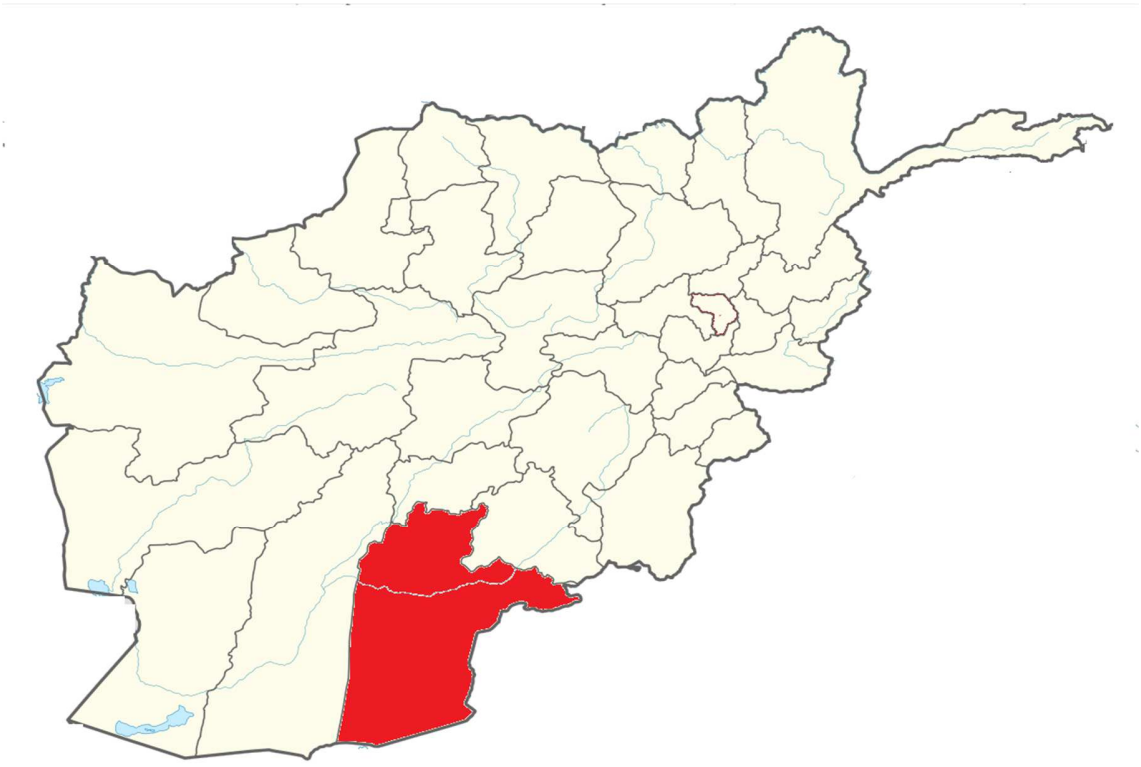
AFGHANISTAN

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

Final Report

Kandahar Province, Afghanistan

21st November to 2nd December 2018



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Acronyms and Abbreviations

AAH	Action Against Hunger
ANC	Antenatal Care
AfDHs	Afghanistan Demographic Health Survey
AIM-WG	Assessment Information Management Working Group
ARI	Acute Respiratory Infection
BARAN	Bu Ali Rehabilitation and Aid Network
BHC	Basic Health Center
BPHS	Basic Package of Health Services
BSU	Basic Sample Unite
CBHC	Community Basic Health Care
CBNP	Community Basic Nutrition Package
CDR	Crude Death Rate
CHC	Comprehensive Health Center
CSO	Central Statistics Organization
CI	Confidential Interval
CHW	Community Health Worker
DH	District Hospital
DOPH	Directorate of Public Health
ECHO	EUROPEAN COMMISION Humanitarian Aid
ENA	Emergency Nutrition Assessment
EPHS	Essential Package of Health Services
EPI	Expanded Program on Immunization
FCS	Food Consumption Score
FSL	Food Security and Livelihoods
GAM	Global Acute Malnutrition

GCMU	Grand Contract Management Unite
HH	Household
HCS	Health Sub centre
HAZ	Height per Age Z score
IMAM	Integrated Management of Acute Malnutrition
IP	Implementer
IPC	Integrated Phase Classification
IPD	Inpatient Department
IYCF	Infant and Young Child Feeding
MAM	Moderate Acute Malnutrition
MCC/GAC	Mennonite Central Committee/Global Affairs Canada
MoPH	Ministry of Public Health
MUAC	Mid Upper Arm Circumference
NCA	Nutrition Causal Analysis
OPD	Outpatient Department
OW	Observed Weight
PH	Provincial Hospital
PLW	Pregnant and Lactating Women
PND	Public Nutrition Department
PNO	Provincial Nutrition Officer
PPHD	Provincial Public Health Directorate
PPS	Probability Proportional to Size
RC	Reserve Cluster
rCSI	reduced Coping Strategy Index
SAM	Severe Acute Malnutrition
SCI	Save the Children International

SD	Standard Deviation
SMART	Standardized Monitoring and Assessment of Relief and Transition
TSFP	Target Supplementary Food Program
UNICEF	United Nation Children's Fund
U5DR	Under Five Death Rate
WASH	Water, Sanitation, and Hygiene
WFP	World Food Program
WHO	World Health Organization
WHZ	Weight for Height Z score

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1. EXECUTIVE SUMMARY

Kandahar Province is one of the 34 provinces of Afghanistan, located in the southern part of the country bordering Helmand in the west, Uruzgan in the north and Zabul Province in the east. Kandahar is the capital of the city.

A nutrition and mortality survey was conducted in Kandahar Province from the 21st November to the 2nd December 2018 during the fall season. It was a cross-sectional population-representative survey following the Standardized Monitoring and Assessment of Relief and Transition (SMART) methodology. The final report presents the analysis and interpretation of the nutritional status of children under five, the nutritional status of pregnant and lactating women (PLW), infant and young child feeding (IYCF), immunization coverage, water, sanitation, and hygiene (WASH), food security, and mortality. 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*	8.7% (6.9-10.9 95% CI)
SAM prevalence among children 6-59 months per WHZ <-3SD	1.1% (0.6- 2.0 95% CI)
GAM prevalence among children 0-59 months per WHZ <-2SD	8.7% (6.9-10.9 95% CI)
SAM prevalence among children 0-59 months per WHZ <-3SD	1.2% (0.7- 2.0 95% CI)
GAM prevalence among children 6-59 months per MUAC <125 mm	8.9% (7.0-11.4 95% CI)
SAM prevalence among children 6-59 months per MUAC <115 mm	3.3% (2.3- 4.8 95% CI)
Combined GAM prevalence among children 6-59 months per WHZ <-2SD or MUAC <125mm	13.6% (11.1-16.6 95% CI)
Combined SAM prevalence among children 6-59 months per WHZ <-3SD or MUAC <115 mm	3.4% (2.4- 4.8 95% CI)
Stunting among children 6-59 months per HAZ <-2SD	55.4%

	(50.6-60.0 95% CI)
Severe Stunting among children 6-59 months per HAZ <-3SD	21.3% (18.2-24.8 95% CI)
Underweight among children 6-59 months per WAZ <-2SD	27.0% (23.8-30.5 95% CI)
Severe Underweight among children 6-59 months per WAZ <-3SD	6.4% (4.7- 8.8 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	17.3% (15.1-19.495% CI)
Low MUAC among pregnant women per MUAC <230 mm	14.5% (8.9-20.1 95% CI)
Low MUAC among lactating women per MUAC <230 mm	14.6% (10.4-18.8 95% CI)
Low MUAC among all pregnant and lactating women per MUAC <230mm	14.7% (11.2-17.9 95% CI)

Infant and Young Children Feeding Practices	
Indicator	**Result**
Initiation of breastfeeding within 1 hour of birth among children 0-23 months	49.1%
Exclusive breastfeeding among infants 0-5 months	51.6%
Continued breastfeeding at 1 year among children 12-15 months	80.6%
Continued breastfeeding at 2 year among children 20-23 months	74.6%

Child Immunization	
Indicator	**Result**

Second dose measles vaccination among children 18-59 months confirmed by vaccination card	13.8%
Second dose measles vaccination among children 18-59 months confirmed by caregiver recall	48.4%
Second dose measles vaccination among children 18-59 months confirmed by vaccination card or caregiver recall	62.3%

Crude and Under Five Death Rate (Death/10,000/Day)	
Indicator	**Result**
Crude Death Rate (CDR)	0.33 (0.20-0.52 95% CI)
Under five Death Rate (U5DR)	0.52 (0.19-1.43 95% CI)

2. INTRODUCTION

Kandahar is the second largest of the thirty-four provinces of Afghanistan., located in the southern part of the country bordering Pakistan. It is surrounded by Helmand in the west, Uruzgan in the north and Zabul Province in the east. Kandahar city is the capital the province located on the Arghandab River. The greater region surrounding the province is called Loy Kandahar.

The province contains 18 districts : Arghandab, Arghistan, Daman, Ghorak, Khakrez, Maruf, Maiwand, Myanashin, Nesh, Panjwayee, Reg, Shahwali kot, Shorabak, Spin Boladak, Zherai, Shaga, Dand and Kandahar city (capital).

2.1 Economy and Demography

Kandahar International airport is located east of Kandahar city. It is designed for military and civilian use. It serves the population of the entire southern Afghanistan by providing domestic and international flights to Dubai, Pakistan, Iran and other regional countries. It serves as the nation's second main international airport and as one of the largest military base, capable of housing up to 250 aircrafts of all types. Although, some of the villages are highly unsecure in the districts.

Most of the households rely on agriculture and earn incomes from non-farm labor, livestock, trade and services.

The estimated population of the Kandahar Province is 13,371,183 (Central Statistics Organization (CSO) 1397), which is a multi-ethnics and mostly rural (63.3%) and urban (36.7%) society. The majority of the population are Pashtuns, although smaller communities of Tajiks, Hazeras, Uzbeks, Bloch and nomadic population. The main language spoken in the province is Pashto but speakers of Dari and Balochi can also be found. The inhabitants of the province are mostly Sunni Muslims, although there are also Shia Muslims.

2.2. Agriculture and Food Practices

The main agricultural crops of the province are grains (wheat and maize), vegetables (onions and tomatoes), and fruits (grapes, pomegranates, mulberry and peaches). Much of the pomegranates and grapes crops are sold locally and exported. The main types of livestock raised in the province are sheep and goats. The most famous agricultural seasons are summer (Jun, Jul and Aug) and fall (Sep, Oct and Nov) , when the grapes and pomegranates are plentiful in the markets. The lean season is considered to last from late November (Qaws in solar in date) until mid early March (Hamal in solar date). Meats, cereals, pulses and vegetables are commonly consumed in the households.

2.3. Humanitarian Assistance

Ten national and international organizations (BARAN, INTERSOUS, SCI and MEDAIR, AHDS, ACTD, ARCS, HNTPO, ICRC, Mercy Malaysia, Wadan, Handicap and MOPH) for Health services and four national and international NGOs (BARAN,MEDAIR, SCI and INTERSOUS) are working for health and nutrition services

in the province. BARAN and MOPH are providing health services as BPHS and EPHS implementer in the province. In Kandahar province, there are a total of 84 health facilities, including 1 Regional Hospital, 1 district hospitals (DHs), 27 comprehensive health centres (CHCs), 16 basic health centres (BHCs), 1 BHC+, 8 health sub-centres (HSCs), 2 Drug Abuse Treatment Center (DATC), and 1 Trauma Center. It is notable that 17 others health facilities and 10 health mobile teams providing health services are managed by different organizations outside of BPHS/EPHS framework. Among these, Kandahar provincial hospital is providing the essential package of health services (EPHS), which is implemented by ICRC under the MoPH. The basic package of health services (BPHS) is implemented by BARAN.

3. SURVEY OBJECTIVES

3.1 Primary Objective

- To investigate the nutritional status of vulnerable population, mainly children under five years and pregnant and lactating women living in the province.

3.2 Specific Objectives

- To estimate the prevalence of undernutrition (stunting, wasting, underweight) among children aged 0-59 months.
- To determine the nutritional status of pregnant and lactating women based on MUAC assessment.
- To estimate Crude Death Rate (CDR) and under five Death Rate (U5DR).
- To assess core Infant and Young Child Feeding (IYCF) practices among children aged <24 months.
- To estimate the second dose measles vaccination coverage among children 18-59 months.
- To assess Water, Sanitation and Hygiene (WASH) proxy indicators: household 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

- Kandahar province is categorized as “critical” based on OCHA analysis for recent drought in Afghanistan.
- There is a possible deterioration of health and nutrition situation due to drought and conflict related issues causing food insecurity in the area that require updated information.
- The area was selected by nutrition cluster and Assessment Information Management Working Group

(AIM-WG) to know the nutrition situation in the districts.

- 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 Kandahar in early 2017 but was not validated by the AIM-WG. The survey findings will be used to inform future programming in the province.
- It was an opportunity of building the technical capacity of the agency MEDAIR in conducting SMART survey.

4. METHODOLOGY

4.1 Sample Size

The sample size of households to be surveyed was determined using ENA software for SMART version 2011 (up dated 9th July 2015). A **two-stage cluster sampling methodology** was applied.

In the first stage, the villages (clusters) were systematically randomly selected from a complete list of villages using the probability proportion to size (PPS) method. This was conducted in the province after a village-level security assessment prior the data collection. The village was the primary sampling unit for the survey. The second stage of the methodology involved the random selection of households from a complete and updated list of households. This was conducted at the field level. The household was the basic sampling unit for the proposed survey.

Tables 2 and 3 highlight the 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 (%)	**12.6%**	Based on results from the MEDAIR/AAH SMART Survey August 2015. GAM prevalence (WHZ) for Kandahar was estimated at 9.8 % (7.6-12.6 95% CI). The upper confidence interval of 12.6% was selected as a more conservative estimate, particularly given the influence of drought on the province.
Desired precision	**±3**	Based on SMART recommendation and consistent with survey objectives in order to estimate the prevalence.
Design effect (DEFF)	**1.5**	The population living in the targeted districts is considered to have similar living conditions and access

		to resources. Nevertheless, access to health facilities cannot be estimated as similar 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	**768**	Minimum sample size-children aged 6-59 months.
Average household (HH) size	**8.0**	Based on AfDHs 2015
% Children 6–59 months	**17.3%**	Based on CSO updated population 1397 (2018)
% Non-response rate	**5%**	Based on the MEDAIR/ACF SMART Survey August 2015.
Households to be included	**649**	Minimum sample size-Households to be 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 and supportive of survey objectives to estimate death rate.
Design effect	1.5	Based on survey objectives
Recall period in days	**98**	Starting point of recall period was 21th Aug 2018 (11th Sunbula 1397) (Eid ul Adha) to the mid-point of data collection estimated to be the 27th November 2018 (6th Qaws 1397).
Population to be included	**3,556**	**Population**
Average HH size	**8.0**	Based on the AfDHs 2015
% Non-response rate	**5%**	Based on the MEDAIR/ACF SMART Survey August 2015.
Households to be included	**468**	Households to be 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 649 households. All additional indicators (PLW nutritional status, IYCF, immunization coverage, WASH, food security) were

collected based on this sample size.

4.2 Sampling Methodology

Stage 1: The clusters were systematically randomly selected by applying PPS using ENA software for SMART. A complete and updated list of all accessible villages were added into the ENA software for SMART. Following the principles of PPS, the villages with a large population had a greater chance of being selected than the villages with a small population and vice versa. (6) Reserve Clusters (RCs) were also selected by ENA software for SMART during the same step. Based on the estimated time to travel to the survey area, select and survey the households, it was estimated that each team could effectively survey 13 HHs per day. Based on the selected HH sample size, the number of clusters to survey was rounded up to 50 clusters (649/13=49.9) . Unfortunately, only 48 clusters were surveyed out of the 50 selected ; 2 clusters were not surveyed, representing 4.0% so less than 10% of sample size), one cluster was unaccessable due to ongoing fighting and one cluster was rejected by village elder). RCs were not used because the number of inaccessible clusters was less than 10%, as per the SMART methodology. The selected clusters are highlighted in Annex 1.

In each selected village, one or more key informants from the community (i.e. village elder, mullah, community health worker) were asked to provide information about the village such as geographic layout and the number of households. In clusters made up of large villages or semi-urban zones, the cluster was divided into smaller segments if they contained more than 150 households or if households were very geographically dispersed. This division was based on existing administrative units (neighbourhood, zone, street) or natural landmarks (river, road, or public places like a market, school, or mosque). If the segments had a similar number of households then a segment was selected randomly to represent the cluster. If the segments had very different numbers of households, a segment was selected using the PPS.

Stage 2: The household was defined as “all people eating from the same pot and living together” (World Food Programme (WFP) definition). The household was the BSU. In Afghanistan, the term household is often used synonymously with a compound, which potentially represents 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.

This survey was planned to survey 650 (50*13) households and each team can cover effectively 13 households in a day. In this assessment households were chosen within each cluster using systematic random sampling. 6 teams were engaged during the assessments, while data collection was conducted over 10 days.

All households were listed and numbered by the survey team. The 13 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 Kandahar province, the teams took into account multi-storeyed buildings as multiple HHs depending on the HH definition. In the case of a multi-storeyed building containing multiple households was accidentally counted as one HH during the initial listing process, the enumerators did another round of randomization to select one HH.

Every household was asked to consent before any data is 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. If a child of a surveyed household was absent due to enrolment in an IPD treatment centre at the time the household was surveyed, teams visited the treatment centre to measure the child if possible. Households without children were still assessed for household level questions (PLW 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. Missing or absent child that were not found after multiple visits were 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 each conducted data collection in the field. Each team was composed of one supervisor/team leader, two measurers, and one interviewer. Each team had at least two female surveyors to ensure acceptance of the team amongst the surveyed households, particularly for IYCF questions. Each female member of the survey team was accompanied by a mahram[1] to facilitate the

Standardization Picture

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

work of the female surveyors at the community level. The teams were supervised by AAH/ACF, MEDAIR and PPHD team.

The entire survey team received a 7-day training in the local language of Pashto on the SMART survey methodology and all its practical aspects. Two AAH/ACF technical staff facilitated the training. A standardisation test was conducted over the course of one day, measuring 10 children in order to evaluate the accuracy and the precision of the surveyors in taking the anthropometric measurements and at the end of the day only 6 children measured complete. The training included a one-day field test in order to evaluate the surveyors in real field conditions.

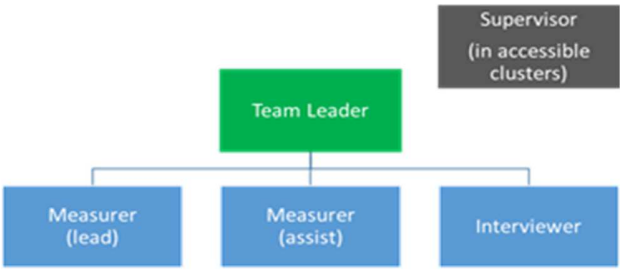


Figure 1: AAH/ACF Afghanistan SMART Team Structure

Each team member was provided with key documents and tools to carry into the field: a guidance document on field operations with instructions for conducting data collection, a household selection document, a local events calendar, and the questionnaire. All documents were translated into Pashto for better comprehension by the teams and to avoid direct translation during data collection. The questionnaire was translated and back-translated using a different translator in advance of the survey. The questionnaire was then pre-tested during the field test. Modifications based on feedback from the field test were made as necessary.

4.4 Data Analysis

Data analysis was conducted using ENA software for SMART for anthropometric and mortality data. The ENA Plausibility Check 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 gained in the field was used to complement survey results and strengthen interpretation. 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 4: 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 can be expressed by using three indicators. Weight for Height (W/H) and Mid Upper Arm Circumference (MUAC) are described below. Nutritional edema is 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 is estimated by comparing it to the weight-for-height distribution curves of the 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 appropriate center if needed. Moreover, the results was presented in Z-score using WHO reference in the final report. The classification of acute malnutrition based on WHZ is well illustrated in Table 6.

Mid Upper Arm Circumference (MUAC)

The mid upper arm circumference does not need to be related to any other anthropometric measurement. It is a reliable indicator of the muscular status of the child and is 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 5 provides the cut-off criteria for categorizing acute malnutrition cases.

Table 5: 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.

Table 6: 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

Chronic Malnutrition

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

The height-for-age measure indicates if a child of a given age is stunted also known as chronically malnourished. This index reflects the nutritional history of a child rather than his/her current nutritional status. This is mainly used to identify chronic malnutrition. The same principle is used as for weight-for-height; except that a child's chronic nutritional status is 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 7: 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 is 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 will be used for monitoring the previous Millennium Development Goals, it is no longer use for monitoring individual children, as it cannot detect children who are stunted. Furthermore, it does not detect life-threating acute malnutrition among children. The WAZ cut-off points are presented in table below

Table 8: 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 9: Classification for Severity of Malnutrition by Prevalence among Children under Five[2]

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

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.

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

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

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

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 IYCF 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

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

The FCS is proxy indicator to assess caloric intake and diet quality at the household level. It also provides an indication of short-term household food security. It is calculated as the weighted sum of the frequency of consumption of eight designated food groups consumed in the seven days prior to the survey based on household recall. Each food group is weighted for nutritional value, with the following weightings: protein 4, cereals 2, pulses 3, vegetables and fruits 1, while sugars and oils are weighted 0.5. 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[3]

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**.

[3] 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**.[4]

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, 1 cluster could not be accessed and surveyed. Insecurity also limited ability of AAH staff to provide direct technical supervision in some clusters.
- Some areas to be surveyed were situated very far from the city of Kandahar province and the team. This hindered the ability the teams to return daily for data quality checks and debriefings.
- Only 3% of the surveyed children had documentation to evidence their exact date of birth and 97% of the children were without exact birth date documentations. Due to the lack of reliable, 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.
- Culture barriers was another limitation and most of the HHs were refused in the middle of the interviewed from the male members of the household.One team going to a cluster was rejected by village elders and was not able to survey that cluster.
- Many HH members were out of households and female members did not allow to measure their children by male and most of the workload were by female enumerators.

[4] 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 48 clusters, 543 households, 6084 individuals, 1171 women 15-49 years, 1184 children under five, and 1082 children 6-59 months. Among the 543 households the teams attempted to survey, 58 were absent or refused, resulting in a non-response rate of 13.0%. This rate is higher than the estimate done at planning stage ; more heads of household have refused to participate to the survey than initially expected. Overall, 87.0% of the planned households were assessed and 140.8% of the anticipated sample size for children 6-59 months was achieved.

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
624	543	87.0%	768	1082	140.8%

The mortality questionnaire is 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 11.2 (average higher than the one used at planning stage with 8 members per household), 50.5% of the population was female, 49.5% of the population was male, and 20.4% was under five. The observed rate of IN/OUT-MIGRATION 0.8 and 0.53 during the recall period may have been influenced by 98 recall period days.

Table 14: Demographic Summary

Indicator	Values
Total number of clusters	48
Total number of HHs	543
Total number of HHs with children under five	501
Average household size	11.2
Female % of the population	50.5%
Male % of the population	49.5%
Children under five % of the population	20.4%
Birth Rate	1.16/10,000/day

In-migration Rate (Joined)	0.8/10,000/day
Out-migration Rate (Left)	0.53/10,000/day

Households were also assessed for residential status. Among the 543 surveyed households, 87.8% were residents of the area, 9.9% were internally displaced, and 1.1% were Refugee.

Table 15: Household Residential Status by Proportion

Residential Status of Households N= 543	Resident	477	87.8%
	IDP	54	9.9%
	Refugee	6	1.1%
	Nomad	6	1.1%

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 2 below. The pyramid is wide at the base and narrows towards the apex, indicating a generally youthful population characterized by a high birth rate and a high mortality rate

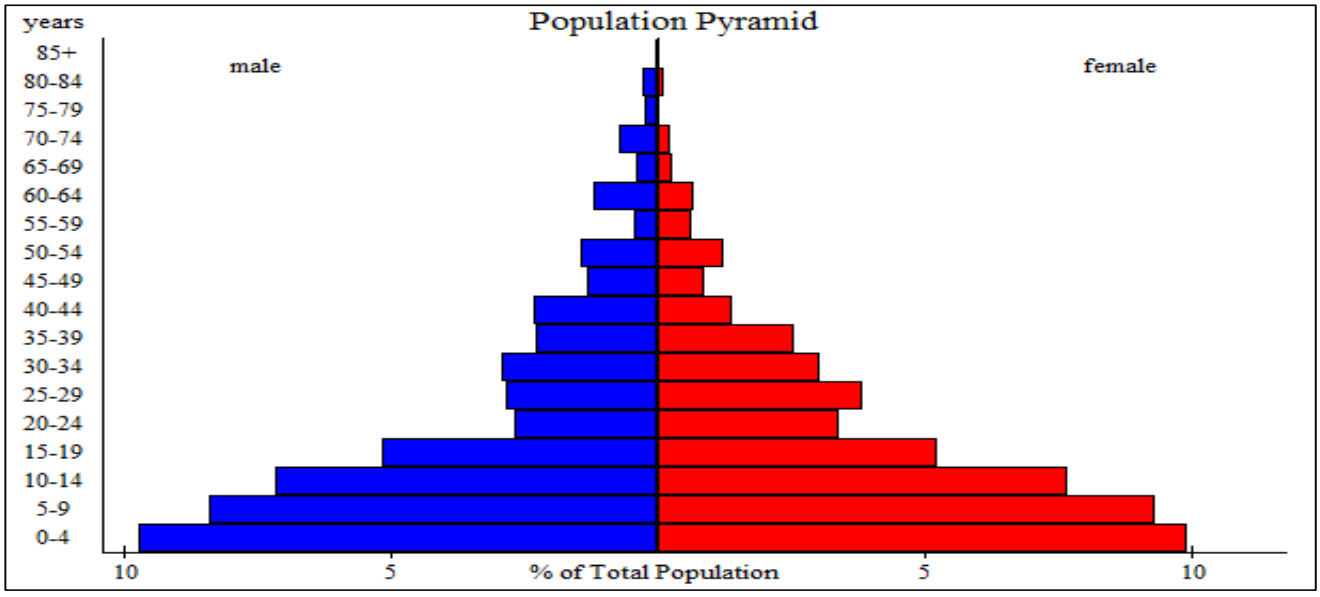


Figure 2: Kandahar Province Population Pyramid

The surveyed sample of children 6-59 months was 1082. The distribution as aggregated by age and sex is presented in Table 16 below. 54-59 months aged girls are lower than boy's maybe because of culture barriers existing in the community and because some families did not allow our teams to measure girls. The overall

sex ratio was 1.0, indicating a sample with equally represented. 97% children were with no exact birth date and only 3% of the surveyed children had documentation to evidence their exact date of birth, this may have reduced the quality of the collected age data.

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	126	46.2	147	53.8	273	24.9	0.9
18-29	130	47.3	145	52.7	275	25.1	0.9
30-41	122	47.1	137	52.9	259	23.6	0.9
42-53	99	49.3	102	50.7	201	18.3	1.0
54-59	57	64.8	31	35.2	88	8.0	1.8
Total	534	48.7	562	51.3	1096	100.0	1.0

7.2. Data Quality

14 children were excluded from WHZ analysis per SMART flags[5], resulting in an overall percentage of flagged data of 1.2%. 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 1082 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 1.07, the SD of HAZ was 1.11, and the SD of WAZ was 0.98, 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*	1081	-0.35±1.07	1.38	1	14
Weight-for-Age*	1088	-1.43±0.98	1.50	1	7
Height-for-Age	1078	-2.14±1.11	2.39	0	18

[5] SMART flags as observation +/- 3 SD from the observed mean

**Z-scores unavailable for children presenting with oedema 1*

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 not statistically significant (p=0.108) and considered of Excellent 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 1.0 boys/girls (expected value between 0.8 and 1.3) (p=0.398) suggesting that boys and girls were equally represented. The overall sex ratio was considered of Excellent quality by the ENA Plausibility Check.
Among children 6-59 months. The age ratio between children 6-29 months and 30-59 months was 0.007 (expected value near 0.85) and the difference was not statistically significant (p=0.007). The overall age ratio was considered of Excellent quality by the ENA Plausibility Check.

Digit preferences scores for weight 0 (4), height 0 (4), and MUAC 0 (4) all digits preference score considered of Excellent by the ENA Plausibility Check. The overall ENA Plausibility Check score was 5%, which is considered a survey of Excellent quality. The complete Kandahar 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 Kandahar was 8.7% (6.9-10.9 95% CI) was catagorized as medium, as presented in Table 18 below. This prevalence was slightly higher in girls than boys.

The prevalence of SAM per WHZ among children 6-59 months was 1.1% (0.6-2.0 95% CI). According to WHO thresholds, this SAM prevalence was categorized as Acceptable.

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 = 1082	Boys n = 526	Girls n = 556
Prevalence of global acute* malnutrition (<-2 z-score and/or oedema)	(94) 8.7 % (6.9 - 10.9 95% C.I.)	(42) 8.0 % (5.5 - 11.5 95% C.I.)	(52) 9.4 % (7.1 - 12.3 95% C.I.)
Prevalence of moderate acute malnutrition (<-2 to ≥-3 z-score)	(82) 7.6 % (5.9 - 9.8 95% C.I.)	(37) 7.0 % (4.7 - 10.4 95% C.I.)	(45) 8.1 % (6.0 - 10.9 95% C.I.)
Prevalence of severe acute malnutrition (<-3 z-score and/or oedema)	(12) 1.1 % (0.6 - 2.0 95% C.I.)	(5) 1.0 % (0.4 - 2.2 95% C.I.)	(7) 1.3 % (0.6 - 2.8 95% C.I.)

**There were 0.1% oedema cases in the sample*

The prevalence of acute malnutrition by WHZ was also assessed among children 0-59 months. The GAM per WHZ was 8.7% (6.9-10.9 95% CI), as presented in Table 18 below. This prevalence was slightly higher in girls than boys. The prevalence of SAM per WHZ among children 0-59 months was 1.2% (0.7- 2.0 95% CI).

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

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 = 1161	Boys n = 561	Girls n = 600
Prevalence of global acute* malnutrition (<-2 z-score and/or oedema)	(101) 8.7% (6.9-10.9 95% CI)	(45) 8.0% (5.7-11.2 95% CI)	(56) 9.3% (7.1-12.3 95% CI)
Prevalence of moderate acute malnutrition (<-2 to ≥-3 z-score)	(87) 7.5% (5.8- 9.6 95% CI)	(39) 7.0% (4.8-10.0 95% CI)	(48) 8.0% (5.9-10.8 95% CI)

Prevalence of severe acute malnutrition (<-3 z-score and/or oedema)	(14) 1.2% (0.7- 2.0 95% CI)	(6) 1.1% (0.5- 2.2 95% CI)	(8) 1.3% (0.6- 2.8 95% CI)

**There were 0.1% oedema cases in the sample*

When disaggregated 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 30-41 months and there was no SAM case in the age of 42-59 months. Results of this disaggregation suggests that the younger age groups were the most vulnerable to acute malnutrition.

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	268	5	1.9	33	12.3	230	85.8	0	0.0
18-29	272	4	1.5	21	7.7	247	90.8	0	0.0
30-41	254	2	0.8	10	3.9	242	95.3	0	0.0
42-53	200	0	0.0	12	6.0	188	94.0	0	0.0
54-59	88	0	0.0	6	6.8	81	92.0	1	1.1
Total	1082	11	1.0	82	7.6	988	91.3	1	0.1

**There were 1 oedema cases in the sample*

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. The lumping of observations on the left of the curve indicates more GAM and SAM children than expected in the sample.

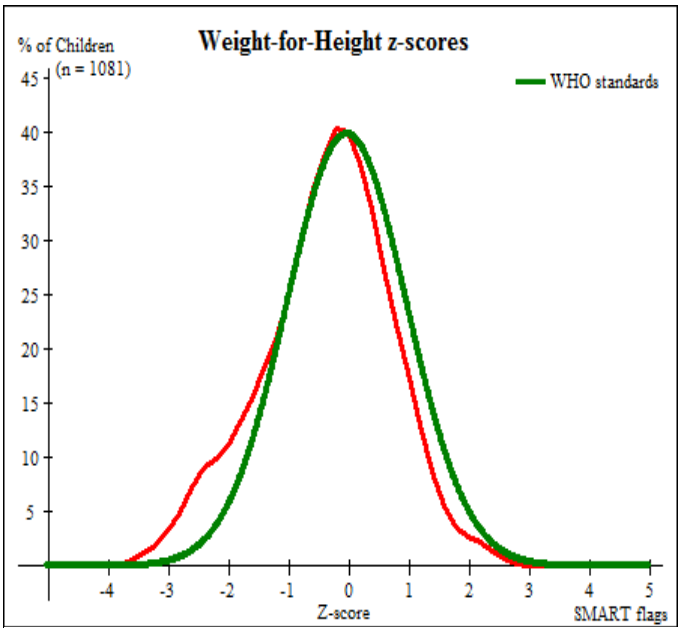


Figure 4: Distribution of WHZ Sample Compared to the WHO 2006 WHZ Reference Curve

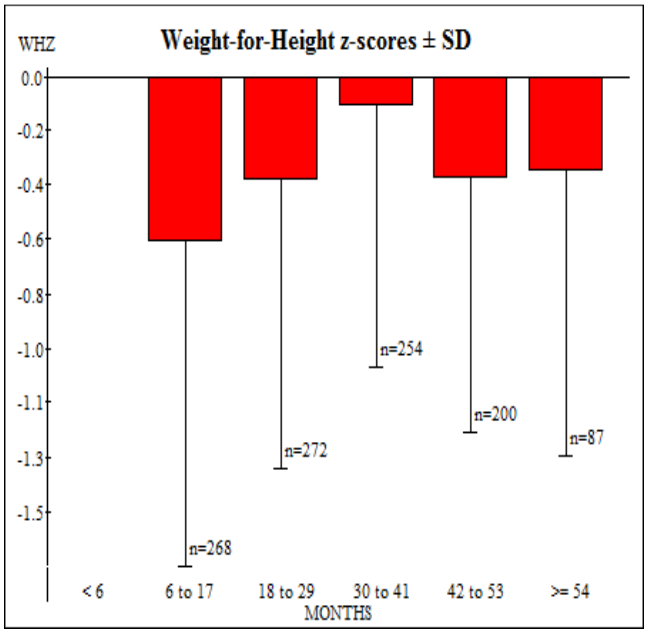


Figure 3: Means WHZ by age groups

Acute Malnutrition by MUAC

The prevalence of GAM per MUAC among children 6-59 months in Kandahar was 8.9% (7.0-11.4 95% CI), as presented in Table 21 below. This prevalence was higher in girls than boys. The prevalence of SAM per MUAC among children 6-59 months was 3.3% (2.3- 4.8 95% CI).

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

Indicators	All n = 1095	Boys n = 534	Girls n = 561
Prevalence of global malnutrition* (<125 mm and/or Oedema)	(98) 8.9 % (7.0 - 11.4 95% C.I.)	(34) 6.4 % (4.5 - 9.0 95% C.I.)	(64) 11.4 % (8.8 - 14.7 95% C.I.)
Prevalence of moderate malnutrition (< 125 mm to ≥115 mm, no Oedema)	(62) 5.7 % (4.2 - 7.6 95% C.I.)	(21) 3.9 % (2.5 - 6.1 95% C.I.)	(41) 7.3 % (5.1 - 10.3 95% C.I.)
Prevalence of severe malnutrition (< 115 mm and/or Oedema)	(36) 3.3 % (2.3 - 4.8 95% C.I.)	(13) 2.4 % (1.4 - 4.1 95% C.I.)	(23) 4.1 % (2.6 - 6.4 95% C.I.)

**There were 1 oedema cases in the sample*

When disaggregated 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 the no MAM was 30-41 months and the lowest SAM was 42-53 months. Results of this disaggregation suggests that the younger age groups were the most vulnerable to acute malnutrition.

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	272	24	8.8	41	15.1	207	76.1	0	0.0
18-29	275	8	2.9	18	6.5	249	90.5	0	0.0
30-41	259	2	0.8	0	0.0	257	99.2	0	0.0
42-53	201	1	0.5	2	1.0	198	98.5	0	0.0
54-59	88	1	1.1	1	1.1	86	97.7	1	1.1
Total	1095	36	3.3	62	5.7	997	91.1	1	0.1

**There were 1 oedema cases in the sample*

Acute Malnutrition by Oedema

Among all children 6-59 Months, there was 1 case of bilateral pitting oedema. This case was categorized as kwashiorkor, and was not categorized as marasmic kwashiorkor, as presented in Table 22 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. 1 (0.1 %)
Absence of Oedema	Marasmic No. 21 (1.9 %)	Not severely malnourished No. 1074 (98.0 %)

**There were 1 oedema cases in the sample*

Combined Acute Malnutrition rate

The prevalence of Combined GAM among children 6-59 months in Kandahar was 13.6% (11.1-16.6 95% CI) as presented in Table 24 below. This prevalence was higher in girls than boys. The prevalence of Combined SAM among children 6-59 months was 3.4% (2.4- 4.8 95% CI). Although there is not globally established threshold for Combined GAM, the GAM and SAM prevalence was higher than for WHZ or MUAC, suggesting that Combined GAM indicator captured more acutely malnourished children.

Table 24: 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)	(147) 13.6% (11.1-16.6 95% CI)	(60) 11.4% (8.5-15.2 95% CI)	(87) 15.6% (12.3-19.7 95% CI)
Prevalence of Sever Acute Malnutrition (MUAC<115 mm+ WHZ<-3SD)	(37) 3.4% (2.4- 4.8 95% CI)	(13) 2.5% (1.5- 4.1 95% CI)	(24) 4.3% (2.7- 6.7 95% CI)

**There were 1 oedema cases in the sample*

Proportion of Acutely Malnourished Children 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 by the teams in the field, 4.65% were enrolled in a program at the time of survey. Of the children who were identified as acutely malnourished but not currently enrolled in a treatment program, 82 children were referred for treatment.

Table 25: Proportion of Acutely Malnourished Children 6-59 Months Enrolled in a Treatment Programme

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 WHZ, MUAC, or oedema (N=86)	(2) 2.3%	(2) 2.3%	(0) 0.0%	(82) 95.3%

7.4. Prevalence of Chronic Malnutrition

The prevalence of stunting per HAZ among children 6-59 months in Kandahar was 55.4% (50.6-60.0 95%CI), as presented in Table 26 below. This prevalence was slightly higher in boys than girls. The prevalence of severe stunting per HAZ among children 6-59 months was 21.3% (18.2-24.8 95% CI). According to WHO thresholds, this prevalence was categorized as high.

Table 26: Prevalence of Chronic Malnutrition by HAZ by Severity and Sex among Children 6-59 months, WHO 2006 Reference

Indicators	All N = 1078	Boys n = 525	Girls n = 553
Prevalence of chronic malnutrition (HAZ <-2 SD)	(597) 55.4% (50.6-60.0 95% CI)	(293) 55.8% (49.8-61.6 95% CI)	(304) 55.0% (49.4-60.4 95% CI)
Prevalence of moderate chronic malnutrition (HAZ <-2 to ≥-3 SD)	(367) 34.0% (30.8-37.4 95% CI)	(176) 33.5% (30.0-37.2 95% CI)	(191) 34.5% (30.5-38.8 95% CI)
Prevalence of severe chronic malnutrition (HAZ <-3 SD)	(230) 21.3% (18.2-24.8 95% CI)	(117) 22.3% (18.4-26.8 95% CI)	(113) 20.4% (16.4-25.2 95% CI)

When disaggregated by age group, the group with the highest moderate chronic malnutrition was 42-53 months, while the age group with the highest severe chronic malnutrition was 18-29 months, as presented in Table 27 below. The age group with the lowest chronic malnutrition was 54-59. Results of this disaggregation suggests that the older age groups were more vulnerable to chronic malnutrition.

Table 27: 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	266	41	15.4	91	34.2	134	50.4
18-29	270	83	30.7	99	36.7	88	32.6
30-41	256	67	26.2	84	32.8	105	41.0
42-53	199	34	17.1	79	39.7	86	43.2
54-59	87	5	5.7	14	16.1	68	78.2
Total	1078	230	21.3	367	34.0	481	44.6

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. Further analysis suggests that linear severe growth retardation is at its highest in the group of children aged 18-29 months (n=270).

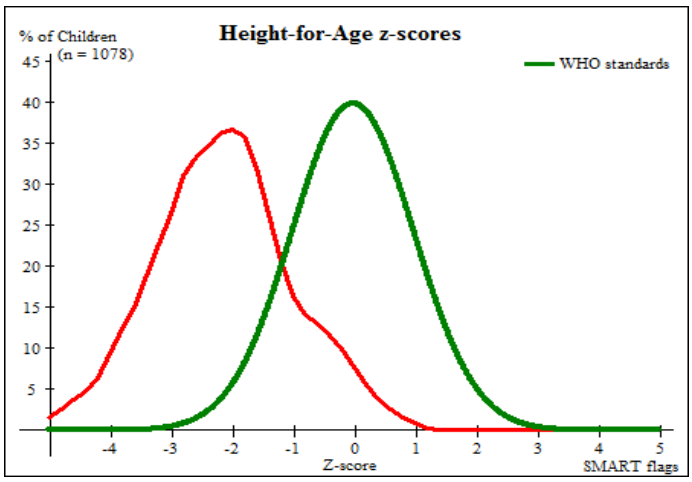


Figure 6: Distribution of HAZ Sample Compared to the WHO 2006 HAZ Reference Curve

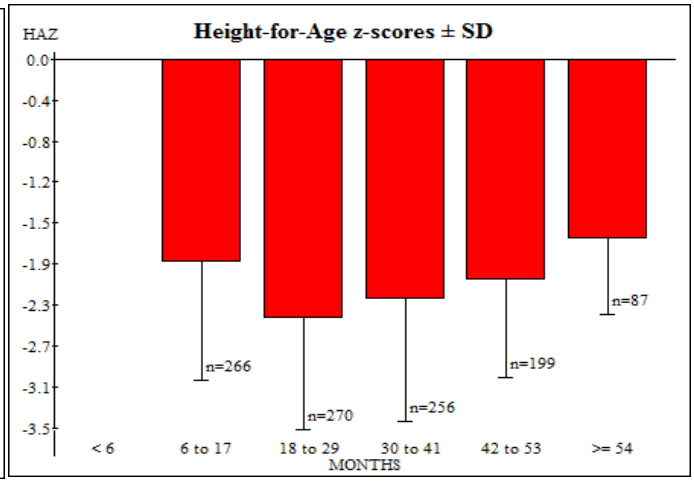


Figure 5: Mean HAZ by Age Group

7.5. Prevalence of Underweight

The prevalence of underweight per WAZ among children 6-59 months in Kandahar was 27.0% (23.8-30.5 95% CI), as presented in Table 28 below. This prevalence was slightly higher in boys than girls. The prevalence of severe underweight per WAZ among children 6-59 months was 6.4% (4.7- 8.8 95% CI). According to WHO thresholds, this underweight prevalence was categorized as High.

Table 28: Prevalence of Underweight by WAZ by Severity and Sex among Children 6-59 months, WHO 2006 Reference

Indicators	All N = 1088	Boys n = 530	Girls n = 558
Prevalence of underweight (WAZ <-2 SD)	(294) 27.0 % (23.8 - 30.5 95% C.I)	(137) 25.8 % (22.1 - 30.0 95%C.I.)	(157) 28.1 % (23.6 - 33.1 95%C.I.)
Prevalence of moderate underweight (WAZ <-2 and >=-3 SD)	(224) 20.6 % (17.9 - 23.6 95%C.I.)	(108) 20.4 % (16.9 - 24.4 95%C.I.)	(116) 20.8 % (17.2 - 24.9 95%C.I.)

Prevalence of severe underweight (WAZ <-3SD)	(70) 6.4 % (4.7 - 8.8 95% C.I.)	(29) 5.5 % (3.4 - 8.6 95% C.I.)	(41) 7.3 % (5.2 - 10.3 95% C.I.)

When disaggregated by age group, the group with the highest moderate underweight was 42-53 months, while the age group with the highest severe underweight was 18-29 months, as presented in Table 29 below. The age group with the lowest moderate underweight was 18-29 months with no severe underweight was 54-59 months. Results of this disaggregation suggests that the younger age groups were the most vulnerable to underweight.

Table 29: 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	270	26	9.6	61	22.6	183	67.8
18-29	272	31	11.4	49	18.0	192	70.6
30-41	259	8	3.1	49	18.9	202	78.0
42-53	200	5	2.5	48	24.0	147	73.5
54-59	87	0	0.0	17	19.5	70	80.5
Total	1088	70	6.4	224	20.6	794	73.0

7.6. Low MUAC among Women

All women of child-bearing age (15-49 years) were included in the survey. A total of 1170 women were assessed for nutrition status by MUAC <230 mm. The analysis looked all women 15-49 years, further disaggregating the sample by physiological status (pregnant, lactating, etc.). The highest proportion of Low MUAC was among 202 (17.3%) 15-59 years women with Low MUAC, and the lowest proportion of Low MUAC was among 67 pregnant and lactating women with 14.7% Low MUAC.

Table 30: Prevalence of Acute Malnutrition among Women per MUAC

Sample	N	MUAC <230 mm	
		N	%
All women 15-49 years	1170	202	17.3%
Pregnant women	152	22	14.5%

Lactating women	274	40	14.6%
Pregnant and lactating women*	29	5	17.2%
Non-pregnant and non-lactating women	715	135	18.9%
All PLWs	455	67	14.7%

**Women that were simultaneously pregnant and lactating*

7.7. Retrospective Mortality

The overall death rate for the surveyed population was 0.33 (0.20-0.52) below the WHO emergency thresholds of 1.0/10,000/day. The death rate was slightly higher for males in the population. The age group with the highest death rate was 65-120 years.

Table 31: Death Rate by Age and Sex with Reported Design Effect

Population	Death Rate (/10,000/Day)	Design Effect
Overall	0.33 (0.20-0.52)	1.0
By Sex		
Male	0.45 (0.24-0.83)	1.2
Female	0.20 (0.09-0.44)	1.0
By Age Group		
0-4	0.52 (0.19-1.43)	1.51
5-11	0.21 (0.07-0.66)	1.0
12-17	0.00 (0.00-0.00)	1.0
18-49	0.20 (0.08-0.55)	1.0
50-64	0.61 (0.15-2.51)	1.01
65-120	2.93 (0.87-9.38)	1.45

7.8. Infant and Young Child Feeding

Indicators for IYCF practices were asked of all caregivers with children less than 24 months. A total of 477 children under two years were included in the sample, with the core IYCF indicators assessed presented in Table 31 below. The proportion of infants breastfed within one hour of birth was 49.0% suggesting some infants were breastfed within an appropriate amount of time after birth, likely receivingcolostrum. The proportion of infants 0-5 months exclusively breastfed was low 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 80.6% and

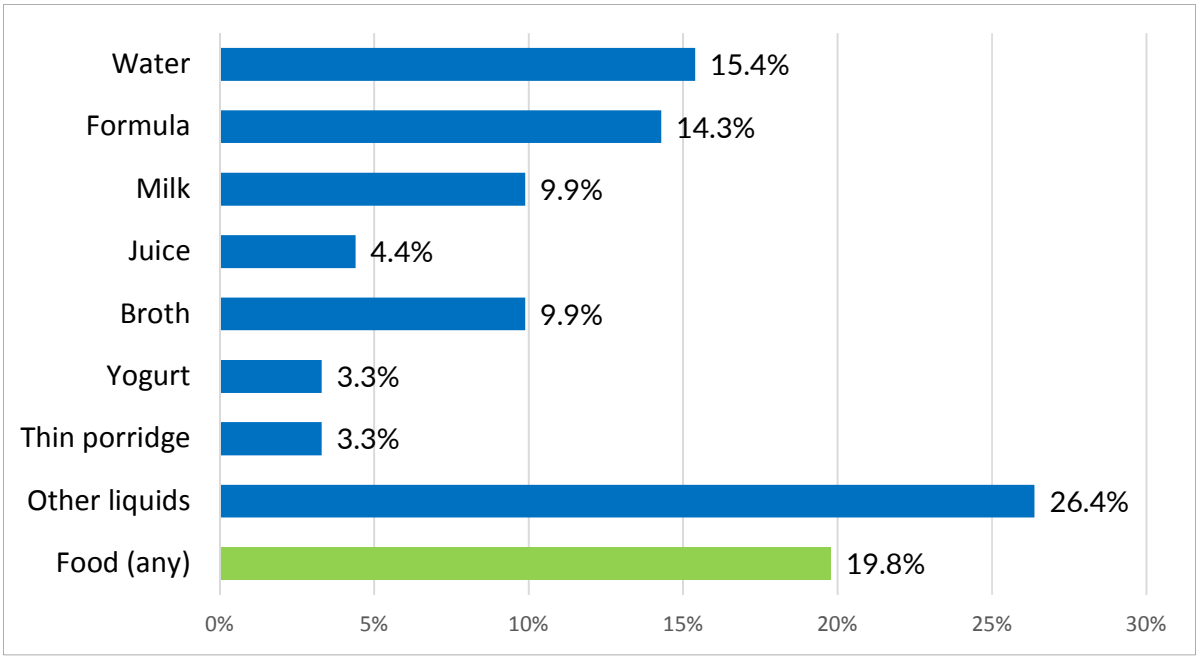
at two years was 74.6%, indicating that many children are receiving breastmilk until their first year but Fewer are receiving breastmilk until their second year.

Table 32: Infant and Young Child Feeding Practices

IYCF Indicator	Sample	N	n	Results
Timely initiation of breastfeeding	Children 0-23 months	477	234	49.0%
Exclusive breastfeeding	Infants 0-5 months	91	47	51.6%
Continued breastfeeding at one year	Children 12–15 months	98	79	80.6%
Continued breastfeeding at two years	Children 20-23 months	59	44	74.6%

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 6 below presents the liquids most frequently displacing breastmilk in this population. 18 at 19.8% was the most frequently fed Solid, semi-solid, or soft foods, followed by 14 at 15.4% and 13 at 14.3% water and formula milks.

Figure 7: Liquids or Food Consumed by Infants 0-5 Months



7.9. Child Immunization Status

In Kandahar the results indicated that 62.3% of children 18-59 months had received the second dose measles immunization, as confirmed by either vaccination card or caregiver recall.

Table 33: Second Dose Measles Immunization Coverages among Children 18-59 Months

Indicator		Frequency	%
Second Dose Measles Immunization (N=803)	Yes by card	111	13.8%
	Yes by recall	389	48.4%
	Yes by card *or* recall	500	62.3%
	No	258	32.1%
	Don't know	45	5.6%

7.10. Water, Sanitation, and Hygiene

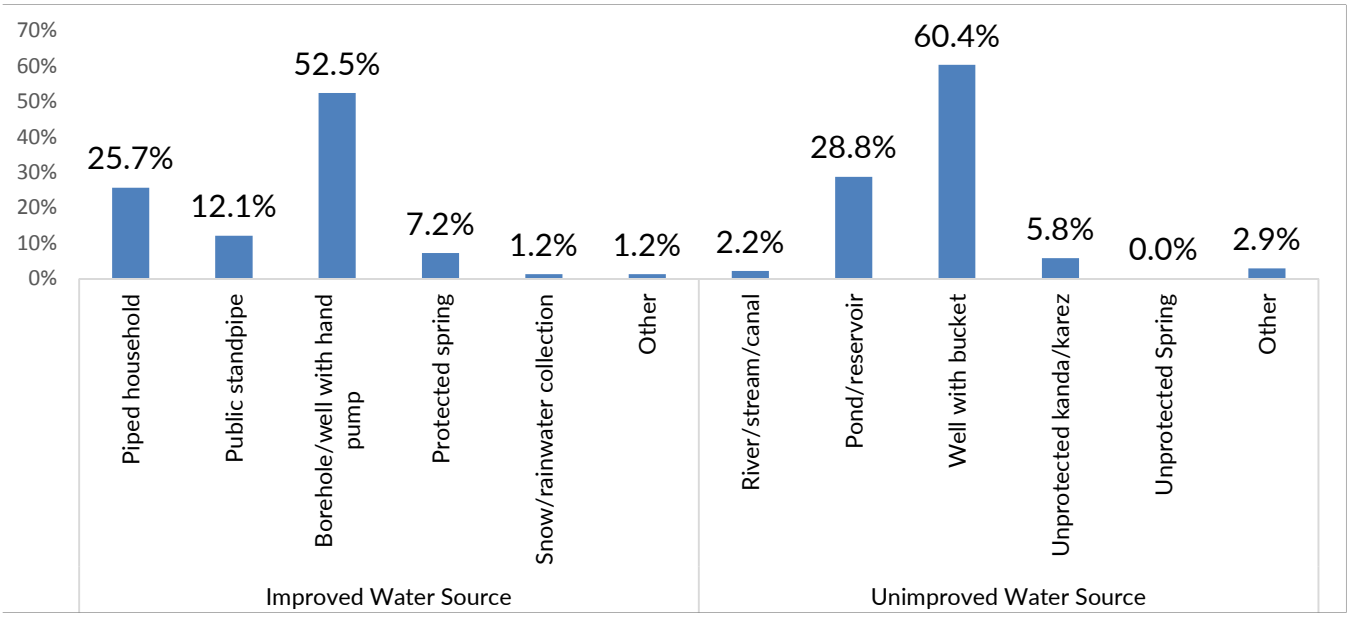
Improved and Unimproved Drinking Water Sources

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, 404 (74.4%) relied mainly on an improved water source, most commonly was borerhol/ well with hand pump and piped houshold. Meanwhile, the remaining 139 (25.6%) relied mainly on an unimproved water source, most commonly well with bucket.

Table 34: Household Main Drinking Water Source

Main Drinking Water Source N= 543	Frequency	%
Improved Water Source	404	74.4%
Unimproved Water Source	139	25.6%

Table 35: 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 for the interviewer. Overall, only 82.2% 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= 1171	Frequency	%
Uses soap or ash with water	962	82.2%
Uses only water	195	16.7%
Uses nothing	14	1.2%

Hand Washing During Critical Moments among Caregivers

Caregiver responses about when they routinely wash their hands were assessed as five critical moments, and further grouped into two categories: Hand washing after coming into contact with feces, and hand washing before coming into contact with food. Overall, 18.8% of caregivers reported washing their hands during five

critical moments that fell into these two categories, suggesting 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[6]	N	n	Results
After defecation	1171	1144	97.4%	Washes hands after coming into contact with faeces	1171	627	53.5%
After cleaning baby's bottom	1171	644	55.0%				
Before food preparation	1171	750	64.0%	Washes hands before coming in contact with food	1171	239	20.4%
Before eating	1171	941	80.4%				
Before feeding or breastfeeding children	1170	354	30.3%				
Reported washing hands during all five critical moments	1171	220	18.8%	**Reported washing hands during critical moments in both categories.**	1171	866	74.0%

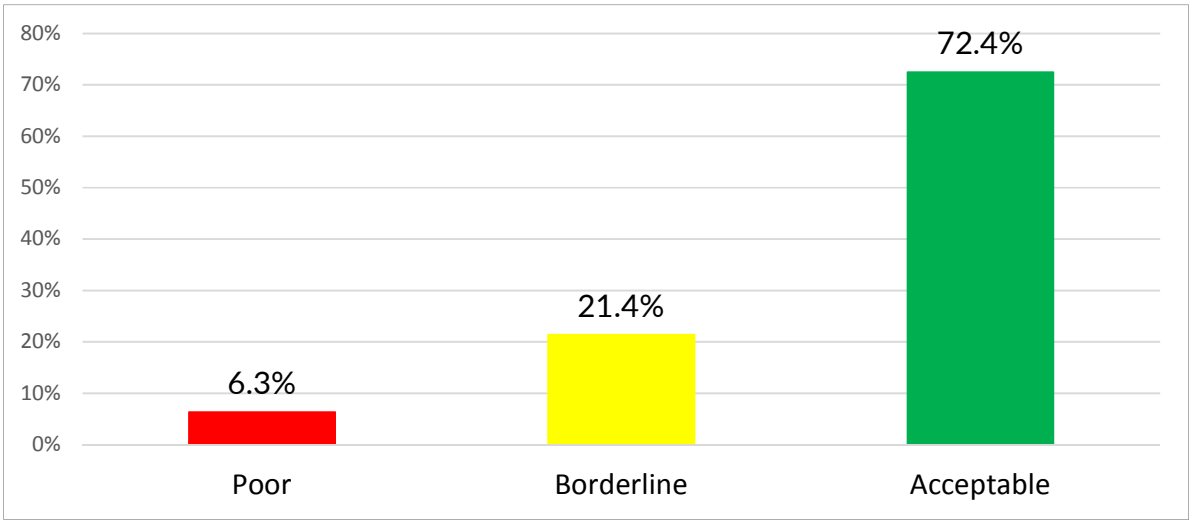
7.11. Food Security

Food Consumption Score

In Kandahar Province, 72.4% of households reported consuming the frequency and quality of food groups suggesting an acceptable consumption score, 21.4% a borderline consumption score, and 6.3% a poor consumption score, as presented in Figure 7 below.

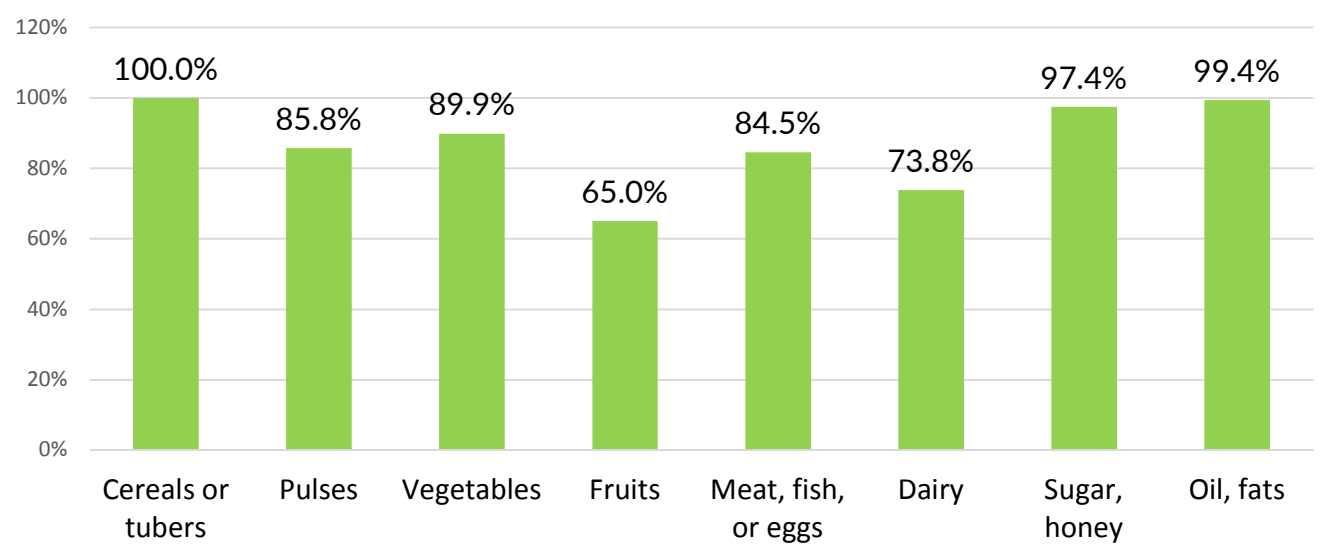
[6] The Sphere Handbook 2018

Figure 8: Household Food Consumption Score



Among surveyed households, the most frequently consumed food group was cereals 100.0%) followed by Oil (99.4%). The least frequently consumed food group was fruit (65.0%), as presented in Figure 8 below.

Figure 9: Frequency of Food Groups Consumed by Households



Reduced Coping Strategies Index

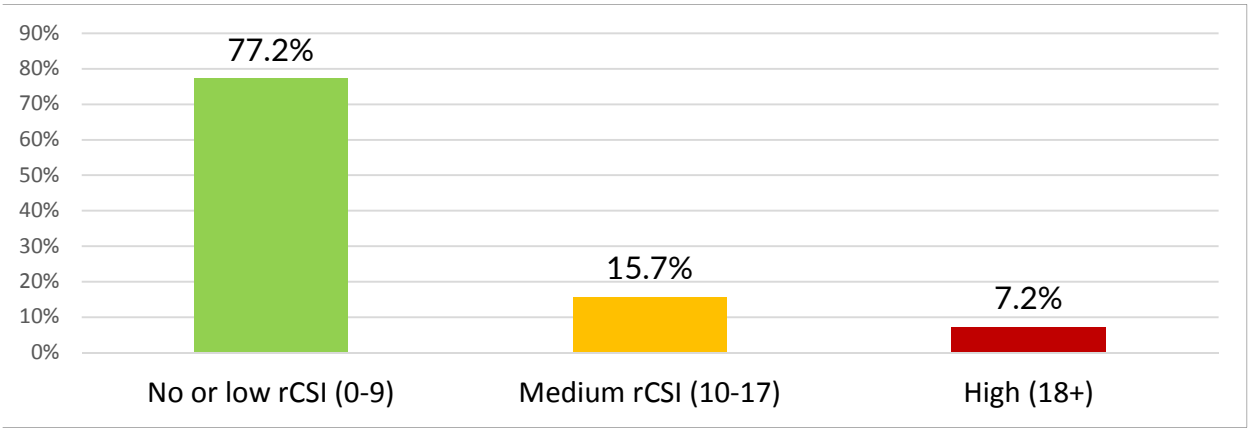
Among surveyed households, 31.1% reported not having sufficient food or money to buy food in the week prior to the survey. The most commonly reported food-related coping strategy was less preferred and less expensive foods (30.6%) followed by restrict food for adult (19.5%), as presented in Table 38 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	169	31.1%
Relying on less preferred and less expensive foods	166	30.6%
Borrowing food, or rely on help from a friend or relative	101	18.6%
Limiting portion size at mealtimes	33	6.1%
Restricting consumption by adults in order for small children to eat	106	19.5%
Reducing number of meals eaten in a day	24	4.4%

Calculated and weighted as per the rCSI, it was estimated that 72.2% of households relied on no or low coping strategies, 15.7% relied on medium coping strategies, and 7.2% relied on high coping strategies, as presented in Figure 9 below.

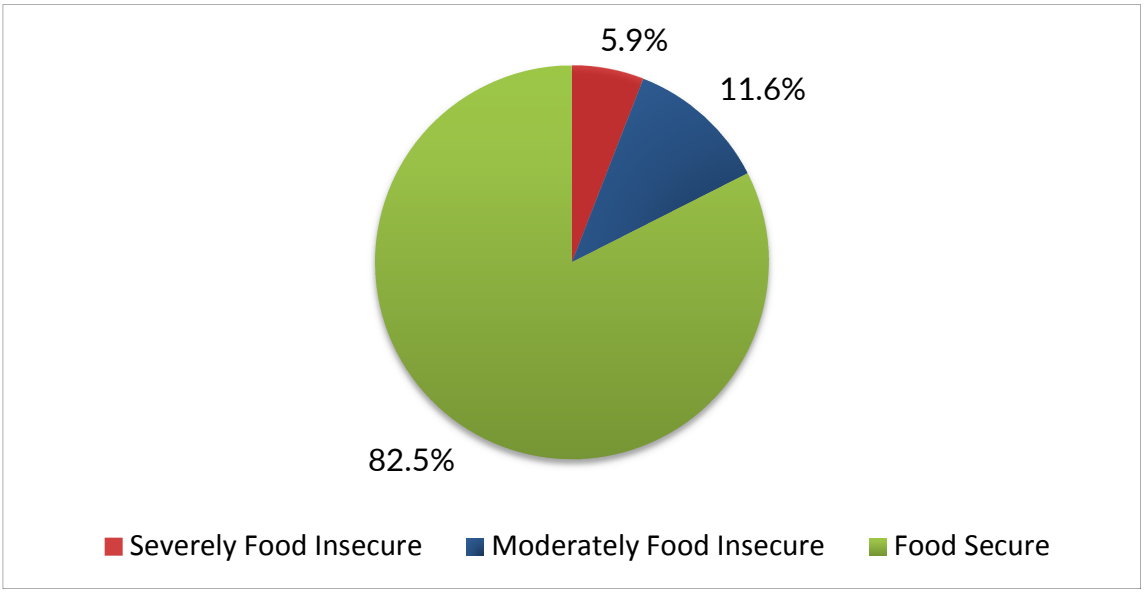
Figure 10: Household Reduced Coping Strategies Index



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 Kandahar province. Based on this triangulation, 5.9% of households were judged as severely food insecure, 11.6% of households were judged as moderately food insecure, and 82.5% of households were considered food secure, as presented in Figure 10.

Figure 11: Food Security Classification Assessed by FCS & rSCI



8. DISCUSSION

8.1. Nutritional Status of the Province

Results of this survey are not a reflection of national nutrition situation but are representative of only for the Province of Kandahar. The results of the survey showed a prevalence of GAM of 8.7% (6.9 - 10.9 95% C.I.) 94 chidlren were malnureshed out of 1082 and of SAM of 1.1% (0.6 - 2.0 95% C.I) 12 chidlren were sever manurehsed out 1082 per WHZ. This level of severity was classified as a poor nutrition situation in the province according to UNICEF WINS Issue 24 , 13 December 2018[7]. 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 fall season of 2015, the prevalence of GAM was 8.9% (7.6-12.6 95% CI) and the prevalence of SAM was 2.2% (1.5-3.3 95% CI).

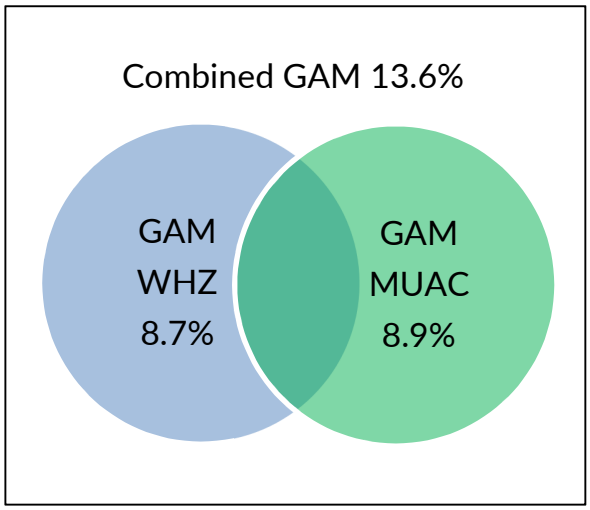
The GAM prevalence per MUAC was 8.9% (7.0 - 11.4 95% CI) 98 chidlren were malnurshed out 1095 and SAM was 3.3% (2.3 - 4.8 95% CI), which was higher than WHZ based GAM. The last SMART survey results reported the GAM prevalence per MUAC was 11.4% (9.2 - 14.1 95% CI) and SAM was 3.1% (2.1 - 4.3 95% CI).

[7] WHO acute malnutrition classification: <5% acceptable, 5-9% poor, 10-14% serious, >15% critical (without aggravating factors)

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 13.6% (11.1-16.6 95% CI) 147 children were malnureshed out 1082 and the Combined SAM prevalence was 3.4%(2.4- 4.8 95% CI) 95% CI) 37 chidlren were malnureshed out 1082, suggesting a higher proportion of children under five were affected by acute malnutrition in the province than either GAM by WHZ or GAM by MUAC could detect.

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, MUAC, or oedema are reflected in this prevalence according to combined criteria. To detect all acutely malnourished children eligible for treatment, WHZ or MUAC only screening, admission, and planning are not sufficient according to Afghanistan IMAM Guidelines.

Figure 12: Children Captured by GAM by WHZ, MUAC, and Combined



Across indicators, children under two years of age had a higher prevalence of GAM [per WHZ 13.5% (10.5-17.2 95% CI) and per MUAC 20.6% (16.1-26.0 95% CI)] compared to children over two years of age [per WHZ 5.9% (4.2-8.2 95% CI) and per MUAC 2.0% (1.1-3.8 95% CI). This suggests higher vulnerability of wasting among younger children. 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 38 below, it is apparent that the prevalence of acute malnutrition was not different with the inclusion of 0-5 month infants.

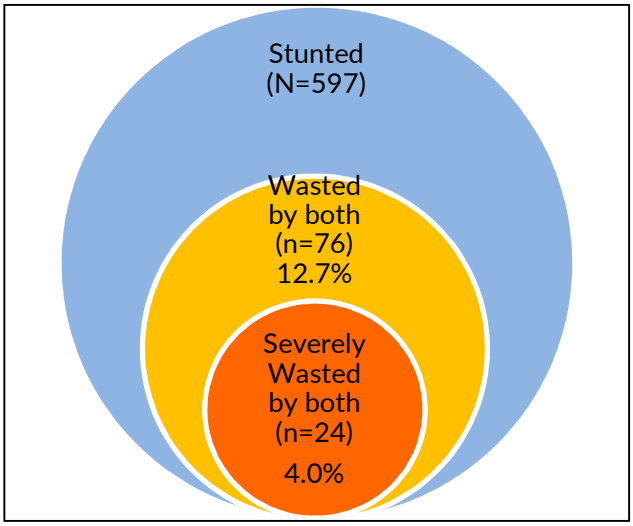
Concerns for the strength of IYCF practices in the Province were raised, particularly when the prevalence of exclusive breastfeeding was found to be 51.6%.

Table 39: 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	8.7%	(6.9-10.9 95% CI)	1.1%	(0.6 - 2.0 95% CI)
Children 6-59 Months	8.7%	(6.9-10.9 95% CI)	1.2%	(0.7- 2.0 95% CI)

Chronic malnutrition in the province is also of concern. The prevalence of chronic malnutrition in province among children 6-59 months was 55.4% (50.6-60.0 95% CI), which was classified as very high according to the WHO thresholds. In other words, more than 1 in 2 children in the Province is not reaching their 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[8], further suggesting that this should be a priority group for treatment interventions. In Kandahar Province, it was found that among the 597 that were stunted, 76 of them (12.7%) were also wasted by both criteria (WHZ<-2SD + MUAC<125 mm) and 24 of them (4.0%) were severely wasted.

Table 40: Among Stunted Children 6-59 Months, those Simultaneous Wasted (WHZ)



Low MUAC among women in Kandahar 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 pregnant/lactating/preg&lact women had a low MUAC (14.7%). This may be linked to the high energy requirements for breastfeeding/fetal development, further suggesting that this group may be at a heightened risk of acute malnutrition.

[8] 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

8.2. Additional Indicators

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 Kandahar Province, the FCS and rCSI were triangulated to provide an indication of food security at the household level. The results indicated that 95 out of 543 households were moderately or severely food insecure. Further, based on household level assessment of water source, 404 out of 543 households were accessing an unimproved water source as their main source of drinking water. Considering second dose measles immunization as a proxy for immunisation status and access to healthcare, it was found that only 500 in 803 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.

9. RECOMMENDATIONS

SMART Finding	#	Recommendation	Actor	Required Resources	Timeline
1. GAM* = 8.7% (6.9-10.9 95% CI) based on WHZ. 2. GAM =8.9% (7.0-11.4 95% CI) based MUAC. 3. Combine GAM =13.6 % (11.1-16.6 95% CI)	1	There is still a need to provide the OPD SAM services.	All actors operating in the area + AIM and ACF	Funding to cover cost of NCA	1st half of 2019
	2	There is still a need to provide TSFP services	WFP and IPs	Budget and commodities	ASAP
	3	A need to increase program coverage in the province. The last SQUEAC survey conducted in 2015 for SAM and there is a need to carry out coverage survey for both SAM and MAM treatment program.	All actors operating in the area + AIM and ACF	Funding to cover cost of NCA	1st half of 2019
	4	Start-up of CBNP in the province to address factors related to appropriate child care and optimal IYCF practice	All IPs, DOPH, Cluster	Funding	1st half of 2019
	5	OPD SAM and MAM curative services should be de-centralized to lower tiers of health system mainly sub-canters level	BPHS partners and GCMU/MOPH	Funding	ASAP
1. Stunting*) = 55.4% (50.6-60.0 95% CI) 2. Underweight*=27.0 %(23.8 - 30.5 95%C.I)	1	NCA is quite recommended to understand the underlying and basic cause of acute and chronic malnutrition	All actors operating in the area + AIM and AAH	Funding to cover cost of NCA	1st half of 2019
	2	CHWs should be supported for effective rollout of CBNP and CBHC program	All actors		
	3	Optimal IYCF promotion through facility based education and community support groups should be strengthened	All actors	Funding to train CHWs and other community volunteers	1st half of 2019
	4	Family Health Action Groups should be established as per the CBHC guide	All actors but mainly BPHS		2019

1. 2nd dose Measles* immunization coverage=62.3%. *(Lower than National standard 90%)	1	Scaling up of EPI services (it would be good if there is another analysis for measles at 9 month (or first dose)	All partners		ASAP
ICFY 1. Early initiation breastfeeding<24 months =49.0%. 2. Exclusive breastfeeding<6 months =51.6%	1	This could be addressed by implementing effective CBNP in the area	All IPs but mainly BPHS since their coverage area is quite large (as large as 75% or more)	Funding	2019
WASH 1. Caregiver hand washing practice at all five critical moment= 18.8%	1	Can be addressed with other community based interventions for hygiene promotion	All IPs supporting CBNP in the area		2019
FSL 1. Food Consumption Score, poor=6.3% and borderline =21.4%. 2. Food insecurity based FCS and rSCI) total Food insecure = 17.5% (Sever Food insecure =5.9% and moderate Food insecure =11.6%)	1	Service linkage with FS supporting agencies and delivering holistic or integrated projects instead of vertical humanitarian programming	All IPs		ASAP
1. Pregnant and lactating women (PLWs) nutrition status based on MUAC <230 mm = 14.7%	1	TSFP program for mothers and strengthening of ANC and PNC coverage	ALL IPs operating in health and nutrition sector		2019

10. ANNEXES

Annex 1: Selected Clusters in Kandahar Province

District Name	Geographical unit	Population size	Cluster
Kandahar	Loy Bala Karz	2970	1
Kandahar	Zakar Sharif	10000	2
Kandahar	Nawi Mashor	1568	3
Kandahar	Ghundi Bala Karz	1260	4
Kandahar	Beloo Qalacha	1148	5
Kandahar	Haji Mohamamd Rasool Khan Qalacha	819	6
Kandahar	Kochni Char Bagh	770	7
Daman	Braj Kalai	1603	8
Daman	Abdul Baqi Qalacha	900	9
Daman	Ansari	1800	10
Arghandab	Loy Tabin	1452	11
Arghandab	Bala Tabin	1575	RC
Arghandab	Fitawi Nagahan	1260	12
Panjwayi	Khalifa Qasab Kalai	882	13
Panjwayi	Haji Mohammad Afzal Kalai	1800	14
Panjwayi	Naik Mohammed Kalai	2086	15
Panjwayi	Kochnai Qala	664	16
Panjwayi	Said Ahmad	342	17
Panjwayi	Adamzoi	1186	18
Panjwayi	Salor Yaran	530	19
Spin Boldak	Haji Fida Mohammed	2100	20
Spin Boldak	Fashtun Abad	1466	21
Spin Boldak	Qasaban	1456	22
Spin Boldak	Abdul Qadim Kalai	2165	RC
Spin Boldak	Salim	2624	23
Spin Boldak	Eshaq Zai & Hajji Mohammad	1700	24
Spin Boldak	Kshata Bahadorzai	1941	25
Spin Boldak	Malim Sadullah	1995	26
Spin Boldak	Hajji Jamal Kalai	793	27
Spin Boldak	Alam Khanzai	1680	28
Spin Boldak	Marsinzai	1323	29
Spin Boldak	Hajji Salam Kalai	910	30
Spin Boldak	Hajji Mullah Ahmad & Abdul Hai	1190	RC
Spin Boldak	Dabari	1645	31
Spin Boldak	Da Dolai Shora Rabat	2170	32
Spin Boldak	Abdul Qadar	2062	33
Spin Boldak	Abo Sa Chapawo	2126	RC

Spin Boldak	Gardai Talai	1505	34
Spin Boldak	Ejansi Hajji Khodai Dad Kalai	1610	35
Zhari	Haji Baz Mohammad Kalai	1410	36
Zhari	Haji Fazal Muhammad Qalacha	1732	37
Zhari	Hajji Abdul Razaq Kalai/Siachoi	1370	38
Zhari	Salo Chaman Fasal Kalai/Qalq	1017	RC
Zhari	Chahar Kocha/ Pashmol	1906	39
Shaga	Haji Abdul Zaher Muhmand	670	40
Shaga	Todonkai Lwar Mail	1052	41
Khakrez	Balochan	1883	42
Maywand	Pir Zada	840	43
Panjwayi	Bazar Juma Kalai	1428	44
Spin Boldak	Hajji Said Rahim Agha	1925	45
Spin Boldak	Abdul Salam Zhara Ghbarga	1220	46
Spin Boldak	Lakari	1995	47
Arghistan	ZarinZai	438	48
Zhari	Haji Abdul Qayoum	1320	RC
Zhari	Nadi Dasht Kochian	1976	49
Zhari	Hajji Dost Mohammad Kalai / Dasht	1792	50

Annex 2: Standardization Test Results: Evaluation of Enumerators

Enumerator	Weight	Height	MUAC
Enumerator 1	OK	OK	POOR
Enumerator 2	POOR	OK	POOR
Enumerator 3	OK	OK	OK
Enumerator 4	POOR	OK	POOR
Enumerator 5	OK	OK	POOR
Enumerator 6	OK	OK	OK
Enumerator 7	POOR	OK	POOR
Enumerator 8	OK	POOR	POOR
Enumerator 9	OK	OK	POOR
Enumerator 10	POOR	OK	POOR
Enumerator 11	POOR	OK	POOR
Enumerator 12	POOR	OK	POOR
Enumerator 13	OK	OK	POOR
Enumerator 14	OK	POOR	POOR
Enumerator 15	POOR	OK	POOR
Enumerator 16	OK	OK	POOR
Enumerator 17	POOR	OK	POOR

Enumerator 18	POOR	OK	POOR
Enumerator 19	OK	POOR	POOR
Enumerator 20	OK	POOR	POOR

Annex 3: Plausibility Check for Kandahar

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 (1.3 %)
Overall Sex ratio	Incl	p	>0.1	>0.05	>0.001	<=0.001	
(Significant chi square)			0	2	4	10	0 (p=0.398)
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=0.007)
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 (4)
Dig pref score - MUAC	Incl	#	0-7	8-12	13-20	> 20	
			0	2	4	10	0 (4)
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 (1.07)
Skewness WHZ	Excl	#	<±0.2	<±0.4	<±0.6	>=±0.6	
			0	1	3	5	1 (-0.29)
Kurtosis WHZ	Excl	#	<±0.2	<±0.4	<±0.6	>=±0.6	
			0	1	3	5	0 (-0.05)
Poisson dist WHZ-2	Excl	p	>0.05	>0.01	>0.001	<=0.001	
			0	1	3	5	0 (p=0.108)
OVERALL SCORE WHZ =			0-9	10-14	15-24	>25	5 %

The overall score of this survey is 5 %, this is excellent.

There were no duplicate entries detected.

Percentage of children with no exact birthday: 97 %

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=6/ID=2: WHZ (-3.551), Weight may be incorrect

Line=10/ID=2: HAZ (1.099), Age may be incorrect

Line=31/ID=5: HAZ (-5.331), Age may be incorrect

Line=51/ID=1: HAZ (7.183), Age may be incorrect

Line=52/ID=2: HAZ (1.431), Age may be incorrect

Line=64/ID=1: WHZ (2.789), Weight may be incorrect

Line=76/ID=1: HAZ (1.075), Age may be incorrect

Line=77/ID=2: HAZ (1.993), Age may be incorrect

Line=83/ID=5: WHZ (2.757), Weight may be incorrect

Line=130/ID=2: WHZ (-3.619), Height may be incorrect

Line=157/ID=1: WHZ (-3.825), Height may be incorrect

Line=167/ID=1: HAZ (3.327), Age may be incorrect

Line=169/ID=1: HAZ (0.939), Age may be incorrect

Line=171/ID=1: WHZ (2.702), Weight may be incorrect

Line=180/ID=1: WAZ (-4.640), Weight may be incorrect

Line=200/ID=1: HAZ (-5.832), Height may be incorrect

Line=215/ID=4: HAZ (1.785), Age may be incorrect

Line=226/ID=4: WHZ (-3.455), Weight may be incorrect

Line=238/ID=1: HAZ (0.909), Age may be incorrect

Line=309/ID=2: HAZ (2.090), Height may be incorrect

Line=591/ID=1: WHZ (14.710), WAZ (8.961), Weight may be incorrect

Line=725/ID=3: WHZ (-3.415), Weight may be incorrect

Line=744/ID=3: WHZ (-3.492), Weight may be incorrect

Line=768/ID=2: WAZ (1.622), Weight may be incorrect

Line=799/ID=3: WHZ (-3.385), HAZ (-5.596), WAZ (-5.108)

Line=941/ID=1: WHZ (-3.751), Height may be incorrect

Line=1005/ID=2: HAZ (0.969), Age may be incorrect

Line=1036/ID=2: WAZ (-4.554), Age may be incorrect

Line=1053/ID=2: HAZ (-5.460), WAZ (-5.167), Age may be incorrect

Line=1069/ID=2: HAZ (-5.486), Age may be incorrect

Line=1103/ID=2: HAZ (2.000), Age may be incorrect

Line=1141/ID=4: WHZ (-3.546), WAZ (-4.473), Weight may be incorrect

Line=1170/ID=3: WHZ (-3.958), Weight may be incorrect

Line=1175/ID=5: HAZ (-5.347), Age may be incorrect

Percentage of values flagged with SMART flags:WHZ: 1.3 %, HAZ: 1.6 %, WAZ: 0.6 %

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 : #################

Age ratio of 6-29 months to 30-59 months: 1.00 (The value should be around 0.85).:

p-value = 0.007 (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	126/123.9 (1.0)	147/130.4 (1.1)	273/254.3 (1.1)	0.86
18 to 29	12	130/120.8 (1.1)	145/127.1 (1.1)	275/247.9 (1.1)	0.90
30 to 41	12	122/117.1 (1.0)	137/123.2 (1.1)	259/240.3 (1.1)	0.89
42 to 53	12	99/115.2 (0.9)	102/121.3 (0.8)	201/236.5 (0.8)	0.97
54 to 59	6	57/57.0 (1.0)	31/60.0 (0.5)	88/117.0 (0.8)	1.84
6 to 59	54	534/548.0 (1.0)	562/548.0 (1.0)		0.95

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

Overall sex ratio: p-value = 0.398 (boys and girls equally represented)

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

Overall age distribution for boys: p-value = 0.521 (as expected)

Overall age distribution for girls: p-value = 0.000 (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: 0.021 (significant difference)

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

p-value for chi2: 0.095

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

p-value for chi2: 0.063

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:	1.21	1.12	1.07
(The SD should be between 0.8 and 1.2)			
Prevalence (< -2)			
observed:	9.4%	9.4%	8.6%
calculated with current SD:	8.8%	7.3%	6.2%

calculated with a SD of 1:	5.1%	5.2%	5.0%
HAZ			
Standard Deviation SD:	1.22	1.19	1.11
(The SD should be between 0.8 and 1.2)			
Prevalence (< -2)			
observed:	55.0%	55.1%	55.4%
calculated with current SD:	53.7%	54.1%	55.1%
calculated with a SD of 1:	54.6%	54.9%	55.7%
WAZ			
Standard Deviation SD:	1.06	1.01	0.98
(The SD should be between 0.8 and 1.2)			
Prevalence (< -2)			
observed:	27.3%	27.3%	
calculated with current SD:	29.7%	29.2%	
calculated with a SD of 1:	28.6%	29.0%	
Results for Shapiro-Wilk test for normally (Gaussian) distributed data:			
WHZ	p= 0.000	p= 0.000	p= 0.000
HAZ	p= 0.000	p= 0.000	p= 0.009
WAZ	p= 0.000	p= 0.006	p= 0.054
(If p < 0.05 then the data are not normally distributed. If p > 0.05 you can consider the data normally distributed)			
Skewness			
WHZ	1.47	-0.36	-0.29
HAZ	0.61	0.25	0.10
WAZ	0.64	-0.23	-0.13

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	21.67	0.22	-0.05
HAZ	3.34	0.67	-0.14
WAZ	8.29	0.26	-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=1.26 (p=0.108)
WHZ < -3: ID=1.16 (p=0.212)
Oedema: ID=1.00 (p=0.473)
GAM: ID=1.22 (p=0.147)
SAM: ID=1.11 (p=0.285)
HAZ < -2: ID=3.35 (p=0.000)
HAZ < -3: ID=2.50 (p=0.000)
WAZ < -2: ID=2.30 (p=0.000)
WAZ < -3: ID=1.92 (p=0.000)

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: 1.01 (n=48, f=0)  #########
02: 1.13 (n=48, f=0)  ##############
03: 1.21 (n=46, f=1)  ##################
04: 1.19 (n=46, f=1)  ################
05: 1.21 (n=45, f=1)  ##################
06: 1.10 (n=45, f=0)  #############
07: 2.42 (n=47, f=2)  ##################################################################
08: 1.02 (n=47, f=0)  #########
09: 0.97 (n=43, f=0)  #######
10: 1.11 (n=43, f=1)  #############
11: 1.00 (n=44, f=0)  ########
12: 1.13 (n=40, f=1)  ##############
13: 0.92 (n=43, f=0)  #####
14: 0.94 (n=40, f=0)  ######
15: 1.27 (n=41, f=0)  ####################
16: 1.19 (n=38, f=0)  ################
17: 1.22 (n=31, f=0)  ##################
18: 1.28 (n=32, f=1)  ####################
19: 1.19 (n=33, f=0)  ################
20: 1.21 (n=27, f=1)  ##################
21: 1.21 (n=29, f=0)  ##################
22: 1.19 (n=28, f=1)  ################
23: 1.07 (n=19, f=0)  ###########
24: 1.08 (n=20, f=0)  ############
25: 1.07 (n=21, f=0)  ############
26: 1.28 (n=16, f=1)  OOOOOOOOOOOOOOOOO
27: 1.38 (n=17, f=1)  OOOOOOOOOOOOOOOOOOOOO
28: 1.37 (n=16, f=1)  OOOOOOOOOOOOOOOOOOOOO
29: 1.09 (n=13, f=0)  OOOOOOOOOOO
30: 1.26 (n=12, f=1)  OOOOOOOOOOOOOOOOO
31: 1.46 (n=09, f=0)  ~~~~~~~~~~~~~~~~~~~~~~~~~~
32: 0.89 (n=12, f=0)  OOOO
33: 1.06 (n=07, f=0)  ~~~~~~~~~~~
34: 0.60 (n=05, f=0)
35: 0.18 (n=03, f=0)
36: 1.07 (n=07, f=0)  ~~~~~~~~~~~
37: 1.01 (n=07, f=0)  ~~~~~~~~~
38: 0.70 (n=05, f=0)
39: 0.60 (n=07, f=0)
40: 0.68 (n=04, f=0)
```

41: 1.39 (n=03, f=0) ~~~~~~~~~~~~~~~~~~~~~~~~

42: 0.29 (n=02, f=0)

43: 0.35 (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 =	178	144	144	141	273	216
Percentage of values flagged with SMART flags:						
WHZ:	2.2	2.8	0.7	0.7	1.5	0.5
HAZ:	2.2	1.4	0.7	0.7	2.6	1.4
WAZ:	1.7	0.7	0.7	0.0	0.7	0.5
Age ratio of 6-29 months to 30-59 months:						
	0.82	1.22	0.76	1.17	1.07	1.04
Sex ratio (male/female):						
	1.05	1.03	1.09	0.91	0.91	0.83
Digit preference Weight (%):						
.0 :	10	10	8	9	10	10
.1 :	7	10	12	13	9	9
.2 :	11	10	11	9	10	15
.3 :	7	7	11	9	7	8
.4 :	7	9	13	6	10	8
.5 :	10	15	6	13	8	10
.6 :	14	11	9	6	12	6
.7 :	11	9	10	9	14	13
.8 :	15	9	11	16	11	13
.9 :	8	10	8	9	9	7
DPS:	9	6	7	10	7	10

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

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

.7 :	11	10	7	11	8	6
.8 :	5	8	12	11	14	11
.9 :	10	6	8	11	8	12
DPS:	8	7	10	7	8	6

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

Digit preference MUAC (%):

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

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

Standard deviation of WHZ:

SD	1.58	1.29	1.19	1.07	1.02	1.10

Prevalence (< -2) observed:

%	10.1	12.5	8.3	8.5	7.4	10.6

Prevalence (< -2) calculated with current SD:

%	12.5	10.5	7.6	6.0	6.5	7.8

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

%	3.5	5.3	4.4	4.7	6.2	5.9

Standard deviation of HAZ:

SD	1.18	1.18	1.19	1.16	1.35	1.20

observed:

%	59.6	61.1	41.0	55.3	58.6	51.9

calculated with current SD:

%	55.4	55.2	48.3	57.3	54.5	51.8

calculated with a SD of 1:

% 56.3 56.1 47.9 58.4 56.0 52.1

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	19/21.1 (0.9)	18/20.2 (0.9)	37/41.3 (0.9)	1.06
18 to 29	12	22/20.6 (1.1)	21/19.7 (1.1)	43/40.3 (1.1)	1.05
30 to 41	12	27/20.0 (1.4)	26/19.1 (1.4)	53/39.0 (1.4)	1.04
42 to 53	12	15/19.6 (0.8)	18/18.8 (1.0)	33/38.4 (0.9)	0.83
54 to 59	6	8/9.7 (0.8)	4/9.3 (0.4)	12/19.0 (0.6)	2.00
6 to 59	54	91/89.0 (1.0)	87/89.0 (1.0)		1.05

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

Overall sex ratio: p-value = 0.764 (boys and girls equally represented)

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

Overall age distribution for boys: p-value = 0.380 (as expected)

Overall age distribution for girls: p-value = 0.208 (as expected)

Overall sex/age distribution: p-value = 0.038 (significant difference)

Team 2:

Age cat.	mo.	boys	girls	total	ratio boys/girls
6 to 17	12	20/16.9 (1.2)	27/16.5 (1.6)	47/33.4 (1.4)	0.74
18 to 29	12	21/16.5 (1.3)	11/16.1 (0.7)	32/32.6 (1.0)	1.91
30 to 41	12	16/16.0 (1.0)	11/15.6 (0.7)	27/31.6 (0.9)	1.45
42 to 53	12	13/15.8 (0.8)	20/15.3 (1.3)	33/31.1 (1.1)	0.65
54 to 59	6	3/7.8 (0.4)	2/7.6 (0.3)	5/15.4 (0.3)	1.50
6 to 59	54	73/72.0 (1.0)	71/72.0 (1.0)		1.03

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

Overall sex ratio: p-value = 0.868 (boys and girls equally represented)

Overall age distribution: p-value = 0.010 (significant difference)

Overall age distribution for boys: p-value = 0.267 (as expected)

Overall age distribution for girls: p-value = 0.004 (significant difference)

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

Team 3:

Age cat.	mo.	boys	girls	total	ratio boys/girls
6 to 17	12	13/17.4 (0.7)	14/16.0 (0.9)	27/33.4 (0.8)	0.93

18 to 29	12	16/17.0 (0.9)	19/15.6 (1.2)	35/32.6 (1.1)	0.84
30 to 41	12	20/16.4 (1.2)	16/15.1 (1.1)	36/31.6 (1.1)	1.25
42 to 53	12	12/16.2 (0.7)	12/14.9 (0.8)	24/31.1 (0.8)	1.00
54 to 59	6	14/8.0 (1.7)	8/7.4 (1.1)	22/15.4 (1.4)	1.75
6 to 59	54	75/72.0 (1.0)	69/72.0 (1.0)		1.09

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

Overall sex ratio: p-value = 0.617 (boys and girls equally represented)

Overall age distribution: p-value = 0.165 (as expected)

Overall age distribution for boys: p-value = 0.111 (as expected)

Overall age distribution for girls: p-value = 0.799 (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	12/15.5 (0.8)	22/17.2 (1.3)	34/32.7 (1.0)	0.55
18 to 29	12	21/15.2 (1.4)	21/16.7 (1.3)	42/31.9 (1.3)	1.00
30 to 41	12	19/14.7 (1.3)	15/16.2 (0.9)	34/30.9 (1.1)	1.27
42 to 53	12	8/14.5 (0.6)	15/16.0 (0.9)	23/30.4 (0.8)	0.53
54 to 59	6	7/7.2 (1.0)	1/7.9 (0.1)	8/15.0 (0.5)	7.00
6 to 59	54	67/70.5 (1.0)	74/70.5 (1.0)		0.91

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

Overall sex ratio: p-value = 0.556 (boys and girls equally represented)

Overall age distribution: p-value = 0.070 (as expected)

Overall age distribution for boys: p-value = 0.125 (as expected)

Overall age distribution for girls: p-value = 0.071 (as expected)

Overall sex/age distribution: p-value = 0.003 (significant difference)

Team 5:

Age cat.	mo.	boys	girls	total	ratio boys/girls
6 to 17	12	36/30.2 (1.2)	35/33.2 (1.1)	71/63.3 (1.1)	1.03
18 to 29	12	26/29.4 (0.9)	44/32.3 (1.4)	70/61.8 (1.1)	0.59
30 to 41	12	22/28.5 (0.8)	33/31.4 (1.1)	55/59.9 (0.9)	0.67
42 to 53	12	30/28.1 (1.1)	20/30.9 (0.6)	50/58.9 (0.8)	1.50
54 to 59	6	16/13.9 (1.2)	11/15.3 (0.7)	27/29.1 (0.9)	1.45
6 to 59	54	130/136.5 (1.0)	143/136.5 (1.0)		0.91

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

Overall sex ratio: p-value = 0.431 (boys and girls equally represented)

Overall age distribution: p-value = 0.416 (as expected)

Overall age distribution for boys: p-value = 0.483 (as expected)

Overall age distribution for girls: p-value = 0.052 (as expected)

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

Team 6:

Age cat.	mo.	boys	girls	total	ratio boys/girls
6 to 17	12	26/22.7 (1.1)	31/27.4 (1.1)	57/50.1 (1.1)	0.84
18 to 29	12	24/22.2 (1.1)	29/26.7 (1.1)	53/48.9 (1.1)	0.83
30 to 41	12	18/21.5 (0.8)	36/25.9 (1.4)	54/47.4 (1.1)	0.50
42 to 53	12	21/21.1 (1.0)	17/25.5 (0.7)	38/46.6 (0.8)	1.24
54 to 59	6	9/10.5 (0.9)	5/12.6 (0.4)	14/23.1 (0.6)	1.80
6 to 59	54	98/108.0 (0.9)	118/108.0 (1.1)		0.83

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

Overall sex ratio: p-value = 0.174 (boys and girls equally represented)

Overall age distribution: p-value = 0.117 (as expected)

Overall age distribution for boys: p-value = 0.846 (as expected)

Overall age distribution for girls: p-value = 0.017 (significant difference)

Overall sex/age distribution: p-value = 0.003 (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: 1.13 (n=09, f=0)  ##############
02: 0.75 (n=09, f=0)
03: 1.11 (n=09, f=0)  #############
04: 1.53 (n=09, f=0)  ###############################
05: 1.36 (n=08, f=0)  ########################
06: 0.99 (n=09, f=0)  ########
07: 5.31 (n=09, f=2)  ######################################################################
08: 1.10 (n=08, f=0)  #############
09: 0.74 (n=09, f=0)
10: 0.67 (n=07, f=0)
11: 1.17 (n=09, f=0)  ################
12: 1.10 (n=09, f=0)  #############
13: 0.78 (n=07, f=0)
14: 0.83 (n=06, f=0)  #
15: 0.92 (n=07, f=0)  #####
16: 1.36 (n=07, f=0)  ########################
17: 1.17 (n=06, f=0)  ################
18: 1.46 (n=04, f=0)  OOOOOOOOOOOOOOOOOOOOOOOOO
19: 0.77 (n=05, f=0)
20: 1.37 (n=04, f=0)  OOOOOOOOOOOOOOOOOOOOO
21: 1.14 (n=05, f=0)  ##############
22: 0.79 (n=05, f=0)
23: 1.97 (n=02, f=0)  ~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~
24: 0.74 (n=04, f=0)
25: 0.83 (n=04, f=0)  O
26: 1.61 (n=03, f=1)  OOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOO
27: 0.10 (n=02, f=0)
28: 0.52 (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: 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: 0.75 (n=07, f=0)
02: 1.46 (n=07, f=0)  ############################
03: 2.02 (n=07, f=1)  ##################################################
04: 1.18 (n=07, f=0)  ################
05: 1.64 (n=07, f=1)  ##################################
06: 1.21 (n=07, f=0)  ################
07: 0.79 (n=07, f=0)
08: 1.36 (n=07, f=0)  ########################
09: 1.19 (n=06, f=0)  ################
10: 1.93 (n=06, f=0)  ################################################
11: 1.50 (n=06, f=0)  ############################
12: 0.65 (n=05, f=0)
13: 0.83 (n=05, f=0)  #
14: 1.21 (n=05, f=0)  ################
15: 1.48 (n=05, f=0)  ############################
16: 0.58 (n=05, f=0)
17: 1.77 (n=05, f=0)  ##########################################
18: 1.83 (n=05, f=1)  ##########################################
19: 1.83 (n=05, f=0)  ##########################################
20: 0.86 (n=03, f=0)  OOO
21: 0.98 (n=05, f=0)  #######
22: 1.75 (n=05, f=1)  ########################################
23: 0.16 (n=02, f=0)
24: 1.85 (n=02, f=0)  OOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOO
25: 0.13 (n=02, f=0)
26: 1.08 (n=02, f=0)  OOOOOOOOOOO
27: 0.23 (n=02, f=0)
28: 0.04 (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: 0.55 (n=07, f=0)
02: 1.04 (n=07, f=0)  ##########
03: 1.62 (n=06, f=0)  ###################################
04: 1.05 (n=07, f=0)  ##########
05: 1.68 (n=07, f=0)  ######################################
06: 1.53 (n=07, f=0)  ################################
07: 0.91 (n=07, f=0)  #####
08: 1.27 (n=07, f=0)  ####################
09: 1.50 (n=07, f=1)  ##############################
10: 1.74 (n=06, f=1)  ########################################
11: 0.87 (n=06, f=0)  ###
12: 1.18 (n=06, f=0)  ################
13: 0.55 (n=06, f=0)
14: 1.03 (n=05, f=0)  ##########
15: 1.52 (n=05, f=0)  ##############################
16: 1.28 (n=04, f=0)  ####################
17: 0.24 (n=03, f=0)
18: 0.99 (n=04, f=0)  ########
19: 1.45 (n=04, f=0)  ############################
20: 0.78 (n=04, f=0)
21: 1.24 (n=03, f=0)  OOOOOOOOOOOOOOOOO
22: 0.78 (n=03, f=0)
23: 0.49 (n=02, f=0)
24: 1.54 (n=02, f=0)  OOOOOOOOOOOOOOOOOOOOOOOOOOOOOO
25: 0.99 (n=02, f=0)  OOOOOOOO
26: 0.65 (n=02, f=0)
28: 1.73 (n=02, f=0)  OOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOO
31: 0.86 (n=02, f=0)  OO
32: 0.55 (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: 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: 1.36 (n=08, f=0)  ########################
02: 1.40 (n=08, f=0)  ########################
03: 0.57 (n=07, f=0)
04: 0.95 (n=07, f=0)  ######
05: 0.90 (n=07, f=0)  ####
06: 1.47 (n=07, f=0)  ############################
07: 0.75 (n=08, f=0)
08: 0.91 (n=08, f=0)  #####
09: 1.13 (n=05, f=0)  ###############
10: 0.76 (n=07, f=0)
11: 0.74 (n=08, f=0)
12: 1.94 (n=05, f=1)  ##################################################
13: 0.41 (n=08, f=0)
14: 0.92 (n=08, f=0)  #####
15: 1.06 (n=07, f=0)  ###########
16: 1.11 (n=06, f=0)  #############
17: 0.57 (n=03, f=0)
18: 1.39 (n=04, f=0)  OOOOOOOOOOOOOOOOOOOOOOO
19: 1.44 (n=04, f=0)  OOOOOOOOOOOOOOOOOOOOOOOO
20: 0.56 (n=03, f=0)
21: 0.39 (n=03, f=0)
22: 0.39 (n=02, f=0)
23: 0.51 (n=02, f=0)
24: 0.48 (n=02, f=0)
25: 0.07 (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: 1.23 (n=08, f=0)  ##################
02: 1.33 (n=08, f=0)  ######################
03: 0.87 (n=08, f=0)  ###
04: 0.52 (n=08, f=0)
05: 0.86 (n=07, f=0)  ###
06: 0.57 (n=06, f=0)
07: 0.80 (n=08, f=0)
08: 1.05 (n=08, f=0)  ##########
09: 0.48 (n=07, f=0)
10: 0.84 (n=08, f=0)  ##
11: 1.01 (n=06, f=0)  #########
12: 1.09 (n=08, f=0)  ############
13: 0.90 (n=08, f=0)  ####
14: 0.71 (n=08, f=0)
15: 0.96 (n=08, f=0)  #######
16: 1.32 (n=08, f=0)  ######################
17: 0.85 (n=07, f=0)  ##
18: 1.10 (n=08, f=0)  #############
19: 0.82 (n=08, f=0)  #
20: 1.33 (n=07, f=0)  ######################
21: 1.20 (n=07, f=0)  ################
22: 0.59 (n=08, f=0)
23: 0.91 (n=07, f=0)  #####
24: 0.50 (n=07, f=0)
25: 0.84 (n=08, f=0)  ##
26: 1.13 (n=06, f=0)  ##############
27: 1.66 (n=07, f=0)  ###################################
28: 1.70 (n=07, f=1)  ########################################
29: 1.08 (n=07, f=0)  ############
30: 1.35 (n=07, f=1)  ######################
31: 1.02 (n=04, f=0)  000000000
32: 0.96 (n=06, f=0)  #######
33: 1.27 (n=04, f=0)  00000000000000000000
34: 0.66 (n=03, f=0)
35: 0.18 (n=03, f=0)
36: 1.08 (n=05, f=0)  ############
37: 0.95 (n=05, f=0)  #######
38: 0.64 (n=04, f=0)
39: 0.73 (n=05, f=0)
```

```
40: 0.77 (n=02, f=0)

41: 1.00 (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: 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: 1.04 (n=09, f=0)  ##########

02: 0.95 (n=09, f=0)  ######

03: 0.73 (n=09, f=0)

04: 1.06 (n=08, f=0)  ###########

05: 0.80 (n=09, f=0)

06: 0.75 (n=09, f=0)

07: 1.41 (n=08, f=0)  ##########################

08: 0.65 (n=09, f=0)

09: 0.81 (n=09, f=0)  #

10: 0.67 (n=09, f=0)

11: 0.68 (n=09, f=0)

12: 0.87 (n=07, f=0)  ###

13: 1.47 (n=09, f=0)  ############################

14: 0.89 (n=08, f=0)  ####

15: 1.11 (n=09, f=0)  #############

16: 1.41 (n=08, f=0)  ##########################

17: 1.61 (n=07, f=0)  ###################################

18: 1.38 (n=07, f=0)  ########################

19: 1.22 (n=07, f=0)  ##################

20: 1.76 (n=06, f=1)  ########################################

21: 1.81 (n=06, f=0)  ############################################

22: 1.16 (n=05, f=0)  ###############

23: 1.22 (n=04, f=0)  OOOOOOOOOOOOOOOO

24: 1.55 (n=03, f=0)  OOOOOOOOOOOOOOOOOOOOOOOOOOOOOO

25: 0.75 (n=03, f=0)

26: 0.42 (n=02, f=0)

27: 1.73 (n=04, f=0)  OOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOO

28: 0.21 (n=03, f=0)

29: 1.36 (n=03, f=0)  OOOOOOOOOOOOOOOOOOOOO

30: 0.95 (n=03, f=0)  OOOOOO

31: 0.85 (n=02, f=0)  ~~

32: 0.57 (n=03, f=0)

33: 0.88 (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 4: Integrated SMART Survey Questionnaire

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

Household Questionnaire

Start date/event of recall period: xxxxx							
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 centre **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
- WHO Child Growth Standard 2006
- MEDAIR/ AAH Kandahar SMART survey August 2015
- Afghanistan Demographic and Health Survey (AfDHs) 2015
- WHO mortality emergency threshold
- WHO Emergency Severity classification
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