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ACTION AGAINST HUNGER

Integrated Health, Nutrition, WASH & FSL SMART Survey Final Report

Kunduz Province, Afghanistan

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ACRONYMS

AAH/ACF	Action Against Hunger/Action Contre La Faim
AIM-WG	Assessment Information Management Working Group
AfDHS	Afghanistan Demographic and Health Survey
BCG	Bacillus Calmette Guerin
BHC	Basic Health Center
BPHS	Basic Package of Health Services
CDR	Crude Death Rate
CHC	Comprehensive Health center
CSO	Central Statistics Organization
CHW	Community Health Worker
DH	District Hospital
ENA	Emergency Nutrition Assessment
EPHS	Essential Package of Health Services
ERM	Emergency Response Mechanism
FCS	Food Consumption Score
FSL	Food Security and Livelihoods
GAM	Global Acute Malnutrition
HH	Household
HQ	Head-Quarter
IYCF	Infant and Young Child Feeding
PENTA	Pertussis, Diphtheria, Tetanus, Hepatitis B and Hemophilia's Influenza Type B
PND	Public Nutrition Department
MoPH	Ministry of Public Health
PPHD	Provincial Public Health Directorate
MUAC	Mid Upper Arm Circumference
MW	Mean Weight
NNS	National Nutrition Survey
PPS	Proportional Population Size
RC	Reserve Cluster
SAM	Severe Acute Malnutrition
SD	Standard Deviation
SMART	Standardized Monitoring and Assessment of Relief and Transition

U5DR	Under five Death Rates
U5	Under five
UNICEF	United Nation Children's Fund
WFP	World Food Program
WASH	Water Sanitation and Hygiene
WHZ	Weight for Height Z score
W/H	Weight for Height
WHO	World Health Organization

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1. EXECUTIVE SUMMARY

Nutrition and mortality SMART survey was conducted in the entire province of Kunduz between 24th March to 11th April, 2018 during the spring season. It was a cross sectional survey following two stage cluster method based on standardized Monitoring and Assessment of Relief and Transition (SMART) methodology. This final report contains following analysis on under-five children nutritional status, morbidity, mortality, immunization, PLW's nutrition status, WASH, Demography and FSL. The summary of the key findings shown in the table below.

1.1 Summary Findings

Children Nutritional Status	
Indicators	**%**
Prevalence of GAM among 6-59 months children based on WHZ <-2SD	**7.8%** (5.8 - 10.3; 95% CI)
Prevalence of SAM among 6-59 months children based on WHZ <-3SD	**2.1%** (1.3 - 3.3; 95% CI)
Prevalence of GAM among 6-59 months children based on MUAC <125mm	**8.8%** (6.7 - 11.7; 95% CI)
Prevalence of SAM among 6-59 months children based on MUAC <115 mm	**2.2%** (1.4 - 3.6; 95% CI)
Prevalence of GAM among 6-59 months children based on combined criteria (MUAC <125mm and/or WHZ <-2SD and/or Oedema)	**12.7%** (10.5-14.9; 95% CI)
Prevalence of SAM among 6-59 months children based on combined criteria (MUAC <115mm and/or WHZ <-3SD and/or Oedema)	**3.8%** (2.5 - 5.0; 95% CI)
Prevalence of Stunting among 6-59 months children based on HAZ <-2SD	**39.9 %** (35.4-44.6; 95% CI)
Prevalence of Severe Stunting among 6-59 months children based on HAZ <-3SD	**14.9%** (11.8 –18.7; 95% CI)
Prevalence of Underweight among 6-59 months children based on WAZ <-2SD	**19.9%** (17.1-22.9; 95% CI)
Prevalence of Severe Underweight among 6-59 months children based on WAZ <-3SD	**4.1%** (3.0 – 5.6; 95% CI)

Child Health and Immunization	
Indicators	**%**
Children aged 0-59 months that reported of being sick/illness during the past 14 days of the survey	44.9%
Children aged 0-59 months that reported of having Fever during the past 14 days of the survey	31.9%

Children aged 0-59 months that reported of having ARI during the past 14 days of survey	22.8%
Children aged 0-59 months that reported of having Diarrhea during the past 14 days of survey	22.0%
Measles vaccination status (both by card and recall) for the children 9-59 months	79.6%
BCG vaccination status based on scar confirmation for children 0-59 months	93.6%
Polio vaccination status (both by card and recall) for children 0-59 months	93.5%
PENTA-3 vaccination status (both by card and recall) for children 3.5–59 months.	88.9%
Deworming of children 24-59 months in the last six months (based on recall only)	64.6%
Vitamin-A supplementation for children 6-59 months in last six months (based on recall only)	87.8%

Nutritional status among Pregnant and Lactating Women (PLW)	
Indicators	**%**
Undernutrition among PLWs based on MUAC <230 mm	**22.3%** (18.9-25.8; 95% CI)
Severe Undernutrition among PLWs based on MUAC <210 mm	**2.7%** (1.4 - 4.1; 95% CI)

Infant and Young Children Feeding (IYCF) Practices	
Indicators	**%**
Children ever breastfed (0-23 months)	100%
Initiation of breastfeeding within 1 hour of birth (0-23 months children)	85.5%
Exclusive breastfeeding (EBF) of children less than 6 months	64.5%
Provision of colostrum in the first 3 days of birth (0-23 months children)	98.0%
Continued breastfeeding at 1 year of age (12-15 months children)	94.3%
Introduction of solid, semi-solid or soft foods to children (6-8 months)	18.8%

Crude and U5 Death Rate	
Crude death rate (CDR)	0.20% (0.10-0.38; 95%)
Under five death rate (U5DR)	0.40% (0.15-1.04; 95% CI)

2. INTRODUCTION

Kunduz is one of the 34 provinces of Afghanistan, located in the northern part of the country next to Tajikistan. The population of the province is around 1,049,249, the province has seven districts namely Ali Abad, Archi, Chardara, Imam Sahib, Khan Abad, Qalay-I-Zal and Kunduz is the capital of the province.

The province is multi ethnics such as 34% Pashtun, 27% Uzbek, 20% Tajik, 9.4% Turkmen, 4.6% Arab and 3.5% Hazara). The Population is constituted of resident people and most of the population live in the rural area.

Organization of Health Promotion and Management (OHPM) is the local NGO who is working in Kunduz province as BPHS partner. OHPM covers the entire province with health and nutrition programme as BPHS implementer since July 2017. There is a total of 75 health facilities in the province (2 DH, 2 CHC+, 11 CHC, 30 BHC, 28 Sub center, 1 HF for prison, 1 mobile health team). There is no OPD MAM programme in the province. There is one Provincial hospital (PH) providing in-patient services for the SAM children with medical complications. Currently OPD SAM programme is being implemented in 2 CHC+, 30 BHC, 11 CHC and 2 DH in the province and the IPD SAM programme is available in one DH (out of two district hospital). EPHS programme is implemented by the MoPH. Previously Save the Children implemented BPHS programme but they handed over to OHPM last year in Kunduz province.

The nutrition SMART survey was conducted during spring (April 2018) covering each district of the entire province. AAH technically supported OHPM organization to implement this survey to investigate the health, nutrition, WASH, FSL and mortality status in the entire province.

2.1. Objective of the Survey

2.1.1. Main objective

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

2.1.2. Specific objectives

- To estimate Crude Death Rate (CDR) and Under five Death Rate (U5DR)
- To determine prevalence of under nutrition among children aged 6-59 months.
- To determine the nutritional status of pregnant and lactating women based on MUAC assessment.

- To determine core Infant and Young Child Feeding (IYCF) practices among children aged <24 months
- To assess institutional birth attendance in the province.
- To assess Water, Sanitation and Hygiene (WASH) proxy indicators: household water storage, water use and caregiver hand washing practices.
- To assess morbidity among children 0-59 months based on a two weeks recall period.
- To assess food access and consumption on seven days recall period: households level.

2.1.3. Justification of the survey

Kunduz province has been identified by UN OCHA and other UN agencies (i.e. Unicef, FAO, WFP) as one of the most difficult to access and hard to reach province. The province faced many security incidents (especially in 2017) that negatively impacted directly or indirectly the health & nutrition status of the vulnerable population mainly under five children, pregnant and lactating women. Kunduz province is also one of the provinces identified by Nutrition cluster in 2017 that have limited updated data and districts' analysis. The last nutrition survey conducted in Kunduz province was the NSS 2013 in 2013 and revealed a GAM rate of 7.5% (5.26-10.65, 95% CI). Therefore, all the stakeholders, donors and different organizations would like to know what is the current nutrition status. In this context, it is of great interest to carry out a SMART survey to investigate the current prevalence of under-nutrition in the province. The Survey findings will be used to inform future programing in the province as well as to strengthen nutrition data environment.

3. METHODOLOGY

3.1. Sample Size

As the survey area is large and the population is dispersed, a two-stage cluster methodology was applied.

The first stage involves a random selection of clusters/villages from a list of villages using probability proportion to size (PPS) method. The sample size of household's survey was determined using ENA for SMART software version 2011 (up dated 9th July 2015). This was done before starting the data collection at the office by the team. Villages was the primary sampling unit for the proposed survey.

The second stage of methodology involved systematic randomly selection of households (13 households per cluster) from an updated list of households. This was conducted at the field level. Household was the basic sampling unit for the proposed survey in the selected villages/Clusters. The table 1 and 2 highlights sample size calculation for anthropometric and mortality surveys.

Table 1: Parameters for sample size calculation for anthropometric indicator

Parameters for Anthropometry	Value	Assumptions based on context
Estimated prevalence of GAM (%)	7.5%	The survey referred to the NNS 2013 assessment for the planning stage of this survey: GAM was 7.5 % (5.26-10.65 95% CI) As there is no updated data and no significant changes in the province since the NNS 2013, we used 7.5 % for the planning stage.
Desired precision	±2.5	It was based on survey objectives in line with low estimated prevalence and SMART methodology recommendations.
Design Effect *(if applicable)*	1.5	The population living in the targeted districts is considered as having similar living conditions and the same access to food and social conditions. Nevertheless, access to health facilities cannot be estimated as similar within the targeted population as some remote areas were not served by health facilities. Hence, the design effect was estimated at 1.5.
Children (6-59 months) to be included	***696***	**Minimum sample size for children aged 6-59 months.** (However to avoid possible bias of selection for younger age group, all children from 0 to 59 months found in the selected households were surveyed)
Average HH Size	8	Based on AfDH[2] survey the mostly frequent of the HH was 8
% Children 6 – 59 Months	15.5%	Based on CSO updated population for Afghanistan 1396 (2017-2018)
% Non-response Households	6%	The percentage of non-respondent households was estimated at 6%, using the last experience of the SMART surveys in the different provinces.
Households to be included	***664***	**Minimum sample size-Households to survey. Household was the basic sampling unit for the SMART survey.**

Table 2: Sample size calculation for mortality component

Parameters for Mortality	Value	Assumptions based on context
Estimated Death Rate /10,000/day	0.5/10,000/day	No updated death rate in this province. This rate is recommended when there is no specific death rate in the population in the surveyed area
Desired precision /10,000/day	±0.3	Based on the survey's objectives and in line with the estimated death rate.
Design Effect *(if applicable)*	1.5	This was catered for heterogeneity between clusters in the population sampled.
Recall Period in days	112	Recall period started from the Melad un Nabi (21th Qaws 1396 in Solar date, that is equivalent to 12th December 2017 as per Gregorian calendar)
Population to be included	**3,112**	**Population**
Average HH Size	8	Based on AfDH[1] survey the mostly frequent of the HH was 8.
% Non-response Households	6%	The percentage of non-respondent households is estimated at 6%, using the last experience of the SMART surveys in the deferent provinces.
Households to be included	**414**	Households

Note: all additional variables data (IYCF, Mortality, FSL, PLWs nutrition status, WASH and children health and immunization) were collected based on anthropometric sample size.

3.2. Sampling Methodology

The surveyed province has a scattered population, therefore a two-stage cluster sampling methodology was chosen. With the above assumptions, the number of children (6-59 months) was 696, converted into 664 households to survey.

[1] Afghanistan Demographic Health Survey 2015

Stage 1: Random selection of clusters/villages were chosen using probability proportional to size (PPS) using ENA for SMART software version 2011 of (Updated 9th July, 2015). A list of all updated villages was amounted into the ENA for SMART software where PPS was applied. The villages with a large population had a higher chance of being selected than villages with a small population and vice versa. Reserve Clusters (RCs) were also selected by ENA software version 2011 (updated 9th July 2015). 664 /13 =51.1 rounded down to 51 clusters were supposed to be surveyed, each team could complete anthropometric measurements in 13 HHs in a day. Finally, 50 Clusters were surveyed out of 51 clusters: one cluster was missed due to ongoing fighting. As the non-response cluster was less than 10 % we did not use the reserve clusters as the reserve clusters were supposed to be used if 10% or more clusters would have been impossible to reach during the survey as per the SMART methodology. The selected clusters are highlighted in Annex 2. In each selected cluster/village, one or more community member(s) was asked to help the survey teams to conduct their work by providing information about the village with regard to the geographical organization or the number of households. For large villages, the village was divided into smaller segments and a segment was selected randomly to represent the cluster. This division was done based on existing administrative units e.g. neighborhoods, or streets or natural landmarks like river, road, or public places like market, schools, and masjid.

Stage 2: Households to be surveyed were randomly selected in each cluster/village using the **Systematic Random Sampling (SRS)** method. Based on the total sample size, each team could effectively cover 13 households in a day. In this assessment, 6 teams were engaged during the assessment, while data collection was reached within 10 days. The survey team was enumerated and given numbers to all households. The 13 households were randomly selected from these enumerated households, by systematic random sampling to identify the households to survey. The teams were trained in both methods of sampling (simple and systematic random sampling) and they were provided with materials to assist in determining the households during the data collection exercise.

All the children living in the selected house, aged 0 to 59 months old, were included for anthropometric measurements. Children aged <24 months were included for IYCF measurements. To ensure that every child had the same chance to be surveyed, if more than one eligible child was found in a household, all children were included, even if there were twins. Eligible orphans living in the selected Households were also surveyed. All the selected HH were included in the mortality survey as well as to answer to questions concerning the HH as a whole (ex. water storage, WASH and FSL).

Any empty households, or households with missing or absent children were revisited at the end of the sampling day in each cluster; any missing or absent child that was not subsequently found was not included in the survey. A cluster control form was used to record all the temporary empty households. The abandoned ones were excluded from the total HHs list at the beginning of the fieldwork. The village elders provided this information to the teams.

The household was the basic sampling unit. The term household was defined as all people eating from the same pot and living together (WFP definition). In Afghanistan, the term household often defined and/or used in synonymous with a compound – which potentially represents more than one household as defined here. In this case, a two-step process was ensured first with the village leaders/community elders and then identifying compound together with the use of the list of households within the community, asking if there were multiple cooking areas to determine what members of the household/compound included in the study.

3.3. Training, team composition and supervision

Six teams of four members conducted the field data collection. Each team was composed of one supervisor, one team leader and two data collectors. Each team had at least one female data collector to ensure acceptance of the team amongst the surveyed households, particularly for IYCF questionnaires. Each female member of the survey team was accompanied with a mahram[2] to facilitate the work of the female data collectors at the community level. The teams were supervised by ACF, Partner and PPHD staffs.

The entire teams received a 7-days training on the survey methodology and all its practical aspects; two ACF technical staffs facilitated the training. A standardization test was conducted over the course of one day, measuring 6 children in order to evaluate the accuracy and the precision of the team members in taking the anthropometric measurements. Due to challenges of bringing children (some were even crying) and less number of anthropometric equipment set available, ten children were not possible to measure during the standardization test. The teams conducted a one-day field test in order to evaluate their work in real field conditions. Feedback was provided to the team in regard to the results of the field test; particularly in relation to digit preferences and data collection. Refresher training on the anthropometric measurement and on the filling of the questionnaires and the household's selection was organized on the last day of the training by ACF to ensure overall comprehension before going to the field.

One field guidelines document with instructions and another household definition & selection document was provided to each team member. All documents, such as local event calendar, questionnaires or consent forms were translated in Pashtu, the local language, for better understanding and to avoid direct translation during the data field collection. The questionnaires were back translated using a different translator and were pre-tested during the field test. Alterations were made as necessary.
Daily data entry and analysis were done using ENA for anthropometric data, plausibility check, and feedbacks were provided to the data collection teams. Anthropometric data was directly entered into ENA while IYCF and other data were completed through an excel spreadsheet.

3.4. Data Analysis

The anthropometric and mortality data were analyzed by ENA for SMART software 2011 version (Updated 9th July, 2015). Survey results were interpreted in reference to WHO 2006 growth standards. The software automatically generated assessment result report for mortality and undernutrition for children <5 years - acute malnutrition (WHZ and MUAC), stunting (HAZ) and underweight (WAZ).

4. INDICATORS: DEFINITION, CALCULATION AND INTERPRETATION

4.1. Anthropometric Indicators:

Definition of nutritional status of children 0-59 months.

Acute Malnutrition

Acute malnutrition in children 6-59 months can be expressed by using 3 indicators; Weight for Height (W/H) or Mid Upper Arm Circumference (MUAC) and Oedema as described below.

Weight-for-height index (W/H)

A child's nutritional status is estimated by comparing it to the weight-for-height curves of a reference population (WHO standards data[3]). These curves have a normal shape and are characterized by the median weight (value separating the population into two groups of the same size) and its standard deviation (SD). 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

[2] Women are not allowed to go outside without being accompanied by one male relative called locally a 'mahram'.

[3] WHO standard 2006

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 the field data collection, the weight-for-height index in Z-score was calculated on the field for each child in order to refer malnourished cases to appropriate center if needed. The classification of acute malnutrition based on WHZ is illustrated in table 3.

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 3 provides the cut-off criteria for categorizing acute malnutrition cases.

Table 3: 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 to >= 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. The table below defines the acute malnutrition according to W/H index, MUAC criterion and oedema.

Table 4: Definition of acute malnutrition according to W/H index, expressed as Z-score

Severe Acute Malnutrition (SAM)
W/H <-3 z-score and/or bilateral Oedema
Moderate Acute Malnutrition (MAM)
W/H <-2 z-score to ≥-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 and so if he is 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 5.

Table 5: Cut off points of the Height for Age index 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

4.2. Mortality Indicator Calculation

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

a. Crude death rate (CDR)

The number of persons in the total population that dies over specified period (112) days refers to the Table 2 above for Sample size calculation for mortality surveys:

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

b. Under-5 death rate (U5DR)

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

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

4.3. Health

Beside anthropometric data, additional information was collected as follows:

- **Immunization status, deworming and vitamin A supplementation**

Mothers/caretakers of all children were asked if children received all the necessary 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 considered. The deworming and the Vitamin A supplementations of children were also recorded using recall method.

- **Morbidity**

Mothers/caretakers of children were asked if children had experienced an illness in the past 2 weeks. Acute respiratory infection, fever and diarrhoea were recorded when symptoms according to the case definition were described by the caretaker.

4.4 WASH

- **Water storage and Usage**

Household heads were asked what type of container they used for storing drinking water and how much water they used in the HH in the last 24 hours to assess the water use per person per day.

- **Hand washing practices**

The mothers were asked on what occasions they washed their hands and what they used to wash their hands to determine the hand washing practices in the surveyed area.

4.5 Infant and Young Child Feeding (IYCF) Practices Indicators

The IYCF indicators were asked to the mothers/caretakers of children aged <24 months are described as follows.

- **Children ever breastfed**

The indicator refers to the proportion of children who have ever received breast milk. It was calculated by dividing the number of children born in the last 24 months who were ever breastfed by all Children born in the last 24 months. The indicator is based on historical recall, and a caregiver(s) was supposed to provide information of all children living or dead who were born in the last 24 months. This indicator was looking at the number of mothers who ever breastfed their children.

- **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 was 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 included living and deceased children who were born within the past 24 months.

- **Provision of colostrum in the first 3 days of life**

Proportion of children who received colostrum (yellowish liquid) within the first 3 days after birth. This indicator looked at the number of mothers with children <24 months who fed their children with Colostrum within the first 3 days after birth.

- **Exclusive breastfeeding under 6 months**

Proportion of infants 0-5 months of age who were fed exclusively with breast milk. It was calculated by dividing the number of all Infants aged 0–5 months who received 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 were fed with breast milk. It was 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

- **Introduction of solid, semi-solid or soft foods:**

Proportion of infants 6-8 months of age who received solid, semi-solid or soft foods. It was calculated from the number of all Infants aged 6-8 months who received solid, semi-solid or soft foods during the previous day by total number of infants 6–8 months of age

- **Continued breastfeeding at 2 years**

Proportion of children 20–23 months of age who are fed breast milk. It was 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.

4.6 Maternal Health and Nutrition

Women of childbearing age assessed for their nutritional status based on MUAC measurements. The nutritional status of pregnant and lactating mothers was assessed by using the MUAC cut-off of 230 mm. The indicator for iron-folate supplementation derived from dividing the total number of pregnant mothers supplemented with Iron-folate in the last 90 days by total number of pregnant mothers.

5. LIMITATION OF THE SURVEY

- Insecurity was one of the major limitation of the assessment in the province as some clusters to survey were situated in very insecure areas. As a result, one cluster was missed due to ongoing fighting at the time of the data collection. This prevented SMART survey's teams to work and limited ACF staffs to provide direct supervision and on job training activities in the field.
- The low education and knowledge levels of the people especially for females in the districts resulted in the fact that female staff could not work in the community as it was considered as taboo for some families. For this survey, we found that six female enumerators had a lot of difficulties.
- Some areas to be surveyed were situated very far from the city of Kunduz province and the team could not come to the office to perform daily database supervision and data quality check especially from Archi district.

6. SURVEY FINDINGS

6.1. Description of sample

Among the 51 clusters that were planned to be surveyed, one cluster was missed due to the ongoing conflict. Data were collected from 50 clusters, 630 households, 893 children aged 6-59 months, 399 children aged 0-23 months and 649 women of reproductive age (15-49 years).

94.9% of the calculated sample size accepted to be surveyed (630 HHs surveyed whereas 664 HH supposed to be surveyed), meaning 5.1 % non-response households. A total of 33 households could not be surveyed as follows: 13 households (1 cluster) due to the ongoing conflict in the Chardara district missed, 8 HHs refused to participate and 12 households were absent during data collection date. The average households size were 5.8%, 592 households have children below under five years, percentage of under-five children were 27.4%. Most of the assessed households were resident (98.7%) only 1.3% households were internal displaced in the surveyed sample. The number of households and children from 6-59 months planned and the number of households with completed interviews and measured children are shown in Table 6.

Table 6: Details of proposed and actual sample size achieved

Number of households planned	Number of households surveyed	% of surveyed	Number of children 6-59 months Planned	Number of children 6-59 months surveyed	% of surveyed
664	630	94.9%	696	893	128.3%

Even though less (630) number of households/samples were reached compared to estimated (664) but still 128.3% children U5 were surveyed. It's because of the difference between original %U5 children (27.4%) among total population and estimated (15.5%) parameters in the sample size calculation for anthropometry.

6.2. Data quality

The plausibility check highlighted good quality of the measurements with an overall score of 12%. Data were collected from 94.9% of households selected for the survey.

The overall sex ratio was found equally represented with a P value of 0.192. The age ratio of 6-29 months to 30-59 months of 0.88 shows a non-significant difference (P-Value=0.605), meaning that there is no difference in the ratio of children aged 6-29 and 30-59 months surveyed. However, there is a significant difference in the overall age distribution (p=0.007). This is possibly an error occurring from age estimation in such a population as only 3.0% of children interviewed were found to have an exact date of age (day month and year) by showing identification paper (vaccination cards, Birth certificates and documented by fathers or mothers while the rest of children age distribution used local event calendars. So age parameter may be questioned.

The data quality was done also based on observed means excluding SMART flags (± 3 for WHZ, HAZ and WAZ). SMART flags (-3/+3 Z-scores) test was used to calculate the proportion of extreme values.The percentage of values flagged with SMART flags was WHZ: 2.0%, HAZ: 3.8% and WAZ: 1.3%. Standard deviation for the distribution of Weight-for-Height (SD 1.10) is classified as good, and Weight-for-Age (SD 0.98) classified as excellent. However, Height-for-Age (SD 1.20) is classified as problematic and we may be cautious with the estimate of the prevalence of the stunting (39.9%).

Table 7: Distribution of age and sex of sample

AGE (months)	Boys		Girls		Total		Ratio
	no.	%	no.	%	no.	%	Boy:girl
6-17	117	50.9	113	49.1	230	25.8	1.0
18-29	94	50.0	94	50.0	188	21.1	1.0
30-41	120	52.9	107	47.1	227	25.4	1.1
42-53	93	57.1	70	42.9	163	18.3	1.3
54-59	42	49.4	43	50.6	85	9.5	1.0
Total	466	52.2	427	47.8	893	100.0	1.1

Age distribution is as indicated in Table 7 above and Figure 1 below. Age ratio of 6-29 months to 30-59 months was as expected with (p=0.605) but not the overall age distribution as explained above.

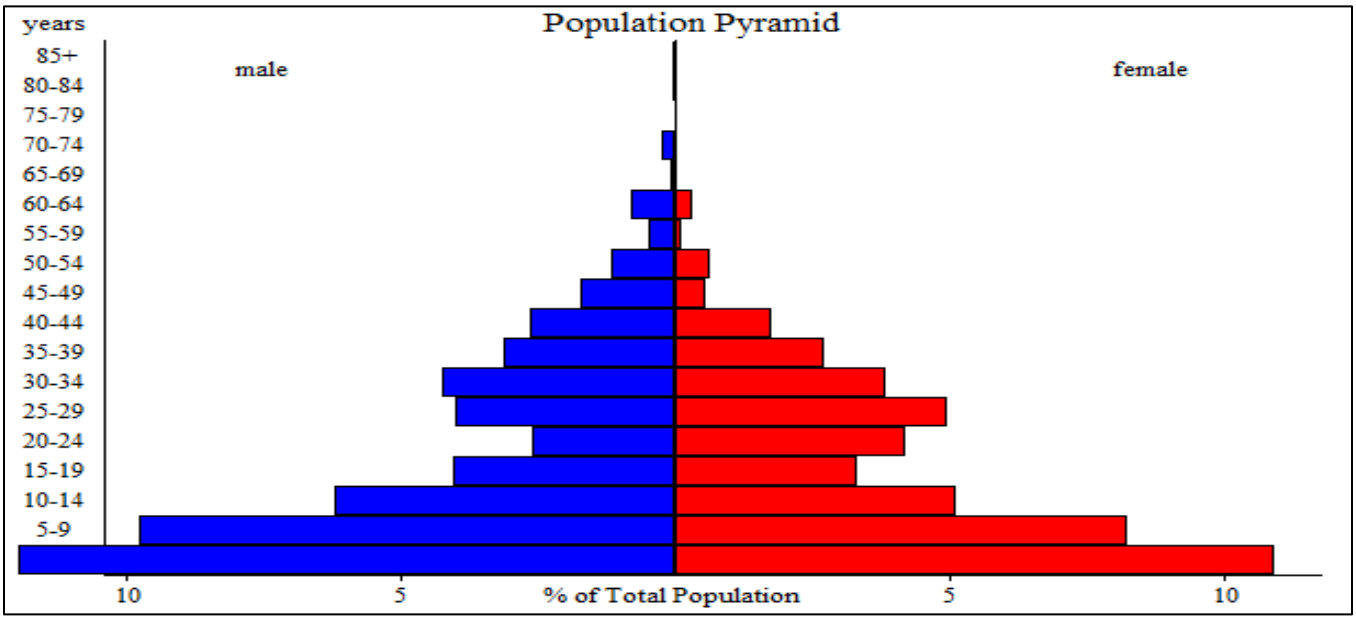


Figure 1: Distribution of age and sex pyramid

6.3. Undernutrition

The nutritional status of children was analyzed using the WHO Child Growth Standards 2006. Table 8 shows the Z-scores, design effect, and the number of children with flag signs and were excluded in the analysis.

Table 8: Mean z-scores, Design Effects and excluded samples of the survey

Indicator	N	Mean z-scores ± SD	Design Effect (z-score < -2)	z-scores not available*	z-scores out of range
Weight-for-Height	875	-0.27±1.10	1.48	0	18
Weight-for-Age	881	-1.15±0.98	1.13	0	12
Height-for-Age	859	-1.72±1.20	1.88	0	34

*Contains for WHZ and WAZ the children with oedema.

6.3.1. Prevalence of Acute Malnutrition

Acute malnutrition is the condition represented by measures of wasting body muscles and thinness or bilateral pitting oedema and represents current nutritional status in the population. It represents child's failure to receive adequate nutrition and may be the result of inadequate food intake or a recent episode of illness causing loss of weight.

Table 9: Acute malnutrition based on WHZ and/or Oedema among children 6-59 months

Indicators	All n = 875	Boys n = 457	Girls n = 418
Prevalence of global acute malnutrition (<-2 z-score and/or oedema)	(68) 7.8 % (5.8 - 10.3 95% C.I.)	(37) 8.1 % (6.0 - 10.9 95% C.I.)	(31) 7.4 % (4.9 - 11.1 95% C.I.)
Prevalence of moderate acute malnutrition (<-2 z-score to ≥-3 z-score, no oedema)	(50) 5.7 % (4.1 - 7.9 95% C.I.)	(26) 5.7 % (3.8 - 8.4 95% C.I.)	(24) 5.7 % (3.8 - 8.5 95% C.I.)
Prevalence of severe acute malnutrition (<-3 z-score and/or oedema)	(18) 2.1 % (1.3 - 3.3 95% C.I.)	(11) 2.4 % (1.3 - 4.3 95% C.I.)	(7) 1.7 % (0.7 - 3.8 95% C.I.)

The prevalence of oedema is 0.0 %

The distribution of WHZ of the observed population (excluding outliers based on SMART flags) compared to WHO Reference curve shows that it is a little bit slightly shifted to left, suggesting restricted growth (wasting) of the observed population. Further analysis suggests that wasting is the highest in the group of children aged 6-17 months (n=225) to then decrease with the increase of age. However, Weight-for-Height SD (1.09) is classified as good since it is within the recommended range SD range of 0.8 to 1.2.

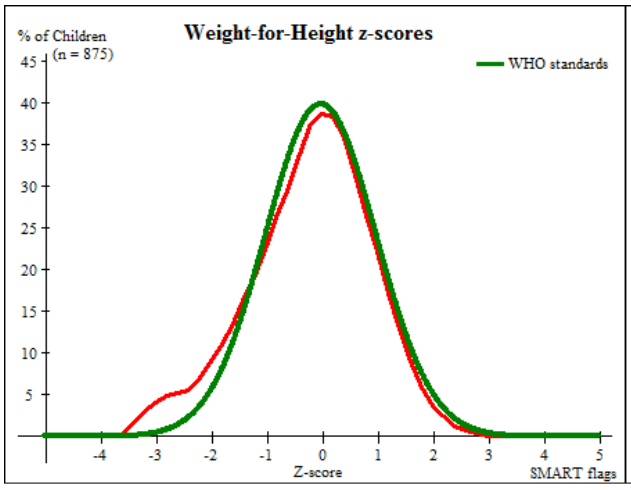


Figure 2: Trend of stunting over the age distribution

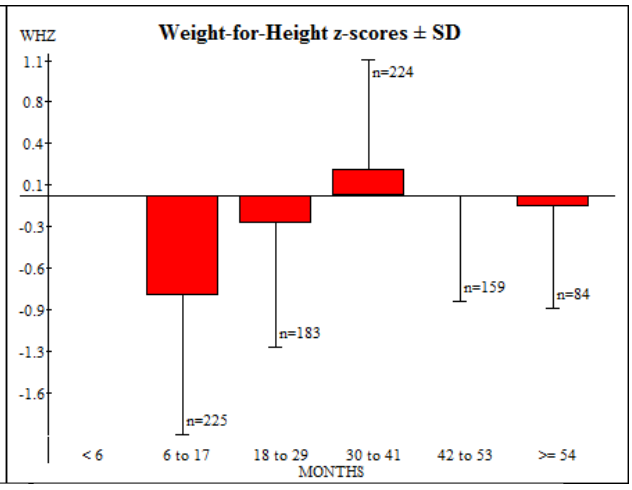


Figure 3: Gaussian distributed curves WHZ

Table 10: Acute malnutrition by age, based on weight-for-height z-scores and/or oedema

		Severe wasting (<-3 z-score)		Moderate wasting (≥-3 to <-2 z-score)		Normal (≥-2 z-score)		Oedema	
Age (mo)	Total no.	No.	%	No.	%	No.	%	No.	%
6-17	225	11	4.9	34	15.1	180	80.0	0	0.0
18-29	183	4	2.2	11	6.0	168	91.8	0	0.0
30-41	224	2	0.9	2	0.9	220	98.2	0	0.0
42-53	159	1	0.6	2	1.3	156	98.1	0	0.0
54-59	84	0	0.0	1	1.2	83	98.8	0	0.0
Total	875	18	2.1	50	5.7	807	92.2	0	0.0

Table 11: Distribution of acute malnutrition based on Oedema among children 6-59 months

	<-3 z-score	>=-3 z-score
Oedema present	Marasmic kwashiorkor 0 (0.0 %)	Kwashiorkor 0 (0.0 %)
Oedema absent	Marasmic 33 (3.7 %)	Not severely malnourished 860 (96.3 %)

Table 12: Acute malnutrition based on MUAC (and/or Oedema) among children 6-59 months

Indicators	All n = 893	Boys n = 466	Girls n = 427
Prevalence of global acute malnutrition (<125mm and/or oedema)	(79) 8.8 % (6.7 - 11.7 95% CI)	(36) 7.7 % (5.6-10.6 95% CI)	(43) 10.1 % (6.7- 14.9 95% CI)
Prevalence of moderate acute malnutrition (<125mm to ≥115mm, no oedema)	(59) 6.6 % (4.9 - 8.9 95% CI)	(27) 5.8 % (3.9 - 8.6 95% CI)	(32) 7.5 % (4.8- 11.5 95% CI)
Prevalence of severe acute malnutrition (<115mm and/or oedema)	(20) 2.2 % (1.4 - 3.6 95% CI)	(9) 1.9 % (1.0 - 3.5 95% CI)	(11) 2.6 % (1.3 - 4.9 95% CI)

Table 13: Prevalence of acute malnutrition by age, based on MUAC cut off's and/or oedema

		Severe wasting (< 115 mm)		Moderate wasting (≥115mm to <125mm)		Normal (≥125 mm)		Oedema	
Age (mo)	Total no.	No.	%	No.	%	No.	%	No.	%
6-17	230	16	7.0	36	15.7	178	77.4	0	0.0
18-29	188	2	1.1	17	9.0	169	89.9	0	0.0
30-41	227	0	0.0	5	2.2	222	97.8	0	0.0
42-53	163	1	0.6	1	0.6	161	98.8	0	0.0
54-59	85	1	1.2	0	0.0	84	98.8	0	0.0
Total	893	20	2.2	59	6.6	814	91.2	0	0.0

Weight for height Z score is considered basic measures for Global Acute Malnutrition, but it should be certainly noted that there is no gold standard measure for acute malnutrition. Beside, based on 2005 WHO and UNICEF Joint Statement on Child Growth Standards and the identification of SAM in infants and children, measured MUAC of less than 115mm among children 6 to 59 months old is documented as severe acute malnutrition. MUAC less than 115mm indicates a high-elevated risk of mortality and morbidity than weight for height. To compare, MUAC SAM rate results for the Kunduz province is higher than weight for height Z score SAM rate result and create a problem for the health system in the province. Hence, it is important to use both criteria (MUAC+WHZ) of malnutrition for IMAM case loading; the table 15 shows the GAM rate by both criteria.

Table 14: Acute malnutrition based on combine criteria (MUAC/WHZ/Oedema) in children

Indicators (N=875)	N	% (95%, CI)
Prevalence of GAM based on combined criteria (MUAC <125 mm and/or WHZ <2 SD and/or Oedema)	111	**12.7%** (10.5 - 14.9; 95% CI)
Prevalence of SAM based on combined criteria (MUAC <115 mm nad/or WHZ <-3SD and/or Oedema)	33	**3.8%** (2.5 - 5.0; 95% CI)

*There was no Oedema case

6.3.2. Prevalence of Chronic Malnutrition (Stunting)

Stunting indicates a failure to achieve one's genetic potential for height. It usually reflects the persistent, cumulative effects of long poor micro and macronutrients and other deficits that often across several generations, which is caused by failure to receive adequate nutrition over a long period and is affected by recurrent and chronic illness. It is not sensitive to recent/short-term changes in dietary intake and multi sectorial approach is needed to contribute to the prevention of stunting. The table below shows stunting rate based on height for age and by sex among children 6-59 months old.

Table 15: Stunting based on HAZ disaggregated by sex among children 6-59 months

Indicators	All n = 859	Boys n = 447	Girls n = 412
Prevalence of stunting (<-2 z-score)	(343) 39.9 % (35.4-44.6 95% CI)	(200) 44.7 % (39.2-50.4 95% CI)	(143) 34.7 % (29.3-40.6 95% CI)
Prevalence of moderate stunting (<-2 z-score and >=-3 z-score)	(215) 25.0 % (22.0-28.3 95% CI)	(121) 27.1 % (23.3-31.2 95% CI)	(94) 22.8 % (18.9-27.2 95% CI)
Prevalence of severe stunting (<-3 z-score)	(128) 14.9 % (11.8-18.7 95% CI)	(79) 17.7 % (13.8-22.3 95% CI)	(49) 11.9 % (8.6-16.3 95% CI)

The distribution of HAZ of the observed population (SMART flags excluded) compared to WHO Reference curve shows that it was strongly shifted to the left, suggesting restricted linear growth of the observed population. Further analysis suggests that linear growth retardation is at its highest in the group of children aged 30-41 months (n=221) to then decrease with the increase of age. However, height-for-Age SD (1.20) reaching the limit 1.2 , we may be cautious with the estimate of the prevalence of the stunting (39.9%).

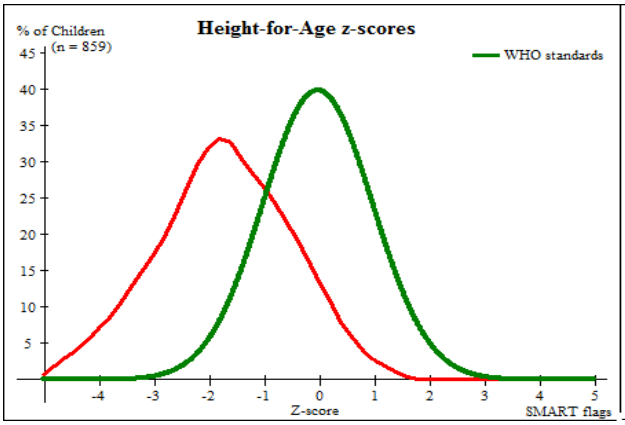


Figure 5: Gaussian distributed curves HAZ

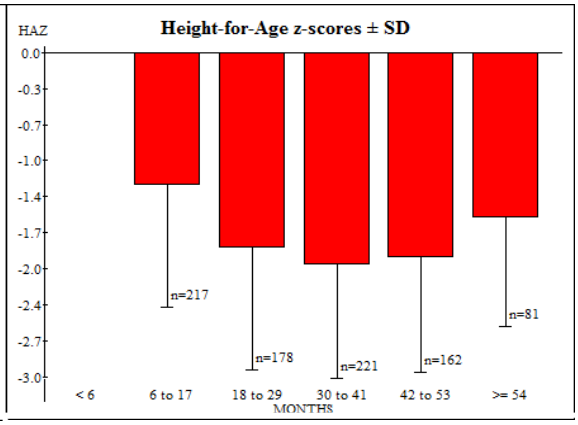


Figure 4: Trend of stunting over the age distribution

6.3.3. Prevalence of Underweight

Underweight is a compound index of height-for-age and weight-for-height. It takes into account both acute and chronic malnutrition. While underweight or weight-for-age is used for monitoring the previous Millennium Development Goals (MDG), it is no longer in use for monitoring individual children as it cannot detect children who are stunted but of normal weight; furthermore, it does not detect acute malnutrition that threatens children's lives. The underweight results are presented in table 17 for more details.

Table 16: Underweight based on WAZ disaggregated by sex among children 6-59 months

Indicators	All n = 881	Boys n = 461	Girls n = 420
Prevalence of underweight (<-2 z-score)	(175) 19.9 % (17.1 - 22.9 95% CI)	(108) 23.4 % (19.5 - 27.8 95% CI)	(67) 16.0 % (12.2-20.6 95% CI)
Prevalence of moderate underweight (<-2 z-score and >=-3 z-score)	(139) 15.8 % (13.4 - 18.5 95% CI)	(87) 18.9 % (15.1 - 23.3 95% CI)	(52) 12.4 % (9.2 - 16.4 95% CI)
Prevalence of severe underweight (<-3 z-score)	(36) 4.1 % (3.0 - 5.6 95% CI)	(21) 4.6 % (3.0 - 6.8 95% CI)	(15) 3.6 % (2.1 - 6.0 95% CI)

6.3.4. Women health and nutritional status

In the survey all women aged 15-49 years, child bearing age (CBA), were included, so a total of 649 women were measured for nutrition status and iron folate supplementation. But the analysis was done only for pregnant and lactating women for nutritional status, and only for pregnant women for iron folate supplementation. Adequate nutrition is critical for women especially during pregnancy and lactation because inadequate nutrition causes damage not only to women's own health but also to their children and the development of the next generation. The results for PLWs are presented in tables 18 and 19.

Table 17: Maternal malnutrition prevalence among PLWs

PLW's Nutritional Status (N=555)	Frequency	Results 95% CI
Global acute malnutrition MUAC <230 mm	124	22.3 % (18.8 -25.8 95% CI)
Moderate acute malnutrition MUAC <230 mm to ≥210mm	109	19.6 % (16.3-22.9 95% CI)
Sever acute malnutrition MUAC <210 mm	15	2.7 % (1.4-4.1 95% CI)

Table 18: Iron folate supplementation for pregnant women

Iron- folate for Pregnant (N=162)	Frequency	Results
Yes	94	58.0%
No	65	40.1%
Don't Know	3	1.9%

Table 19: ANC visits in the last/most recent pregnancy

ANC Visits in the last/most recent pregnancy, N= 649		
	Frequency	**Results**
Yes	528	81.4%
No	121	18.6%
ANC visits by Whom? N= 528*		
Health professional	476	90.2%
Traditional birth attendance (TBA)	19	3.6%
Community health worker	19	3.6%
Relative/ Friends	14	2.7%

*ANC visited by whom" response came from those women who actually had ANC checkup.

Table 20: Skill Births Attendance (SBA) status for the last baby

Status , N=649		**Frequency**	**Results**
Last delivery at the health facilities		342	52.7%
Last Delivery at home	Professionals (midwifes , Community midwifes, Doctors and Nurses)	91	14.0%
	None Professionals (CHWs, Transitional and relatives)	216	33.3%

6.4. Crude and U5 Death Rate

The mortality data was also included in the survey to know the rate of CDR and U5DR. The survey estimated plan was to survey 3,112 individuals in 414 households. So it was less than the sample size for anthropometric, the teams referred for all additional variables including mortality data

based on anthropometric sample size. Information was collected in 630 households with 3,773 individuals. The survey results shows that the mortality rate is higher at the age of 65-120 than at the other age. The CDR and U5DR are lower than WHO emergency threshold[4] as shown in the table below.

Table 21: Mortality rate by age category with design effect

	Crude Death Rate (95% CI)	Design Effect
'Overall	0.20 (0.10-0.38)	1.00
'Sex		
'Male	0.28 (0.13-0.60)	1.00
'Female	0.10 (0.03-0.43)	1.00
'Years		
'0-4	0.40 (0.15-1.04)	1.00
'5-11	0.00 (0.00-0.00)	1.00
'12-17	0.00 (0.00-0.00)	1.00
'18-49	0.06 (0.01-0.46)	1.00
'50-64	0.00 (0.00-0.00)	1.00
'65-120	4.25 (0.47-28.75)	1.00

[4] WHO's emergency thresholds of CMR 1/10,000/day and U5MR 2/10,000/day respectively.

6.5. Child Health and Immunization

6.5.1. Morbidity

The survey found that of the 986 children, 44.9% were reported to have illness in the last 14 days prior to the survey, the major illness reported such as diarrhea, ARI and Fever as a highlighted in the table below.

Table 22: Morbidity status among children (0-59 months)

Parameters based on 14 days recall period (N=986)	Frequency	Results (%)
% Children suffering from Acute respiratory Infection (ARI)	225	22.8%
% Children suffering from Fever	315	31.9%
% Children suffering from Diarrhea	217	22.0%

6.5.2. Child Immunization

Immunization is an important public health intervention that protects children from illness and disability. As part of the Expanded Program on Immunization (EPI), measles vaccination is given to infants aged between 9th and 18th month, BCG is given to infant on birth time and PENTA 3 is given to infant on 14 weeks of birth for fully immunization. The survey finding shows 986 under five children were assessed in 630 HHs, the immunization results of this survey is presented in the table 24 below.

Table 23: Immunization coverages (BCG, Measles, PENTA-3 and Polio) among children

Indicators	Class	Frequency	Results
Measles (children 9-59 months) (N= 845)	Yes by card	13	1.5%
	Yes by recall	660	78.1%
	Both by card and recall	**673**	**79.6 %**
	No	170	20.1%
	Don't know	2	0.2%
Polio (Children 0-59 months) (N= **986**)	Yes by card	24	2.4%
	Yes by recall	898	91.1%
	Both by card and recall	**922**	**93.5 %**
	No	64	6.5%
	Don't know	0	0.0%
PENTA 3 (Children from 3.5-59 months) (N=**935)**	Yes by card	21	2.2 %
	Yes by recall	810	86.6 %
	Both by card and recall	**831**	**88.9 %**
	No	97	10.4 %
	Don't know	7	0.7%
BCG scar (Children 0-59 months) (N=**986**)	By scar confirmation	923	93.6%
	No	63	6.4%
	Don't Know	0	0.0%

6.5.3. Vitamin A Supplementation

Provision of vitamin A supplementation among children 6-59 months old every 6 months can help protect a child from mortality and morbidity associated with vitamin A deficiency and is documented as being one of the most cost-effective approaches to improve child continuation of life or existence. The coverage of vitamin A supplementation in the last 6 months is presented in the table below.

Table 24: Vitamin A supplementation among children 6-59 months

Indicator	Class	Frequency	Results
Vitamin A supplementation among children 6-59 months (N=893)	**Yes**	784	87.8%
	No	55	6.2%
	Don't know	54	6.0%

6.5.4. Deworming

Helminths or intestinal worms represent a serious public health problem in areas where climate is tropical, sanitation inadequate and unhygienic. Helminths cause significant malabsorption of vitamin A and aggravate malnutrition and anemia, which eventually contributes to retarded growth and poor performance in school. Children under five years old are extremely vulnerable to the deficiencies induced by worm infestations. This puts deworming as critical for the reduction of child morbidity and mortality. The proportion of children who received deworming the past 6 months is presented in table 26.

Table 25: Deworming among children 24-59 months

Indicators	Class	Frequency	Results
Deworming of 24-59 months children (N=587)	**Yes**	379	64.6%
	No	171	29.1%
	Don't know	37	6.3%

6.6. Infant and Young Child Feeding (IYCF) Practices

Indicators for infant and young child feeding (IYCF) practice included in the survey for all children 0-23 months old. The total (399) children were included in the sample. The results are presented in percentage of the total answers available. Data on IYCF indicators were collected using 24 hours recall method except the indicator on colostrum feeding.

IYCF indicators	Definition	Frequency	Results
Children ever breastfed (N=399)	Proportion of children who have ever received breast milk	399	100%
Timely initiation of breastfeeding (N=399)	Proportion of children born in the last 24 months who were put to the breast within one hour of birth	341	85.5%
Provision of colostrum within first 3 days of delivery (N=399)	Proportion of children who received colostrum (yellowish liquid) within the first 3 days after birth	391	98.0%
Continued breastfeeding at one year (N=88)	Proportion of children 12–15 months of age who fed breast milk.	83	94.3%
Exclusive breastfeeding for children <6 months (N=93)	Proportion of infants 0–5 months of age who fed exclusively with breast milk	60	64.5%
Introduction of solid, semi solid or soft foods (N=48)	Proportion of infants 6–8 months of age who receive solid, semi-solid or soft foods	9	18.8%

6.7. WASH

6.7.1. Water Availability and Consumption

630 representing households and 3,773 individuals included in the survey where there are 2,009 male and 1,764 female. The information collected from households regarding total amount of water consumption in liters per households. Analysis excluded those water used by animals, and subsequently organized into range of liters used. The results were then divided in quantity of water in liters available to each household's member per day and liters to each person per day, refer to the figures below.

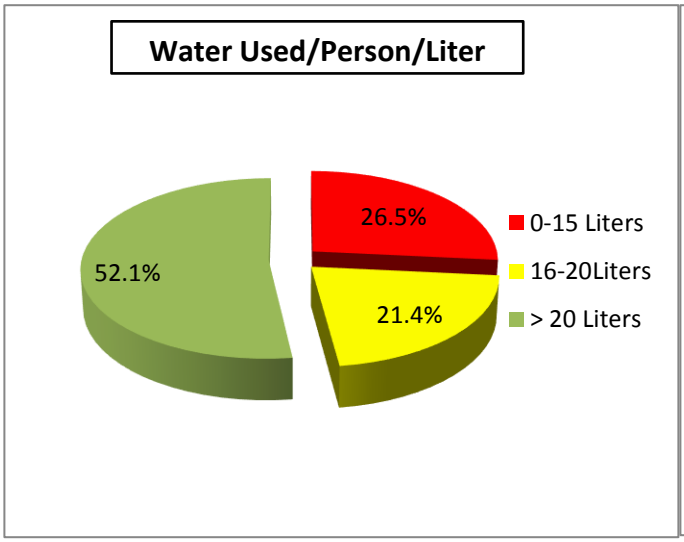


Figure 7: Percentage of water usage in liter/person/day

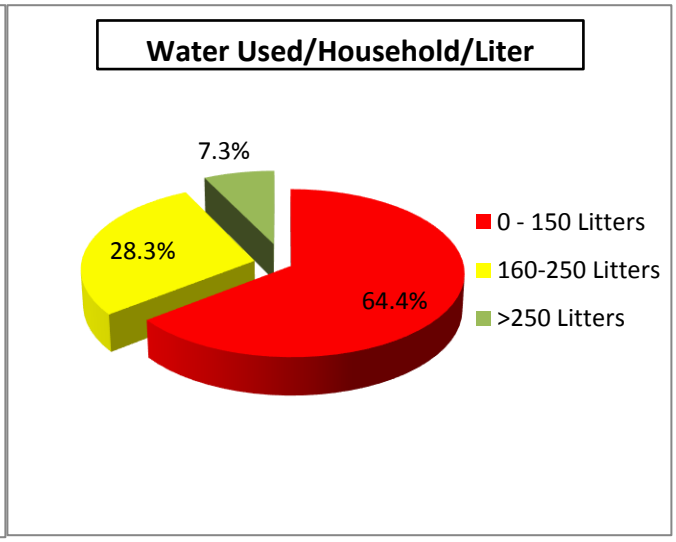


Figure 6: Percentage of HH water usage in liter/day

6.7.2. Houesholds Waters Sources and Treatment

Closed to half of the households in the province were found to use unsafe water sources (42.5%) with the specific sources illustrated in Figure 6. Analysis of water treatment methods by household's unsafe water sources indicated that the majority (74.0%) did not treat water prior to consumption. This predisposes households to water related illnesses such as diarrhea and typhoid fever.

Table 26: Households with access to and practices of different water treatment options

Water treatment (N=630)	Frequency	Results
Boil	135	21.4%
Chlorine	8	1.3%
Strain it through a cloth	16	2.5%
Water Filter	5	0.8%
Stand and settle	466	74.0%

The percentage of households using improved water sources is quite low (57.5%). Improved water sources includes water from pipe scheme, protected spring, borehole with hand pump, protected kanda/karez etc. whereas the unimproved sources are river, stream, canal, pond, reservoir, unprotected well/spring/kanda/karez etc.

Parameters (N=630)	Frequency	Result
Households using improved water sources	362	57.5%
Households using unimproved water sources	268	42.5%

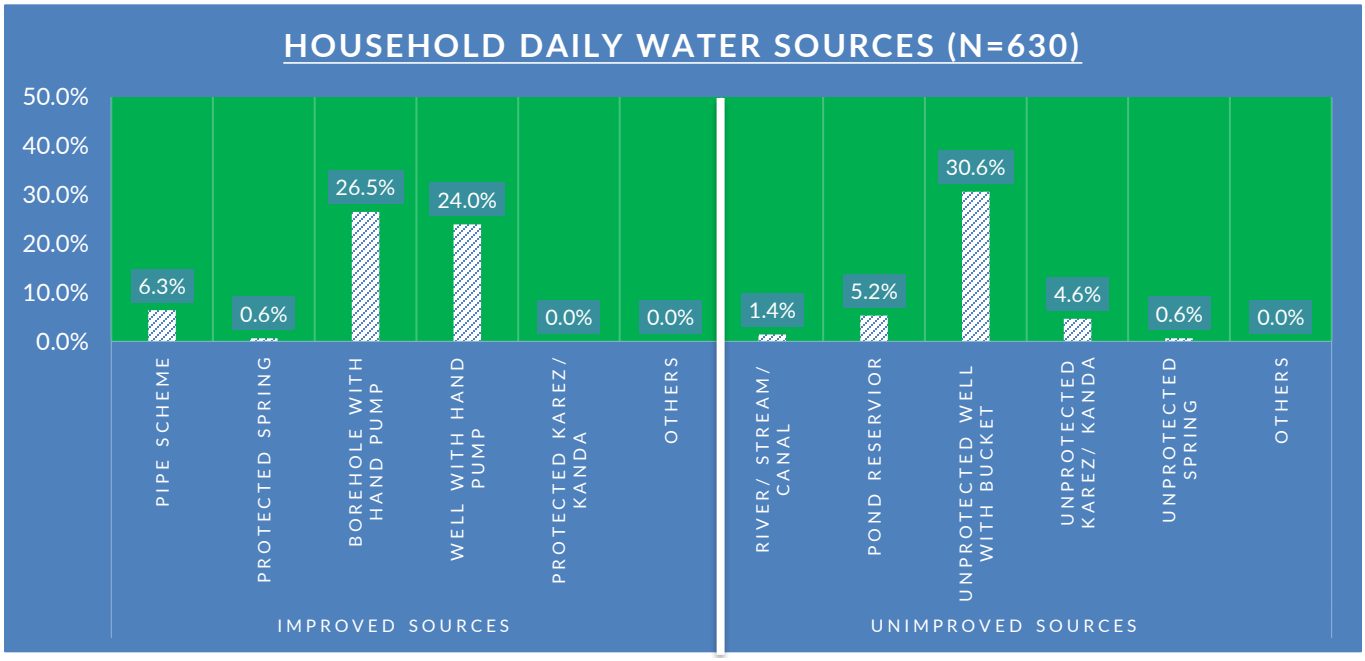


Figure 8: HH level daily improved and unimproved water sources

From the above figure we can see that the majority of the households are using borehole with hand pump (26.5%) and protectec well (24.0%) as their improved sources of water while unprotected well (30.6%) as unimproved water source.

6.7.3. Hand Washing Practices

Hand washing practice were also included in the survey, this information was largely knowledge/recall based, there is no practical verification process to know if mothers/caretakers actually practiced hand washing at all critical points or if they were largely recalling times. Appropriate hand washing is a general measure that contributes to the prevention and control of communicable diseases. (52.9%) mothers/caregivers hand washing practice at five critical point, for further information refer to the tables below.

Table 27: Hand-washing practices by the mothers/caretakers

Hand washing practices by mothers/caretakers (N=649)	Frequency	Results
Clean only with water	512	78.9%
Soap/Ash with clean water	137	21.1%
Wash both hands	633	97.5%
Rubs hands together at least 3 times	488	75.2%
Dries hand hygienically by air-drying or using a clean cloths	376	57.9%

Table 28: Handwashing practice by mothers/caretakers

Response (n=649)	Frequency	Results
Wash hands at 5 critical moments	**343**	**52.9%**
After defecation	645	99.4%
After cleaning baby's bottom	486	74.9%
Before food preparation	564	86.9%
Before eating	580	89.4%
Before feeding children (including breastfeeding)	373	57.5%

6.8. Households Food Security and Livelihoods (FSL) Situation

6.8.1. Food Consumption Scores and Food Based Coping Strategies

Food Consumption Scores and Food Based Coping Strategies are two very important food security 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 this survey, food consumption based on the Food Consumption Score (FCS)[5] as a description for the current short-term household food security situation is triangulated with the food-based or reduced Coping Strategy Index (rCSI)[6] to provide an indication of the food security status of the household. The triangulation of these two food security proxy indicators, instead of only food consumption, allows for capturing the interaction between household food consumption and coping strategies adopted, and hence, more properly reflects the food security situation in Kunduz province.

As a result, households having poor food consumption with high or medium coping and those with borderline food consumption but with high coping are considered as ***severely food insecure***. Households having poor food consumption with low coping, households having borderline food consumption with medium coping and those having acceptable consumption but with high coping are considered as ***moderately food insecure.*** Households having borderline or acceptable food consumption with low or medium coping are considered as Food Security ***(Table)***[7]**.**

Food consumption groups (based on FCS)	Coping group (based on CSI)		
	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

[5] The Food Consumption Score (FCS) is an acceptable proxy indicator to measure caloric intake and diet quality at household level, giving an indication of food security status of the household if combined with other household access indicators. It is a composite score based on dietary diversity, food frequency, and relative nutritional importance of different food groups. The FCS is calculated based on the past 7-day food consumption recall for the household and classified into three categories: poor consumption (FCS = 1.0 to 28); borderline (FCS = 28.1 to 42); and acceptable consumption (FCS = >42.0). The FCS is a weighted sum of food groups. The score for each food group is calculated by multiplying the number of days the commodity was consumed and its relative weight.

[6] The reduced Coping Strategy Index (rCSI) is often used as a proxy indicator of household food insecurity. Households were asked about how often they used a set of five short-term food based coping strategies in situations in which they did not have enough food, or money to buy food, during the one-week period prior to interview. The information is combined into the rCSI which is a score assigned to a household that represents the frequency and severity of coping strategies employed. First, each of the five strategies is assigned a standard weight based on its severity. These weights are: Relying on less preferred and less expensive foods (=1.0); Limiting portion size at meal times (=1.0); Reducing the number of meals eaten in a day (=1.0); Borrow food or rely on help from relatives or friends (=2.0); Restricting consumption by adults for small children to eat (=3.0). Household CSI scores are then determined by multiplying the number of days in the past week each strategy was employed by its corresponding severity weight, and then summing together the totals. The total rCSI score is the basis to determine and classify the level of coping: into three categories: No or low coping (rCSI= 0-9), medium coping (rCSI = 10-17), high coping (r ≥18).

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

6.8.2. Food security situation

Based on triangulation of Food Consumption Score (FSC) with the food-based or reduced Coping Strategy Index (rCSI), the survey finding shows 3% of households have severely food insecurity and 20% of households were moderately food insecurity see figure for more details.

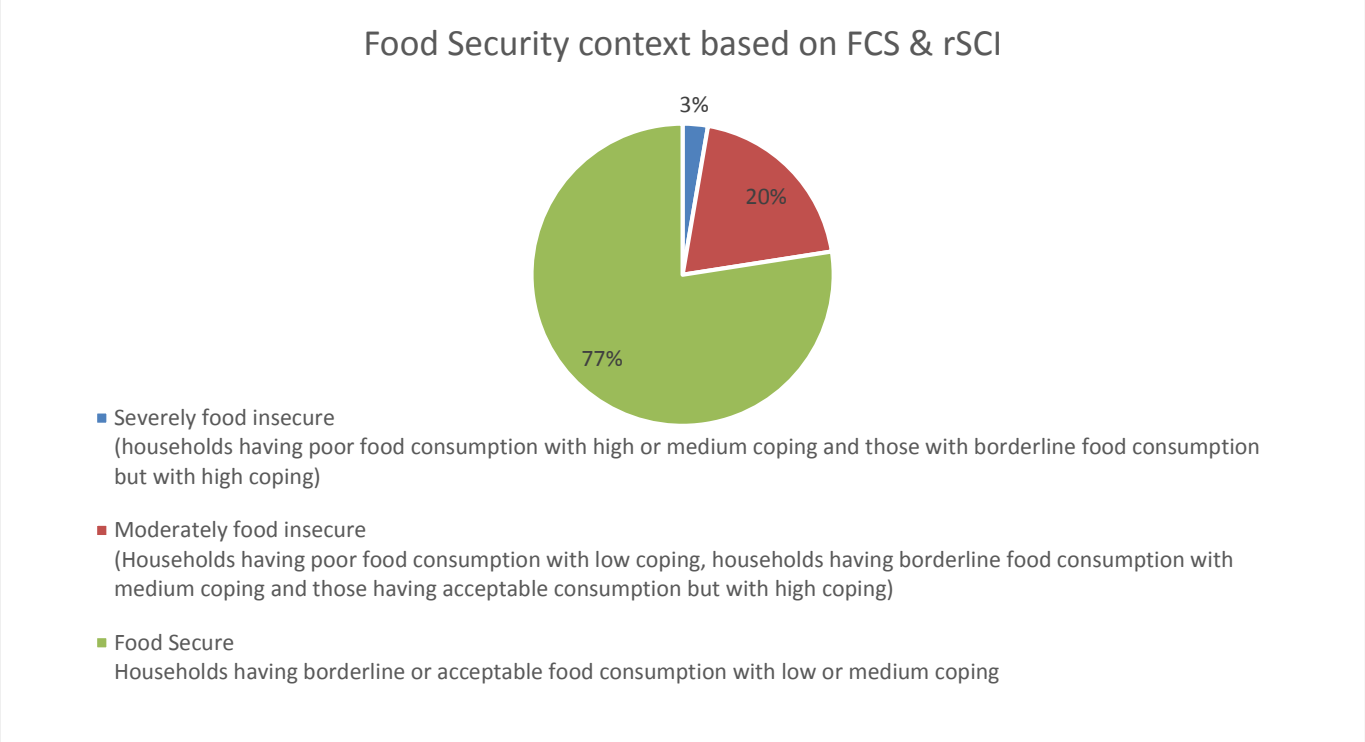
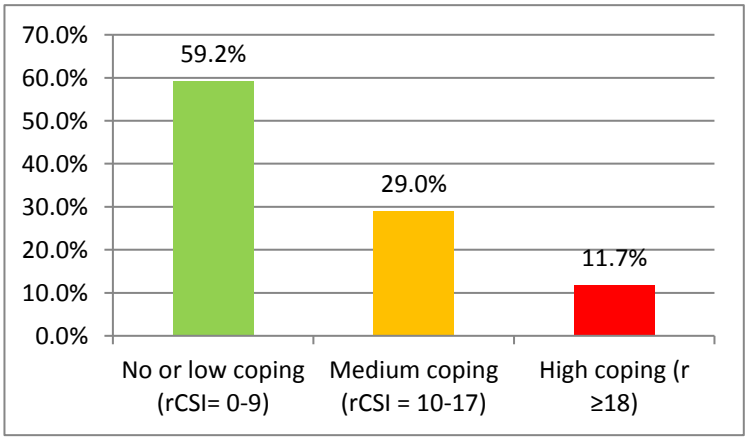


Figure 9: Food security situation (Based on FCS & rCSI)

6.8.3. Reduced Coping Strategy Index (rCSI)[8]

The Food Based Coping Strategy Index is based on measures of the frequency of use of food deprivation, such as the recourse to cheaper food, reductions of the quantity of meals, the act of borrowing food, as well as alterations in food distribution within the household to favor children. Each strategy is weight as per its severity with borrowing food and altering the



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

distribution of food within the household regarded as the most severe strategies. Categories are then defined based upon these scores varying from low coping (0-9) to medium coping (10-17) and high coping (>18).

- 11.7% of HHs with a high level of coping (rCSI ≥18 score).
- 29.0% of HHs with a medium level of coping (rCSI = 10-17 score).
- 59.2% of HHs with no or Low-level coping (rCSI =0-9 score).

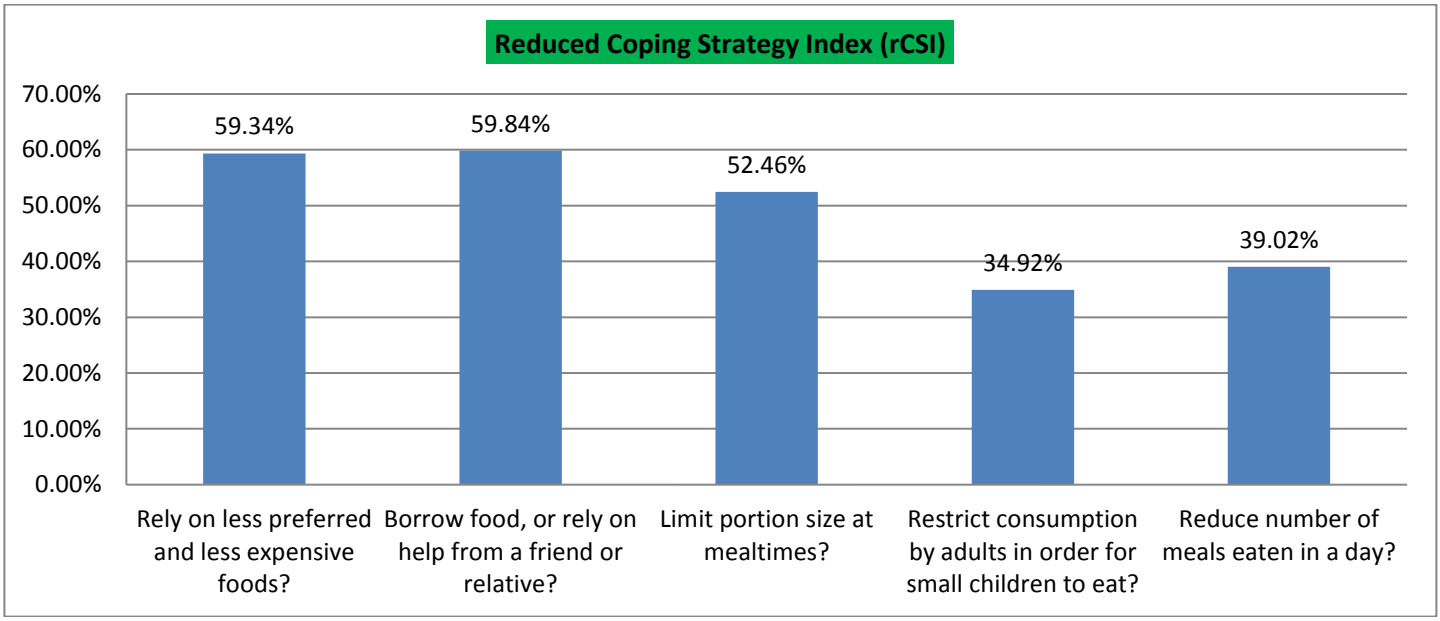


Figure 10: Reduced coping strategy index

6.8.4. Food Consumption Score (FCS)

Food Consumption Scores are the sum of the frequency of consumption (in the 7 days prior to the interview) of each type of food item (cereal, pulses, vegetables, meat fish and eggs, dairies, oil and sugar) weighted by their nutritional value (proteins are weighted 4, cereals 2, pulses 3, and vegetables and fruits 1, while sugar is weighted 0.5). Households are then grouped into "Poor" food consumption (1.0-28), "Borderline" (28.01 – 42) and acceptable (above 42). Food consumption groups are a proxy of food consumption and reflect both the frequency and quality of food consumption.

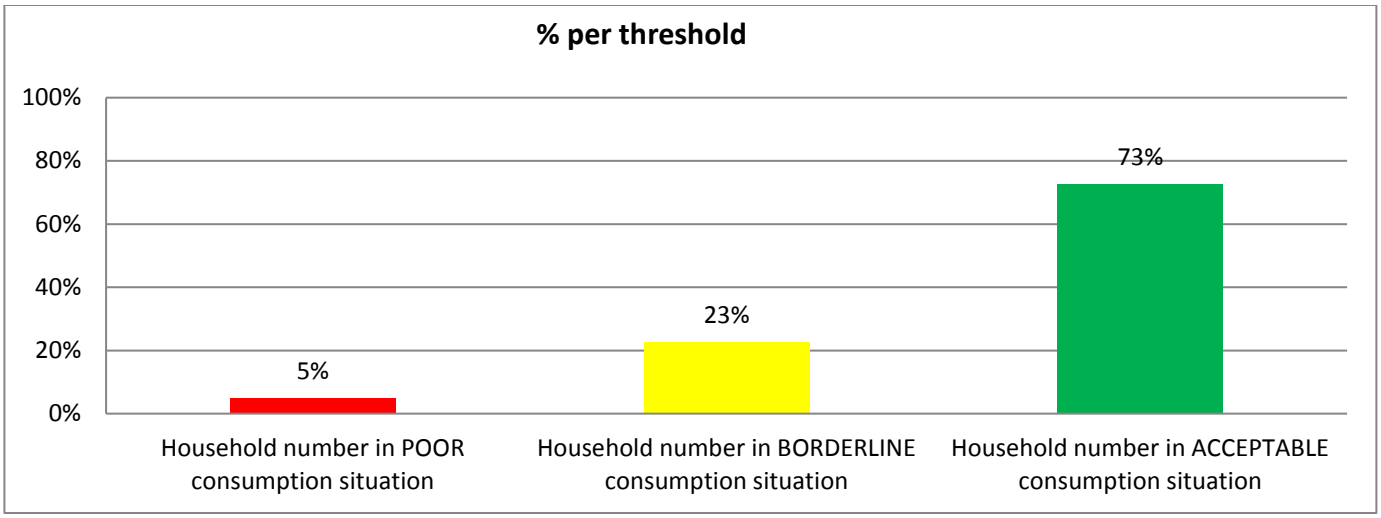


Figure 11: Food Consumption score per HH

- 5% households surveyed have Poor consumption scores (FCS = 1.0 to 28).
- 23% households surveyed have Borderline consumption scores (FCS = 28.1 to 42).
- 73% households surveyed have Acceptable food consumption scores (FCS = >42.0).

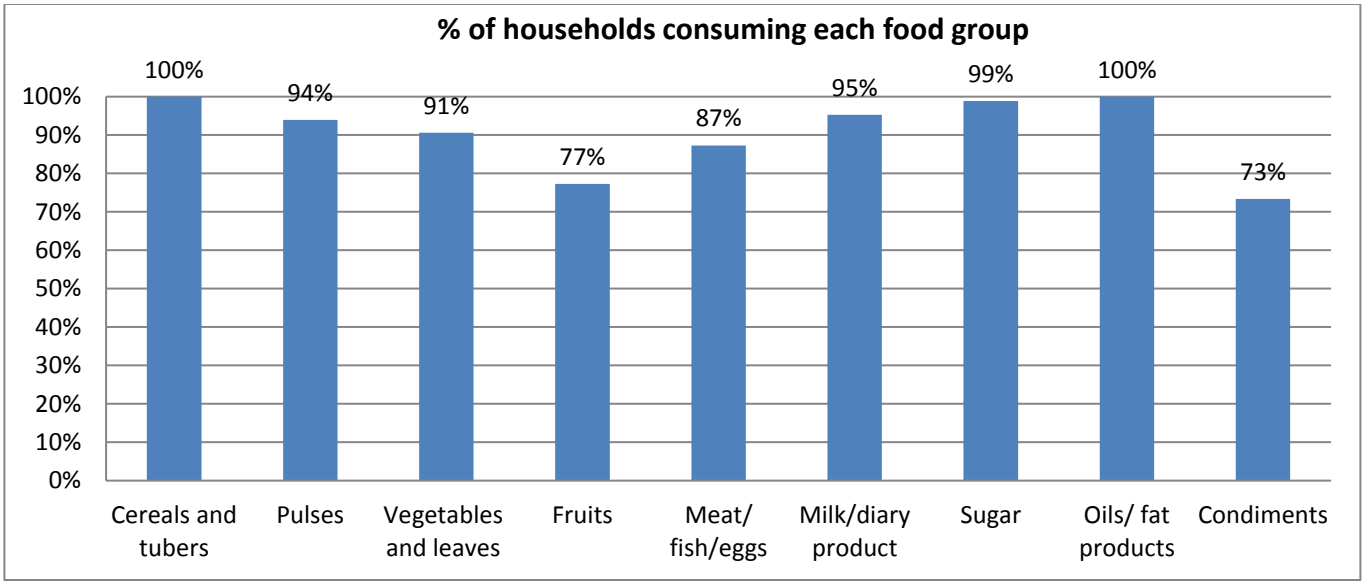


Figure 12: Households consuming each food group

6.8.5. Food Stock

630 households respondent for the food stock, table below show HHs percentages with duration of food stock in HHs.

Status, N=630 respondents	N	Results
No food stock in the households	167	26.5%
Less than a week food stock in households	37	5.9%
Food stock in households from 1-3 weeks	149	23.7%
Stock food in households up to 3 months	79	12.5%
Stock food in households more than 3 months	198	31.4%

6.8.6. Food main sources

The food that households used in the last 7 days prior to the survey as main sources of the food - survey finding shows most of the food was cash based, see table below for more details.

Table 29: Food main sources that the households consumed

	Own production	Cash	Credit	Battering	Gift/ charity	Wild food	Food Aid
Cereals and tubers	71%	28%	0%	0%	0%	0%	0%
Pulses/ Nuts	18%	81%	1%	0%	1%	0%	0%
Vegetables and leaves	20%	78%	1%	0%	1%	0%	0%
Fruits	2%	94%	1%	1%	1%	1%	0%
Meat/ fish/eggs	2%	93%	1%	1%	2%	0%	1%
Milk/diary product	55%	38%	0%	1%	5%	1%	0%
Sugar / Honey	2%	94%	1%	0%	2%	0%	0%
Oils/ fat products	3%	95%	1%	0%	0%	0%	0%
Condiments	1%	98%	0%	0%	0%	0%	0%

6. 9. Demography

The mortality questionnaires in SMART designed in a way that some additional useful demography data can withdraw. 630 households, 3,773 individuals including male and female, with 579 households have under five children, Summery highlighted in table below.

Table 30: Summery of the demography

Indicators	Values*
Total number of HHs with children under five	592
Average household size	5.8
Percentage of children under five	27.4
Birth Rate	2.44
In-migration Rate (Joined)	0.0
Out-migration Rate (Left)	0.52

*Based on ENA mortality dataset

6.9.1 Residential Status

The information collected from households regarding returnees and IDPs due to deferent reason, results is presented in table below.

Residential status of households N= 630	Permanent resident	622	98.7%
	Internal displacement	8	1.3%
	Returnees	0	0.0%

7. CONCLUSION

7.1. Undernutrition

Results of this survey is only representative for the entire province of Kunduz and may not reflect the national nutrition situation.

The survey showed a level of Global Acute Malnutrition of **7.8% (5.8 - 10.3 95% CI)** and Severe acute malnutrition (SAM) of **2.1 % (1.3 - 3.3; 95% CI)** based on WHZ, that according to the WHO classification GAM is considered as poor threshold in the province. The GAM and SAM prevalence were respectively 7.5% (5.26-10.65 95% CI), and 2.7% (1.58 - 4.64; 95% CI) based on Weight-for-height, in the last 2013 NNS.

The GAM prevalence based on MUAC is **8.8% (6.7 - 11.7 95% CI)** and SAM based on MUAC was of **2.2 % (1.4 - 3.6 95% CI)** was slightly higher than WHZ based GAM, but insignificantly.

The combine MUAC and WHZ score based on revealed GAM and SAM prevalence at **12.7% (10.5 - 14.9; 95% CI)** and **3.8% (2.5 - 5.0; 95% CI)** respectively. The combine rate informs on estimated GAM and SAM caseload in the province for better programing. Only children in the sample were detected as acutely malnourished according both criteria, in our survey. Children were defined malnourished using both criteria. To detect all acute malnourished children eligible for treatment, the MUAC only detection is not enough according criteria specified in Afghanistan IMAM Guidelines.

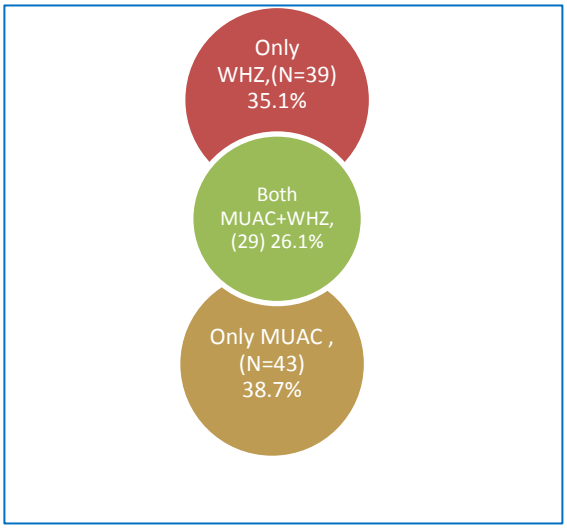


Figure 13: Overlapping WHZ and MUAC

This has to be further investigated. See figure 13 in the actual acute malnutrition comparing WHZ <-2 Z-score with MUAC <125 mm and there is slight difference.

Chronic malnutrition in the province continue worrying. The results of the present survey clearly showed that, based on WHO classification of severity of malnutrition, the overall prevalence of stunting was serious **39.9 % (35.4 - 44.6 95% CI)** and in fact almost touching the critical threshold of 40%**.** Two in every five children included in the survey were found to be stunted, while one in every five children was underweight.

7.2. Mortality Rates

The Crude death rate (0.18 death/10,000/Day) and under five death rate (0.37 death/10,000/Day) were well below the WHO emergency threshold for CDR (1/10,000/Day) and U5DR (2/10,000/Day).

7.3. Maternal Nutritional Status

There are no commonly accepted standards for maternal nutrition status. In surveys, the MUAC cutoff of 230 mm is used to approximately identify their status. This survey shows that **22.3% (18.9-25.8 95%CI)** of the mothers suffered from malnutrition based on MUAC<230mm.

Other main concerns were iron supplementation and institutional deliveries among pregnant women, which the survey found to be low **(58.0% and 52.7% respectively)**. The Iron supplementation prevent anemia during pregnancy and eventual life-threatening complications during pregnancy and delivery. Therefore, it decreases maternal mortality, perinatal infant loss and prematurity (that can be directly related to child stunting in the first 2 years of life).

7.3. Child Health and Immunization

The UNICEF conceptual framework of malnutrition can be used to explain the probable causes of under-nutrition in this area. Diseases weaken the individual immune system, increase nutritional needs and at the same time might be a reason of reduced food intake and absorption (diarrhea), engaging the body in a vicious cycle with malnutrition. In the Kunduz province, half of the sampled children **(44.9 %)** had suffered from one or another form of illness symptoms such as diarrhea **(22.0%)**, fever (**31.9%)** or acute respiratory **(22.8%)** signs in the last 2 weeks prior the survey, suggesting quite high illness of basic treatable diseases. It is important to note that low child immunity system also contributes to increase the malnutrition, morbidity and mortality. The survey shows a BCG vaccination coverage of **93.6%**, polio vaccination coverage of **93.5%,** measles vaccination coverage both by recall and by card confirmation of **79.5%,** and **88.9%** for **PENTA 3** vaccination that compared to national target 90 % is considered as low. Low immunization coverages contribute to increase morbidity and mortality rates.

Worm infection in children caused malabsorption, which can aggravate malnutrition and anemia rates and contribute to retarded growth, child morbidity and mortality. Deworming is recommended for children from 24 to 59 months of age as children in this age group are considered as a potential risk of acquiring the disease. As deworming also helps to enhance the iron status of children which eventually helps children to exercise their intellectual ability to the completest. The proportion of all children aged 24-59 months who had received deworming in the last 6 month prior to the survey was low (**64.6%),**

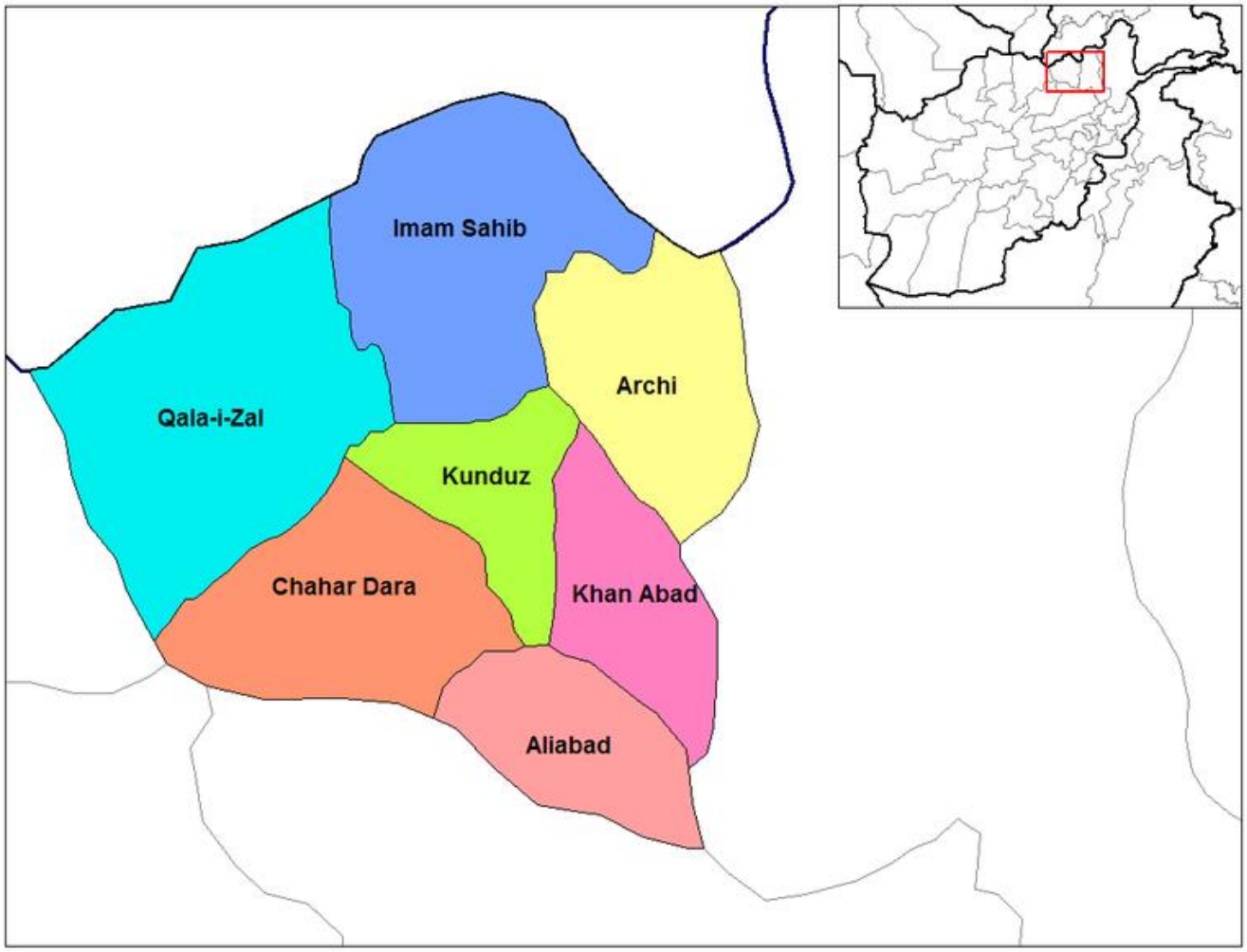
Improving the Vitamin A status of deficient children through supplementation enhances their resistance to disease and can significantly reduce mortality and morbidity, therefore it can be considered as a central element of the child survival program. The proportion of all children aged 6-59 months who had received vitamin A in the last 6 months prior to the survey was **87.8 %**, which is good the SPHERE recommendation and WHO target of 80%.

8. RECOMMENDATIONS

- Efforts should be put towards scaling up health and nutrition services coverage at health facility and community levels including additional integrated outreach services
- Continuation and strengthening of the ongoing community management of OTP SAM programme in the province
- Provide health education and strengthen awareness of community about the benefits of immunization, micronutrient supplementation and children health care practices through CHWs (convincing of incentive) and health facilities staffs.
- Consider starting of TSFP program to all health facilities (CHCs and BHCs if possible) for preventing and rehabilitating MAM children as well as Pregnant and lactating women.
- Advocate for the implementation of longer term multi-sectoral nutrition programme focusing on 1,000 days integrating WASH, FSL, Health and Nutrition interventions.
- To Increase health education at community and health facilities level through CHWs and health facilities staffs; convince CHWs to strengthen active case findings through regular monthly planning in the community level.
- Convince CHWs to strengthen active case findings through regular monthly planning in the community level.
- Khan Abad CHC has promoted to DH and need to create OTP SAM and TFU centers for better coverage, case identification and treatment.

9. ANNEXES

Annex 1: Kunduz Province Map



Annex 2: Selected Clusters in the Kunduz province

SN	Province	District Name	Name of Health Facility	Villages Name	Population size	Cluster
1	Kunduz	Kunduz	Teepa Borida BHC	Bagh-e-Sherlet	8275	1
2	Kunduz	Kunduz	Larkhabi CHC	Haji Khal Mirza	680	2
3	Kunduz	Kunduz	Gul Teepa BHC	Madrsa Arabha	2190	3
4	Kunduz	Kunduz	Khwajaghaltan BHC	Aziz Ahamad	209	4
5	Kunduz	Kunduz	Asqalan CHC	Reeg Qishlaq	600	5

6	Kunduz	Kunduz	Asqalan CHC	Chawlak / Madrasa	750	6
7	Kunduz	Kunduz	Bolak Quchi BHC	Andijani	787	7
8	Kunduz	Kunduz	Bolak Quchi BHC	Kobai Ulia	2496	8
9	Kunduz	Kunduz	Kanam BHC	Panjshriha	1153	9
10	Kunduz	Kunduz	Angor Bagh BHC	Nasariha	1881	10
11	Kunduz	Kunduz	Saridawra BHC	Shura khak 2	120	11
12	Kunduz	Imam Sahib	DH Imam Sahib	Masjid Toor Gul	2389	12
13	Kunduz	Imam Sahib	DH Imam Sahib	Khan Aqa	1716	13
14	Kunduz	Imam Sahib	Shirkhan Bandar BHC	Burzangi Arbab Noorullah	3141	14
15	Kunduz	Imam Sahib	Basus Imam Sahib CHC	Murad Sheekh	1716	15
16	Kunduz	Imam Sahib	Basus Imam Sahib CHC	Sanjid Shakh	886	16
17	Kunduz	Imam Sahib	Achghan BHC	Bishkapa	585	17
18	Kunduz	Imam Sahib	Aq Masjid BHC	Haji Abdur Raheem	1200	18
19	Kunduz	Imam Sahib	Koldaman BHC	Koldaman Afghania	890	19
20	Kunduz	Imam Sahib	Koldaman BHC	Chghaur Afghania	919	20
21	Kunduz	Imam Sahib	Quter Bulaq BHC	Shorqoduq	180	21
22	Kunduz	Imam Sahib	Eichkili CHC	Yaka Toot Uzbikia	3400	22
23	Kunduz	Imam Sahib	Eichkili CHC	Aftab Luq Afghania	2527	23
24	Kunduz	Imam Sahib	Kalbad CHC	Masjid Qamruq	674	24
25	Kunduz	Khan Abad	Khan Abad CHC+	Mir Hashim	2000	25
26	Kunduz	Khan Abad	Khan Abad CHC+	Saridawra	3000	26
27	Kunduz	Khan Abad	Khan Abad CHC+	Mafali Qazi Dayan	1300	27
28	Kunduz	Khan Abad	Jan Qataghan BHC	Sangosh	1350	28
29	Kunduz	Khan Abad	NikPai CHC	Tajikha	1014	29
30	Kunduz	Khan Abad	Charsary BHC	Zard Kamar Payan	949	30
31	Kunduz	Khan Abad	Suduq Sai BHC	Quji Nal / Pasi Mazar	500	31
32	Kunduz	Khan Abad	Musazai BHC	Dehkalan	1100	32
33	Kunduz	Ali Abad	Ali Abad CHC	Cheep Ousat	509	33
34	Kunduz	Ali Abad	Madrasa CHC	Mehrabud Din	920	34

35	Kunduz	Ali Abad	Arbab Ramazani BHC	Haji Karim	277	35
36	Kunduz	Chardara	Chardara CHC	Madrasa Shaikhan	400	36
37	Kunduz	Chardara	Chardara CHC	Surkhabiha	449	37
38	Kunduz	Chardara	Juma Bazar BHC	Dr Abdu Raheem	481	38
39	Kunduz	Chardara	Juma Bazar BHC	Ishaq Bai	860	39
40	Kunduz	Chardara	Sedokan Basus BHC	Ahmadzai	158	40
41	Kunduz	Qalaizal	Sayed Masoom Shaheed BHC	Safer Muhammad Khan	350	41
42	Kunduz	Qalaizal	Aq Teepa CHC+	Markaz	1099	42
43	Kunduz	Qalaizal	Aq Teepa CHC+	Rahman Agha	700	43
44	Kunduz	Qalaizal	Aq Teepa CHC+	Mual Siddiq	1290	44
45	Kunduz	Qalaizal	Doorman BHC	Toor Gul	736	45
46	Kunduz	Archi	Archi CHC+	Chawli Bai	1152	46
47	Kunduz	Archi	Archi CHC+	Haji Muhammad Alam	2363	47
48	Kunduz	Archi	Qarluq CHC	Imam Bukhari	1000	48
49	Kunduz	Archi	Shahrawan BHC	Masjid Cqalacha Payay and Bala	1046	49
50	Kunduz	Archi	Haji Nayam Jan CHC	Amir Malook	2261	50
51	Kunduz	Archi	Haji Nayam Jan CHC	HSC Sra Mata	7000	51
52	Kunduz	Imam Shaib	Imam Saib DH	Qerghiz/Masjid Khosti ha	1500	RC
53	Kunduz	Imam Saib	Alif Berdi BHC	Madrasai Alif Berdi	1500	RC
54	Kunduz	Khan Abad	Khan Abad CHC+	Khubazi Mahkama	1500	RC
55	Kunduz	Khan Abad	Nike Pai CHC	Tepa Mamor	562	RC
56	Kunduz	Archi	Archi CHC+	Shinwari Kalai	2757	RC
57	Kunduz	Archi	Qarlog CHC	Ghajir Khana	948	RC

Annex 3: Plausibility check for: AFG_KANDUZ_ 042018_FV.as ENA dataset

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** (2.0 %)
Overall Sex ratio	Incl	p	>0.1	>0.05	>0.001	<=0.001	
(Significant chi square)			0	2	4	10	**0** (p=0.192)
Age ratio(6-29 vs 30-59)	Incl	p	>0.1	>0.05	>0.001	<=0.001	
(Significant chi square)			0	2	4	10	**0** (p=0.605)
Dig pref score - weight	Incl	#	0-7	8-12	13-20	> 20	
			0	2	4	10	**0** (3)
Dig pref score - height	Incl	#	0-7	8-12	13-20	> 20	
			0	2	4	10	**2** (11)
Dig pref score - MUAC	Incl	#	0-7	8-12	13-20	> 20	
			0	2	4	10	**2** (10)
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	**5** (1.10)
Skewness WHZ	Excl	#	<±0.2	<±0.4	<±0.6	>=±0.6	
			0	1	3	5	**3** (-0.42)
Kurtosis WHZ	Excl	#	<±0.2	<±0.4	<±0.6	>=±0.6	
			0	1	3	5	**0** (0.03)
Poisson dist WHZ-2	Excl	p	>0.05	>0.01	>0.001	<=0.001	
			0	1	3	5	**0** (p=0.088)
OVERALL SCORE WHZ =			0-9	10-14	15-24	>25	**12** %

The overall score of this survey is 12 %, this is good.

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

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

Line=19/ID=1: **WHZ (-3.952)**, Weight may be incorrect

Line=81/ID=1: HAZ (3.055), WAZ (2.722), Age may be incorrect

Line=86/ID=2: **WHZ (-4.860)**, WAZ (-4.833), Weight may be incorrect

Line=168/ID=1: HAZ (1.620), Age may be incorrect

Line=186/ID=1: **WHZ (-4.369)**, Weight may be incorrect

Line=226/ID=1: HAZ (1.746), Height may be incorrect

Line=255/ID=1: **WHZ (-4.079)**, Height may be incorrect

Line=268/ID=1: HAZ (-5.193), Age may be incorrect

Line=276/ID=3: **WHZ (-4.207)**, Height may be incorrect

Line=277/ID=1: HAZ (2.981), Height may be incorrect

Line=365/ID=2: HAZ (-5.932), Age may be incorrect

Line=374/ID=1: **WHZ (-3.730)**, HAZ (-5.203), WAZ (-5.124)

Line=388/ID=1: HAZ (1.850), Height may be incorrect

Line=410/ID=1: HAZ (1.886), Age may be incorrect

Line=435/ID=1: **WHZ (6.397)**, HAZ (-7.226), Height may be incorrect

Line=440/ID=2: **WHZ (-4.089)**, HAZ (1.495), Height may be incorrect

Line=441/ID=1: **WHZ (-4.767)**, HAZ (4.158), Height may be incorrect

Line=446/ID=2: **WHZ (-4.816)**, HAZ (4.025), Height may be incorrect

Line=448/ID=1: WAZ (-4.686), Age may be incorrect

Line=457/ID=2: HAZ (-5.881), Age may be incorrect

Line=470/ID=1: HAZ (-7.044), Age may be incorrect

Line=483/ID=2: HAZ (-6.693), WAZ (-4.202), Age may be incorrect

Line=490/ID=2: **WHZ (-3.388)**, WAZ (-4.395), Weight may be incorrect

Line=505/ID=1: **WHZ (-3.494)**, Weight may be incorrect

Line=510/ID=1: **WHZ (-3.652)**, HAZ (-4.875), WAZ (-5.080)

Line=583/ID=1: HAZ (1.401), Age may be incorrect

Line=590/ID=1: **WHZ (-4.503)**, HAZ (2.539), Height may be incorrect

Line=591/ID=2: HAZ (-6.324), WAZ (-5.190), Age may be incorrect

Line=606/ID=1: HAZ (1.952), Age may be incorrect

Line=631/ID=2: HAZ (-5.268), Age may be incorrect

Line=654/ID=1: HAZ (1.984), Height may be incorrect

Line=672/ID=1: HAZ (1.357), Age may be incorrect

Line=676/ID=1: **WHZ (3.608)**, Height may be incorrect

Line=693/ID=2: HAZ (-6.077), Height may be incorrect

Line=694/ID=1: HAZ (-5.547), Age may be incorrect

Line=696/ID=2: HAZ (-5.517), Age may be incorrect

Line=724/ID=1: **WHZ (3.059)**, Height may be incorrect

Line=791/ID=2: HAZ (1.395), Height may be incorrect

Line=829/ID=3: HAZ (-4.773), Age may be incorrect

Line=869/ID=1: HAZ (-4.825), WAZ (-4.549), Age may be incorrect

Line=961/ID=1: HAZ (4.219), Age may be incorrect

Line=962/ID=1: HAZ (5.535), Age may be incorrect

Line=965/ID=1: HAZ (-5.003), WAZ (-4.392), Age may be incorrect

Line=966/ID=2: **WHZ (-3.732)**, WAZ (-4.457), Weight may be incorrect

Line=967/ID=1: **WHZ (-5.156)**, WAZ (-4.667), Weight may be incorrect

Line=969/ID=1: HAZ (-5.611), Age may be incorrect

Percentage of values flagged with SMART flags:WHZ: 2.0 %, HAZ: 3.8 %, WAZ: 1.3 %

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: 0.88 (The value should be around 0.85).:

p-value = 0.605 (as expected)

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

Age cat.	mo.	boys	girls	total	ratio boys/girls
6 to 17	12	117/108.1 (1.1)	113/99.1 (1.1)	230/207.2 (1.1)	1.04
18 to 29	12	94/105.4 (0.9)	94/96.6 (1.0)	188/202.0 (0.9)	1.00
30 to 41	12	120/102.2 (1.2)	107/93.6 (1.1)	227/195.8 (1.2)	1.12
42 to 53	12	93/100.6 (0.9)	70/92.1 (0.8)	163/192.7 (0.8)	1.33
54 to 59	6	42/49.7 (0.8)	43/45.6 (0.9)	85/95.3 (0.9)	0.98
6 to 59	54	466/446.5 (1.0)	427/446.5 (1.0)		1.09

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

Overall sex ratio: p-value = 0.192 (boys and girls equally represented)

Overall age distribution: p-value = 0.007 (significant difference)

Overall age distribution for boys: p-value = 0.144 (as expected)

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

Overall sex/age distribution: p-value = 0.001 (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: **3** (0-7 excellent, 8-12 good, 13-20 acceptable and > 20 problematic)

p-value for chi2: 0.710

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: **11** (0-7 excellent, 8-12 good, 13-20 acceptable and > 20 problematic)

p-value for chi2: 0.000 (significant difference)

Digit preference MUAC:

Digit .0 : ##

Digit .1 : ###################

Digit .2 : ######################

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

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

Digit .5 : ##

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

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

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

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

Digit preference score: **10** (0-7 excellent, 8-12 good, 13-20 acceptable and > 20 problematic)

p-value for chi2: 0.000 (significant difference)

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

exclusion (Flag) procedures

.	no exclusion	exclusion from reference mean (WHO flags)	exclusion from observed mean (SMART flags)
WHZ			
Standard Deviation SD:	1.24	1.21	1.10
(The SD should be between 0.8 and 1.2)			
Prevalence (< -2)			
observed:	9.3%	9.2%	7.8%
calculated with current SD:	8.7%	8.2%	5.8%
calculated with a SD of 1:	4.6%	4.7%	4.2%
HAZ			
Standard Deviation SD:	1.44	1.39	1.20
(The SD should be between 0.8 and 1.2)			
Prevalence (< -2)			
observed:	40.3%	40.0%	39.9%
calculated with current SD:	42.1%	41.0%	40.7%
calculated with a SD of 1:	38.7%	37.6%	38.9%
WAZ			
Standard Deviation SD:	1.05	1.05	0.98
(The SD should be between 0.8 and 1.2)			
Prevalence (< -2)			
observed:	20.8%	20.8%	
calculated with current SD:	22.2%	22.2%	
calculated with a SD of 1:	21.0%	21.0%	
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= 0.008
WAZ	p= 0.000	p= 0.000	p= 0.000
(If p < 0.05 then the data are not normally distributed. If p > 0.05 you can consider the data normally distributed)			
Skewness			
WHZ	-0.50	-0.66	-0.42
HAZ	0.12	0.33	-0.09
WAZ	-0.52	-0.52	-0.26

If the value is:

-below minus 0.4 there is a relative excess of wasted/stunted/underweight subjects in the sample

-between minus 0.4 and minus 0.2, there may be a relative excess of wasted/stunted/underweight subjects in

the sample.

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

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

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

Kurtosis

WHZ	1.79	0.92	0.03
HAZ	1.96	1.70	-0.36
WAZ	0.90	0.90	-0.05

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=1.28 (p=0.088)

WHZ < -3: ID=0.99 (p=0.487)

GAM: ID=1.28 (p=0.088)

SAM: ID=0.99 (p=0.487)

HAZ < -2: ID=1.67 (p=0.002)

HAZ < -3: ID=2.00 (p=0.000)

WAZ < -2: ID=1.03 (p=0.417)

WAZ < -3: ID=0.91 (p=0.654)

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: 1.72 (n=50, f=3)  ########################################
02: 1.19 (n=44, f=0)  ################
03: 1.20 (n=47, f=0)  ##################
04: 1.04 (n=50, f=0)  ##########
05: 0.96 (n=47, f=0)  #######
06: 1.34 (n=48, f=3)  ########################
07: 1.10 (n=46, f=1)  #############
08: 1.31 (n=44, f=1)  ######################
09: 1.05 (n=40, f=0)  ###########
10: 1.21 (n=48, f=1)  #################
11: 1.29 (n=44, f=1)  ####################
12: 1.33 (n=49, f=2)  ######################
13: 1.17 (n=43, f=0)  ################
14: 1.29 (n=46, f=2)  ####################
15: 1.27 (n=44, f=1)  ####################
16: 1.23 (n=42, f=1)  ##################
17: 1.11 (n=39, f=0)  #############
18: 1.39 (n=36, f=1)  ########################
19: 1.43 (n=22, f=1)  OOOOOOOOOOOOOOOOOOOOOOOO
20: 0.98 (n=18, f=0)  OOOOOOO
21: 1.18 (n=15, f=0)  OOOOOOOOOOOOOOO
22: 0.88 (n=11, f=0)  ~~~
23: 0.71 (n=10, f=0)
24: 0.62 (n=04, f=0)
25: 0.56 (n=03, 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 =	148	156	155	127	137	170
Percentage of values flagged with SMART flags:						
WHZ:	2.0	0.0	3.9	1.6	4.4	0.6
HAZ:	4.1	1.3	5.8	3.9	2.9	4.7
WAZ:	0.7	0.6	2.6	1.6	1.5	1.2
Age ratio of 6-29 months to 30-59 months:						
	0.85	0.88	0.67	1.12	0.88	0.98
Sex ratio (male/female):						
	1.24	1.03	0.80	1.23	1.28	1.10
Digit preference Weight (%):						
.0 :	9	13	11	11	9	9
.1 :	12	11	10	13	8	10

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

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

Digit preference Height (%):

.0 :	14	15	14	12	17	21
.1 :	3	10	13	9	7	6
.2 :	11	14	9	14	14	15
.3 :	19	6	10	12	14	9
.4 :	11	11	12	11	9	7
.5 :	12	12	14	17	9	19
.6 :	5	8	6	14	14	4
.7 :	18	8	8	3	7	7
.8 :	5	11	8	5	4	7
.9 :	1	5	6	3	5	5
DPS:	19	10	10	15	14	19

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

Digit preference MUAC (%):

.0 :	17	10	8	6	15	31
.1 :	1	8	14	9	9	1
.2 :	10	9	8	9	7	4
.3 :	10	8	12	12	12	6
.4 :	14	13	15	24	8	7
.5 :	14	7	15	10	10	29
.6 :	8	17	10	16	12	2
.7 :	16	8	6	4	7	8
.8 :	5	15	8	7	8	9
.9 :	4	6	5	3	12	4
DPS:	17	11	12	19	8	34

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

Standard deviation of WHZ:

SD	1.26	1.00	1.43	1.27	1.34	1.10

Prevalence (< -2) observed:

%	7.4	5.8	9.7	12.6	11.7	9.4

Prevalence (< -2) calculated with current SD:

%	7.2	4.0	13.5	11.3	10.8	6.0

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

%	3.3	4.0	5.8	6.2	4.9	4.4

Standard deviation of HAZ:

SD	1.34	1.22	1.70	1.37	1.46	1.48

observed:

%	44.6	45.5	38.1	35.4	40.1	37.6

calculated with current SD:

%	45.7	45.0	40.8	38.5	41.3	41.2

calculated with a SD of 1:

%	44.2	43.9	34.6	34.5	37.5	37.2

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	19/19.0 (1.0)	17/15.3 (1.1)	36/34.3 (1.0)	1.12
18 to 29	12	14/18.5 (0.8)	18/14.9 (1.2)	32/33.5 (1.0)	0.78
30 to 41	12	23/18.0 (1.3)	10/14.5 (0.7)	33/32.5 (1.0)	2.30
42 to 53	12	9/17.7 (0.5)	10/14.2 (0.7)	19/31.9 (0.6)	0.90
54 to 59	6	17/8.8 (1.9)	11/7.0 (1.6)	28/15.8 (1.8)	1.55
6 to 59	54	82/74.0 (1.1)	66/74.0 (0.9)		1.24

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

Overall sex ratio: p-value = 0.188 (boys and girls equally represented)
Overall age distribution: p-value = 0.005 (significant difference)
Overall age distribution for boys: p-value = 0.006 (significant difference)
Overall age distribution for girls: p-value = 0.224 (as expected)
Overall sex/age distribution: p-value = 0.000 (significant difference)

Team 2:

Age cat.	mo.	boys	girls	total	ratio boys/girls
6 to 17	12	24/18.3 (1.3)	16/17.9 (0.9)	40/36.2 (1.1)	1.50
18 to 29	12	12/17.9 (0.7)	21/17.4 (1.2)	33/35.3 (0.9)	0.57
30 to 41	12	24/17.3 (1.4)	26/16.9 (1.5)	50/34.2 (1.5)	0.92
42 to 53	12	12/17.0 (0.7)	8/16.6 (0.5)	20/33.7 (0.6)	1.50
54 to 59	6	7/8.4 (0.8)	6/8.2 (0.7)	13/16.6 (0.8)	1.17
6 to 59	54	79/78.0 (1.0)	77/78.0 (1.0)		1.03

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

Overall sex ratio: p-value = 0.873 (boys and girls equally represented)
Overall age distribution: p-value = 0.007 (significant difference)
Overall age distribution for boys: p-value = 0.092 (as expected)
Overall age distribution for girls: p-value = 0.027 (significant difference)
Overall sex/age distribution: p-value = 0.001 (significant difference)

Team 3:

Age cat.	mo.	boys	girls	total	ratio boys/girls
6 to 17	12	11/16.0 (0.7)	18/20.0 (0.9)	29/36.0 (0.8)	0.61
18 to 29	12	17/15.6 (1.1)	16/19.5 (0.8)	33/35.1 (0.9)	1.06
30 to 41	12	15/15.1 (1.0)	22/18.9 (1.2)	37/34.0 (1.1)	0.68
42 to 53	12	19/14.9 (1.3)	18/18.6 (1.0)	37/33.4 (1.1)	1.06

54 to 59	6	7/7.4 (1.0)	12/9.2 (1.3)	19/16.5 (1.1)	0.58
6 to 59	54	69/77.5 (0.9)	86/77.5 (1.1)		0.80

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

Overall sex ratio: p-value = 0.172 (boys and girls equally represented)
Overall age distribution: p-value = 0.648 (as expected)
Overall age distribution for boys: p-value = 0.584 (as expected)
Overall age distribution for girls: p-value = 0.697 (as expected)
Overall sex/age distribution: p-value = 0.144 (as expected)

Team 4:

Age cat.	mo.	boys	girls	total	ratio boys/girls
6 to 17	12	20/16.2 (1.2)	19/13.2 (1.4)	39/29.5 (1.3)	1.05
18 to 29	12	17/15.8 (1.1)	11/12.9 (0.9)	28/28.7 (1.0)	1.55
30 to 41	12	11/15.3 (0.7)	12/12.5 (1.0)	23/27.8 (0.8)	0.92
42 to 53	12	17/15.1 (1.1)	8/12.3 (0.7)	25/27.4 (0.9)	2.13
54 to 59	6	5/7.5 (0.7)	7/6.1 (1.2)	12/13.6 (0.9)	0.71
6 to 59	54	70/63.5 (1.1)	57/63.5 (0.9)		1.23

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

Overall sex ratio: p-value = 0.249 (boys and girls equally represented)
Overall age distribution: p-value = 0.363 (as expected)
Overall age distribution for boys: p-value = 0.518 (as expected)
Overall age distribution for girls: p-value = 0.347 (as expected)
Overall sex/age distribution: p-value = 0.063 (as expected)

Team 5:

Age cat.	mo.	boys	girls	total	ratio boys/girls
6 to 17	12	19/17.9 (1.1)	17/13.9 (1.2)	36/31.8 (1.1)	1.12
18 to 29	12	13/17.4 (0.7)	15/13.6 (1.1)	28/31.0 (0.9)	0.87
30 to 41	12	25/16.9 (1.5)	15/13.2 (1.1)	40/30.0 (1.3)	1.67
42 to 53	12	18/16.6 (1.1)	7/12.9 (0.5)	25/29.6 (0.8)	2.57
54 to 59	6	2/8.2 (0.2)	6/6.4 (0.9)	8/14.6 (0.5)	0.33
6 to 59	54	77/68.5 (1.1)	60/68.5 (0.9)		1.28

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

Overall sex ratio: p-value = 0.146 (boys and girls equally represented)
Overall age distribution: p-value = 0.097 (as expected)
Overall age distribution for boys: p-value = 0.042 (significant difference)
Overall age distribution for girls: p-value = 0.427 (as expected)
Overall sex/age distribution: p-value = 0.002 (significant difference)

Team 6:

Age cat.	mo.	boys	girls	total	ratio boys/girls

```
6  to 17     12      24/20.6 (1.2)      26/18.8 (1.4)      50/39.4 (1.3)    0.92
18 to 29     12      21/20.1 (1.0)      13/18.3 (0.7)      34/38.5 (0.9)    1.62
30 to 41     12      22/19.5 (1.1)      22/17.8 (1.2)      44/37.3 (1.2)    1.00
42 to 53     12      18/19.2 (0.9)      19/17.5 (1.1)      37/36.7 (1.0)    0.95
54 to 59      6        4/9.5 (0.4)        1/8.6 (0.1)        5/18.1 (0.3)    4.00
-------------------------------------------------------------------------------
6  to 59     54      89/85.0 (1.0)      81/85.0 (1.0)                       1.10
```

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

Overall sex ratio: p-value = 0.540 (boys and girls equally represented)
Overall age distribution: p-value = 0.007 (significant difference)
Overall age distribution for boys: p-value = 0.385 (as expected)
Overall age distribution for girls: p-value = 0.016 (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: 1.59 (n=08, f=1)  ##################################
02: 1.14 (n=07, f=0)  ###############
03: 1.59 (n=06, f=1)  ##################################
04: 1.41 (n=08, f=0)  ########################
05: 0.90 (n=08, f=0)  ####
06: 1.61 (n=08, f=1)  ##################################
07: 0.54 (n=06, f=0)
08: 1.73 (n=08, f=1)  ########################################
09: 0.80 (n=08, f=0)
10: 1.24 (n=07, f=0)  ###################
11: 0.78 (n=07, f=0)
12: 1.08 (n=08, f=0)  ############
13: 1.18 (n=06, f=0)  ################
14: 1.58 (n=07, f=0)  ##################################
15: 1.09 (n=08, f=0)  ############
16: 1.72 (n=07, f=0)  ########################################
17: 1.03 (n=05, f=0)  OOOOOOOOOO
18: 1.38 (n=06, f=0)  ########################
19: 0.68 (n=05, f=0)
20: 0.85 (n=04, f=0)  OO
21: 0.93 (n=05, f=0)  OOOOO
22: 1.32 (n=03, f=0)  OOOOOOOOOOOOOOOOOOOOO
23: 0.47 (n=03, 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: 1.33 (n=09, f=0)  ######################
02: 1.41 (n=07, f=0)  ########################
03: 0.62 (n=09, f=0)
04: 0.78 (n=09, f=0)
05: 0.82 (n=07, f=0)  #
06: 0.80 (n=09, f=0)
07: 0.88 (n=09, f=0)  ####
```

```
08: 1.21 (n=08, f=0)  #################
09: 1.40 (n=07, f=0)  #########################
10: 1.01 (n=09, f=0)  #########
11: 0.77 (n=07, f=0)
12: 0.94 (n=09, f=0)  ######
13: 0.80 (n=09, f=0)
14: 1.10 (n=09, f=0)  #############
15: 0.62 (n=08, f=0)
16: 1.29 (n=08, f=0)  ####################
17: 0.88 (n=07, f=0)  ####
18: 1.45 (n=06, f=0)  ###########################
20: 1.98 (n=02, f=0)  ~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~
22: 0.61 (n=02, f=0)
23: 0.50 (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: 2.28 (n=09, f=1)  ##################################################################
02: 1.15 (n=08, f=0)  ###############
03: 1.15 (n=09, f=0)  ###############
04: 1.14 (n=09, f=0)  ##############
05: 0.83 (n=09, f=0)  #
06: 1.79 (n=09, f=1)  ########################################
07: 0.63 (n=08, f=0)
08: 1.67 (n=07, f=0)  #####################################
09: 1.01 (n=08, f=0)  #########
10: 1.25 (n=09, f=0)  ###################
11: 2.01 (n=09, f=1)  ####################################################
12: 1.32 (n=09, f=0)  #####################
13: 1.20 (n=07, f=0)  #################
14: 1.66 (n=07, f=1)  #####################################
15: 1.60 (n=09, f=1)  ###################################
16: 1.38 (n=07, f=1)  #######################
17: 1.53 (n=08, f=0)  ##############################
18: 1.46 (n=06, f=0)  ############################
19: 1.54 (n=02, f=0)  ~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~
20: 0.90 (n=03, f=0)  OOOO
```

(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: 1.32 (n=08, f=0)  #####################
02: 0.92 (n=07, f=0)  #####
03: 1.23 (n=08, f=0)  ##################
04: 1.26 (n=08, f=0)  ###################
05: 1.20 (n=08, f=0)  #################
06: 1.33 (n=07, f=0)  #####################
07: 1.34 (n=08, f=0)  ######################
08: 1.54 (n=08, f=0)  ##############################
09: 1.69 (n=04, f=0)  OOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOO
10: 0.98 (n=08, f=0)  #######
11: 1.26 (n=06, f=0)  ###################
12: 0.75 (n=08, f=0)
13: 1.59 (n=06, f=0)  ##################################
14: 1.65 (n=08, f=1)  #####################################
15: 1.03 (n=07, f=0)  ##########
16: 1.09 (n=06, f=0)  ############
17: 1.11 (n=05, f=0)  #############
18: 1.82 (n=03, f=1)  OOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOO
19: 0.93 (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: 1.83 (n=07, f=1)  ##########################################
02: 1.48 (n=07, f=0)  ##############################
03: 1.04 (n=07, f=0)  ##########
04: 0.70 (n=07, f=0)
05: 1.46 (n=07, f=0)  ############################
06: 1.72 (n=07, f=1)  ########################################
07: 1.68 (n=06, f=1)  ####################################
08: 0.54 (n=06, f=0)
09: 1.07 (n=05, f=0)  ###########
10: 0.88 (n=06, f=0)  ###
11: 1.14 (n=07, f=0)  ##############
12: 2.21 (n=06, f=2)  ############################################################
13: 0.94 (n=06, f=0)  ######
14: 1.16 (n=07, f=0)  ################
15: 1.95 (n=05, f=0)  ################################################
16: 0.65 (n=06, f=0)
17: 1.31 (n=06, f=0)  ####################
18: 1.32 (n=07, f=0)  ####################
19: 1.98 (n=05, f=1)  ##################################################
20: 0.85 (n=04, f=0)  ##
21: 1.44 (n=03, f=0)  OOOOOOOOOOOOOOOOOOOOOOOOO
22: 0.52 (n=02, f=0)
24: 0.83 (n=02, f=0)  O
25: 0.01 (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: 1.67 (n=09, f=0)  ###################################
02: 0.93 (n=08, f=0)  #####
03: 1.10 (n=08, f=0)  #############
04: 1.05 (n=09, f=0)  ##########
05: 0.60 (n=08, f=0)
06: 0.44 (n=08, f=0)
07: 1.15 (n=09, f=0)  ################
08: 0.94 (n=07, f=0)  ######
09: 0.95 (n=08, f=0)  ######
10: 1.70 (n=09, f=1)  ########################################
11: 1.13 (n=08, f=0)  ##############
12: 1.12 (n=09, f=0)  ##############
13: 1.34 (n=09, f=0)  ########################
14: 0.44 (n=08, f=0)
15: 1.25 (n=07, f=0)  ###################
16: 0.85 (n=08, f=0)  ##
17: 0.99 (n=08, f=0)  ########
18: 0.68 (n=08, f=0)
19: 1.46 (n=07, f=0)  ############################
20: 1.05 (n=05, f=0)  OOOOOOOOOO
21: 1.79 (n=04, f=0)  OOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOO
22: 0.38 (n=02, f=0)
23: 0.83 (n=03, f=0)  O
```

(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)

Household questionnaire

A. **Identification variables:** This section is mandatory to fill to all teams in all the HH visited during the survey. The information contained in this section are:

1. **Date of the survey:** This is the date of data collection, it should written in the standard format for all the questionnaires administered during the survey. (day/month/year
2. **Name of the village:** Indicate the name of the sampled village that is visited on the particular day of data collection.
3. **Cluster number:** Indicate the number of cluster allocated for the village or area visited. This is automatically generated by ENA during the sampling stage. Sampling and cluster allocation will be done together with the team at the **training hall.** Important to note that once Cluster number has been assigned it cannot be changed.
4. **Team ID number:** Teams was formed during the training session. Each team was assigned a unique number ranging from 1-6. Each team must indicate the team number on the questionnaires they administer.
5. **Household number:** Each HH in the selected cluster was assigned a number. There are 13 HH in each cluster to be sampled. Each sampled HH should be indicated a number in order of their visit **(e.g. the first randomly selected HH is allocated HH number 1 regardless of whether it is the 10th HH in the village)**
6. **Starting time of the interview:** This is indicated the time of start of the interview in the selected HH.
7. **Consent:** Each team was provided with a consent form that they were required to ask for permission to conduct the survey in each HH. This is meant to seek permission from the HH head or caregiver to be allowed to conduct the assessment. It is important to note the reason for refusal in case the HH does not accept the interview.

B. **Wash:** Description of the following key WASH indicators

1. **Source of drinking water:** This question was asked to the respondent of the HH to find out where HH are accessing their drinking water. The sources of water are categorised into

two main categories I.e. Improved sources and un-improved sources. These are based on the two main recommended categories of responses.

- Number of HH accessing water from improved sources[9]/ total number of respondents.
- Number of HH accessing water from unimproved sources[10]/ total number of respondents.

2. **Water treatment methods:** This question was seek to find out what methods HH are using to make their drinking water safe. This indicator will show the proportion of HH practicing safe methods of water treatment in the survey area. The calculation of this will be:
   - Total number of HH practicing safe water treatment methods[11]/ total number of respondents
- Total number of HH not practicing safe water treatment methods/ total number of respondents.

3. **Water Use/Consumption at HH level:** This question was seeking to find out the amount of water consumed by each individual living in the household per day. The aim of this indicator is to check whether households are consuming the required minimum amount of water per person per day compared to the minimum threshold as defined by the WHO standard for HH water consumption.
4. **Hand washing practices:** Caregivers was asked on hand washing practices to ascertain instances in their daily activities and in the 5 critical points when they wash their hands. The caregiver should not probed for answers/response rather they should be allowed to provide their response independently.
5. **Use of Soap:** A follow up question was asked to ascertain the hand washing practice by asking the caregiver to demonstrate how they wash their hands and what they use to wash

[9] Piped scheme, protected springs, boreholes with hand pump, well with hand pump, protected karez

[10] River/ stream/ canal. Pond/ reservoir, well with bucket, unprotected karez, unprotected spring.

[11] Boil, use of water filter

their hands, they rubs both hands and drying by clean cloths.

Food access and consumption

1. **Food consumption scoring:** this question was seeking to find out the group of food to check whether households are consuming in the past 7 days and check the source of the food.
2. **Reduced coping of strategy index:** this question check enough many and food to buy.
3. **Food security situation:** **the question check the food security in households level** Based on triangulation of Food Consumption Score (FSC) with the food-based or reduced Coping Strategy Index (rCSI).

Child Questionnaire

Identification:

This section is mandatory was filled to all teams in all the HH visited during the survey. The information contained in this section is:

1. **Date of the survey:** This is the date of data collection, it should written in the standard format for all the questionnaires administered during the survey. (day/month/year
2. **Name of the village:** Indicate the name of the sampled village that is visited on the particular day of data collection.
3. **Cluster number:** Indicate the number of cluster allocated for the village or area visited. This is automatically generated by ENA during the sampling stage. Sampling and cluster allocation will be done together with the team at the **training hall.** Important to note that once Cluster number has been assigned it cannot be changed.
4. **Team ID number:** Teams was formed during the training session. Each team was assigned a unique number ranging from 1-6. Each team must indicate the team number on the questionnaires they administer.
5. **Household number:** Each HH in the selected cluster was assigned a number. There are a total of 13 HH in each cluster to be sampled. Each sampled HH should be indicated a number in order of their visit **(e.g. the first randomly selected HH is allocated HH number 1 regardless of whether it is the 10th HH in the village)**
6. **Caregiver Number:** Each caregiver living in the selected HH was assigned a specific unique number. This is the same number that will appear in the Caregiver questionnaire. In case of more than one caregiver in a HH each will be assigned a unique number to identify and distinguish them from each other. Each caregiver was linked to her/his children selected in the HH to be able to link each caregiver with the children.
7. **Child Number:** Each Child Under the age of 5 years living in the selected HH was assigned a specific unique number. In case of more than one child in a HH each will be assigned a unique number to identify and distinguish them from each other. Each child was linked to her/his caregiver selected in the HH to be able to link each caregiver with the children.

8. **Age in months:** Only children between 0 and 59 months old of age will be included. Height will not be considered as a valid criterion in absence of age due to the high stunting rates in The province. Age was confirmed by showing a vaccination card or a birth certificate, if available. If these documents are not available, the use of a local event calendar built for the province was used to determine the age. The age was recorded into the questionnaire in months.
9. **Sex:** Male or female
10. **Weight (in kg):** Children were weighed to the nearest 0.1kg by using an Electronic Uni-scale. The children who can easily stand was asked to stand on the weighing scale and their weight recorded. In a situation when the children could not stand up, the double weighing method was applied.
11. **Height (in cm):** Measuring board was used to measure bare headed and barefoot children. The precision of the measurement is 1 mm. Children of less than 2 years of age will be measured lying down and those equal to or above 2 years of age measured standing up.
12. **Mid-Upper Arm Circumference (in mm):**MUAC will be used as an indicator of mortality risk for malnutrition and will be measured to the nearest 1mm for all children with an indicated age of greater than 6 months, using the UNICEF MUAC strips. An adult MUAC tape was used to measure women of reproductive age (15-49 years)
13. **Oedema:** Only children with bilateral pitting nutrition oedema was recorded as having nutritional oedema this will be checked by applying normal thumb pressure for at least 3 seconds to both feet.

Infant and Young Child Feeding

In this section only children <24 months were considered as eligible respondents. All children within these age groups were selected in the surveyed HH and the following indicators administered to them.

1. **Ever Breastfed:** This indicator looked at the number of mothers who have ever breast fed their children. This looked at the last pregnancy of the mother or the current child who is <24 months old.
2. **Time to Breastfeeding/Initiation to Breast milk:** This indicator assessed at the amount of time it took for mothers to put their children to the breast after giving birth. The focus was on the mother's last pregnancy in which the child is <24 months.
3. **Colostrum feeding:** this indicator looked at the number of mothers with children <24 months who fed their children with Colostrum within the first 3 days after birth.
4. **Breast-feeding Yesterday:** This indicator investigated the number of mothers who breast-fed their children <24 months one day (day and Night) prior to the data collection day.
5. **Other Liquids offered to the child:** This indicator asked the mothers of children <24 months what other liquids were offered to the child one day (day and night) prior to the data collection day.
6. **Complimentary feeding:** This indicator looked at the number of mothers who gave solid and semi-solid foods to children <24 months one day (day and night) prior to the data collection day.
7. **Minimum Meal frequency:** This indicator asked mothers on the number of times they provided solid and semi-solid foods to their children <24 months one day (day and night) prior to the data collection day.

Child Health status

This section was look at all children in the HH between the ages of 0-59 months.

1. **Type of Illness:** This question asked about the types of illness that the child (0-59 months) has had in the last 14 days prior to the data collection day. A small definition of the key illness is provided in the questionnaire to enable the data collector identify the illness correctly
2. **Vitamin A supplementation:** This question will ask the caregiver of child 6-59 months on whether the child has received vitamin A tablets in the previous 6 months prior to the data collection day. Each team was provided with a Sample of the Vitamin A tablet to enable the caregivers to easily identify it.
3. **Deworming:** This question asked the caregiver of child 24-59 months on whether the child has received deworming tablets in the previous 6 months prior to the data collection day. Each team was provided with a Sample of the deworming tablet to enable the caregivers to easily identify it.
4. **BCG vaccination:** This question asked the caregiver on whether the child 0-59 months has received BCG vaccination.
5. **PENTA vaccination:** the question asked the caregiver on whether the child 3.5-59 months has received PENTA3 vaccination.
6. **Measles vaccination:** the question asked the caregiver whether the child 9-59 months has received the measles vaccination.
7. **Polio vaccination:** the question asked the caregiver whether the child 0-59 months has received the polio vaccination.

Caregiver questionnaire

Identification:

This section is mandatory was filled to all teams in all the HH visited during the survey. The information contained in this section is:

1. **Date of the survey:** This is the date of data collection, it should written in the standard format for all the questionnaires administered during the survey. (day/month/year
2. **Name of the village:** Indicate the name of the sampled village that is visited on the particular day of data collection.
3. **Cluster number:** Indicate the number of cluster allocated for the village or area visited. This is automatically generated by ENA during the sampling stage. Sampling and cluster allocation will be done together with the team at the **training hall.** Important to note that once Cluster number has been assigned it cannot be changed.
4. **Team ID number:** Teams was formed during the training session. Each team was assigned a unique number ranging from 1-6. Each team must indicate the team number on the questionnaires they administer.

5. **Household number:** Each HH in the selected cluster was assigned a number. There are a total of 13 HH in each cluster to be sampled. Each sampled HH should be indicated a number in order of their visit **(e.g. the first randomly selected HH is allocated HH number 1 regardless of whether it is the 10th HH in the village)**
6. **Caregiver Number:** Each caregiver living in the selected HH was assigned a specific unique number. This is the same number that will appear in the Caregiver questionnaire. In case of more than one caregiver in a HH each will be assigned a unique number to identify and distinguish them from each other. Each caregiver was linked to her/his children selected in the HH to be able to link each caregiver with the children.

Antenatal Care, delivery assist and Health seeking behavior

1. **Antenatal care:** Caregivers between the ages of 15-49 years at household level will be asked on whether they sought ante-natal care during their last pregnancy. In this case, last pregnancy was considered of the last child who is still between 0-59 months for purposes of having a more precise re-call period.
2. **Delivery assisted by SBA:** caregiver who respond positive to getting assistance from Skilled Birth Attendants during the last delivery.
3. **Health seeking behaviour:** Caregivers who respond positive to seeking antenatal care will be asked who they sought assistance from. This question seeks to identify the health seeking pattern of the respondents from the first point of contact to the last point of contact.
4. **Distance to Health centre:** This question seeks to identify how long it takes a caregiver to access the health facility and ascertain if geographical distance is a factor affecting access to the health centre

Maternal Nutrition

This section seeks to identify the nutrition status of pregnant and lactating women.

1. **MUAC measurement:** The caregivers mid – upper arm circumference will be measured using the standard WFP issued adult MUAC tape.
2. **Physiological status:** Each of the caregivers will asked about their current physiological status to ascertain whether they are currently pregnant, lactating, pregnant and lactating or not pregnant.
3. **Iron – Folate supplementation**: Caregivers who report to be currently pregnant will be asked whether they are taking iron folate tablets or not. This is to ascertain the number of pregnant mothers who are supplemented and using iron –folate/ferrous.

10. REFERENCES

- ENA software 2011 updated 9 July 2018.
- WHO child Growth Standards 2006
- CSO: updated population 1396 (2017-2018)
- National Nutrition Survey 2013
- Afghanistan Demographic and Health Survey 2015
- WHO: morality emergency thresholds
- WHO: emergency severity classification
- Adapt from WFP (Kabul informal Settlements) Winter Need Assessment FINAL REPORT ON FOOD SECURITY 2016