% (0.7- 3.5 95% CI)	(13) 3.5% (1.9- 6.3 95% CI)

**There was not found any case of oedema.*

Proportion of Acutely Malnourished Children by MUAC Enrolled in and Referred to a Program

The proportion of children identified as acutely malnourished and their corresponding treatment enrolment status are presented in Table 25 below. Overall, of children identified as acutely malnourished based on MUAC by the teams in the field, 23.8% were enrolled in a program at the time of the survey. Of the children who were identified as acutely malnourished but not currently enrolled in a treatment program, 32 children were referred form those 7 (21.8 %) SAM and 23(71.8 %) were MAM cases referred for the treatment.

Table 26: Proportion of Acutely Malnourished by MUAC Children 6-59 Months Enrolled in a Treatment Program.

Sample	Enrolled in an OPD SAM	Enrolled in an OPD MAM	Enrolled in an IPD SAM	Not Enrolled

Acutely malnourished children 6-59 months by MUAC, or oedema (N=42)	(5) 11.9%	(5) 11.9%	(0) 0.0%	(32) 76.2%

7.4. Prevalence of Chronic Malnutrition

The prevalence of stunting per HAZ among children 6-59 months in Khost was 26.9% (22.4-31.9 95% CI). as presented in Table 26 below. The prevalence of severe stunting per HAZ among children 6-59 months was 6.1% (4.2- 8.8 95% CI). According to WHO thresholds, this prevalence is categorized as high.

The prevalence of chronic malnutrition is high in boys compared to girls (p-value <0.05).

Table 27: Prevalence of Chronic Malnutrition by HAZ by Severity and Sex among Children 6-59 months, WHO 2006 Reference

Indicators	All n = 733	Boys n = 373	Girls n = 360
Prevalence of chronic malnutrition (HAZ <-2 SD)	(197) 26.9 % (22.4 - 31.9 95% C.I.)	(114) 30.6 % (24.9 - 36.9 95% C.I.)	(83) 23.1 % (17.8 - 29.3 95% C.I.)
Prevalence of moderate chronic malnutrition (HAZ <-2 to ≥-3 SD)	(152) 20.7 % (17.3 - 24.7 95% C.I.)	(91) 24.4 % (19.6 - 29.9 95% C.I.)	(61) 16.9 % (13.2 - 21.5 95% C.I.)
Prevalence of severe chronic malnutrition (HAZ <-3 SD)	(45) 6.1 % (4.2 - 8.8 95% C.I.)	(23) 6.2 % (3.7 - 10.1 95% C.I.)	(22) 6.1 % (3.7 - 10.0 95% C.I.)

When disaggregating the data by age group, the group with the highest moderate chronic malnutrition was 18-29 months, while the age group with the highest severe chronic malnutrition was 30-41 months, as presented in Table 26 below. The age group with the lowest chronic malnutrition was 54-59. Results of this

disaggregation suggest that the younger age groups were more vulnerable to chronic malnutrition, but this difference is not statistically significant.

Table 28: Prevalence of Chronic Malnutrition per HAZ by Severity and Age Group

Age (months)	N	Severe stunting (HAZ <-3)		Moderate stunting (HAZ >= -3 to <-2)		Normal (HAZ>= -2)	
		n	%	N	%	n	%
6-17	175	11	6.3	30	17.1	134	76.6
18-29	190	13	6.8	47	24.7	130	68.4
30-41	185	13	7.0	40	21.6	132	71.4
42-53	132	5	3.8	29	22.0	98	74.2
54-59	51	3	5.9	6	11.8	42	82.4
Total	733	45	6.1	152	20.7	536	73.1

The HAZ distribution curve (in red) as compared to the WHO 2006 reference HAZ distribution curve (in green) as presented in Figure 5 below demonstrates a large shift to the left, suggesting a very stunted population in comparison to normal population. Further analysis suggests that linear severe growth retardation is at its highest in the group of children aged 18-29 months (n=190).

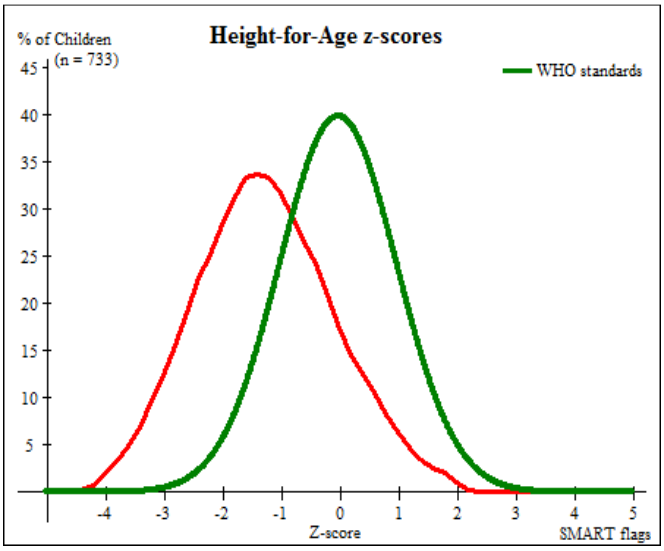


Figure 6: Distribution of HAZ Sample Compared to the WHO 2006 HAZ Reference Curve

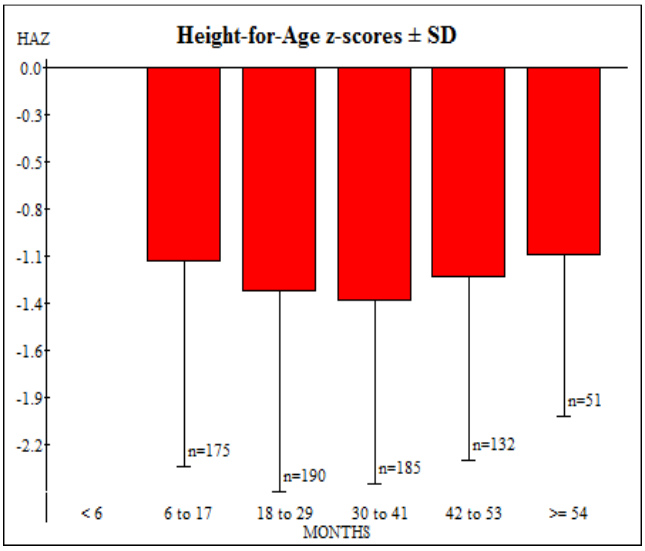


Figure 7: Mean HAZ by Age Group

7.5. Prevalence of Underweight

The prevalence of underweight per WAZ among children 6-59 months in Khost was 16.8% (13.1-21.3 95% CI), as presented in Table 26 below. The prevalence of severe underweight per WAZ among children 6-59 months was 3.1% (1.8- 5.0 95% CI). According to WHO thresholds, this underweight prevalence is categorized as Medium. There is no difference between boys and girls for the underweight prevalence.

Table 29: Prevalence of Underweight by WAZ by Severity and Sex among Children 6-59 months, WHO 2006 Reference

Indicators	All n = 754	Boys n = 383	Girls n = 371
Prevalence of underweight (WAZ <-2 SD)	(127) 16.8 % (13.1 - 21.3 95%C.I.)	(69) 18.0 % (13.2 - 24.1 95%C.I.)	(58) 15.6 % (11.5 - 20.8 95%C.I.)
Prevalence of moderate underweight (WAZ <-2 and >=-3 SD)	(104) 13.8 % (10.9 - 17.3 95%C.I.)	(58) 15.1 % (11.1 - 20.3 95%C.I.)	(46) 12.4 % (9.0 - 16.8 95% C.I.)
Prevalence of severe underweight (WAZ <-3SD)	(23) 3.1 % (1.8 - 5.0 95% C.I.)	(11) 2.9 % (1.5 - 5.6 95% C.I.)	(12) 3.2 % (1.8 - 5.7 95% C.I.)

When disaggregating the data by age group, the group with the highest moderate underweight was 6-17 months, while the age group with the highest severe underweight was 6-17 months, as presented in Table 29 below. The age group with the lowest moderate underweight was 30-41 months. Results of this disaggregation suggest that the younger age groups were the most vulnerable to underweight, but this difference is not statistically significant.

Table 30: Prevalence of Underweight per WAZ by Severity and Age Group

Age (months)	N	Severe underweight (WAZ <-3)		Moderate underweight (WAZ ≥-3 to <-2)		Normal (WHZ ≥-2)	
		N	%	n	%	n	%
6-17	182	8	4.4	30	16.5	144	79.1
18-29	197	5	2.5	26	13.2	166	84.3
30-41	191	5	2.6	23	12.0	163	85.3
42-53	133	4	3.0	17	12.8	112	84.2
54-59	51	1	2.0	8	15.7	42	82.4
Total	754	23	3.1	104	13.8	627	83.2

7.6. Low MUAC among Women

All women of child-bearing age (15-49 years) were included in the survey. A total of 897 women were assessed for nutrition status by MUAC <230 mm. The analysis looked at all women 15-49 years, further disaggregating the sample by physiological status (pregnant, lactating, no pregnant/lactating or both conditions). The lowest proportion of low MUAC was surprisingly among the lactating women (12.7%).

The highest proportion of women with Low MUAC was found among the pregnant and lactating women, with 29.4% of them malnourished according to MUAC criterion. This shows a high vulnerability of women pregnant and lactating in comparison to women not pregnant neither lactating; although this comparison is not statistically valid (p-value = 0.480).

Table 31: Prevalence of Acute Malnutrition among Women per MUAC

Sample	N	MUAC <230 mm	
		N	%
All women 15-49 years	897	144	16.1%

Pregnant women	145	30	20.6%
Lactating women	297	38	12.7%
Pregnant and lactating women*	51	15	29.4%
Non-pregnant and non-lactating women	404	61	15.0%
All PLWs	493	83	16.8%

**Women that were simultaneously pregnant and lactating*

7.7. Retrospective Mortality

The overall death rate for the surveyed population was 0.28 (0.16-0.48) below the WHO emergency thresholds of 1.0/10,000/day. The age group with the highest death rate was 65-120 years, the population included in the survey was 3989 from those 13 were deaths among the recall period.

Table 32: Death Rate by Age and Sex with Reported Design Effect

Population	Death Rate (/10,000/Day)	Design Effect
Overall	0.28 (0.16-0.48)	1.0
By Sex		
Male	0.36 (0.19-0.68)	1.0
Female	0.19 (0.07-0.48)	1.0
By Age Group		
0-4	0.31 (0.10-0.96)	1.0
5-11	0.00 (0.00-0.00)	1.0
12-17	0.00 (0.00-0.00)	1.0
18-49	0.26 (0.11-0.61)	1.0
50-64	0.85 (0.21-3.31)	1.0
65-120	3.64 (1.16-10.71)	1.0

7.8. Infant and Young Child Feeding

Questions related to IYCF practices were asked to all caregivers with children less than 24 months. A total of 326 children under two years were included in the sample, with the core IYCF indicators presented in Table 32 below. The proportion of infant's breastfed within one hour of birth was 63.8% this highlighting that more than 1 child out of 3 do not get colostrum. The proportion of infants 0-5 months exclusively breastfed was low (85.7%) suggesting frequent replacement of breastmilk by other liquids or foods at a stage when an infant should be receiving the protective benefits of exclusive breastfeeding. The proportion of

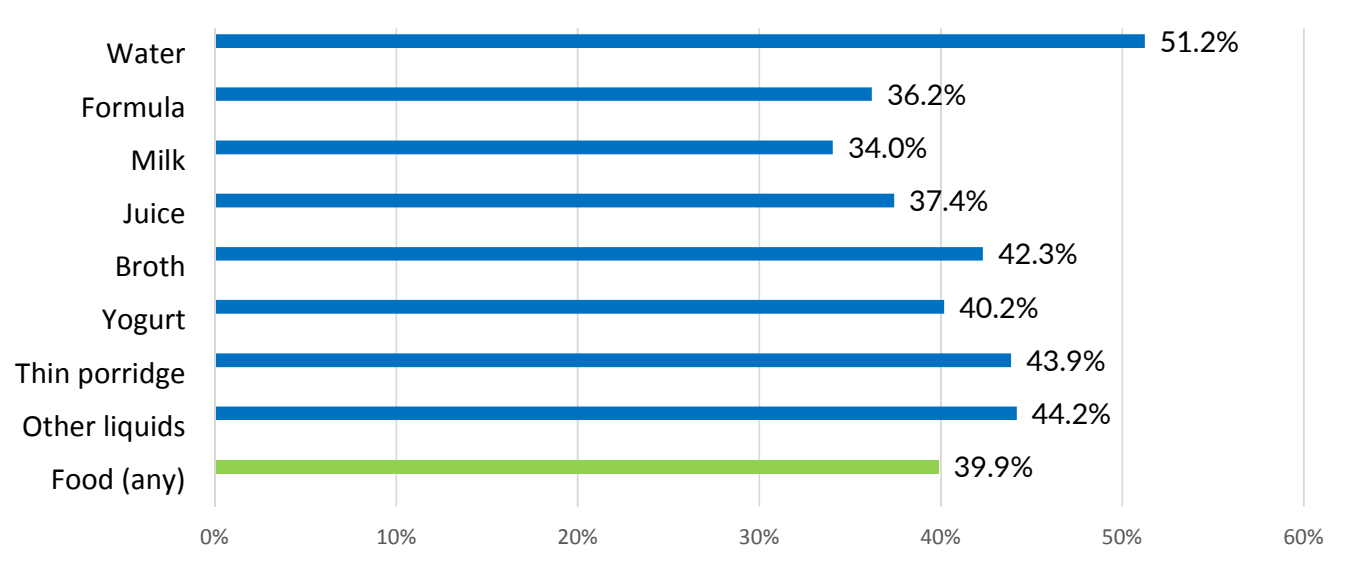
children with continued breastfeeding at one year was 94.7% and at two years was 96.0%, indicating that many children are still receiving breastmilk until their first and second years.

Table 33: Infant and Young Child Feeding Practices

IYCF Indicator	Sample	N	N	Results
Timely initiation of breastfeeding	Children 0-23 months	326	208	63.8%
Exclusive breastfeeding	Infants 0-5 months	77	66	85.7%
Continued breastfeeding at one year	Children 12–15 months	76	72	94.7%
Continued breastfeeding at two years	Children 20-23 months	50	48	96.0%

While asking questions about breastfeeding practices, caregivers of infants 0-5 months were also asked if the infant had consumed liquids or soft, semi-soft, or solid foods in the past day. Figure 7 below presents the liquids most frequently displacing breastmilk in this population.

Figure 8: Liquids or Food Consumed by Infants 0-5 Months



7.9. Child Immunization Status

The results indicated that 84.0% of children 18-59 months had received the second dose measles immunization, as confirmed by either vaccination card or caregiver recall.

Table 34: Second Dose Measles Immunization Coverages among Children 18-59 Months

Indicator		Frequency	%
Second Dose Measles Immunization (N=568)	Yes by card	83	14.6%
	Yes by recall	394	69.4%
	Yes by card *or* recall	477	84.0%
	No	67	11.8%
	Don't know	24	4.2%

7.10. Water, Sanitation, and Hygiene

Improved and Unimproved Drinking Water Sources

Households were asked to identify their main source of drinking water, which was then categorized as improved or unimproved during analysis. Among all households surveyed, 526 (96.9%) relied mainly on an improved water source, most commonly borehole/ well with hand pump and piped household. tThe remaining 17 (3.1%) relied mainly on an unimproved water source, most commonly well with a bucket.

Table 35: Household Main Drinking Water Source

Main Drinking Water Source N= 543	Frequency	%
Improved Water Source	526	96.9%
Unimproved Water Source	17	25.6%

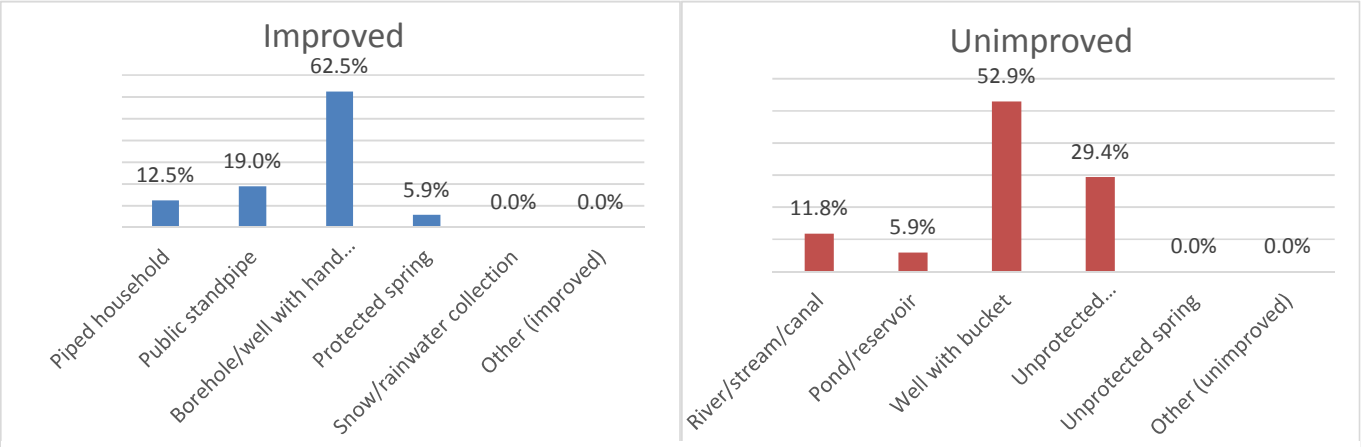


Figure 9: Household Use of Improved and Unimproved Drinking Water Sources

Hand Washing Practices (Use of Soap or Ash) among Caregivers

Caregivers demonstrated how they washed their hands in front of the interviewer. Overall, only 74.0% of caregivers demonstrated washing their hands with soap/ash and water. For more details refer to table 35 below

Table 36: Hand Washing Practices (Use of Soap or Ash) among Caregivers

Hand washing practices by caregivers N= 897	Frequency	%
Uses soap or ash with water	664	74.0%
Uses only water	233	26.0%

Hand Washing During Critical Moments among Caregivers

all the caregivers were asked regarding thier Hand washing after coming into contact with feces, and hand washing before coming into contact with food. Overall, 29.3% of caregivers reported washing their hands during five critical moments that fell into these two categories, suggesting a low understanding of the importance of hand washing at these moments.

Table 37: Hand Washing Practices by Caregivers at Critical Moments

Hand washing during Five Critical Moments	N	N	Results	Critical Moments in Two Categories[10]	N	n	Results
After defecation	897	751	83.7%	Washes hands after coming into contact with faeces	897	856	95.4%
After cleaning baby's bottom	897	584	65.1%				
Before food preparation	897	615	68.6%	Washes hands before coming in contact with food	897	855	95.3%
Before eating	897	718	80.0%				
Before feeding or breastfeeding children	897	480	53.5%				
Reported washing hands during all five critical moments	897	263	29.3%	**Reported washing hands during critical moments in both categories.**	897	814	90.7%

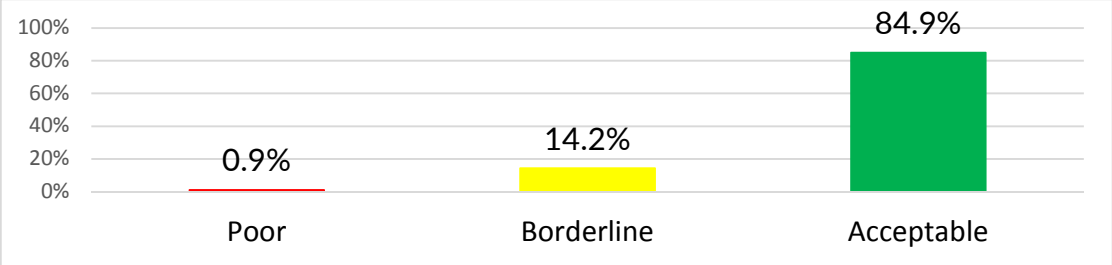
[10] The Sphere Handbook 2018

7.11. Food Security

Food Consumption Score

all the households were asked for their variety , frequency and quality of the consumed foods in one week recall period which shows that, the acceptable consumption score was 84.9, 14.2% a borderline consumption score, and 0.9% a poor consumption score, as presented in Figure 9 below.

Figure 10: Household Food Consumption Score



Among surveyed households, the most frequently consumed food group was cereals and oil (99.8%) followed by sugar/honey (99.6%). The least frequently consumed food group was meat (80.3%), as presented in Figure 10 below.

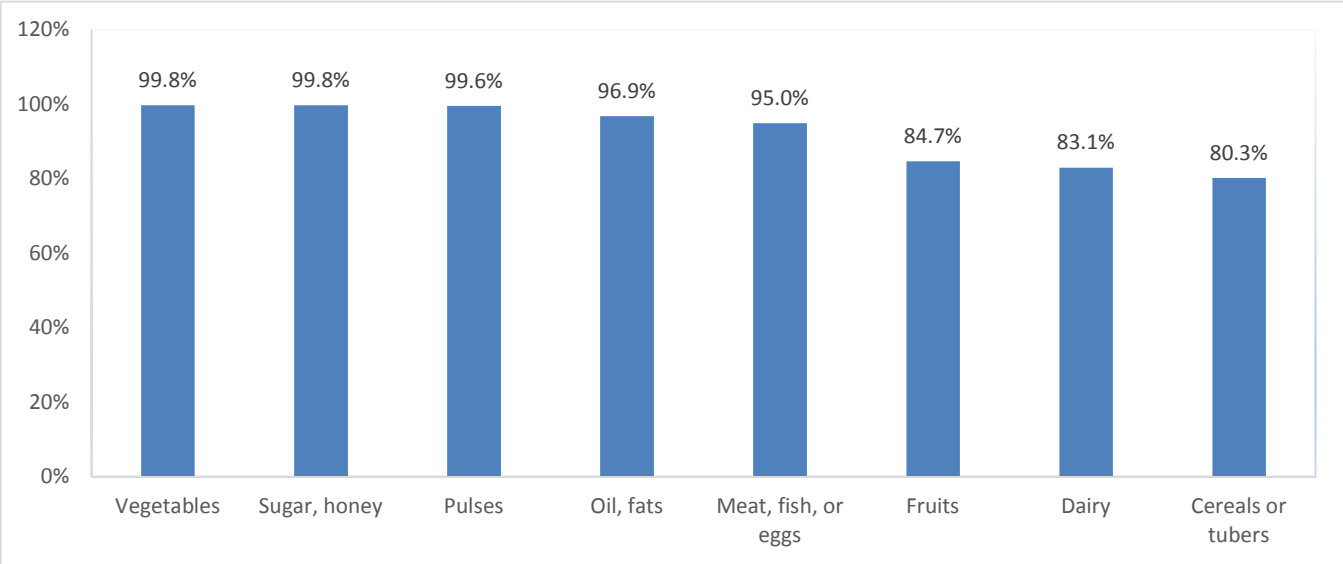


Figure 11: Frequency of Food Groups Consumed by Households

Reduced Coping Strategies Index

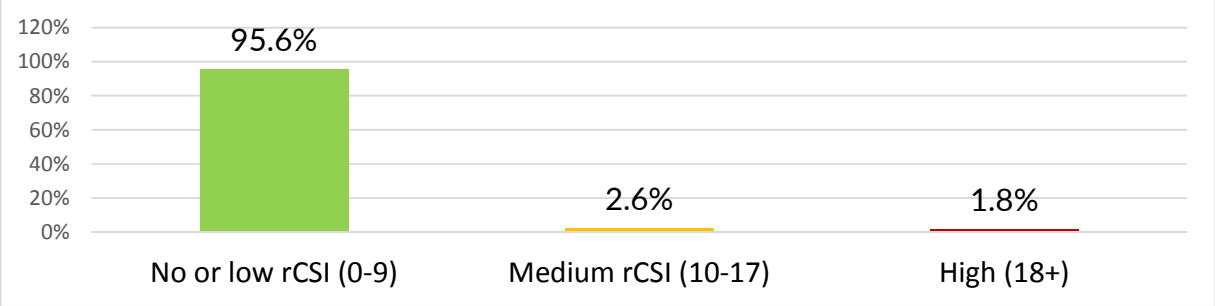
Among surveyed households, 22.7% reported not having sufficient food or money to buy food in the week prior to the survey. The most commonly reported food-related coping strategy was borrowing foods (14.9%) followed by preparing less food (14.7%), as presented in Table 37 below.

Table 38: Reduce Coping Strategy Index Categories

Household Coping Strategies N=543	Frequency	%
Reported insufficient food or money to buy food per 7-day recall	453	22.7%
Relying on less preferred and less expensive foods	80	14.7%
Borrowing food, or rely on help from a friend or relative	81	14.9%
Limiting portion size at mealtimes	36	6.6%
Reducing number of meals eaten in a day	33	6.1%
Restricting consumption by adults in order for small children to eat	26	4.8%

Calculated and weighted as per the rCSI, it was estimated that 95.8% of households relied on no or low coping strategies, 2.6% relied on medium coping strategies, and 1.7% relied on high coping strategies, as presented in Figure 11 below.

Figure 12: Household Reduced Coping Strategies Index



Food Security Classification

The triangulation of FCS and rCSI attempts to capture the interaction between household food consumption and coping strategies required to more appropriately reflect the food security situation in Khost province. Based on this triangulation, 1.5% of households were judged as severely food insecure, 2.4% of households were judged as moderately food insecure, and 96.1% of households were considered food secure, as presented in Figure 12.

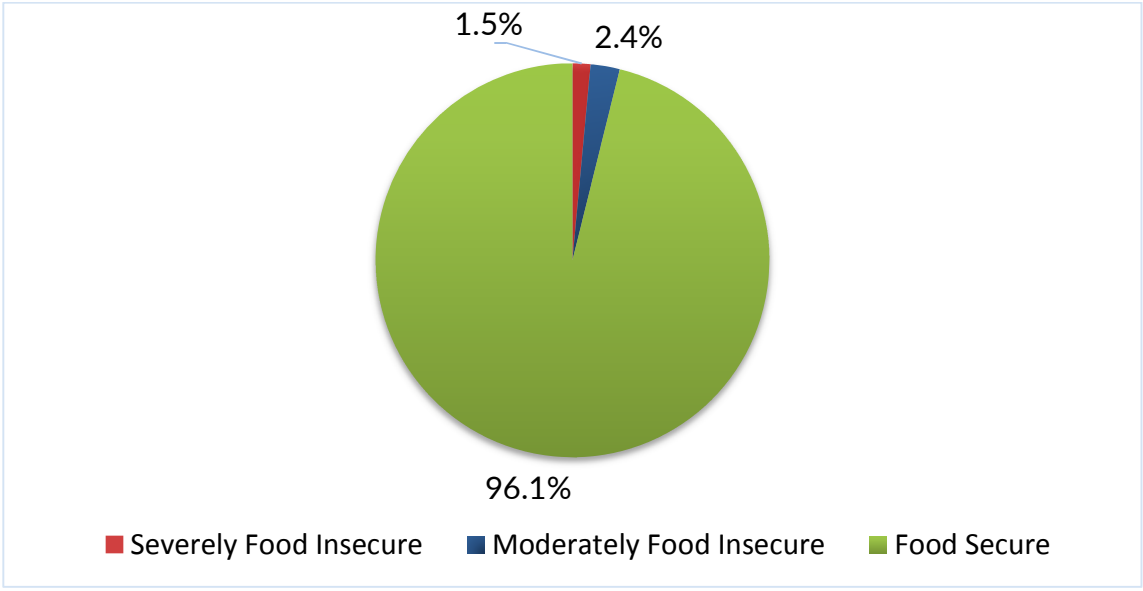


Figure 13: Food Security Classification Assessed by FCS & rSCI

8. DISCUSSION

8.1. Nutritional Status of the Province

The results of the survey showed a prevalence of GAM at 9.1% (6.6-12.5 95% CI)and of SAM at 1.3% (0.6-2.7 95% CI).

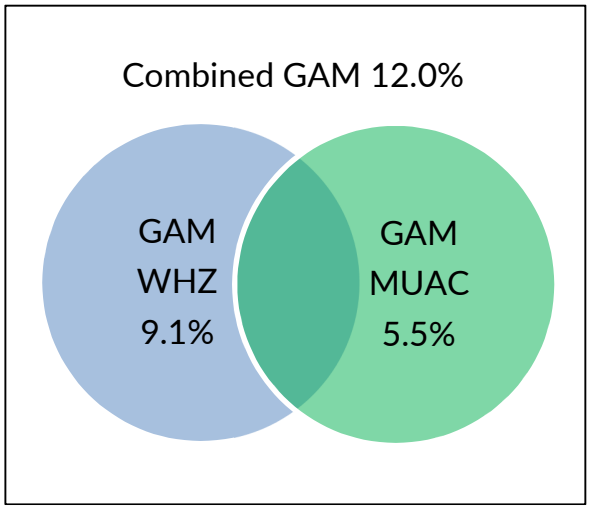
This situation in Khost province is classified as poor and near to serious level of severity according to the WHO threshold 2018. The 3.0% SAM by WHZ threshold, established by MoPH, Nutrition Cluster and AIM-WG as the cut-off after which a response should be prioritized in the Afghanistan context, was not exceeded.

According to the last SMART survey conducted in the spring season of 2015, the prevalence of GAM was 6.5% (5.2 - 8.1) and the prevalence of SAM was 0.8% (0.5 - 1.5).

The GAM prevalence per MUAC was 9.1% (6.3 - 13.0) and SAM was 1.6% (1.0 - 2.8), which were higher than WHZ based GAM/SAM. The last SMART survey results reported the GAM prevalence per MUAC was 5.5% (3.8- 8.1 95% CI) and SAM was 1.6% (0.8- 2.9 95% CI). The 2019 results shows a deteriorated situation, with higher acute malnutrition prevalence among under five children according to WHZ and oedema criteria, but also according to MUAC criterion.

The 23.8% were enrolled in a program at the time of the survey.

Figure 14: Children Captured by GAM by WHZ, MUAC, and Combined



The discrepancy between the prevalence of GAM by WHZ and GAM by MUAC continues to be a topic of interest in Afghanistan. Considering both indicators, the Combined GAM prevalence was 12.0% (9.0-16.0 95% CI) and the Combined SAM prevalence was 2.5% (1.5- 4.2 95% CI). This suggests that a higher proportion of children under five are affected by acute malnutrition in the province by using both criteria and not solely MUAC neither WHZ. Combined GAM captures a greater proportion of acutely malnourished children 6-59 months, and may inform better estimations of SAM and MAM caseloads in the province; ultimately strengthening planning and programming. All the children in the sample detected as acutely malnourished by either by WHZ and MUAC are reflected in this prevalence according to combined criteria.

Over all caseload of children Under-5 was 816 children, the observed GAM rate was 9.9% and totally

81children were malnourished by WHZ.

Across indicators, children under two years of age had a higher prevalence of GAM per WHZ 9.8% (6.5-14.4 95% CI) and per MUAC 11.3% (7.5-16.7 95% CI) compared to children over two years of age per WHZ 8.7% (5.9-12.6 95% CI) and per MUAC 2.3% (1.2- 4.4 95% CI). With difference statistically is not significant (P-Value <0.05) based on WHZ. What is often overlooked, however, is the vulnerability of infants 0-5 months in the Afghan context. When the sample of children 0-59 months was compared to the sample of children 6-59 months, as presented in Table 39 below, it is apparent that the prevalence of acute malnutrition was little different with the inclusion of 0-5 month infants.

8.2 Nutrition status in women:

Prevalence of malnutrition in all women was 16.1% and among PLWs this rate was 16.8 which shows more vulnerability among PLWs.

8.3 Mortality:

The overall death rate for the surveyed population was 0.28 (0.16-0.48) below the WHO emergency thresholds of 1.0/10,000/day.

8.4 IYCF:

Concerns for the strength of IYCF practices in Khost province were raised, particularly when the rate of early breastfeeding initiation was found to be only 63.8%. Efforts to promote the early initiation of breastfeeding are required. The rate of exclusive breastfeeding was close to 90%, with a satisfactory prevalence of continued breastfeeding at 1 and 2 years old.

8.5 Vaccination:

Considering second dose measles immunization as a proxy for immunization status and access to healthcare, it was found that only 568 in 477 children 18-59 months had received this service. Although these serve only as proxy indicators for child nutrition and health, these findings indicate a challenging environment for child growth and development.

8.6 WASH:

Based on the household level assessment of water source, 17 out of 543 households were accessing an unimproved water source as their main source of drinking water.

8.7 FSL:

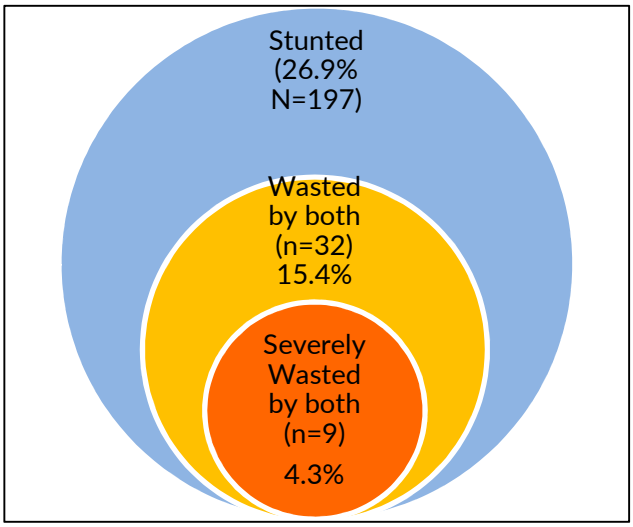
Food security exists when all people, at all times have physical, social and economic access to sufficient, safe and nutritious food for a healthy and active life. In Khost Province, the FCS and rCSI were triangulated to provide an indication of food security at the household level. The results indicated that 18 out of 543 households were moderately or severely food insecure.

Table 40: Prevalence of GAM by WHZ Comparing the 0-59 Month to the 6-59 Month Sample

Sample	GAM by WHZ		SAM by WHZ	
	%	95% CI	%	95% CI
Children 0-59 Months	9.9%	(7.6-12.9 95% CI)	1.6%	(0.9- 2.8 95% CI)
Children 6-59 Months	9.1%	(6.6-12.5 95% CI)	1.3%	(0.6- 2.7 95% CI)

Chronic malnutrition in Khost province is also of concern. The prevalence of chronic among children 6-59 months is 26.9% (22.4-31.9 95% CI), which was classified as high according to the WHO thresholds 2018. In other words, more than 1 in 3 children in the province is not reaching his/her

Optimal growth and development. This prevalence is of further concern, when the simultaneous presence of acute malnutrition is demonstrated. Recent research has concluded that children that are both stunted and wasted are at a heightened risk of mortality[11], further suggesting that this should be a priority group for treatment interventions. In Khost Province, it was found that among the 208 that were stunted, 32 of them (15.4%) were also wasted by both criteria (WHZ<-2SD + MUAC<125 mm) and 9 of them (4.3%) were severely wasted.



Low MUAC among women in Khost Province was also of concern. Although there is no globally defined cut-off for acute malnutrition among women, the results demonstrated that a higher proportion of women

[11] Myatt, M. et al (2018) Children who are both wasted and stunted are also underweight and have a high risk of death: a descriptive epidemiology of multiple anthropometric deficits using data from 51 countries

simultaneously pregnant and lactating women had a low MUAC. This may be linked to the high energy requirements for breastfeeding/fatal development and for lactation, further suggesting that this group may be at a heightened risk of acute malnutrition.

9. Recommendations

SMART Finding	#	Recommendation	Actor	Required Resources	Timeline
1. GAM = 9.1% (6.6-12.5 95% CI) based on WHZ. 2. GAM =5.5% (3.8-8.1 95% CI) based MUAC 3.Combine GAM =12.0% (9.0-16.0 95% CI)	1	Strengthen supportive supervision from related HFs	PNO/BPHS implementer	IEC materials, faithfully of supervisors	Regular
	2	Strengthening Health education.	PNO/BPHS implementer	IEC materials	01-12-2019
	3	Strengthening coordination between all stockholders.	PNO/BPHS implementer/Health Partner	IEC materials,	01-12-2019
	4	Apply the OPD SAM/MAM program to all related HFs.	PNO/BPHS implementer/Health Partner	IEC materials, Food commodities	01-12-2019
	5	Changing community behavior	PNO/BPHS implementer/Health Partner	IEC materials	01-12-2020
	6	Screening of all U5 & GM of U2 children & apply proper IYCF counseling for mothers of children in each visit	PNO/BPHS implementer	IEC materials, Food commodities	Regular
	7	Implementing TSFP program	PNO/BPHS implementer/Health Partner	Food commodities	01-12-2019

1. Stunting =) 26.9% (22.4-31.9 95% CI) 2. Underweight=16.8% (13.1-21.3 95% CI)	1	Apply the OPD SAM/MAM program to all related HFs.	PNO/BPHS implementer	IEC materials, Food commodities (TSFP/RUTF /F 100/F75)	01-12-2019
	2	Implementing TSFP program	PNO/BPHS implementer/Health Partner	IEC materials, Food commodities (TSFP)	01-12-2019
	3	Strengthening of routine health services in related HFs specially MCH section	RHO/BPHS implementer	IEC materials, Training budget	Regular
	4	Strengthening of health education	PNO/BPHS implementer	IEC materials	Regular
	5	Strengthening of home supplementary food program in community level	PNO/BPHS implementer/Health Partner	IEC materials, Food commodities (TSFP/RUTF /F 100/F75)	01-12-2019
	6	Strengthening of routine health services in related HFs specially vaccination section	PEMT/BPHS implementer/Health Partner	IEC materials, Vaccines	Regular
	7	Apply public education in local media like (Radio & TV).	PPHD/BPHS implementer/Health Partner	IEC materials, line budget	01-12-2019
	8	Changing community behavior	PPHD/BPHS implementer/Health Partner	IEC materials	01-12-2020
	9	Strengthening coordination between all stockholders.	PPHD/BPHS implementer/Health Partner	Meeting Hall and time	Monthly / Quarterly base

1. 2nd dose Measles immunization coverage=84.0% (Lower than National standard 90%)	1	Strengthening of EPI routine, outreach & mobile team program in the filed.	PEMT/BPHS implementer	IEC materials, Transport & Vaccine	Regular
	2	Strengthening coordination between all stockholders.	PEMT/BPHS implementer/Health Partner	Meeting Hall and time	Monthly / Quarterly base
	3	Apply public education in community level by CHS and CHWs.	PPHO/BPHS implementer	IEC & Training materials,	01-12-2020
	4	Strengthening of refer system from community to fixed centers.	PPHO/PEMT/ BPHS implementer	Refer sheet	Regular
	5	To strengthen on the job training EPI Micro planning.	PEMT/BPHS implementer	IEC & Training materials,	01-12-2020
	6	Strengthening of routine health services in related HFs specially vaccination section	PEMT/BPHS implementer	IEC materials, Vaccines	Regular
	7	To strengthen on the job training EPI Micro planning.	PEMT/BPHS implementer	IEC & Training materials,	01-12-2020
	8	Strictly follow up all coverage of EPI during supervision	PEMT/BPHS implementer	Checklist	Regular
	9	To strengthen supportive supervision	PEMT/BPHS implementer	Checklist	Regular
ICFY 1. Early initiation breastfeeding<24 months =63.8%.	1	Apply public education in local media like (Radio & TV).	PEMT/BPHS implementer/Health Partner	IEC materials, line budget	01-12-2019

2. Exclusive breastfeeding<6 months =85.7% 3. Introduction of solid and semisolid food 6-8 months= 25.0%	2	Strengthening Health education & usage of IEC materials.	PEMT/BPHS implementer/Health Partner	IEC materials	01-12-2019
	3	Conducting refresher and on the job training for related health personals.	PEMT/BPHS implementer/Health Partner	IEC materials	01-12-2019
	4	Strengthening IYCF policy in HFs level.	BPHS implementer	Report and Tally sheet & IYCF policy	Regular
WASH 1. Caregiver hand washing practice at all five critical moment= 29.3%	1	Strengthening water sanitation HFs & community level.	PPHD/BPHS implementer/Health Partner	IEC materials, line budget	01-12-2020
	2	Strengthening Health education.	PPHD/BPHS implementer	IEC materials	01-12-2019
	3	Changing community behavior about open defecation.	PPHD/BPHS implementer/Health Partner	IEC materials	01-12-2020
FSL 1. Food Consumption Score, poor=0.9% and borderline = 14.2% -	1	Strengthening usage of fortified salt, oil & flour.	PNO/BPHS implementer	IEC materials, Food commodities	01-12-2019
	2	Changing community behavior & Strengthen usage of local food recipe	PNO/BPHS implementer	IEC materials, Food commodities	01-12-2019
	3	Strengthening health education	PPHD/BPHS implementer/Health Partner	IEC materials	01-12-2019

	4	Strengthening of supervision	PNO/BPHS implementer	IEC materials, faithfully of supervisors	Regular
	5	Strengthening coordination between all stockholders & applying of TSFP program	PPHD/BPHS implementer/Health Partner	IEC materials, Food commodities	01-12-2019
2. Food insecurity based FCS and rSCI) total Food insecure = 2.4% (Sever Food insecure = 1.5% and moderate Food insecure. -	1	Strengthening usage of fortified salt , oil & flour.	PPHD/BPHS implementer/Health Partner	IEC materials, Food commodities	01-12-2019
	2	Changing community behavior & Strengthen usage of local food recipe	PNO/BPHS implementer	IEC materials, Food commodities	01-12-2019
	3	Strengthening health education	PNO/BPHS implementer	IEC materials, Food commodities	01-12-2019
	4	Strengthening of supervision	PNO/BPHS implementer	IEC materials, faithfully of supervisors	Regular

	5	Strengthening coordination between all stockholders & applying of TSFP program	PPHD/BPHS implementer/Health Partner	IEC materials, Food commodities	01-12-2019
1. Pregnant and lactating women (PLWs) nutrition status based on MUAC <230 mm = 16.8%	1	Strengthening health education	PNO/BPHS implementer	IEC materials, Food commodities	01-12,2019
	2	Strengthening home supplementary food program during pregnancy and lactating.	PNO/RHO /BPHS implementer	IEC materials, Food commodities	01-12-2019
	3	Strengthening coordination between all stockholders & Applying of TSFP program	PPHD/BPHS implementer/Health Partner	IEC materials, Food commodities	01-12-2019

10. ANNEXES

Annex 1: Selected Clusters in Khost Province

District Name	Geographical unit	Population size	Cluster
Baak	حاجي ماموت کلی	399	1
Baak	کوزشمل خیل	940	2
Baak	شري کلي	350	3
Tani	ملنگان ورژله	420	4
Tani	سادګل	577	5
Tani	حصارک کلی	2240	6
Tani	دلغوړی کوټکی	839	7
Zazi Medan	شآو کلی	119	8
Zazi Medan	ستیوان برکلی	1470	9
Zazi Medan	تیاکي کلی	1211	RC
Zazi Medan	هاشم خیل	1050	10
Spera	تنخیل کلی	938	11
Musa khail	چشنه غاړه	476	12
Musa khail	تري کلی	355	RC
Alisher	ګوریزان سودک	490	13
Alisher	سنګزه غوندي	367	14
Alisher	شاه ولي کلی	498	15
Sabari	سرسنګ کلی	1610	16
Sabari	حاني کلی	1204	17
Sabari	دولت زي کلی	784	18
Sabari	پاتک کوته	290	RC
Nadershahkot	نوي کوټ سحرا کلی	952	19
Nadershahkot	المره کنډو	1050	20
Nadershahkot	ملنګان	1650	21
Nadershahkot	زیړی خوله	900	22
Shamal	خویخیل	539	23
Shamal	سنګر راغه	833	RC
Gurbaz	علیدایه نوي کلی	980	24

Gurbaz	بوځی خیل	1057	25
Gurbaz	حضرت خان کلی	1550	26
Matoon	کوړیان	1891	27
Matoon	متون تپه	8344	28
Matoon	خوست بنار	30152	29,30
Matoon	ورغه کلی	5872	31
Matoon	گلزاراقا	2109	32
Matoon	نوی پونځیه	4013	RC
Matoon	دیرخیل	2000	33
Matoon	خا ني خوړ	9237	34
Matoon	کوندي	10034	35
Matoon	اذادي مېنه	2275	36
Matoon	وچه خوړه	18685	37
Matoon	ډ ب	4823	RC
Matoon	سرکی بوړی سترکلی	175	38
Matoon	ملایانو کلی	385	39
Matoon	تبي سترکلی	805	40
Matoon	گل بادشاه کلی	630	41
Matoon	انځرو خوړه	2730	42
Matoon	څینارو کلی	770	43
Qalander	مزاری	1029	44
Qalander	سترمزغوره کینِ طرف	2751	45
ismahil khel	حسن محمد	2478	46
ismahil khel	پاینده خیل	1211	47
ismahil khel	منگلو دیگان	2303	48
ismahil khel	درنامیو للمئ	1036	49
ismahil khel	خوارسات	420	50

Annex 2: Event Calendar

د میاشتو نومونه	میاشتی	1392	میاشتی	1393	میاشت	1394	میاشت	1395	میاشت
حمل نخدای تعالی میاشت			58	نوی کال دبزګرورځ ، میږی بچی زیږوی آلوچی اومندتی ګلان کوی ونی شنی کیږی مکتبونه شروع کیږی	46	نوی کال دبزګرورځ ، میږی بچی زیږوی آلوچی اومندتی ګلان کوی ونی شنی کیږی مکتبونه شروع کیږی	34	نوی کال دبزګرورځ ، میږی بچی زیږوی آلوچی اومندتی ګلان کوی ونی شنی کیږی مکتبونه شروع کیږی	22
ثور (برات)			57	روژه مبارکه دروسانوماتی ، ترکاری رسیدل	45	روژه مبارکه دروسانوماتی ، ترکاری رسیدل	33	روژه مبارکه دروسانوماتی ، ترکاری رسیدل	21
جوزا(روژه) سرطان(کوچنی اختر)			56	کوچنی اختر دغنمولو، توتان پخیږ ی آلوچی پخیږی ، مندتی پخیږی	44	کوچنی اختر دغنمولو، توتان پخیږ ی آلوچی پخیږی ، مندتی پخیږی	32	کوچنی اختر دغنمولو، توتان پخیږ ی آلوچی پخیږی ، مندتی پخیږی	20
			55	دملاریا واقعات زیات وی ، خوساوسه	43	دملاریا واقعات زیات وی ، خوساوسه	31	دملاریا واقعات زیات وی ، خوساوسه	19
اسد (میانی)			54	دجواروکرنه ، شولوکرنه، دمټکوراټولول ګورکوری رسیدل دانګریزانونه خپلواکی ، لوی اختر	42	دجواروکرنه ، شولوکرنه، دمټکوراټولول ګورکوری رسیدل دانګریزانونه خپلواکی ، لوی اختر	30	دجواروکرنه ، شولوکرنه، دمټکوراټولول ګورکوری رسیدل دانګریزانونه خپلواکی ، لوی اختر	18
سنبلهلوی اختر)			53	دمعلم ورځ ، دجوارولو دکوچیانوراتګ دجلغوزوراټول ، مي رسیږ ی	41	دمعلم ورځ ، دجوارولو دکوچیانوراتګ دجلغوزوراټول ، مي رسیږ ی	29	دمعلم ورځ ، دجوارولو دکوچیانوراتګ دجلغوزوراټول ، مي رسیږ ی	17

16	میلوه پخیری ، دسنخلورسیدل ، براره شپه دونوپانی زیریدل	28	میلوه پخیری ، دسنخلورسیدل ، براره شپه دونوپانی زیریدل	40	میلوه پخیری ، دسنخلورسیدل ، براره شپه دونوپانی زیریدل	52			میزان (حسن حسین)
15	دغنموکرل دګری اوسرپټول سفره ، شولی راټولیږی	27	دغنموکرل دګری اوسرپټول سفره ، شولی راټولیږی	39	دغنموکرل دګری اوسرپټول سفره ، شولی راټولیږی	51			عقرب (سفره)
14	دانارورسیدنه ، دژمی آمادګی اودلرګیو راټولونه ، دربخاری ایښودل ، دښکلی نبی میاشت دمکتب سالانه امتحانونه	26	دانارورسیدنه ، دژمی آمادګی اودلرګیو راټولونه ، دربخاری ایښودل ، دښکلی نبی میاشت دمکتب سالانه امتحانونه	38	دانارورسیدنه ، دژمی آمادګی اودلرګیو راټولونه ، دربخاری ایښودل ، دښکلی نبی میاشت دمکتب سالانه امتحانونه	50			قوس (لمړی خور)
13	دروسانویرغل په افغانستان ، دکال اوږده شپه ، غوره ځیله سخته ځیله یاسپیرکی ځیله	25	دروسانویرغل په افغانستان ، دکال اوږده شپه ، غوره ځیله سخته ځیله یاسپیرکی ځیله	37	دروسانویرغل په افغانستان ، دکال اوږده شپه ، غوره ځیله سخته ځیله یاسپیرکی ځیله	49			جدی (دوهمه خور)
12	دپولی یاکنکوموسم ، دبادموسم زیاته واوره اوریدل	24	دپولی یاکنکوموسم ، دبادموسم زیاته واوره اوریدل	36	دپولی یاکنکوموسم ، دبادموسم زیاته واوره اوریدل	48			دلوه (دریمه خور)
11	بارانونه زیات وی **دبخاری راټولول دکوټوپاکول اوسپینول ، دنیالګیوکینول ، سونډک مونډک بادونه**	23	بارانونه زیات وی **دبخاری راټولول دکوټوپاکول اوسپینول ، دنیالګیوکینول ، سونډک مونډک بادونه**	35	بارانونه زیات وی **دبخاری راټولول دکوټوپاکول اوسپینول ، دنیالګیوکینول ، سونډک مونډک بادونه**	47	بارانونه زیات وی **دبخاری راټولول دکوټوپاکول اوسپینول ، دنیالګیوکینول ، سونډک مونډک بادونه**	59	حوت (څورمه خور)

Annex 3: Standardization Test Results: Evaluation of Enumerators

Enumerator	Weight	Height	MUAC
Enumerator 1	OK	POOR	POOR
Enumerator 2	OK	OK	POOR
Enumerator 3	OK	POOR	POOR
Enumerator 4	OK	POOR	POOR
Enumerator 5	OK	POOR	POOR
Enumerator 6	OK	POOR	POOR
Enumerator 7	OK	OK	POOR
Enumerator 8	POOR	POOR	POOR
Enumerator 9	OK	OK	POOR
Enumerator 10	OK	OK	POOR
Afternoon			
Enumerator 1	POOR	POOR	POOR
Enumerator 2	POOR	POOR	POOR
Enumerator 3	POOR	POOR	OK
Enumerator 4	POOR	POOR	POOR
Enumerator 5	POOR	POOR	POOR
Enumerator 6	POOR	POOR	POOR
Enumerator 7	POOR	POOR	OK
Enumerator 8	POOR	POOR	POOR
Enumerator 9	POOR	POOR	POOR
Enumerator 10	POOR	POOR	POOR

Annex 4: Plausibility Check for Khost

Standard/Reference used for z-score calculation: WHO standards 2006

(If it is not mentioned, flagged data is included in the evaluation. Some parts of this plausibility report are

more for advanced users and can be skipped for a standard evaluation)

Overall data quality

Criteria	Flags*	Unit	Excel.	Good	Accept	Problematic	**Score**
Flagged data	Incl	%	0-2.5	>2.5-5.0	>5.0-7.5	>7.5	
(% of out of range subjects)			0	5	10	20	**0** (1.6 %)
Overall Sex ratio	Incl	p	>0.1	>0.05	>0.001	<=0.001	
(Significant chi square)			0	2	4	10	**0** (p=0.717)
Age ratio(6-29 vs 30-59)	Incl	p	>0.1	>0.05	>0.001	<=0.001	
(Significant chi square)			0	2	4	10	**4** (p=0.017)
Dig pref score - weight	Incl	#	0-7	8-12	13-20	> 20	
			0	2	4	10	**0** (4)
Dig pref score - height	Incl	#	0-7	8-12	13-20	> 20	
			0	2	4	10	**0** (7)
Dig pref score - MUAC	Incl	#	0-7	8-12	13-20	> 20	
			0	2	4	10	**0** (5)
Standard Dev WHZ	Excl	SD	<1.1	<1.15	<1.20	>=1.20	
.			and	and	and	or	
.	Excl	SD	>0.9	>0.85	>0.80	<=0.80	
			0	5	10	20	**0** (1.06)
Skewness WHZ	Excl	#	<±0.2	<±0.4	<±0.6	>=±0.6	
			0	1	3	5	**1** (-0.24)
Kurtosis WHZ	Excl	#	<±0.2	<±0.4	<±0.6	>=±0.6	
			0	1	3	5	**0** (0.03)
Poisson dist WHZ-2	Excl	p	>0.05	>0.01	>0.001	<=0.001	
			0	1	3	5	**3** (p=0.006)
OVERALL SCORE WHZ =			0-9	10-14	15-24	>25	**8** %

The overall score of this survey is 8 %, this is excellent.

There were no duplicate entries detected.

Percentage of children with no exact birthday: 81 %

Anthropometric Indices likely to be in error (-3 to 3 for WHZ, -3 to 3 for HAZ, -3 to 3 for WAZ, from observed mean - chosen in Options panel - these values will be flagged and should be excluded from analysis for a nutrition survey in emergencies. For other surveys this might not be the best

procedure e.g. when the percentage of overweight children has to be calculated):

Line=31/ID=3: HAZ (1.853), Age may be incorrect

Line=33/ID=5: HAZ (1.840), Age may be incorrect

Line=95/ID=1: **WHZ (3.754)**, WAZ (2.346), Weight may be incorrect

Line=101/ID=2: HAZ (-5.426), WAZ (-4.706), Age may be incorrect

Line=105/ID=1: **WHZ (2.646)**, Weight may be incorrect

Line=113/ID=1: HAZ (1.877), Age may be incorrect

Line=269/ID=1: **WHZ (-3.608)**, Weight may be incorrect

Line=284/ID=3: **WHZ (-4.021)**, Weight may be incorrect

Line=286/ID=1: HAZ (-4.509), Age may be incorrect

Line=299/ID=2: HAZ (4.931), Age may be incorrect

Line=307/ID=1: HAZ (-4.243), Age may be incorrect

Line=340/ID=1: **WHZ (-3.604)**, Height may be incorrect

Line=343/ID=1: HAZ (2.336), Age may be incorrect

Line=367/ID=2: HAZ (2.973), Age may be incorrect

Line=399/ID=2: HAZ (-5.453), Age may be incorrect

Line=425/ID=2: **WHZ (-3.603)**, Height may be incorrect

Line=434/ID=3: HAZ (2.284), Age may be incorrect

Line=535/ID=1: **WHZ (-6.865)**, WAZ (-4.738), Weight may be incorrect

Line=540/ID=1: HAZ (-5.520), Age may be incorrect

Line=548/ID=1: **WHZ (-3.812)**, Weight may be incorrect

Line=555/ID=1: HAZ (-4.489), Age may be incorrect

Line=559/ID=1: HAZ (-5.551), WAZ (-4.046), Age may be incorrect

Line=564/ID=2: HAZ (-5.747), Height may be incorrect

Line=600/ID=1: HAZ (2.574), Age may be incorrect

Line=602/ID=3: HAZ (2.536), Height may be incorrect

Line=610/ID=1: **WHZ (-4.415)**, Weight may be incorrect

Line=630/ID=1: HAZ (2.800), Height may be incorrect

Line=669/ID=1: HAZ (2.243), Height may be incorrect

Line=670/ID=1: **WHZ (-3.974)**, HAZ (2.854), Height may be incorrect

Line=674/ID=1: **WHZ (-4.859)**, WAZ (-4.141), Weight may be incorrect

Line=685/ID=1: HAZ (2.046), Height may be incorrect

Line=719/ID=1: HAZ (-5.616), WAZ (-4.429), Age may be incorrect

Line=722/ID=2: HAZ (-4.871), Age may be incorrect

Line=748/ID=3: HAZ (3.122), Age may be incorrect

Line=761/ID=1: **WHZ (-3.809)**, Weight may be incorrect

Line=776/ID=2: HAZ (-4.463), Age may be incorrect

Line=789/ID=1: HAZ (1.972), Age may be incorrect

Line=818/ID=1: HAZ (2.801), Age may be incorrect

Percentage of values flagged with SMART flags:WHZ: 1.6 %, HAZ: 3.6 %, WAZ: 0.8 %

Age distribution:

Month 6 : ######

Month 7 : ############

Month 8 : ###########

Month 9 : ##########

Month 10 : ####################

Month 11 : ############

Month 12 : ##################################

Month 13 : ###############

Month 14 : ####################

Month 15 : ############

Month 16 : #######

Month 17 : ####################

Month 18 : ########################

Month 19 : ########

Month 20 : #################

Month 21 : ###################

Month 22 : ###############

Month 23 : ###########

Month 24 : ######################

Month 25 : ################################

Month 26 : ##################

Month 27 : ############

Month 28 : ############

Month 29 : ##########

Month 30 : #################

Month 31 : ########
Month 32 : ##########
Month 33 : ###############
Month 34 : ################
Month 35 : ########
Month 36 : ##
Month 37 : ########################
Month 38 : ######################
Month 39 : ###########
Month 40 : ######
Month 41 : #######
Month 42 : ########
Month 43 : ########
Month 44 : #######
Month 45 : ############
Month 46 : #########
Month 47 : ########
Month 48 : ######################################
Month 49 : ############
Month 50 : ###########
Month 51 : ##########
Month 52 : #####
Month 53 : #####
Month 54 : ###########
Month 55 : ##########
Month 56 : #####
Month 57 : #######
Month 58 : #########
Month 59 : ##########
Month 60 : #
Age ratio of 6-29 months to 30-59 months: 1.01 (The value should be around 0.85).:
p-value = 0.017 (significant difference)

Statistical evaluation of sex and age ratios (using Chi squared statistic):

Age cat.	mo.	boys	girls	total	ratio boys/girls
6 to 17	12	86/89.3 (1.0)	98/87.0 (1.1)	184/176.3 (1.0)	0.88
18 to 29	12	90/87.1 (1.0)	108/84.8 (1.3)	198/171.9 (1.2)	0.83
30 to 41	12	114/84.4 (1.4)	79/82.2 (1.0)	193/166.6 (1.2)	1.44
42 to 53	12	71/83.1 (0.9)	62/80.9 (0.8)	133/164.0 (0.8)	1.15
54 to 59	6	24/41.1 (0.6)	28/40.0 (0.7)	52/81.1 (0.6)	0.86
6 to 59	54	385/380.0 (1.0)	375/380.0 (1.0)		1.03

The data are expressed as observed number/expected number (ratio of obs/expect)

Overall sex ratio: p-value = 0.717 (boys and girls equally represented)

Overall age distribution: p-value = 0.000 (significant difference)

Overall age distribution for boys: p-value = 0.001 (significant difference)

Overall age distribution for girls: p-value = 0.003 (significant difference)

Overall sex/age distribution: p-value = 0.000 (significant difference)

Digit preference Weight:

Digit .0 : ##################################

Digit .1 : ##

Digit .2 : ##

Digit .3 : ######################################

Digit .4 : ##############################

Digit .5 : ##############################

Digit .6 : ##################################

Digit .7 : ######################################

Digit .8 : ####################################

Digit .9 : ######################################

Digit preference score: **4** (0-7 excellent, 8-12 good, 13-20 acceptable and > 20 problematic)

p-value for chi2: 0.442

Digit preference Height:

Digit .0 : ##

Digit .1 : ##

Digit .2 : ##

Digit .3 : ##

Digit .4 : ##

Digit .5 : ##################################

Digit .6 : ##

Digit .7 : ##############################

Digit .8 : ##########################

Digit .9 : ########################

Digit preference score: **7** (0-7 excellent, 8-12 good, 13-20 acceptable and > 20 problematic)

p-value for chi2: 0.000 (significant difference)

Digit preference MUAC:

Digit .0 : ##############################

Digit .1 : ##

Digit .2 : ##

Digit .3 : ##################################

Digit .4 : ##

Digit .5 : ##############################

Digit .6 : ##

Digit .7 : ##############################

Digit .8 : ##############################

Digit .9 : ##

Digit preference score: **5** (0-7 excellent, 8-12 good, 13-20 acceptable and > 20 problematic)

p-value for chi2: 0.030 (significant difference)

Evaluation of Standard deviation, Normal distribution, Skewness and Kurtosis using the 3 exclusion

(Flag) procedures

.	no exclusion	exclusion from reference mean (WHO flags)	exclusion from observed mean (SMART flags)
WHZ			
Standard Deviation SD:	1.16	1.14	1.06
(The SD should be between 0.8 and 1.2)			
Prevalence (< -2)			
observed:	10.3%	10.1%	9.1%
calculated with current SD:	10.0%	9.4%	7.5%
calculated with a SD of 1:	6.8%	6.7%	6.3%
HAZ			
Standard Deviation SD:	1.35	1.35	1.15
(The SD should be between 0.8 and 1.2)			
Prevalence (< -2)			
observed:	27.4%	27.4%	26.9%
calculated with current SD:	28.5%	28.5%	26.0%
calculated with a SD of 1:	22.2%	22.2%	22.9%
WAZ			
Standard Deviation SD:	1.05	1.05	1.01
(The SD should be between 0.8 and 1.2)			
Prevalence (< -2)			
observed:	17.4%	17.4%	16.8%
calculated with current SD:	17.9%	17.9%	16.5%
calculated with a SD of 1:	16.7%	16.7%	16.2%
Results for Shapiro-Wilk test for normally (Gaussian) distributed data:			
WHZ	p= 0.000	p= 0.000	p= 0.001
HAZ	p= 0.000	p= 0.000	p= 0.011
WAZ	p= 0.017	p= 0.017	p= 0.269
(If p < 0.05 then the data are not normally distributed. If p > 0.05 you can consider the data normally distributed)			
Skewness			
WHZ	-0.55	-0.38	-0.24
HAZ	0.24	0.24	0.18
WAZ	-0.20	-0.20	-0.07
If the value is:			
-below minus 0.4 there is a relative excess of wasted/stunted/underweight subjects in the sample			
-between minus 0.4 and minus 0.2, there may be a relative excess of wasted/stunted/underweight subjects in			

the sample.

-between minus 0.2 and plus 0.2, the distribution can be considered as symmetrical.

-between 0.2 and 0.4, there may be an excess of obese/tall/overweight subjects in the sample.

-above 0.4, there is an excess of obese/tall/overweight subjects in the sample

Kurtosis

WHZ	1.60	0.70	0.03
HAZ	1.21	1.21	-0.30
WAZ	0.47	0.47	0.06

Kurtosis characterizes the relative size of the body versus the tails of the distribution. Positive kurtosis indicates relatively large tails and small body. Negative kurtosis indicates relatively large body and small tails.

If the absolute value is:

-above 0.4 it indicates a problem. There might have been a problem with data collection or sampling.

-between 0.2 and 0.4, the data may be affected with a problem.

-less than an absolute value of 0.2 the distribution can be considered as normal.

Test if cases are randomly distributed or aggregated over the clusters by calculation of the Index of Dispersion (ID) and comparison with the Poisson distribution for:

WHZ < -2: ID=1.58 (p=0.006)

WHZ < -3: ID=1.22 (p=0.135)

GAM: ID=1.58 (p=0.006)

SAM: ID=1.22 (p=0.135)

HAZ < -2: ID=2.38 (p=0.000)

HAZ < -3: ID=1.55 (p=0.008)

WAZ < -2: ID=1.82 (p=0.000)

WAZ < -3: ID=1.35 (p=0.052)

Subjects with SMART flags are excluded from this analysis.

The Index of Dispersion (ID) indicates the degree to which the cases are aggregated into certain clusters (the degree to which there are "pockets"). If the ID is less than 1 and p > 0.95 it indicates that the cases are UNIFORMLY distributed among the clusters. If the p value is between 0.05 and 0.95 the cases appear to be randomly distributed among the clusters, if ID is higher than 1 and p is less than 0.05 the cases are aggregated into certain cluster (there appear to be pockets of cases). If this is the case for Oedema but not for WHZ then aggregation of GAM and SAM cases is likely due to inclusion of oedematous cases in GAM and SAM estimates.

Are the data of the same quality at the beginning and the end of the clusters?

Evaluation of the SD for WHZ depending upon the order the cases are measured within each cluster (if one

cluster per day is measured then this will be related to the time of the day the measurement is made).

```
Time                                          SD for WHZ
point                0.8 0.9 1.0 1.1 1.2 1.3 1.4 1.5 1.6 1.7 1.8 1.9 2.0 2.1 2.2 2.3
01: 1.18 (n=50, f=2)  ################
02: 1.29 (n=50, f=1)  ####################
03: 1.38 (n=47, f=2)  ########################
04: 0.97 (n=47, f=0)  #######
05: 1.66 (n=44, f=3)  ####################################
06: 1.17 (n=47, f=0)  ################
07: 1.09 (n=42, f=0)  ############
08: 1.06 (n=48, f=1)  ###########
09: 1.20 (n=47, f=1)  #################
10: 0.84 (n=44, f=0)  ##
11: 1.19 (n=44, f=1)  ################
12: 0.88 (n=40, f=0)  ###
13: 1.12 (n=34, f=0)  ##############
14: 0.99 (n=30, f=0)  ########
15: 1.20 (n=30, f=0)  #################
16: 1.17 (n=25, f=0)  ################
17: 1.41 (n=17, f=1)  000000000000000000000000
18: 1.29 (n=12, f=0)  00000000000000000000
19: 1.05 (n=13, f=0)  00000000000
20: 0.77 (n=10, f=0)
21: 0.90 (n=10, f=0)  ~~~~
22: 1.45 (n=06, f=0)  ~~~~~~~~~~~~~~~~~~~~~~~~~~
23: 0.45 (n=09, f=0)
24: 0.52 (n=06, f=0)
25: 0.87 (n=03, f=0)  ~~~
26: 0.31 (n=02, f=0)
```

(when n is much less than the average number of subjects per cluster different symbols are used: 0 for n < 80% and ~ for n < 40%; The numbers marked "f" are the numbers of SMART flags found in the different time

points)

Analysis by Team

Team	**1**	**2**	**3**	**4**	**5**	**6**
n =	120	132	145	125	126	112
Percentage of values flagged with SMART flags:						
WHZ:	2.5	0.8	0.0	0.8	4.0	0.9
HAZ:	2.5	3.0	1.4	5.6	5.6	2.7
WAZ:	0.8	0.8	0.0	0.8	1.6	0.9
Age ratio of 6-29 months to 30-59 months:						
	1.14	1.24	0.79	0.87	1.17	0.96
Sex ratio (male/female):						
	0.71	1.00	1.01	0.98	1.25	1.33
Digit preference Weight (%):						
.0 :	13	13	6	13	5	7
.1 :	13	11	12	5	11	17
.2 :	10	11	9	10	17	13
.3 :	11	8	12	6	16	11
.4 :	8	8	7	10	10	6
.5 :	3	12	6	22	4	6
.6 :	8	10	12	8	8	11
.7 :	10	9	12	11	12	10
.8 :	11	8	13	6	10	10
.9 :	14	10	12	10	9	10
DPS:	11	6	9	15	13	10

Digit preference score (0-7 excellent, 8-12 good, 13-20 acceptable and > 20 problematic)

Digit preference Height (%):						
.0 :	8	7	7	23	17	8
.1 :	17	9	12	5	8	17
.2 :	13	11	12	10	14	15
.3 :	16	14	10	8	17	8
.4 :	10	12	10	6	9	19
.5 :	7	11	6	20	7	7
.6 :	12	10	10	10	10	12

.7 :	6	13	12	5	8	6
.8 :	7	7	13	7	3	4
.9 :	6	8	8	5	7	4
DPS:	13	8	8	21	15	17

Digit preference score (0-7 excellent, 8-12 good, 13-20 acceptable and > 20 problematic)

Digit preference MUAC (%):

.0 :	4	11	8	10	10	3
.1 :	18	9	11	8	12	7
.2 :	10	16	10	14	8	12
.3 :	9	11	11	9	9	8
.4 :	14	12	12	7	12	13
.5 :	10	10	7	11	10	4
.6 :	12	10	11	12	8	17
.7 :	6	3	10	7	11	10
.8 :	7	9	8	10	5	14
.9 :	10	8	12	12	16	13
DPS:	13	10	6	7	9	15

Digit preference score (0-7 excellent, 8-12 good, 13-20 acceptable and > 20 problematic)

Standard deviation of WHZ:

SD	1.18	1.17	0.94	1.08	1.44	1.11

Prevalence (< -2) observed:

%	10.8	5.3		10.4	15.9	13.4

Prevalence (< -2) calculated with current SD:

%	11.2	7.0		9.7	15.9	10.4

Prevalence (< -2) calculated with a SD of 1:

%	7.5	4.3		8.0	7.5	8.1

Standard deviation of HAZ:

SD	1.14	1.30	1.30	1.45	1.49	1.33

observed:

%	15.0	29.5	22.1	32.8	35.7	29.5

calculated with current SD:

%	18.3	29.1	24.1	33.5	35.4	28.5

calculated with a SD of 1:

%	15.2	23.7	18.0	26.9	28.9	22.5

Statistical evaluation of sex and age ratios (using Chi squared statistic) for:

Team 1:

Age cat.	mo.	boys	girls	total	ratio boys/girls
6 to 17	12	17/11.6 (1.5)	21/16.2 (1.3)	38/27.8 (1.4)	0.81
18 to 29	12	8/11.3 (0.7)	18/15.8 (1.1)	26/27.1 (1.0)	0.44
30 to 41	12	16/11.0 (1.5)	11/15.3 (0.7)	27/26.3 (1.0)	1.45
42 to 53	12	6/10.8 (0.6)	14/15.1 (0.9)	20/25.9 (0.8)	0.43
54 to 59	6	3/5.3 (0.6)	6/7.5 (0.8)	9/12.8 (0.7)	0.50
6 to 59	54	50/60.0 (0.8)	70/60.0 (1.2)		0.71

The data are expressed as observed number/expected number (ratio of obs/expect)

Overall sex ratio: p-value = 0.068 (boys and girls equally represented)

Overall age distribution: p-value = 0.182 (as expected)

Overall age distribution for boys: p-value = 0.062 (as expected)

Overall age distribution for girls: p-value = 0.510 (as expected)

Overall sex/age distribution: p-value = 0.006 (significant difference)

Team 2:

Age cat.	mo.	boys	girls	total	ratio boys/girls
6 to 17	12	14/15.3 (0.9)	15/15.3 (1.0)	29/30.6 (0.9)	0.93
18 to 29	12	20/14.9 (1.3)	24/14.9 (1.6)	44/29.9 (1.5)	0.83
30 to 41	12	16/14.5 (1.1)	13/14.5 (0.9)	29/28.9 (1.0)	1.23
42 to 53	12	13/14.2 (0.9)	7/14.2 (0.5)	20/28.5 (0.7)	1.86
54 to 59	6	3/7.0 (0.4)	7/7.0 (1.0)	10/14.1 (0.7)	0.43
6 to 59	54	66/66.0 (1.0)	66/66.0 (1.0)		1.00

The data are expressed as observed number/expected number (ratio of obs/expect)

Overall sex ratio: p-value = 1.000 (boys and girls equally represented)

Overall age distribution: p-value = 0.033 (significant difference)

Overall age distribution for boys: p-value = 0.351 (as expected)

Overall age distribution for girls: p-value = 0.053 (as expected)

Overall sex/age distribution: p-value = 0.008 (significant difference)

Team 3:

Age cat.	mo.	boys	girls	total	ratio boys/girls
6 to 17	12	14/16.9 (0.8)	14/16.7 (0.8)	28/33.6 (0.8)	1.00
18 to 29	12	22/16.5 (1.3)	14/16.3 (0.9)	36/32.8 (1.1)	1.57
30 to 41	12	18/16.0 (1.1)	24/15.8 (1.5)	42/31.8 (1.3)	0.75
42 to 53	12	14/15.8 (0.9)	12/15.5 (0.8)	26/31.3 (0.8)	1.17
54 to 59	6	5/7.8 (0.6)	8/7.7 (1.0)	13/15.5 (0.8)	0.63
6 to 59	54	73/72.5 (1.0)	72/72.5 (1.0)		1.01

The data are expressed as observed number/expected number (ratio of obs/expect)

Overall sex ratio: p-value = 0.934 (boys and girls equally represented)

Overall age distribution: p-value = 0.213 (as expected)

Overall age distribution for boys: p-value = 0.437 (as expected)

Overall age distribution for girls: p-value = 0.211 (as expected)

Overall sex/age distribution: p-value = 0.047 (significant difference)

Team 4:

Age cat.	mo.	boys	girls	total	ratio boys/girls
6 to 17	12	15/14.4 (1.0)	14/14.6 (1.0)	29/29.0 (1.0)	1.07
18 to 29	12	11/14.0 (0.8)	18/14.3 (1.3)	29/28.3 (1.0)	0.61
30 to 41	12	19/13.6 (1.4)	15/13.8 (1.1)	34/27.4 (1.2)	1.27
42 to 53	12	13/13.4 (1.0)	10/13.6 (0.7)	23/27.0 (0.9)	1.30
54 to 59	6	4/6.6 (0.6)	6/6.7 (0.9)	10/13.3 (0.7)	0.67
6 to 59	54	62/62.5 (1.0)	63/62.5 (1.0)		0.98

The data are expressed as observed number/expected number (ratio of obs/expect)

Overall sex ratio: p-value = 0.929 (boys and girls equally represented)

Overall age distribution: p-value = 0.553 (as expected)

Overall age distribution for boys: p-value = 0.423 (as expected)

Overall age distribution for girls: p-value = 0.710 (as expected)

Overall sex/age distribution: p-value = 0.198 (as expected)

Team 5:

Age cat.	mo.	boys	girls	total	ratio boys/girls
6 to 17	12	13/16.2 (0.8)	18/13.0 (1.4)	31/29.2 (1.1)	0.72
18 to 29	12	17/15.8 (1.1)	20/12.7 (1.6)	37/28.5 (1.3)	0.85
30 to 41	12	19/15.3 (1.2)	7/12.3 (0.6)	26/27.6 (0.9)	2.71
42 to 53	12	16/15.1 (1.1)	11/12.1 (0.9)	27/27.2 (1.0)	1.45
54 to 59	6	5/7.5 (0.7)	0/6.0 (0.0)	5/13.4 (0.4)	
6 to 59	54	70/63.0 (1.1)	56/63.0 (0.9)		1.25

The data are expressed as observed number/expected number (ratio of obs/expect)

Overall sex ratio: p-value = 0.212 (boys and girls equally represented)

Overall age distribution: p-value = 0.090 (as expected)

Overall age distribution for boys: p-value = 0.650 (as expected)

Overall age distribution for girls: p-value = 0.006 (significant difference)

Overall sex/age distribution: p-value = 0.002 (significant difference)

Team 6:

Age cat.	mo.	boys	girls	total	ratio boys/girls
6 to 17	12	13/14.8 (0.9)	16/11.1 (1.4)	29/26.0 (1.1)	0.81
18 to 29	12	12/14.5 (0.8)	14/10.9 (1.3)	26/25.3 (1.0)	0.86
30 to 41	12	26/14.0 (1.9)	9/10.5 (0.9)	35/24.6 (1.4)	2.89
42 to 53	12	9/13.8 (0.7)	8/10.4 (0.8)	17/24.2 (0.7)	1.13
54 to 59	6	4/6.8 (0.6)	1/5.1 (0.2)	5/12.0 (0.4)	4.00
6 to 59	54	64/56.0 (1.1)	48/56.0 (0.9)		1.33

The data are expressed as observed number/expected number (ratio of obs/expect)

Overall sex ratio: p-value = 0.131 (boys and girls equally represented)

Overall age distribution: p-value = 0.027 (significant difference)

Overall age distribution for boys: p-value = 0.008 (significant difference)

Overall age distribution for girls: p-value = 0.130 (as expected)

Overall sex/age distribution: p-value = 0.000 (significant difference)

Evaluation of the SD for WHZ depending upon the order the cases are measured within each cluster (if one cluster per day is measured then this will be related to the time of the day the measurement is made).

Team: 1

```
Time                                          SD for WHZ
point                 0.8 0.9 1.0 1.1 1.2 1.3 1.4 1.5 1.6 1.7 1.8 1.9 2.0 2.1 2.2 2.3
01: 0.77 (n=09, f=0)
02: 2.04 (n=09, f=1)  ###################################################
03: 1.84 (n=09, f=1)  ############################################
04: 1.18 (n=09, f=0)  ################
05: 1.15 (n=08, f=0)  ###############
06: 1.07 (n=09, f=0)  ###########
07: 1.33 (n=08, f=0)  #######################
08: 0.94 (n=09, f=0)  ######
09: 1.12 (n=09, f=0)  #############
10: 0.94 (n=08, f=0)  ######
11: 1.34 (n=08, f=1)  #######################
12: 0.74 (n=06, f=0)
13: 1.03 (n=04, f=0)  ##########
14: 0.21 (n=02, f=0)
15: 2.01 (n=02, f=0)  OOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOO
16: 1.07 (n=02, f=0)  OOOOOOOOOOO
(when n is much less than the average number of subjects per cluster different symbols are used: 0 for n <
80% and ~ for n < 40%; The numbers marked "f" are the numbers of SMART flags found in the different time
```

points)

Team: 2

```
Time                                              SD for WHZ
point                0.8 0.9 1.0 1.1 1.2 1.3 1.4 1.5 1.6 1.7 1.8 1.9 2.0 2.1 2.2 2.3
01: 1.36 (n=08, f=0)  ########################
02: 0.59 (n=08, f=0)
03: 0.88 (n=06, f=0)  ###
04: 1.27 (n=06, f=0)  ####################
05: 1.55 (n=08, f=1)  ################################
06: 1.19 (n=08, f=0)  ################
07: 0.79 (n=05, f=0)
08: 0.83 (n=08, f=0)  #
09: 1.35 (n=08, f=0)  ########################
10: 0.77 (n=08, f=0)
11: 2.06 (n=06, f=1)  ##########################################################
12: 1.27 (n=07, f=0)  ####################
13: 1.23 (n=06, f=0)  ##################
14: 1.09 (n=05, f=0)  ############
15: 1.58 (n=05, f=0)  ################################
16: 0.80 (n=04, f=0)
17: 0.46 (n=04, f=0)
18: 1.59 (n=03, f=0)  OOOOOOOOOOOOOOOOOOOOOOOOOOOOOOO
19: 0.81 (n=03, f=0)  O
20: 1.12 (n=04, f=0)  OOOOOOOOOOOOOO
21: 1.13 (n=04, f=0)  OOOOOOOOOOOOOO
22: 0.77 (n=02, f=0)
23: 0.45 (n=04, f=0)
24: 0.51 (n=02, f=0)
(when n is much less than the average number of subjects per cluster different symbols are used: 0 for n <
80% and ~ for n < 40%; The numbers marked "f" are the numbers of SMART flags found in the different time
```

points)

Team: 3

```
Time                                              SD for WHZ
point                0.8 0.9 1.0 1.1 1.2 1.3 1.4 1.5 1.6 1.7 1.8 1.9 2.0 2.1 2.2 2.3
01: 1.20 (n=09, f=0)  ##################
02: 0.74 (n=09, f=0)
03: 1.27 (n=09, f=0)  ####################
04: 0.62 (n=09, f=0)
05: 1.15 (n=09, f=0)  ###############
06: 0.41 (n=08, f=0)
07: 0.91 (n=08, f=0)  #####
08: 1.48 (n=09, f=1)  ##############################
09: 0.55 (n=08, f=0)
10: 0.77 (n=08, f=0)
11: 1.02 (n=09, f=0)  #########
12: 0.32 (n=08, f=0)
13: 0.51 (n=07, f=0)
14: 0.95 (n=07, f=0)  ######
15: 0.83 (n=07, f=0)  #
16: 1.48 (n=07, f=0)  ##############################
17: 0.22 (n=03, f=0)
18: 0.97 (n=03, f=0)  OOOOOOO
19: 1.56 (n=03, f=0)  OOOOOOOOOOOOOOOOOOOOOOOOOOOOOO
```

(when n is much less than the average number of subjects per cluster different symbols are used: 0 for n < 80% and ~ for n < 40%; The numbers marked "f" are the numbers of SMART flags found in the different time

points)

Team: 4

```
Time                                              SD for WHZ
point                0.8 0.9 1.0 1.1 1.2 1.3 1.4 1.5 1.6 1.7 1.8 1.9 2.0 2.1 2.2 2.3
01: 0.67 (n=08, f=0)
02: 1.14 (n=08, f=0)  ##############
03: 1.40 (n=07, f=0)  ##########################
04: 1.17 (n=07, f=0)  ###############
05: 1.09 (n=06, f=0)  ############
06: 1.39 (n=07, f=0)  ##########################
07: 0.99 (n=08, f=0)  ########
08: 1.09 (n=06, f=0)  ############
09: 1.11 (n=08, f=0)  #############
10: 0.73 (n=07, f=0)
11: 0.61 (n=07, f=0)
12: 0.94 (n=07, f=0)  ######
13: 0.88 (n=06, f=0)  ###
14: 1.14 (n=06, f=0)  ##############
15: 1.17 (n=05, f=0)  ###############
16: 1.20 (n=05, f=0)  ################
17: 2.16 (n=05, f=1)  ############################################################
18: 0.13 (n=02, f=0)
19: 0.53 (n=03, f=0)
20: 0.53 (n=02, f=0)
21: 0.31 (n=02, f=0)
22: 0.69 (n=02, f=0)
(when n is much less than the average number of subjects per cluster different symbols are used: 0 for n <
80% and ~ for n < 40%; The numbers marked "f" are the numbers of SMART flags found in the different time
```

points)

Team: 5

```
Time                                              SD for WHZ
point                 0.8 0.9 1.0 1.1 1.2 1.3 1.4 1.5 1.6 1.7 1.8 1.9 2.0 2.1 2.2 2.3
01: 1.71 (n=08, f=2)  ####################################
02: 1.55 (n=08, f=0)  ##############################
03: 1.17 (n=08, f=0)  ###############
04: 0.94 (n=08, f=0)  ######
05: 3.49 (n=06, f=2)  ##################################################################
06: 1.59 (n=08, f=0)  ################################
07: 1.46 (n=07, f=0)  ############################
08: 1.29 (n=08, f=0)  ####################
09: 1.72 (n=08, f=1)  ########################################
10: 1.09 (n=07, f=0)  ############
11: 0.89 (n=07, f=0)  ####
12: 0.52 (n=06, f=0)
13: 1.31 (n=07, f=0)  ######################
14: 1.06 (n=06, f=0)  ###########
15: 1.45 (n=06, f=0)  ##########################
16: 0.44 (n=04, f=0)
17: 1.90 (n=02, f=0)  OOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOO
```

(when n is much less than the average number of subjects per cluster different symbols are used: 0 for n < 80% and ~ for n < 40%; The numbers marked "f" are the numbers of SMART flags found in the different time

```
points)
```

Team: 6

```
Time                                          SD for WHZ
point                 0.8 0.9 1.0 1.1 1.2 1.3 1.4 1.5 1.6 1.7 1.8 1.9 2.0 2.1 2.2 2.3
01: 1.15 (n=08, f=0)  ###############
02: 1.33 (n=08, f=0)  #####################
03: 1.52 (n=08, f=1)  ##############################
04: 0.71 (n=08, f=0)
05: 1.48 (n=07, f=0)  ############################
06: 1.14 (n=07, f=0)  #############
07: 0.99 (n=06, f=0)  ########
08: 0.70 (n=08, f=0)
09: 1.52 (n=06, f=0)  ##############################
10: 0.70 (n=06, f=0)
11: 0.86 (n=07, f=0)  ##
12: 0.97 (n=06, f=0)  #######
13: 1.21 (n=04, f=0)  #################
14: 0.74 (n=04, f=0)
15: 1.02 (n=05, f=0)  #########
16: 1.01 (n=03, f=0)  OOOOOOOOO
17: 0.37 (n=02, f=0)
18: 0.16 (n=02, f=0)
19: 0.32 (n=02, f=0)

(when n is much less than the average number of subjects per cluster different symbols are used: 0 for n <
80% and ~ for n < 40%; The numbers marked "f" are the numbers of SMART flags found in the different time
points)
```

(for better comparison it can be helpful to copy/paste part of this report into Excel)

Annex 5: Integrated SMART Survey Questionnaire

Date (dd/mm/year)			**Cluster Name**		
Cluster Number		**Team Number**		**HH Number**	

Household Questionnaire

Start date/event of recall period: 117							
1	2	3	4	5	6	7	8
No.	Name	Sex (m/f)	Age (years)	Joined on or after	Left on or after	Born on or after	Died on or after
List all current household members*							
1	Head of household						
2							

3							
4							
5							
6							
7							
8							
9							
10							
11							
12							
13							
14							
15							
16							
17							
18							
19							
20							
List all household members which left since the start of the recall period							
1					Y		
2					Y		
3					Y		
4					Y		
5					Y		
List all household members which died since the start of the recall period							
1							Y
2							Y
3							Y
4							Y
5							Y

*Household defined as all people eating from the same pot and living together (WFP definition)

Date (dd/mm/year)			**Cluster Name**		
Cluster Number		**Team Number**		**HH Number**	

Household Questionnaire

Q1. What is the household resident status? 1=Resident of this area 2=Internally displaced 3=Refugee 4=Nomadic	
Q2. What is the main source of <u>drinking water</u> used by household members?	

Record <u>one</u> of the options (the main source) according to the respondent 1=Piped household water connection 2=Public standpipe 3=Borehole/well with hand pump 4=Protected spring 5=Snow/rainwater collection 6=River/stream/canal water 7=Pond/reservoir water 8=Well with bucket 9=Unprotected kanda/karez 10=Unprotected spring 98=Other (specify)	

Q3. What foods have been eaten in the household in the last 7 days? On how many days of the last 7 days was the food eaten?		
Food items are not read aloud, complete based on respondent's account	Number of days eaten of the last 7 days (0-7)	Total
A. Cereals or tubers (bread, wheat, rice, maize, potatoes, etc.)	○ ○ ○ ○ ○ ○ ○	
B. Pulses (beans, lentils, peas, etc.)	○ ○ ○ ○ ○ ○ ○	
C. Vegetables	○ ○ ○ ○ ○ ○ ○	
D. Fruit	○ ○ ○ ○ ○ ○ ○	
E. Meat, fish, or eggs	○ ○ ○ ○ ○ ○ ○	
F. Dairy (milk, yogurt, cheese, etc.)	○ ○ ○ ○ ○ ○ ○	
G. Sugar, honey	○ ○ ○ ○ ○ ○ ○	
H. Oil, fats	○ ○ ○ ○ ○ ○ ○	

Q4. In the past 7 days, have there have been times when you did not have enough food or money to buy food? If yes, what did you do?	Number of days of the last 7 days (0-7)	Total
A. Rely on less preferred and less expensive food	○ ○ ○ ○ ○ ○ ○	
B. Borrow food, or rely on help from a friend or relative	○ ○ ○ ○ ○ ○ ○	
C. Limit portion size at mealtimes	○ ○ ○ ○ ○ ○ ○	
D. Restrict consumption by adults in order for small children to eat	○ ○ ○ ○ ○ ○ ○	
E. Reduce number of meals eaten in a day	○ ○ ○ ○ ○ ○ ○	

Date (dd/mm/year)			**Cluster Name**		
Cluster Number		**Team Number**		**HH Number**	

Child Questionnaire 0-59 months

1	2	3	4	5	6	7	8	9	10

Child ID	**Sex** (f/m)	**Birthday** (dd/mm/yyyy)	**Age** (months)	**Weight** (00.0 kg)	**Height or length** (00.0 cm)	**Measure** (l/h)*	**Bilateral oedema**	**MUAC** (000 mm) *Left arm*	**With clothes** (y/n)
1									
2									
3									
4									
5									
6									
7									
8									

**Note <u>only</u> if length is measured for a child who is older than 2 years or height is measured for a child who is younger than 2 years, due to unavoidable circumstances in the field*

Child (6-59 months) ID Number					
For any child that is identified as acutely malnourished (WHZ, MUAC, or oedema) **Q5. Is the child currently receiving any malnutrition treatment services?** *Probe, ask for enrolment card, and observe the treatment food (RUTF / RUSF) to identify the type of treatment service* 1=OPD SAM 2=OPD MAM 3=IPD SAM 4=No treatment 98=Don't know					
If the child is <u>not</u> enrolled in a treatment program, refer to nearest appropriate treatment center **Q6. Did you refer the child?** 1=yes 0=no					

Date (dd/mm/year)			**Cluster Name**		
Cluster Number		**Team Number**		**HH Number**	

Child Questionnaire

Child (18-59 months) ID Number					

Q7. Has the child received <u>two doses</u> of measles vaccination? (on the upper right arm) *Ask for vaccination card to verify if available* 1=Received two doses as confirmed by vaccination card 2=Received two doses as confirmed by caregiver recall 3=Has not received two doses 98=Don't know					

Child (<24 months) ID Number					
Q8. How long after birth was the child first put to breast? 1=Within one hour 2=In the first day within 24 hours 3=After the first day (>24 hours) 98=Don't know					
Q9. Was the child breastfed yesterday during the day or night? *This includes if the child was fed expressed breastmilk by cup, bottle, or by another woman (these are also considered "yes")* 1=Yes 0=No 98=Don't know					
Q10. Did the child have any liquid drink other than breastmilk yesterday during the day or night? *Do not read options, probe by asking open questions and record all that apply. Vitamin drops, ORS, or medicine as drops are not counted* 1=Yes 0=No					
A. Plain water					
B. Infant formula					
C. Powdered or fresh animal milk					
D. Juice or soft drinks					
E. Clear broth					
F. Yogurt					
G. Thin porridge					
H. Any other liquids (tea, coffee, etc.)					
Q11. Did the child have any solid, semi-solid, or soft foods yesterday during the day or night? 1=Yes 0=No 98=Don't know					

Date (dd/mm/year)		**Cluster Name**	

Cluster Number		Team Number		HH Number	

Caregiver Questionnaire

Caregiver HH Member ID Number					
Q12. Can you show me how you wash your hands? *Observe the caregiver as they wash their hands. Do not probe or read the answers, record the most appropriate response* 1=Yes 0=No					
A. Uses soap or ash with water					
B. Uses only water					
C. Uses nothing					
D. Other (specify)					

Caregiver HH Member ID Number					
Q13. When do you usually wash your hands? *Do not probe or read the answers, record all appropriate responses* 1=Yes 0=No					
A. After defecation					
B. After cleaning baby`s bottom					
C. Before food preparation					
D. Before eating					
E. Before feeding children (including breastfeeding)					

Woman (15-49 years) HH Member ID Number					
Q14. Status of woman 1=Pregnant 2=Lactating 3=Pregnant and lactating 4=None					
MUAC measurement (mm)					

General comments (optional)

11. REFERENCES

- ENA software 2011 updated 9th July 2015
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- OHPM/ AAH Khost SMART survey June 2015
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- CSO updated population 1397 (2018)
- Myatt, M. et al (2018) Children who are both wasted and stunted are also underweight and have a high risk of death: a descriptive epidemiology of multiple anthropometric deficits using data from 51 countries.
- The SPEHER Handbooks 2018
- The IPC_Acute_Food_Insecurity_Analysis_Report_2018