AFGHANISTAN

Nutrition & Mortality SMART Survey
Final Report

Nimroz Province, Afghanistan

11th April to 26th April 2017

Report compiled by: Dr. Baidar Bakht Habib

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Action Against Hunger

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Abbreviations

ACF	Action Contra la Faim/Action Against Hunger
SAF	Solidarity for Afghan Families
BCG	Bacillus Calmette Guerin
CDR	Crude Death Rate
CHW	Community Health Worker
CSO	Central Statistics Organization
ENA	Emergency Nutrition Assessment
GAM	Global Acute Malnutrition
HAZ	Height for Age Z-Score
HH	Household
IYCF	Infant and Young Child Feeding
MOPH	Minister of Public Health
MUAC	Mid Upper Arm Circumference
NNS	National Nutrition Survey
OW	observed Weight
OCHA	Office for the Coordination of Humanitarian Affairs
PPS	Proportional Population Size
PND	Public Health Nutrition Department
RC	Reserve Cluster
SAM	Severe Acute Malnutrition
SD	Standard Deviation
SMART	Standardized Monitoring and Assessment of Relief and Transition
MW	Mean Weight
WASH	Water Sanitation and Hygiene
WAZ	Weight for Age Z-Score
WHZ	Weight for Height Z score
W/H	Weight for height
WHO	World Health Organization
U5DR	Under five Death Rates
U5	Under five
UNICEF	United Nation Children's Fund

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1. Executive summary

The Nutrition SMART assessment took place from 11 to 26 April 2017 and covered whole Nimroz Province. This assessment did by technically supported of ACF with partnership of SAF in close coordination with Nimroz public health directorate. The assessment cover all (6 districts) of the province, Nimroz has six districts named Chaharburjak, Chakhansur, Kang, Khashrood, Del- aram and Zaranj which is provincial capital of Nimroz in order to assess the current nutrition status of children U5, Pregnant, lactating women's, households Food security, wash and hygiene proxy indicators, immunization status of children, iron and folate supplementation among PLWs, vitamin A supplementation and optimal IYCF practices. 636 households assessed during assessment, using two-stage cluster sampling methodology. The preliminary report provides a summary of the methodology used, analysis and interpretation of the survey findings with preliminary recommendations proposed. The final report included comprehensive analysis of the collected data such as FSL, WASH, IYCF, Water storage and usages by household's level.

Summary findings

- Total 4,747 individuals living in **636** households were assess. Out of them **1,063** were children aged from 0-59 months, **982** were children aged from 6-59 months and **864** were women in the childbearing age in the selected households.
- Prevalence of global acute malnutrition based on MUAC was at **6.2% (4.5-8.6 95% CI)** and SAM is **2.2% (1.4 - 3.4 95% CI).**
- Prevalence of underweight (WAZ) was at **27.4% (24.3-30.9 95% CI)** and severe underweight was **7.2% (5.5- 9.4 95% CI)**
- Prevalence of stunting or chronic malnutrition (HAZ) was at **41.6% (37.4-45.9 95% CI)** while severe stunting was at **12.7% (10.4-15.5 95% CI)** based
- Nutrition status of childbearing aged (15-49 years) women was at 1**9.8%** respectively.
- Immunization coverage such as Measles both by card and recall, BCG confirmed by scar and Polio both by card and recall were at **82.3%, 88.4%** and **89.1%** respectively.

2. Introduction

Nimroz is one of the 34 provinces of Afghanistan, it's located in the southwestern part of the country. It lays to the east of the Sistan and Baluchestan Province of Iran and north of Balochistan, Pakistan. The province contains six districts, encompassing about 217 total villages, and roughly 170,790[1] settled people. The city of Zaranj serves as the provincial capital. The demography of Nimroz is dominated by 61% Baloch, 27% Pashtun and remaining is Tajik and Hazara ethnicity. In addition, Nimroz has nomad ethnicity as well.

The province of Nimroz has six districts named Chaharburjak, Chakhansur, Kang, Khashrood, Del- aram and Zaranj, which is provincial capital of Nimroz.

3. Context and Justification

The justification of the proposed assessment is to estimate the current prevalence of under-nutrition among vulnerable populations in the province. The survey will also investigate the current mortality rates, child health status (morbidity, immunization and supplementation), nutritional status of women of reproductive age (15-49 years) with special focus on pregnant and lactating women, IYCF and WASH practices. The last assessment that provided information on nutritional status of under-fives conducted through the National Nutrition Survey in 2013 and GAM rates 9.4% (6.87 – 12.86 95 %CI) was at serous at Poor levels of WHO classification. There are needs to investigate on the current prevalence of under-nutrition in the province. The survey findings use to inform future programing in the province. It is also serve as a good opportunity of building the capacity of SAF and other stakeholders.

4. Objective of the survey

4.1. Broad objective

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

4.2. Specific objective

- To estimate Crude Death Rate (CDR) and under five Death Rate (U5DR).
- To determine prevalence of under nutrition among children aged 6-59 months.

[1] CSO updated population of Afghanistan 1396 (2016-2017)

- To determine core Infant and Young Child Feeding (IYCF) practices among children aged 0-23 months.
- To determine the nutritional status of pregnant and lactating women based on MUAC assessment.
- 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 levels.
- To assess education of the school ages population in the province.

5. Methodology

5.1 Sampling Methodology

In the stage 1, random selection of clusters/villages was using probability proportionate to size (PPS) using ENA software version 2011 of (9 July 2015). A list of all updated villages (217) was amounted into the ENA for SMART software where PPS applied. The villages with large population have a higher chance of selected than villages with small population and vice versa. Reserve Clusters (RCs) was also be selected by ENA software version 2011(updated 9th July 2015). Reserve clusters was only be used if 10% or more clusters was impossible to reach during the survey as highlighted in Annex 3**.** Total 50 clusters was covered by each survey team completed anthropometric measurements in 13 households in a day (652/13=50clusters). At each selected village, one or more community member(s) was ask 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. In cases where there are large villages in a cluster, the village was divide into smaller segments and a segment was select randomly to represent the cluster. This division based on existing administrative units e.g. neighborhoods, or streets or natural landmarks like river, road, or public places like market, schools, and mosques.

In the Stage 2, random selection of households from updated and complete list of households within a given village. In this case the actual survey data collection, was incorporate 652 households randomly selected based on survey parameters calculation for anthropometric. Based on total sample size each team can cover effectively 13 households in a day. In this assessment, six teams were engage during the assessments, while data collection is expect to

last 9 days. All households enumerated and given numbers by the survey team. The 13 households was chosen randomly from these enumerated households, by randomly drawing household numbers required from a hat or using a random number table generated from ENA for SMART software. There was difficult to obtain an updated list of households, systematic random sampling was used, to identify the households to be surveyed, The teams were trained on both methods of sampling (simple and systematic random sampling) and they were being offered with materials to assist in determining the households during the data collection exercise.

All the children living in the selected house aged 6 to 59 months old was included for anthropometric measurements. Children aged (0-23) months were included for IYCF measurements. If more than one eligible child found in a household, both were included, even if there are twins. Eligible orphans living in the selected Households was also be surveyed. All of the selected HH was included in the mortality survey as well as was respond to questions concerning the HH as a whole (ex. water storage).

Any empty households, or households with missing or absent children was revisited at the end of the sampling day in each cluster; any missing or absent children that was not be subsequently found was not be included in the survey. A cluster control form was used to record all these missed and absent households.

Table 1: Details of proposed and actual sample size achieved, Nimroz SAMRT, April 2017

Number of households planned	Number of households surveyed	% surveyed /planned	Number of children 6-59 months planned	Number of children 6-59 months surveyed	% surveyed /planned
652	636	97.5%	671	981	146.2%

5.2. Sample Size

The sample size of households surveyed was determined using ENA software version 2011 (up dated 9th July 2015). A two- stage cluster methodology applied. In first stage, it involves random selection of clusters/villages (50 clusters) from total list of villages using probability proportion to size (PPS) method. This was before starting of data collection at the office or training hall selected. Villages were the primary sampling unit for the proposed survey. In the second stage of methodology, it involve random selection of household (13 households) from an updated list of households. This was at the field level conducted. Households were the basic sampling unit for the proposed survey. The table 2 and 3 highlights sample size calculation for anthropometric and mortality surveys.

Table 2: Parameters for sample size calculation of anthropometric indicators, Nimroz SAMRT, April 2017

Parameters for Anthropometry	Value	Assumptions based on context
Estimated prevalence of GAM (%)	10.8%	The survey team referred to the Farah nutrition SMART survey conducted on 04 March – 2017 the neighboring province of the Nimroz for the planning stage of this survey (GAM was 10.8% 8.5-13.7 95 CI).The SD was in the range of recommended limit of 0.85-1.2. According to the National Nutrition Survey, the GAM rate was 9.4% (6.87-12.86 95 CI) with high limit of SD (1.5) and no any updated data for the province. For this reason, we will use the neighboring province GAM rate (10.8 %) for the planning stage.
± Desired precision	3.0%	It was on survey objectives in line to estimated prevalence and SMART methodology recommendations. If we use an estimate, point prevalence of 10.8 % as our predicted GAM prevalence then a precision of. ±3.0 is recommend.
Design Effect *(if applicable)*	1.5	The population living in the targeted districts is consider as having similar living conditions and the same access to food and social conditions. Nevertheless, access to health facilities could not estimated as similar within the targeted population as some remote areas are not well serve by health facilities. Hence, the design effect was estimate at 1.5.
Children to be included	**671**	Minimum sample size-children aged 6-59 months. (However to avoid possible bias of selection for younger age group, all children from 0 to 59 months old found in the selected households surveyed.)
Average HH Size	7	Based on Farah SMART survey the mostly frequent of the HH was 7.
% Children under-6-59 month	17.4%	Based on Farah SMART survey the percentage of 6-59 months age was 17.4%.
% Non-response Households	6%	The percentage of non-respondent households was estimate at 6%. Using the last experience of the SMART surveys in the deferent provinces. The non-response rate will cater for unforeseen circumstances to include refusal, absenteeism or population movements Farah SMART Assessment ACF 2017.
Households to be included	**652**	Minimum sample size-Households to be surveyed. Households the basic sampling unit for the SMART survey

Table 3: Sample size calculation for mortality surveys, Nimroz SMART, April 2017

Parameters for Mortality	Value	Assumptions based on context
Estimated Death Rate /10,000/day	0.38/10000/day	Based on recently conducted SMART assessment in Farah province. Therefore, we use 0.38 as neighboring province of Nimroz.
± Desired precision /10,000/day	0.3%	Based on survey objectives and inline to estimated death rate.
Design Effect *(if applicable)*	1.5	This will caters for heterogeneity in the population sampled.
Recall Period in days	120	Starting point of recall period calculated from the commencement of Winter session, 1st Jadi 1395 the date of recall is equivalent to 21th December 2016 as per Gregorian calendar.
Population to be included	**2,207**	Population
Average HH Size	**7%**	Based on Farah SMART survey the most frequent HH size was 7.
% Non-response Households	**6%**	The percentage of non-respondent households estimated at 6%. Using the last experience of the SMART surveys in the deferent provinces. The non-response rate will cater for unforeseen circumstances to include refusal, absenteeism or population movements.
Households to be included	**335**	Households

6. QUESTIONNAIRES

6.1. Household questionnaire

Make the list of the data with explanation. For example:

1. **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:
2. **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).
3. **Name of the village:** Indicate the name of the sampled village that visited on the particular day of data collection.

4. **Cluster number:** Indicate the number of cluster allocated for the village or area visited. This automatically generated by ENA during the sampling stage. Sampling and cluster allocation done together with the team at the **training hall.** Important to note that once Cluster number has assigned it cannot changed.
5. **Team ID number:** Teams formed during the training session. Each team assigned a unique number ranging from 1-5. Each team must indicate the team number on the questionnaires they administer.
6. **Household number:** Each HH in the selected cluster 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)**
7. **Starting time of the interview:** This indicated the time of start of the interview in the selected HH.
8. **Consent:** Each team provided with a consent form that they required ask for permission to conduct the survey in each HH. This meant to seek permission from the HH head or caregiver allowed to conduct the assessment. It is important to note the reason for refusal in case the HH does not accept the interview.
9. **School age education:** each team will ask in the selected HH from the HHs member about the number of school-aged children in the HH. A further question to check how many children are attended school in the last 4 days in the last 7 days.
10. **National ID cards**: each team will ask in the selected households how many members in the HH have Taskera.

A. Wash: Description of the following key WASH indicators

1. **Source of drinking water:** This question 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 were on the two main recommended categories of responses.
   - Number of HH accessing water from improved sources[2]/ total number of respondents.
   - Number of HH accessing water from unimproved sources[3]/ total number of respondents.
2. **Water treatment methods:** This question will 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[4]/ 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 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

[2] Piped scheme, protected springs, boreholes with hand pump, well with hand pump, protected karez
[3] River/ stream/ canal. Pond/ reservoir, well with bucket, unprotected karez, unprotected spring.
[4] Boil, use of water filter

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 asked on hand washing practices to ascertain instances in their daily activities and in the five critical points when they wash their hands. The caregiver should not probed for answers/response rather they should allowed to provide their response independently.
5. **Use of Soap:** A follow up question asked to ascertain the hand washing practice by asking the caregiver to demonstrate how they wash their hands and what they use to wash their hands, they rubs both hands and drying by clean cloths .

6.2. Food access and consumption

1. **Food consumption scoring:** this question 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 will check enough many and food to buy.

6.2. Child Questionnaire

Identification:

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

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

Name of the village: Indicate the name of the sampled village that visited on the particular day of data collection.

Cluster number: Indicate the number of cluster allocated for the village or area visited. This automatically generated by ENA during the sampling stage. Sampling and cluster allocation done together with the team at the **training hall.** Important to note that once Cluster number has assigned it cannot changed.

Team ID number: Teams formed during the training session. Each team assigned a unique number ranging from 1-6; each team must indicate the team number on the questionnaires they administer.

Household number: Each HH in the selected cluster assigned a number. There are total of 13 HH in each cluster 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)**

Caregiver Number: Each caregiver living in the selected HH 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 assigned a unique number to identify and distinguish them from each other. Each caregiver linked to

her/his children selected in the HH to be able to link each caregiver with the children.

Child Number: Each Child Under the age of 5 years living in the selected HH assigned a specific unique number. In case of more than one child in a HH, each assigned a unique number to identify and distinguish them from each other. Each child linked to her/his caregiver selected in the HH to be able to link each caregiver with the children.

Age in months: Only children between 0 and 59 months old of age included. Height was not be considered as a valid criterion in absence of age due to the high stunting rates in the province. Age 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 province used to determine the age. The age recorded into the questionnaire in months.

Sex: Male or female

Weight (in kg): Children weighed to the nearest 0.1kg by using an Electronic Uni-scale. The children who can easily stand 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 applied.

Height (in cm): Measuring board used to measure bare headed and barefoot children. The precision of the measurement is one mm. Children of less than 2 years of age measured lying down and those equal to or above 2 years of age measured standing up.

Mid-Upper Arm Circumference (in mm):MUAC used as an indicator of mortality risk for malnutrition and 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 used to measure women of reproductive age (15-49 years)

Oedema: Only children with bilateral pitting nutrition oedema recorded as having nutritional oedema this checked by applying normal thumb pressure for at least 3 seconds to both feet.

6.3. Infant and Young Child Feeding

In this section, only children 0-23 months considered as eligible respondents. All children within these age groups selected in the surveyed HH and the following indicators administered to them.

1. **Ever Breastfed:** This indicator looking at the number of mothers who have ever breast-fed their children. This will look at the last pregnancy of the mother or the current child who is between 0-23 months old.
2. **Time to Breastfeeding/Initiation to Breast milk:** This indicator will look at the amount of time it took for mothers to put their children to the breast after giving birth. The focus on the mother's last pregnancy in which the child is between 0-23months.
3. **Colostrum feeding:** this indicator will look at the number of mothers with children 0-

23 months who fed their children with Colostrum within the first 3 days after birth.

4. **Breast-feeding Yesterday:** this indicator will look at the number of mothers who breast-fed their children 0-23 months one day (day and Night) prior to the data collection day.
5. **Other Liquids offered to the child:** This indicator will ask the mothers of children 0-23 months what other liquids offered to the child one day (day and night) prior to the data collection day.
6. **Minimum dietary diversity:** This indicator will ask the mothers on the types of food given to the child 0-23 months one day (day and night) prior to the day of data collection. The food groups are categorised based on the WHO-IYCF guidelines.
7. **Complimentary feeding:** This indicator looks at the number of mothers who gave solid and semi-solid foods to children 0-23 months one day (day and night) prior to the data collection day.
8. **Minimum Meal frequency:** This indicator will ask mothers on the number of times they provided solid and semi-solid foods to their children 0-23 months one day (day and night) prior to the data collection day.

6.4. Child Health status

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

1. **Type of Illness:** This question will ask 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 provided with a Sample of the Vitamin A tablet to enable the caregivers easily identify it.
3. **Deworming:** This question will ask 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 provided with a Sample of the deworming tablet to enable the caregivers easily identify it.
4. **BCG vaccination:** This question will ask the caregiver on whether the child 0-59 months has received BCG vaccination.
5. **PENTA vaccination:** the question will ask the caregiver on whether the child 3.5- 5 months has received PENTA3 vaccination.
6. **Measles vaccination:** the question will asked the caregiver whether the child 9-59 months has received the measles vaccination.
7. **Polio vaccination:** the question will asked the caregiver whether the child 0-59 months has received the polio vaccination.

6.5. Caregiver questionnaire

Identification:

This section is mandatory 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 visited on the particular day of data collection.
3. **Cluster number:** Indicate the number of cluster allocated for the village or area visited. This automatically generated by ENA during the sampling stage. Sampling and cluster allocation done together with the team at the training hall. Important to note that once Cluster number has assigned it cannot changed.
4. **Team ID number:** Teams formed during the training session. Each team 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 assigned a number. There are total 13 HH in each cluster 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 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 assigned a unique number to identify and distinguish them from each other. Each caregiver linked to her/his children selected in the HH to be able to link each caregiver with the children.

6.6. Antenatal Care, delivery assist and Health seeking behavior

1. **Antenatal care:** Caregivers between the ages of 15-49 years at household level asked on whether they sought antenatal care during their last pregnancy. In this case, last pregnancy 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 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

6.7. Maternal Nutrition

This section seeks to identify the nutrition status of women between the ages 15-49 years (Childbearing age)

1. **MUAC measurement:** The caregivers mid – upper arm circumference 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 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.

7. INDICATORS: DEFINITION, CALCULATION and INTERPRETATION

7.1. Anthropometric Indicators: Definition of nutritional status of children 0-59 months

7.1.1. Acute Malnutrition

Acute malnutrition in children 0-59 months can be expressed by using 2 indicators; Weight for Height (W/H) or Mid Upper Arm Circumference (MUAC) as described below.

Weight-for-height index (W/H)

A child's nutritional status estimated by comparing it to the weight-for-height curves of a reference population (WHO standards data[5]). These curves have a normal shape and 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 of the surveyed child to the mean weight (MW) of the reference population, for a child of the same height. The Z-score represents the number of standard deviations (SD) separating the observed weight from the mean weight of the reference population: WHZ = (OW - MW) / SD.

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

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

Table 4: **MUAC cut-offs points for children aged 6-59 months**

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

Nutritional bilateral "pitting" oedema

Nutritional bilateral pitting oedema is a sign of Kwashiorkor, one of the major clinical forms of severe acute malnutrition. When associated with Marasmus (severe wasting), it is called Marasmic-Kwashiorkor. Children with bilateral oedema 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 5 : **Definition of acute malnutrition according to weight-for-height index (W/H), expressed as a Z-score based on WHO standards**

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

7.1.2. 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 mainly used to identify chronic malnutrition. The same principle used as for weight-for-height; except that a child is 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 expressed in Z-score (HAZ). The HAZ cut-off points presented in table 6.

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

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

7.2. 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.

Crude death rate (CDR)

The number of persons in the total population that dies over specified period of time .

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

Under-5 death rate (U5DR)

The number of children aged (0-5) years who die over specified period of time. Calculated as:

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

8. Health

Beside anthropometric data, additional information collected as follows:

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

Mothers/caretakers of all children asked if children received all the necessary vaccinations, which subsequently be 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 supplementation of children also recorded using samples.

- **Morbidity**

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

- **Mothers nutritional status and Iron/Folate supplementation for pregnant**

Women in childbearing age assessed for their nutritional status based on MUAC using the cut-off of 230 mm.

WASH

- **Water storage and Usage**

Household heads asked what type of container they use for storing drinking water also 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 asked on what occasions they wash their hands also what they use to wash their hands to determine the hand washing practices in the surveyed area.

8.1. Infant and Young Child Feeding Practices Indicators (IYCF)

The IYCF indicators used in the measurement of infant and young child feeding practices asked to the mothers/caretakers of children aged 0-23 months described as follows.

- **Child ever breastfed**

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

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

- **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 will look at the number of mothers with children 0-23 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 fed exclusively with breast milk. **It calculated by dividing the number of all** Infants aged 0–5 months who receive only breast milk during the previous day by total infants aged 0-5 months.

- **Continued breastfeeding at 1 year**

Proportion of children 12 – 15 months of age who fed with breast milk. It 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 receive solid, semi-solid or soft foods. It has calculated by diving 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 fed breast milk. It has 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.

8.2. Maternal Health and Nutrition

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

8.3. 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 collector. Each team was having at least one female data collectors to ensure acceptance of the team amongst the surveyed households; particularly for IYCF questionnaires. Each female member of the survey team accompanied with a mahram[6] to facilitate the work of the female data collectors at the community level. ACF Nutrition SMART Deputy Program manager and SAF Program Manager supervised the teams.

The entire teams received a 7-days training on the survey methodology and all its practical aspects; conducted by ACF Nutrition SMART Deputy Program Manager. A standardization test conducted over the period of one day, measured six children, in order to evaluate the accuracy and the precision of anthropometric measurement for each team members. Despite standardization test one day, filed works (field test) was conducted to seek the professionalism of the team on the ground. Base on filed test, result feedback provided to the

[6] Women are not allow to go outside without being accompany by one male relative called locally a 'mahram'.

team in order to strength their weak points; 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 organize 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 household definition and selection document was provide to each team member. All documents, such as local event calendar, questionnaires or consent forms was translated in Dari, local language, for better understanding and to avoiding direct translation during the data field collection. The questionnaires was back translated using a different translator and was pre-tested during the field test. Alterations were as necessary.

8.4. Data Entry and analysis

Anthropometric and mortality data were study-using ENA for SMART software 2011 version (updated 9 July 2015). The software automatically generated assessment result report for acute malnutrition (WHZ and MUAC), stunting (HAZ) and underweight (WAZ), anthropometric and mortality results are presented in (percentage) with 95 % Confidential interval and additional indicators (IYCF, Morbidity and immunization) were studied using excel 2010.

9. Results

9.1. Anthropometric results (WHO standards 2006)

The results are presented with exclusion of z- score from observed mean SAMRT flags: WHZ-3to +3, HAZ -3 to +3 and WAZ -3to +3. The sex ratio (boys and girls) was as expected (p-value = 0.449).for complete plausibility check report refer to Annex 1 automatically generated from ENA software.

Table 7: Distribution of age and sex of children 6-59 months, Nimroz SMART, April 2017

	Boys		Girls		Total		Ratio
AGE (mo)	no.	%	no.	%	no.	%	Boy : girl
6-17	129	54.0	110	46.0	239	24.3	1.2
18-29	108	48.2	116	51.8	224	22.8	0.9
30-41	107	54.9	88	45.1	195	19.9	1.2
42-53	95	45.0	116	55.0	211	21.5	0.8
54-59	61	54.0	52	46.0	113	11.5	1.2
Total	**500**	**50.9**	**482**	**49.1**	**982**	**100.0**	**1.0**

Data quality

For anthropometric data, analyze using ENA SMART survey Software (version 2011, July 2015 updated). The plausibility check report is available in Annex 1.

The summery of mean z score with Standard deviations, the design effects and number of the out of range data per index is indicating in table below.

Table 8: Mean z-scores, Design Effects and excluded subjects, Nimroz SMART, April 2017.

Indicator	n	Mean z-scores ± SD	Design Effect (z-score < -2)	z-scores not available*	z-scores out of range
Weight-for-Height	982	-0.71±1.09	1.00	0	0
Weight-for-Age	980	-1.51±0.93	1.31	0	2
Height-for-Age	959	-1.82±1.02	1.75	0	23

* contains for WHZ and WAZ the children with edema.

It is to be noted that due to a problem that occurred between data collection and data entry, SAM based on weight for height could not be taken in consideration as it was potentially overestimated. Thus, in this report, only MAM is reported and SAM and GAM are reported based on MUAC.

Table 9: Prevalence of acute malnutrition based on weight-for-height z-scores (and/or oedema) and by sex, Nimroz SMART, April 2017.

	All n = 982	Boys n = 500	Girls n = 482
Prevalence of moderate malnutrition (<-2 z-score and >=-3 z-score, no oedema)	(58) 5.9 % (4.5 - 7.8 95% C.I.)	(37) 7.4 % (5.1 - 10.6 95% C.I.)	(21) 4.4 % (3.0 - 6.3 95% C.I.)

Prevalence of MUAC cut off classification and/ Or oedema:

The prevalence of acute malnutrition based on MUAC cut off presented in table below.

Table 10 Prevalence of acute malnutrition based on MUAC cut off's (and/or oedema) and by sex, Nimroz SMART, April 2017.

	All n = 982	Boys n = 500	Girls n = 482
Prevalence of global malnutrition (< 125 mm and/or oedema)	(61) 6.2 % (4.5 - 8.6 95% C.I.)	(31) 6.2 % (4.4 - 8.7 95% C.I.)	(30) 6.2 % (3.9 - 9.8 95% C.I.)

Prevalence of moderate malnutrition (< 125 mm and >= 115 mm, no oedema)	(39) 4.0 % (2.6 - 5.9 95% C.I.)	(18) 3.6 % (2.3 - 5.7 95% C.I.)	(21) 4.4 % (2.5 - 7.5 95% C.I.)
Prevalence of severe malnutrition (< 115 mm and/or oedema)	(22) 2.2 % (1.4 - 3.4 95% C.I.)	(13) 2.6 % (1.6 - 4.3 95% C.I.)	(9) 1.9 % (0.9 - 3.9 95% C.I.)

Table 11: Prevalence of acute malnutrition by age, based on MUAC cut off's and/or oedema, Nimroz SMART, April 2017

		Severe wasting (< 115 mm)		Moderate wasting (>= 115 mm and < 125 mm)		Normal (> = 125 mm)		Oedema	
Age (mo)	**Total no.**	**No.**	**%**	**No.**	**%**	**No.**	**%**	**No.**	**%**
6-17	239	18	7.5	25	10.5	196	82.0	0	0.0
18-29	224	4	1.8	10	4.5	210	93.8	0	0.0
30-41	195	0	0.0	3	1.5	192	98.5	0	0.0
42-53	211	0	0.0	0	0.0	211	100.0	0	0.0
54-59	113	0	0.0	1	0.9	112	99.1	0	0.0
Total	982	22	2.2	39	4.0	921	93.8	0	0.0

Prevalence of underweight (WHO 2006)

The underweight defined by weight for age Z score (WAZ), the sex and age disaggregated results are present in the table below.

Table 10: Prevalence of underweight based on weight-for-age z-scores by sex, Nimroz SMART, April 2017

	All n = 980	Boys n = 498	Girls n = 482
Prevalence of underweight (<-2 z-score)	(269) 27.4 % (24.3 - 30.9 95% C.I.)	(162) 32.5 % (28.2 - 37.2 95% C.I.)	(107) 22.2 % (17.9 - 27.2 95% C.I.)
Prevalence of moderate underweight (<-2 z-score and >=-3 z-score)	(198) 20.2 % (17.4 - 23.3 95% C.I.)	(114) 22.9 % (19.2 - 27.1 95% C.I.)	(84) 17.4 % (13.8 - 21.8 95% C.I.)

Prevalence of severe underweight (<-3 z-score)	(71) 7.2 % (5.5 - 9.4 95% C.I.)	(48) 9.6 % (7.2 - 12.8 95% C.I.)	(23) 4.8 % (3.0 - 7.4 95% C.I.)

Table 11: Prevalence of underweight by age, based on weight-for-age z-scores, Nimroz SMART, April 2017

		Severe underweight (<-3 z-score)		Moderate underweight (>= -3 and <-2 z-score)		Normal (> = -2 z score)		Oedema	
Age (mo)	**Total no.**	**No.**	**%**	**No.**	**%**	**No.**	**%**	**No.**	**%**
6-17	239	27	11.3	61	25.5	151	63.2	0	0.0
18-29	223	24	10.8	37	16.6	162	72.6	0	0.0
30-41	194	12	6.2	36	18.6	146	75.3	0	0.0
42-53	211	7	3.3	43	20.4	161	76.3	0	0.0
54-59	113	1	0.9	21	18.6	91	80.5	0	0.0
Total	980	71	7.2	198	20.2	711	72.6	0	0.0

Prevalence of stunting based on height for age Z score (HAZ)

The stunting or chronic malnutrition defined by height for age Z score (HAZ), the sex and age disaggregated results presented in table below.

Table 14: Prevalence of stunting based on height-for-age z-scores and by sex, Nimroz SMART, April 2017.

	All n = 959	Boys n = 488	Girls n = 471
Prevalence of stunting (<-2 z-score)	(399) 41.6 % (37.4 - 45.9 95% C.I.)	(218) 44.7 % (39.5 - 50.0 95% C.I.)	(181) 38.4 % (33.4 - 43.7 95% C.I.)
Prevalence of moderate stunting (<-2 z-score and >=-3 z-score)	(277) 28.9 % (25.5 - 32.5 95% C.I.)	(146) 29.9 % (26.0 - 34.2 95% C.I.)	(131) 27.8 % (23.7 - 32.4 95% C.I.)
Prevalence of severe stunting (<-3 z-score)	(122) 12.7 % (10.4 - 15.5 95% C.I.)	(72) 14.8 % (11.5 - 18.7 95% C.I.)	(50) 10.6 % (8.2 - 13.7 95% C.I.)

Table 15: Prevalence of stunting by age based on height-for-age z-scores, Nimroz SMART survey, April 2017

		Severe stunting (<-3 z-score)		Moderate stunting (>= -3 and <-2 z-score)		Normal (> = -2 z score)	
Age (mo)	Total no.	No.	%	No.	%	No.	%
6-17	232	20	8.6	59	25.4	153	65.9
18-29	217	49	22.6	84	38.7	84	38.7
30-41	188	28	14.9	74	39.4	86	45.7
42-53	211	24	11.4	46	21.8	141	66.8
54-59	111	1	0.9	14	12.6	96	86.5
Total	959	122	12.7	277	28.9	560	58.4

Figure 2 shows the distribution of HAZ of the observed population (SMART flags excluded) compared to WHO Reference curve. In Nimroz, it was strongly shift to the left, suggesting restricted linear growth of the observed population. Further analysis (**Figure 3**) suggests that linear growth retardation is at its highest in the lower age group of children (18-29 months)

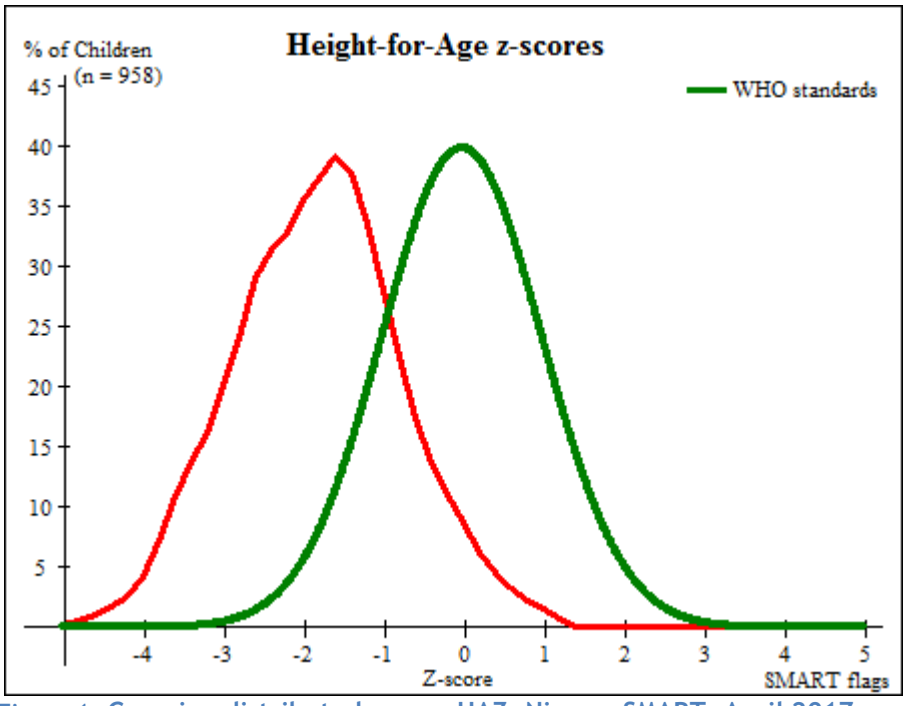


Figure 1: Gaussian distributed curve, HAZ, Nimroz SMART, April 2017

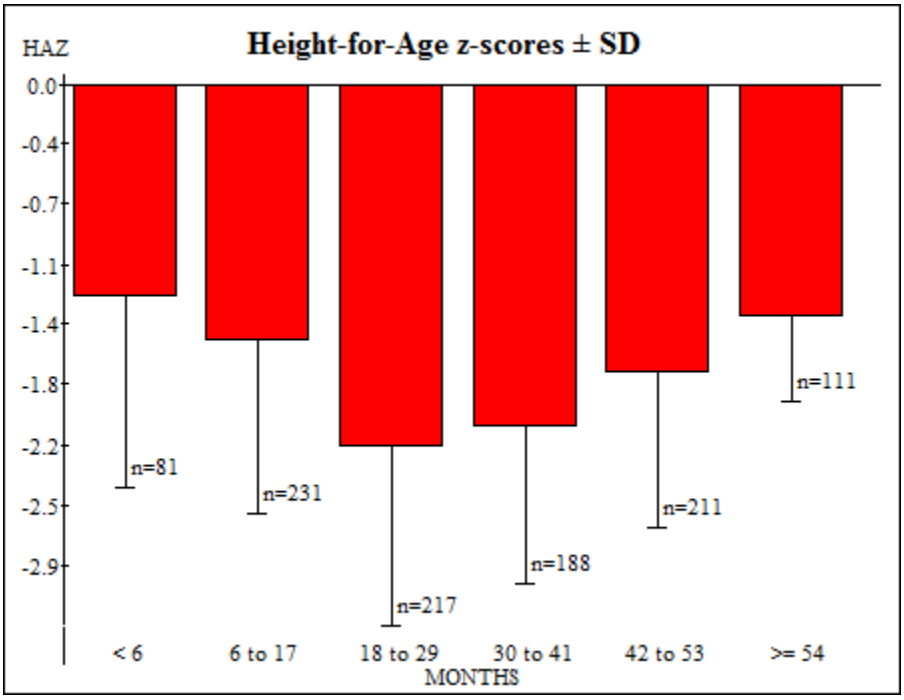


Figure 2: Trend of stunting over the age distribution, Nimroz SMART, April 2017

9.2. Maternal nutrition status of childbearing age (CBA)

864 mothers and care takers were living in the select households surveyed, the survey results presented in table below as a proportion from the total number of PLWs measured using MUAC cut off 230 mm and 210 mm. while to classify the early stage of nutrition status for referral OPD-MAM enrolment criteria the unique cut off 230 mm is used in Afghanistan.

Table 16: Maternal nutrition status of PLWs Nimroz SMART, April 2017

PLWs MUAC cut off (N=459)	Frequency	Results 95% CI
Global acute malnutrition MUAC< 230 mm	91	19.8 % (95%CI,16.2-23.5)
Moderate acute malnutrition MUAC ≥210mm to< 230 mm	83	18.1 % (95%CI, 14.6-21.6)
Sever acute malnutrition MUAC < 210	8	1.7 % (95%CI, 0.5-2.9)

Table 12: Physiological status of women of reproductive age (15 - 49 years), (n=864), Nimroz SMART, April 2017

Status	Frequency	%
Pregnant	131	15.1%
Lactating	328	38.0%
Non-pregnant & non-lactating	405	46.9%

Table 18: Iron folate for pregnant women based on available answers, (n=131), Nimroz SMART, April 2017

Iron-folate for PLW	Frequency	%
Yes	100	76.3%
No	30	22.9%
Don't know	1	0.8%

Table 19: ANC visits in the last pregnancy, (N=864), Nimroz SMART, April 2017

ANC visited by WHOM	Frequency	%
Health professional	649	75.1%
Traditional birth attendant	9	1.0%
Community health worker	1	0.1%
Relative/Friends	0	0.0%
No visited during pregnancy	205	23.7%

Table 20: Skill birth Attendance (SBA), (N=764), Nimroz SMART, April 2017

		Frequency	%
Delivery at health facilities		645	84.4%
Delivery at home		119	15.6%
Delivery at home with professional and non-professional staff	Professional staff (midwife, community midwife, Doctor and Nurse).	15	12.6%
	None professional staff (CHWs , TBA and relatives)	104	87.4%

9.3. Child health and immunization

Retrospective morbidity data, collected among children 0-59 months with two weeks recall prior to the survey assessed prevalence of main disease. The survey finding shows that 61.1 % of children had at least one episode of illness in the 2 weeks recall prior to the survey. The major illnesses reported such as fever diarrhea and ARI as a highlighted in table below.

Table 21: Morbidity status among under-fives, n=1063, Nimroz SMART, April 2017.

Parameter	Frequency	Results (%)
Acute respiratory Infection (ARI)	245	23.0%
Fever	484	45.5%
Diarrhea	360	33.8 %

Table 13: Immunization coverages for BCG, measles and Polio Nimroz SMART, April 2017

Indicators	Class	Frequency	Results
Measles (children 9-59 months) (N=919)	Yes by cards	279	30.3%
	Yes by recall	477	51.9%
	Both by cards and recall	756	82.3%
	No	132	14.4%
	Don't know	31	3.8%
Polio (children from 0-59 months) (N= 1063)	Yes by cards	361	34.0%
	Yes by recall	586	55.1%
	Both by cards and recall	947	89.1%
	No	95	8.9%
	DK	21	2.0%
PENTA 3 (children from 3.5-59 months) (N=1008)	Yes by cards	341	33.8%
	Yes by recall	454	45.0%
	Both by cards and recall	795	78.9%
	No	147	14.6%
	Don't know	66	6.5%
BCG scares (children 0-59 months (N=1063)	By scare confirmation	940	88.4%

Vitamin A supplementation was quite satisfactory, deworming was significant low see table below.

Table23: Vitamin A supplementation and Deworming for under five children, Nimroz SMART, April 2017

Indicators	Class	Frequency	Results 95% CI
Vitamin A supplementation 6-59 months (N= 984)	Yes	885	89.9% (95% CI,88.1-91.8)
	No	93	9.5% (95% CI, 7.6-11.3)
	Don't know	6	0.6% (95% CI, 0.1-1.1)
Deworming 24-59 months (N=625)	Yes	421	67.4% (95% CI,63.7-71.0)
	No	198	31.7% (95% CI, 28.0-35.3)
	Don't know	6	1.0% (95% CI,0.2-1.7)

9.4. IYCF Indicators

Indicators for infant and young child feeding (IYCF) practices included all children 0 – 23.99 months. Total 444 children's (6-23.99 months) were included in the sample. The results presented as percentage of the total answers available with confidence interval (See Table below).

Table 24: Infant and Young Child Feeding Practice, Nimroz SMART, April 2017

CORE INDICATORS	DEFINITION	n	%
Child ever breastfed (N=444)	Proportion of children who have ever received breast milk	**438**	**98.6%**
Timely initiation of breastfeeding (N=444)	Proportion of children born in the last 23 months who were put to the breast within one hour of birth	**423**	**95.2%**
Provision of colostrum within first 3 days (N=444)	Proportion of children who received colostrum (yellow liquid) within the first 3 days after birth	**438**	**98.6%**
Still breast feeding at 1 year (N=89)	Proportion of children 12-15 months of age who fed breast milk.	**83**	**93.2%**
Exclusive breast feeding (N=79)	Proportion of infants 0-5 months of age who fed exclusively with breast milk.	**48**	**60.7%**
Introduction of solid, semi-solid or soft foods (N=65)	Proportion of infants 6-8 months of age who receive solid, semi-solid or soft foods.	**29**	**44.6%**

9.10 Crude and U5 mortality rate

The table below shows mortality rates with age and sex categorized. The crude and under five children mortality rates were below as WHO emergency threshold.

Table 25: Mortality rate by age category with design effect, Nimroz SMART, April 2017

	Crude Death Rate (95% CI)	Design Effect
'Overall	0.05 (0.02-0.17)	1.00
'Sex		
'Male	0.03 (0.00-0.25)	1.02
'Female	0.07 (0.02-0.30)	1.00
'Years		
'0-4	0.18 (0.04-0.74)	1.00
'5-11	0.00 (0.00-0.00)	1.00
'12-17	0.12 (0.02-0.91)	1.01
'18-49	0.00 (0.00-0.00)	1.00
'50-64	0.00 (0.00-0.00)	1.00
'65-120	0.00 (0.00-0.00)	1.00

a. WASH Indicators

Total 636 responders, representing 636 households and 4747 individuals, included, either male or female. The information collected from household's regarding total amount of water consumption in litter per household, excluded those water used by animals, and subsequently organized into range of litters used. The results were then divide into the quantity of water in liters available to each household member per day; refer to figures 5 and 6 below.

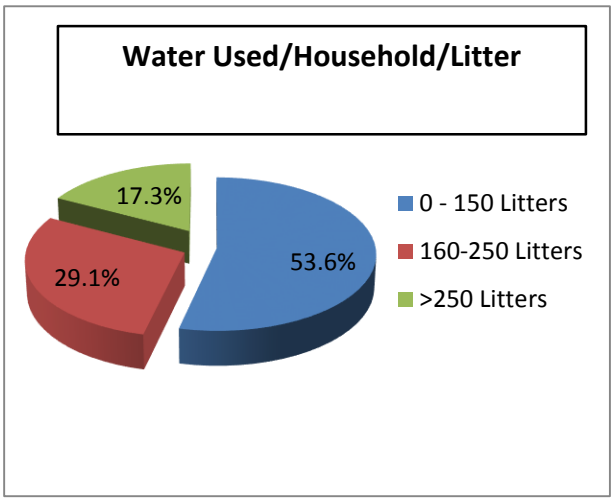


Figure 3: Percentage of household's level daily quantity in Used per HH (n=636), Nimroz SMART, April 2017

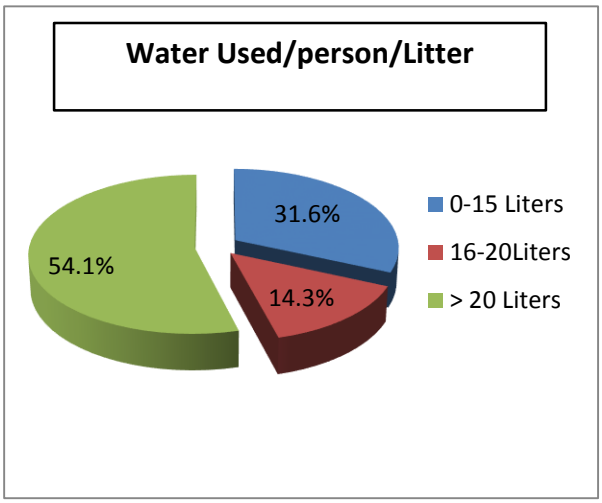


Figure 4: Percentage of access to water daily used Liter/person/day (n=636), Nimroz SMART, April 2017

Table 26: Percentage of households with access to water treatment (n=636), Nimroz SMART, April 2017

Water treatment	Frequency	%
Boil	52	8.2%
Chlorine	65	10.2%
Strain into the cloths	44	6.9%
Water filter	10	1.6%
Stand and settle	115	18.1%
Others	350	55.0%

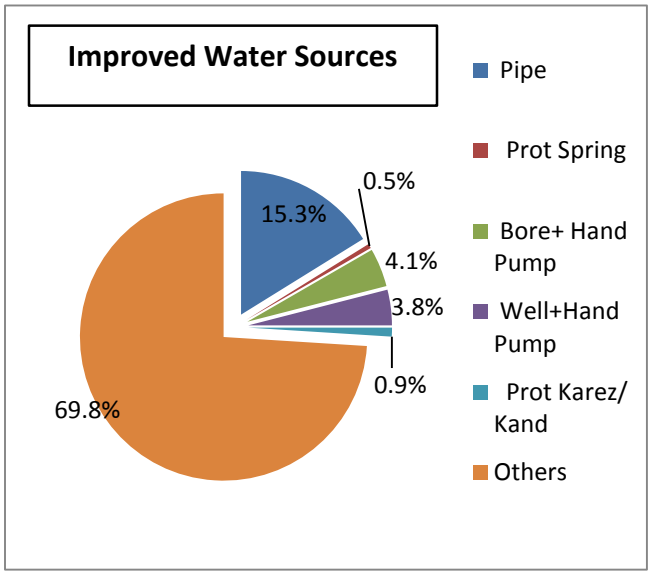


Figure 5: Household level daily-improved water sources (n=636), Nimroz SMART, April 2017

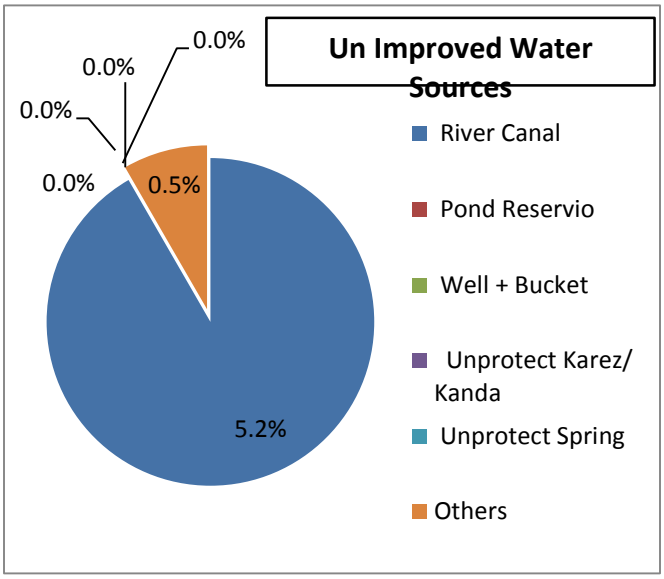


Figure 6: Households level daily-unimproved water sources (n =636), Nimroz SMART, April 2017

Hand washing practices before and after events indicated in table below.

Table 27: Hand washing practice, Nimroz SMART, April 2017

Hand Washing care takers (n=864)	Frequency	%
Only water	**545**	**63.0%**
Soap/ASH with water	**315**	**36.4%**
Wash both hands	**850**	**98.3%**
Rubs hands together at least three times	**713**	**82.5%**
Dries hands hygienically by air-drying or using a clean cloth	**754**	**87.2%**

Table 28: Hand washing practice at 5 critical moments, (n=864), Nimroz SMART, April 2017

Response	Frequency	%
Wash hands at all 5 critical moments	**623**	**72.1%**
After Toilet/latrines	**857**	**99.1%**
After taking children to the toilet	**802**	**92.8%**
Before food preparation	**789**	**91.3%**
Before eating	**797**	**92.2%**
Before feed child	**672**	**77.8%**

*: This was a multiple response question; percentages do not add up to 100.

NB: As this information was largely knowledge/recall based, there is no practical verification process to know if mothers/caretakers actually practiced hand washing at all five critical points or if they were largely recalling times to which they were previously informed.

11. Food Security and livelihood

a. Food Consumption Scores and (Food Based) Coping Strategies

Food Consumption Scores and Food Based Coping Strategies 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 measurement is based on the Food Consumption Score (FCS)[7] as a description for the current short-term household food security situation; it is triangulated with the reduced Coping Strategy Index (rCSI)[8] 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 defined and adopted, and hence, more properly reflects the food security situation in Ghor 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 Secure ***(Table)***[9].

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

[7] 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.

[8] 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).

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

Border line	Severely food insecure	Moderately food insecure	Food secure
Acceptable	Moderately food insecure	Food secure	Food secure

b. Food security situation

Based on triangulation of Food Consumption Score (FSC) with the reduced Coping Strategy Index (rCSI), the survey finding shows 7% of households have severely food insecurity and 19 % of households were moderately food insecure see figure below for more details.

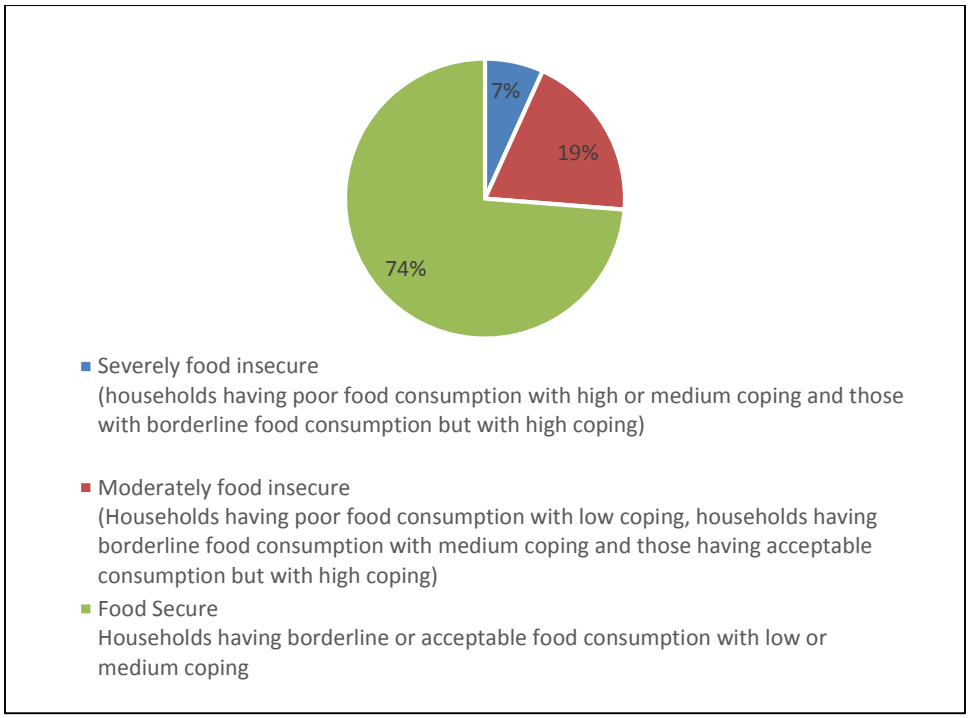
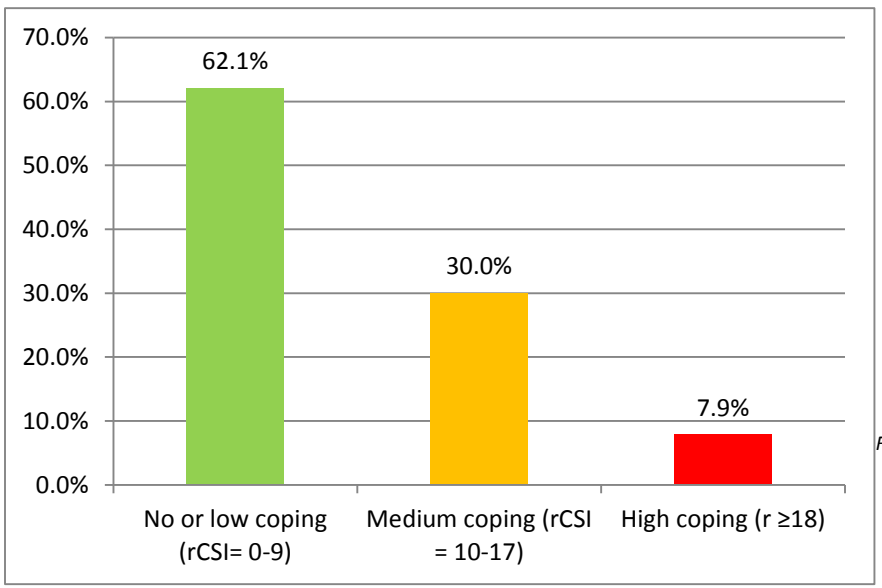


Figure 7: Food Security Situation (Based on FCS & rSCI)



c. Reduced Coping Strategy Index[10]

The Food Based Coping Strategy Index based on measures of the frequency of use of food deprivation,

FOOD SECURITY, December 8th, 2015)

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 weighted as per its severity with borrowing food and altering the 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).

- ✓ 7.9% of HHs with a high level of coping (rCSI ≥18 score).
- ✓ 30.0% of HHs with a medium level of coping (rCSI= 10-17 score).
- ✓ 62.1% of HHs with No or Low-level coping (rCSI=0-9 score).

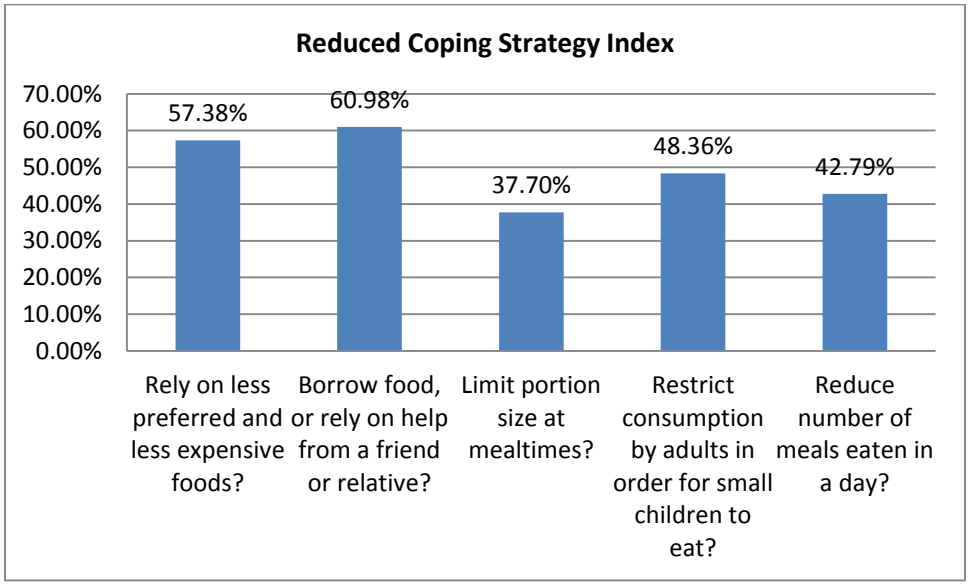


Figure 8: Reduced coping strategy index, Nimroz SMART, April 2017

d. Food Consumption Score:

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.

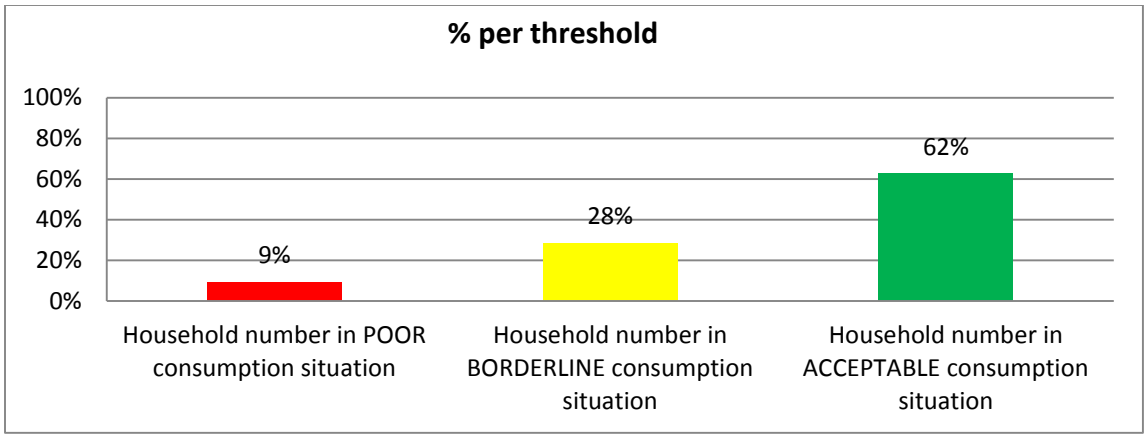


Figure 9: Food Consumption scores per HH, Nimroz SMART, and April 2017

- ✓ 9% households surveyed have Poor consumption scores (FCS = 1.0 to 28).
- ✓ 28% households surveyed have Borderline consumption scores (FCS = 28.1 to 42).
- ✓ 62% households surveyed have acceptable food consumption scores (FCS = >42.0).

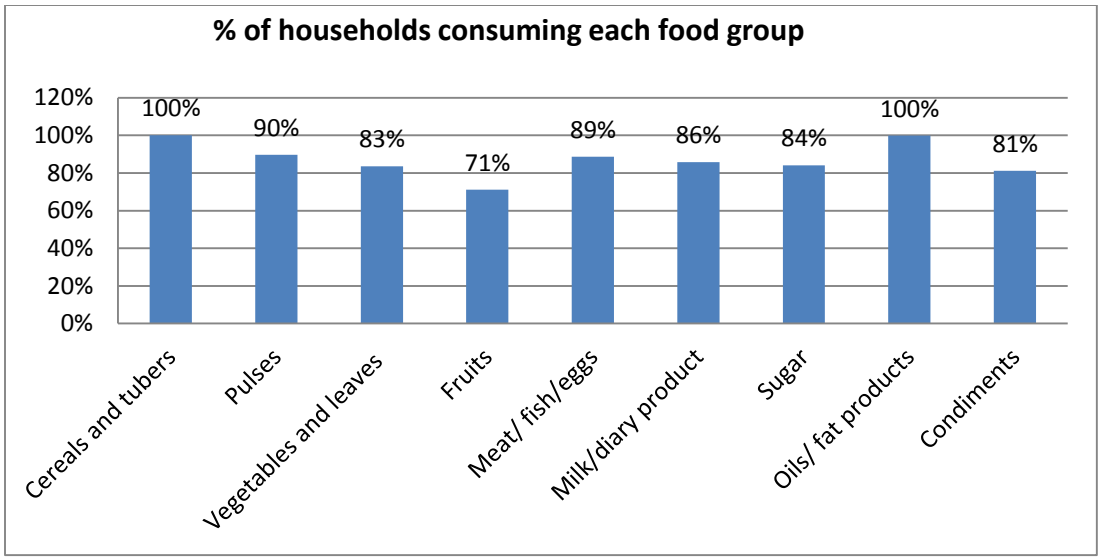


Figure 10: Households consuming each food group, Nimroz SMART, April 2017

e. Food stock

Out of 636 households 636 households responded for the food stock, for more detail refer to table below;

Table 29: food stock in households level, (n=636), Nimroz SMART survey, April 2017

	N	%
No food stock in the households	**379**	**59.6%**

Less than a week stock in the HH	**75**	**11.8%**
Food stock in HHs from 1 to 3 weeks	**117**	**18.4%**
Food stock in HHS up to 3 months	**4**	**0.6%**
Food stock in HHs more than 3 months	**61**	**9.6%**

f. Food Main Sources

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

Table 30: Food main sources, Nimroz SMART, April 2017

	Own production	Cash	Credit	Battering	Gift/ charity	Wild food	Food Aid	Total
Cereals and tubers	56	525	33	0	6	0	7	**627**
Pulses/ Nuts	20	509	27	1	3	0	1	**561**
Vegetables and leaves	30	473	9	1	6	1	3	**523**
Fruits	5	424	10	0	2	0	1	**442**
Meat/ fish/eggs	35	479	34	1	6	0	0	**555**
Milk/diary product	73	437	7	2	16	0	3	**538**
Sugar / Honey	4	496	15	0	3	1	6	**525**
Oils/ fat products	11	560	37	0	4	1	13	**626**
Condiments	2	489	6	1	2	0	6	**506**

12. Demography

The mortality questionnaires in SMART designed in a way that some additional useful demography data withdrawn. Summery highlighted in tables below. A total of 4747 individuals and 1779 School age children (6-18) years) were presented in the surveyed households.

Table 31: Short Summery of demography, Nimroz SMART, April 2017

Indicators	Value
Average households size	7.5
Children under five	20.4%
People have Tazkera	60.1%

Table 32: school age children (6-18 years) (N=1779), Nimroz SMART, April 2017

Indicators	%
Attendant school in the last 4 consecutive days	67.0%
Not attendant school in the last 4 consecutive days	33.0%
Main reasons of not attendant school were Distances , security and lack of female teachers in the school	52.4%%

13. Returnees

The information collected from households regarding returnees and IDPs due to different reasons, in the survey no collected data for the reason of IDPs, see below table for more details.

Table 33: percentage of Returnees and IDPs, (N=636), Nimroz SMART, April 2017

Residential status of Households	**Permanent residential**	**433**	**68.1%**
	Internal Displacement	**143**	**22.5%**
	Returnees	**60**	**9.4%**

13. Discussions

13.1. Nutrition status

It is to be noted that due to a problem that occurred between data collection and data entry, SAM based on weight for height could not be taken in consideration as it was potentially overestimated. Thus, in this report, only MAM (5.9% (4.5- 7.8 95% CI)) is reported and SAM and GAM are reported based on MUAC.The GAM rate based on MUAC<125 mm was **6.2% (4.5-8.6 95% CI)** and SAM is **2.2% (1.4 - 3.4 95% CI**

Chronic malnutrition trends in Nimroz province remain worrying. The results of the present survey clearly showed that stunting was of **41.6% (37.4-45.9 95% CI)**. More than one in each three children included in the survey were found be stunted, while one in each four children was underweight. The high stunting rates are in line with high morbidity (61.1% reported of being ill in 2 weeks prior to survey), and poor infant feeding practices (exclusive breastfeeding was found to be 60.7% and timely complementary feeding was of 44.6%) have been known to expose children under nutrition and its potential consequences.

1.1. Water hygiene and Sanitation (WASH)

The WASH indicators collected in this survey were mostly limited to the most pragmatic and easy to collect using a SMART methodology. In the survey, finding shows 55.1% mothers/

caretakers hand wash practice and used soap. It is important to note that due to the limited scope of WASH questions and indicators included, a more general conclusion of the WASH situation is not possible. In addition, the survey did not include observation of the practice of hand washing and the responses are suspected to be more of knowledge. However, it have been seen that around 50.9% of the individuals living in the sampled households had access to less than 20 litters of water the last 24 hours prior the survey, below minimum emergency Sphere standards.

1.2. Maternal nutritional status

There are no commonly accepted international standards for maternal nutrition status. In line with the Afghanistan National Guideline, the MUAC cutoff for women of 230 mm is used to approximately identify their status. In this survey 19.8 % (95%CI, 16.2-23.5) of pregnant and lactating women were found to have a MUAC<230mm, which suggest that a considerable number of PLWs in the province are likely to have low nutritional status. The main concern was iron supplementation among pregnant women, which was found low (76.3%). The Iron supplementation prevent anemia during pregnancy and eventual life-threatening complications during delivery. Therefore, it decreases maternal mortality, prenatal and perinatal infant loss and prematurity that can be directly related to child stunting in the first 2 years of life. The Iron/Folate supplementation for pregnant women needs to be increase significantly by reinforcing the usual channels for that in BPHS/CBHC. The BPHS Implementing partner needs to make immediately significant progress by reinforcing ANC and CHW home visits to PLW.

13.3. IYCF practice

Optimal infant and young child nutrition, especially exclusive breastfeeding estimated to prevent potentially deaths every year among children under five years old. Infant and young child feeding nutrition in this area still needs to be improved.

Findings so far have indicated that timely initiation of breastfeeding, colostrum feeding and continuous breastfeeding up to the first year of life were well practice by the mothers. However, exclusive breastfeeding rate of 60.7% is of real concern as these potentially contribute to stunting in the first two years of life. The introduction of complementary feeding after 6 months of EBF period remain relatively poor (44.6 %) and often mixed with tea (inhibits iron absorption). These two practices need to be significantly improve in a targeted manner. Further analysis of the quality of the complementary food has to do.

14.4. Death rates

The survey showed that the Crude Mortality Rate (CMR) and under five mortality rate (U5MR) were 0.05/10,000/day and 0.18/10,000/per day respectively. Both CMR and U5MR rates were below the WHO's emergency thresholds of 2/10,000/day and 4/10,000/day respectively.

15.5. Risk factors

Morbidity, immunization, Supplementation and deworming

The UNICEF conceptual framework of malnutrition can be used to explain the probable causes of under-nutrition in this area. Diseases weaken an individual immune system causing them have other side effects such as reduced food intake and diarrhea. In the entire province, more than half of the sampled children had suffered from one form of illness or another (61.1 %) such as diarrhea, fever, cough and skin infection.

The coverage of Vitamin A supplementation, 6 months prior to the survey, was good. About 89.9% children received vitamin A supplementation. One of the core functions of Vitamin A is to boost an individuals' immunity hence important of supplement. Building awareness on Vitamin A is of importance as the current rates are high compared to the recommended WHO target of 80%, vitamin A coverage which probably happened due to effectiveness of the integrated NIDs campaign.

The proportion of all children aged 24-59 months who had received deworming in the last 6 months was poor (67.4%) in the province it has related in Nutrition for absorption of minerals and vitamins.

2. Conclusion

The survey findings revealed that the prevalence of Global Acute Malnutrition (GAM) based on on MUAC cut-offs was **6.2% (4.5-8.6 95% CI)**, SAM prevalence by MUAC was at **2.2% (1.4-3.4 95% CI)** respectively.

Crude Death Rate and Under-five Death rate was at 0.05/10,000/day and 0.18/10,000/per day. The both rates are below SPHERE emergency thresholds.

Stunting prevalence in Nimroz can considered Very high. Although for comparing this survey results for stunting significant high from NNS 2013 as a reported. It is important to consider for the stunting situation in the province. Poor micronutrient supplementation and deworming, low maternal nutritional status as observed in Nimroz province if not addressed can contribute to increasing the levels of chronic malnutrition. The fact that chronic malnutrition not given the attention in the health facilities could be a factor exacerbating the

situation. Currently there is no clear guidance in Afghanistan on how to address chronic malnutrition.

3. Recommendations

Summary of some key recommendations noted below:

15.1 Under nutrition

- Prioritize activities addressing chronic malnutrition, high stunting rates, at the community level, through food security/agricultural, WASH, nutrition cooking demonstrations, IYCF, appropriate supplementation, growth monitoring, and improving maternal health and nutrition.
- Reinforcing of health education including home management of diarrhea and ARI, hygiene at both facility and community levels.
- The survey finding representing over burden of illness experienced by children. So, it is recommended to lunch some infection prevention intervention and applying malnutrition sensitive interventions such as provision of safe drinking water, Hygiene promotion practices, sanitation.

3.1. Child health and immunization

- Improve awareness and investigate more on barriers for improved health care seeking by families for management of children's infections
- Strength child health prevention (vaccination, deworming and supplementation) and referral system.
- Concentrating efforts on encouraging IYCF that fails achieved exclusive breastfeeding and timely introduction of quality complementary food.

3.2. Maternal nutrition status

- Continue up SFP to address PLW having MUAC <230 mm and potentially prevent child under nutrition
- To strength awareness of iron folate supplementation.
- To strength referral system for Antenatal care and health seeking visits during pregnancy trough CHWs in the community level.

4. Annexes

Annex 1: plausibility check report

Plausibility check for: Nimroz_Assessment_April_2017_Afghanistan.as

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** (0.0 %)

Overall Sex ratio Incl p >0.1 >0.05 >0.001 <=0.001
(Significant chi square) 0 2 4 10 **0** (p=0.566)

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=0.449)

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 **0** (5)

Dig pref score - MUAC Incl # 0-7 8-12 13-20 > 20
0 2 4 10 **0** (4)

Standard Dev WHZ Excl SD <1.1 <1.15 <1.20 >=1.20
. and and and or
. Excl SD >0.9 >0.85 >0.80 <=0.80
0 5 10 20 **0** (1.09)

Skewness WHZ Excl # <±0.2 <±0.4 <±0.6 >=±0.6
0 1 3 5 **3** (-0.43)

Kurtosis WHZ Excl # <±0.2 <±0.4 <±0.6 >=±0.6
0 1 3 5 **0** (-0.01)

Poisson dist WHZ-2 Excl p >0.05 >0.01 >0.001 <=0.001
0 1 3 5 **0** (p=0.356)

OVERALL SCORE WHZ = 0-9 10-14 15-24 >25 **3** %

The overall score of this survey is 3 %, this is excellent.

There were no duplicate entries detected.

Percentage of children with no exact birthday: 70 %

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 flagged and should be excluded from analysis for a nutrition survey in emergencies. For other surveys this might not be the best procedure e.g. when the percentage of overweight children has to be calculated):

Line=12/ID=2: HAZ (-4.977), Age may be incorrect
Line=75/ID=3: HAZ (2.058), Height may be incorrect
Line=193/ID=4: HAZ (1.706), Age may be incorrect
Line=238/ID=3: HAZ (1.740), Age may be incorrect
Line=266/ID=1: HAZ (-5.050), Height may be incorrect
Line=276/ID=1: HAZ (-5.427), Age may be incorrect
Line=347/ID=1: HAZ (-5.179), Height may be incorrect
Line=348/ID=2: HAZ (-4.966), Height may be incorrect
Line=384/ID=2: HAZ (1.618), Age may be incorrect
Line=408/ID=1: HAZ (1.331), Age may be incorrect
Line=449/ID=1: HAZ (1.775), Age may be incorrect
Line=528/ID=4: HAZ (-5.512), Age may be incorrect
Line=539/ID=1: HAZ (3.671), WAZ (2.320), Age may be incorrect
Line=633/ID=3: HAZ (1.285), Age may be incorrect
Line=643/ID=1: HAZ (1.401), WAZ (1.719), Age may be incorrect
Line=709/ID=1: HAZ (1.594), Age may be incorrect
Line=713/ID=2: HAZ (2.796), Age may be incorrect
Line=874/ID=1: HAZ (-5.579), Age may be incorrect
Line=875/ID=2: HAZ (-5.374), Age may be incorrect
Line=927/ID=1: HAZ (-5.156), Age may be incorrect
Line=936/ID=1: HAZ (2.180), Height may be incorrect
Line=957/ID=1: HAZ (1.565), Age may be incorrect
Line=1019/ID=2: HAZ (-4.971), Age may be incorrect

Percentage of values flagged with SMART flags:WHZ: 0.0 %, HAZ: 2.3 %, WAZ: 0.2 %

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 : ################
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Month 54 : ########################
Month 55 : ##############
Month 56 : ################
Month 57 : ############
Month 58 : ####################
Month 59 : ##################

Age ratio of 6-29 months to 30-59 months: 0.89 (The value should be around 0.85).: p-value = 0.449 (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	129/116.0 (1.1)	110/111.8 (1.0)	239/227.8 (1.0)	1.17

18 to 29	12	108/113.1 (1.0)	116/109.0 (1.1)	224/222.1 (1.0)	0.93
30 to 41	12	107/109.6 (1.0)	88/105.7 (0.8)	195/215.3 (0.9)	1.22
42 to 53	12	95/107.9 (0.9)	116/104.0 (1.1)	211/211.9 (1.0)	0.82
54 to 59	6	61/53.4 (1.1)	52/51.4 (1.0)	113/104.8 (1.1)	1.17
6 to 59	54	500/491.0 (1.0)	482/491.0 (1.0)		1.04

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

Overall sex ratio: p-value = 0.566 (boys and girls equally represented)
Overall age distribution: p-value = 0.538 (as expected)
Overall age distribution for boys: p-value = 0.357 (as expected)
Overall age distribution for girls: p-value = 0.306 (as expected)
Overall sex/age distribution: p-value = 0.049 (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: 0.677

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: **5** (0-7 excellent, 8-12 good, 13-20 acceptable and > 20 problematic)
p-value for chi2: 0.003 (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: **4** (0-7 excellent, 8-12 good, 13-20 acceptable and > 20 problematic)
p-value for chi2: 0.104

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:	1.09	1.09	1.09
(The SD should be between 0.8 and 1.2)			
Prevalence (< -2)			
observed:	11.5%	11.5%	11.5%
calculated with current SD:	11.9%	11.9%	11.9%
calculated with a SD of 1:	9.8%	9.8%	9.8%
HAZ			
Standard Deviation SD:	1.15	1.15	1.02
(The SD should be between 0.8 and 1.2)			
Prevalence (< -2)			
observed:	41.6%	41.6%	41.6%
calculated with current SD:	43.3%	43.3%	43.1%
calculated with a SD of 1:	42.3%	42.3%	42.9%
WAZ			
Standard Deviation SD:	0.94	0.94	0.93
(The SD should be between 0.8 and 1.2)			
Prevalence (< -2)			
observed:			
calculated with current SD:			
calculated with a SD of 1:			
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= 0.212
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	-0.43	-0.43	-0.43
HAZ	0.21	0.21	0.03
WAZ	-0.17	-0.17	-0.27

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	-0.01	-0.01	-0.01
HAZ	1.25	1.25	-0.17
WAZ	0.40	0.40	0.15

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=1.06 (p=0.356)
WHZ < -3: ID=0.94 (p=0.599)
GAM: ID=1.06 (p=0.356)
SAM: ID=0.94 (p=0.599)
HAZ < -2: ID=1.61 (p=0.004)
HAZ < -3: ID=1.29 (p=0.083)
WAZ < -2: ID=1.38 (p=0.040)
WAZ < -3: ID=1.38 (p=0.039)

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 related to the time of the day the measurement is made).

Time point — SD for WHZ
0.8 0.9 1.0 1.1 1.2 1.3 1.4 1.5 1.6 1.7 1.8 1.9 2.0 2.1 2.2 2.3
01: 0.96 (n=50, f=0) #######
02: 1.05 (n=47, f=0) ##########
03: 1.18 (n=44, f=0) ################
04: 1.05 (n=46, f=0) ##########
05: 1.13 (n=47, f=0) ##############
06: 1.18 (n=46, f=0) ################

07: 1.15 (n=47, f=0) ###############
08: 0.88 (n=45, f=0) ###
09: 0.99 (n=48, f=0) ########
10: 1.17 (n=47, f=0) ################
11: 1.01 (n=45, f=0) #########
12: 1.26 (n=46, f=0) ###################
13: 1.24 (n=46, f=0) ##################
14: 0.95 (n=46, f=0) ######
15: 1.10 (n=46, f=0) #############
16: 1.05 (n=41, f=0) ##########
17: 1.17 (n=35, f=0) ################
18: 0.74 (n=34, f=0)
19: 1.03 (n=30, f=0) #########
20: 1.23 (n=31, f=0) ##################
21: 1.23 (n=26, f=0) OOOOOOOOOOOOOOOOO
22: 1.13 (n=20, f=0) OOOOOOOOOOOOO
23: 0.92 (n=16, f=0) OOOOO
24: 1.45 (n=15, f=0) OOOOOOOOOOOOOOOOOOOOOOOOO
25: 1.30 (n=11, f=0) ~~~~~~~~~~~~~~~~~~~~
26: 1.21 (n=07, f=0) ~~~~~~~~~~~~~~~~~
27: 1.07 (n=07, f=0) ~~~~~~~~~~~~
28: 1.04 (n=06, f=0) ~~~~~~~~~~
29: 0.34 (n=05, f=0)
30: 1.64 (n=02, f=0) ~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~

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

Analysis by Team

Team	**1**	**2**	**3**	**4**	**5**	**6**
n =	180	169	144	163	146	180
Percentage of values flagged with SMART flags:						
WHZ:	0.0	0.0	0.0	0.0	0.0	0.0
HAZ:	2.2	0.6	3.5	1.8	2.7	3.3
WAZ:	0.0	0.0	1.4	0.0	0.0	0.0
Age ratio of 6-29 months to 30-59 months:						
	1.05	0.99	0.78	0.72	0.78	1.05
Sex ratio (male/female):						
	0.98	1.01	1.22	0.87	1.28	0.98
Digit preference Weight (%):						
.0 :	9	13	6	7	13	8
.1 :	12	11	10	12	10	12
.2 :	9	7	6	9	14	13
.3 :	10	11	7	10	11	9
.4 :	8	10	10	11	8	15
.5 :	7	10	11	8	10	6
.6 :	13	9	13	13	10	11
.7 :	11	11	17	10	8	6
.8 :	10	8	10	12	3	11
.9 :	10	10	10	7	12	10
DPS:	5	6	11	7	10	9

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

Digit preference Height (%):

.0 :	7	20	4	3	5	6
.1 :	12	9	5	12	15	6
.2 :	13	9	14	13	14	13
.3 :	13	8	12	10	11	10
.4 :	13	7	12	12	14	11
.5 :	6	17	12	10	8	18
.6 :	14	6	15	10	10	7
.7 :	7	6	13	12	8	12
.8 :	6	11	10	9	6	12
.9 :	8	8	4	9	10	7
DPS:	11	15	13	9	11	12

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

Digit preference MUAC (%):

.0 :	2	19	1	1	2	16
.1 :	19	5	12	12	11	4
.2 :	8	8	13	8	14	8
.3 :	12	10	16	9	12	10
.4 :	12	11	14	12	12	8
.5 :	6	21	7	6	5	20
.6 :	10	8	10	10	11	6
.7 :	8	11	6	10	9	11
.8 :	11	5	6	15	8	12
.9 :	11	4	15	17	16	5
DPS:	15	18	15	14	13	16

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

Standard deviation of WHZ:

SD	1.06	1.10	1.08	1.07	1.09	1.13

Prevalence (< -2) observed:

%	10.6	11.8	8.3	14.1	14.4	10.0

Prevalence (< -2) calculated with current SD:

%	10.4	13.8	8.3	13.5	15.3	10.4

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

%	9.2	11.6	6.8	11.9	13.2	7.7

Standard deviation of HAZ:

SD	1.12	1.11	1.27	1.11	1.08	1.23

observed:

%	43.9	34.3	45.8	37.4	40.4	47.8

calculated with current SD:

%	45.8	40.6	40.9	40.6	42.9	48.1

calculated with a SD of 1:

%	45.3	39.6	38.5	39.6	42.4	47.7

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	21/20.6 (1.0)	24/21.1 (1.1)	45/41.8 (1.1)	0.88
18 to 29	12	22/20.1 (1.1)	25/20.6 (1.2)	47/40.7 (1.2)	0.88
30 to 41	12	15/19.5 (0.8)	11/20.0 (0.6)	26/39.5 (0.7)	1.36
42 to 53	12	19/19.2 (1.0)	18/19.6 (0.9)	37/38.8 (1.0)	1.06
54 to 59	6	12/9.5 (1.3)	13/9.7 (1.3)	25/19.2 (1.3)	0.92
6 to 59	54	89/90.0 (1.0)	91/90.0 (1.0)		0.98

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

Overall sex ratio: p-value = 0.881 (boys and girls equally represented)
Overall age distribution: p-value = 0.105 (as expected)
Overall age distribution for boys: p-value = 0.757 (as expected)
Overall age distribution for girls: p-value = 0.158 (as expected)
Overall sex/age distribution: p-value = 0.073 (as expected)

Team 2:

Age cat.	mo.	boys	girls	total	ratio boys/girls
6 to 17	12	26/19.7 (1.3)	23/19.5 (1.2)	49/39.2 (1.2)	1.13
18 to 29	12	18/19.2 (0.9)	17/19.0 (0.9)	35/38.2 (0.9)	1.06
30 to 41	12	19/18.6 (1.0)	15/18.4 (0.8)	34/37.1 (0.9)	1.27
42 to 53	12	14/18.3 (0.8)	17/18.1 (0.9)	31/36.5 (0.9)	0.82
54 to 59	6	8/9.1 (0.9)	12/9.0 (1.3)	20/18.0 (1.1)	0.67
6 to 59	54	85/84.5 (1.0)	84/84.5 (1.0)		1.01

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

Overall sex ratio: p-value = 0.939 (boys and girls equally represented)
Overall age distribution: p-value = 0.406 (as expected)
Overall age distribution for boys: p-value = 0.519 (as expected)
Overall age distribution for girls: p-value = 0.631 (as expected)
Overall sex/age distribution: p-value = 0.213 (as expected)

Team 3:

Age cat.	mo.	boys	girls	total	ratio boys/girls
6 to 17	12	22/18.3 (1.2)	15/15.1 (1.0)	37/33.4 (1.1)	1.47
18 to 29	12	12/17.9 (0.7)	14/14.7 (1.0)	26/32.6 (0.8)	0.86
30 to 41	12	18/17.3 (1.0)	17/14.3 (1.2)	35/31.6 (1.1)	1.06
42 to 53	12	23/17.0 (1.3)	18/14.0 (1.3)	41/31.1 (1.3)	1.28
54 to 59	6	4/8.4 (0.5)	1/6.9 (0.1)	5/15.4 (0.3)	4.00
6 to 59	54	79/72.0 (1.1)	65/72.0 (0.9)		1.22

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

Overall sex ratio: p-value = 0.243 (boys and girls equally represented)
Overall age distribution: p-value = 0.016 (significant difference)
Overall age distribution for boys: p-value = 0.131 (as expected)
Overall age distribution for girls: p-value = 0.148 (as expected)

Overall sex/age distribution: p-value = 0.004 (significant difference)

Team 4:

Age cat.	mo.	boys	girls	total	ratio boys/girls
6 to 17	12	17/17.6 (1.0)	19/20.2 (0.9)	36/37.8 (1.0)	0.89
18 to 29	12	18/17.2 (1.0)	14/19.7 (0.7)	32/36.9 (0.9)	1.29
30 to 41	12	18/16.7 (1.1)	19/19.1 (1.0)	37/35.7 (1.0)	0.95
42 to 53	12	9/16.4 (0.5)	28/18.8 (1.5)	37/35.2 (1.1)	0.32
54 to 59	6	14/8.1 (1.7)	7/9.3 (0.8)	21/17.4 (1.2)	2.00
6 to 59	54	76/81.5 (0.9)	87/81.5 (1.1)		0.87

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

Overall sex ratio: p-value = 0.389 (boys and girls equally represented)
Overall age distribution: p-value = 0.806 (as expected)
Overall age distribution for boys: p-value = 0.100 (as expected)
Overall age distribution for girls: p-value = 0.146 (as expected)
Overall sex/age distribution: p-value = 0.004 (significant difference)

Team 5:

Age cat.	mo.	boys	girls	total	ratio boys/girls
6 to 17	12	18/19.0 (0.9)	12/14.8 (0.8)	30/33.9 (0.9)	1.50
18 to 29	12	19/18.5 (1.0)	15/14.5 (1.0)	34/33.0 (1.0)	1.27
30 to 41	12	17/18.0 (0.9)	9/14.0 (0.6)	26/32.0 (0.8)	1.89
42 to 53	12	16/17.7 (0.9)	16/13.8 (1.2)	32/31.5 (1.0)	1.00
54 to 59	6	12/8.8 (1.4)	12/6.8 (1.8)	24/15.6 (1.5)	1.00
6 to 59	54	82/73.0 (1.1)	64/73.0 (0.9)		1.28

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

Overall sex ratio: p-value = 0.136 (boys and girls equally represented)
Overall age distribution: p-value = 0.188 (as expected)
Overall age distribution for boys: p-value = 0.829 (as expected)
Overall age distribution for girls: p-value = 0.157 (as expected)
Overall sex/age distribution: p-value = 0.046 (significant difference)

Team 6:

Age cat.	mo.	boys	girls	total	ratio boys/girls
6 to 17	12	25/20.6 (1.2)	17/21.1 (0.8)	42/41.8 (1.0)	1.47
18 to 29	12	19/20.1 (0.9)	31/20.6 (1.5)	50/40.7 (1.2)	0.61
30 to 41	12	20/19.5 (1.0)	17/20.0 (0.9)	37/39.5 (0.9)	1.18
42 to 53	12	14/19.2 (0.7)	19/19.6 (1.0)	33/38.8 (0.8)	0.74
54 to 59	6	11/9.5 (1.2)	7/9.7 (0.7)	18/19.2 (0.9)	1.57
6 to 59	54	89/90.0 (1.0)	91/90.0 (1.0)		0.98

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

Overall sex ratio: p-value = 0.881 (boys and girls equally represented)

Overall age distribution: p-value = 0.521 (as expected)
Overall age distribution for boys: p-value = 0.620 (as expected)
Overall age distribution for girls: p-value = 0.122 (as expected)
Overall sex/age distribution: p-value = 0.040 (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 related to the time of the day the measurement is made).

Team: 1

```
Time                                SD for WHZ
point            0.8 0.9 1.0 1.1 1.2 1.3 1.4 1.5 1.6 1.7 1.8 1.9 2.0 2.1 2.2 2.3
01: 0.87 (n=09, f=0)  ###
02: 0.54 (n=08, f=0)
03: 1.23 (n=08, f=0)  ##################
04: 1.35 (n=09, f=0)  ######################
05: 1.44 (n=09, f=0)  ##########################
06: 0.91 (n=08, f=0)  #####
07: 1.29 (n=09, f=0)  ####################
08: 0.57 (n=09, f=0)
09: 1.04 (n=09, f=0)  ##########
10: 0.58 (n=08, f=0)
11: 1.31 (n=07, f=0)  ####################
12: 1.39 (n=07, f=0)  ########################
13: 1.18 (n=08, f=0)  ################
14: 0.71 (n=08, f=0)
15: 0.83 (n=07, f=0)  #
16: 1.00 (n=07, f=0)  ########
17: 1.28 (n=06, f=0)  ####################
18: 0.91 (n=06, f=0)  ####
19: 1.46 (n=06, f=0)  ############################
20: 1.17 (n=06, f=0)  ###############
21: 0.49 (n=05, f=0)
22: 1.07 (n=05, f=0)  ###########
23: 0.38 (n=03, f=0)
24: 0.85 (n=03, f=0)  OO
25: 1.48 (n=03, f=0)  OOOOOOOOOOOOOOOOOOOOOOOOOOOO
26: 0.35 (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: 0.91 (n=09, f=0)  #####
02: 1.19 (n=08, f=0)  ################
03: 1.05 (n=08, f=0)  ###########
04: 1.07 (n=08, f=0)  ###########
05: 0.91 (n=09, f=0)  ####
06: 0.53 (n=09, f=0)
07: 0.81 (n=09, f=0)
08: 0.61 (n=07, f=0)
09: 0.65 (n=08, f=0)
10: 1.36 (n=09, f=0)  ########################
11: 1.08 (n=08, f=0)  ############
12: 1.56 (n=09, f=0)  ################################
13: 1.47 (n=08, f=0)  ############################
14: 1.27 (n=07, f=0)  ###################
15: 1.09 (n=07, f=0)  ############
16: 0.88 (n=06, f=0)  ####
17: 1.36 (n=05, f=0)  ########################
```

```
18: 0.78 (n=05, f=0)
19: 0.79 (n=05, f=0)
20: 0.75 (n=04, f=0)
21: 1.79 (n=04, f=0)  OOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOO
22: 0.88 (n=03, f=0)  OOOO
23: 1.09 (n=03, f=0)  OOOOOOOOOOOO
24: 2.09 (n=03, f=0)  OOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOO
25: 0.35 (n=02, f=0)
26: 1.62 (n=02, f=0)  ~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~
27: 1.93 (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: 3

```
Time                              SD for WHZ
point           0.8 0.9 1.0 1.1 1.2 1.3 1.4 1.5 1.6 1.7 1.8 1.9 2.0 2.1 2.2 2.3
01: 0.44 (n=08, f=0)
02: 0.66 (n=08, f=0)
03: 1.39 (n=08, f=0)  #########################
04: 0.35 (n=06, f=0)
05: 1.38 (n=07, f=0)  ########################
06: 1.32 (n=07, f=0)  ######################
07: 1.22 (n=08, f=0)  ##################
08: 1.06 (n=06, f=0)  ###########
09: 1.05 (n=07, f=0)  ###########
10: 0.87 (n=07, f=0)  ###
11: 0.64 (n=07, f=0)
12: 1.26 (n=07, f=0)  ####################
13: 1.12 (n=06, f=0)  #############
14: 0.84 (n=08, f=0)  ##
15: 1.12 (n=08, f=0)  #############
16: 1.52 (n=07, f=0)  ##############################
17: 1.30 (n=06, f=0)  #####################
18: 0.61 (n=05, f=0)
19: 0.66 (n=04, f=0)
20: 1.12 (n=04, f=0)  OOOOOOOOOOOOO
21: 0.04 (n=02, f=0)
22: 0.52 (n=02, f=0)
24: 2.75 (n=02, f=1)  ~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~
```

(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: 1.15 (n=08, f=0)  ###############
02: 0.74 (n=08, f=0)
03: 0.67 (n=08, f=0)
04: 0.92 (n=08, f=0)  #####
05: 1.23 (n=07, f=0)  ##################
06: 1.08 (n=06, f=0)  ############
07: 1.35 (n=07, f=0)  #######################
08: 0.71 (n=07, f=0)
09: 1.07 (n=08, f=0)  ###########
10: 1.03 (n=08, f=0)  ##########
11: 0.60 (n=08, f=0)
12: 0.97 (n=08, f=0)  #######
13: 1.36 (n=08, f=0)  #######################
14: 1.18 (n=08, f=0)  ################
15: 1.03 (n=08, f=0)  #########
16: 0.99 (n=06, f=0)  ########
17: 1.04 (n=07, f=0)  ##########
18: 0.82 (n=06, f=0)  #
19: 0.75 (n=05, f=0)
20: 1.11 (n=07, f=0)  #############
21: 1.01 (n=06, f=0)  #########
```

22: 1.15 (n=05, f=0) OOOOOOOOOOOOOOO
23: 0.47 (n=03, f=0)
24: 1.47 (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: 0.86 (n=08, f=0) ###
02: 1.27 (n=08, f=0) ###################
03: 1.56 (n=07, f=0) ################################
04: 1.15 (n=08, f=0) ###############
05: 0.82 (n=08, f=0) #
06: 1.38 (n=08, f=0) ########################
07: 1.02 (n=06, f=0) #########
08: 0.80 (n=08, f=0)
09: 1.10 (n=08, f=0) ############
10: 1.02 (n=07, f=0) #########
11: 1.16 (n=08, f=0) ###############
12: 1.19 (n=08, f=0) ################
13: 1.35 (n=08, f=0) ######################
14: 0.70 (n=07, f=0)
15: 1.11 (n=08, f=0) ############
16: 0.91 (n=07, f=0) #####
17: 1.50 (n=04, f=0) OOOOOOOOOOOOOOOOOOOOOOOOOOOO
18: 0.63 (n=06, f=0)
19: 1.32 (n=03, f=0) OOOOOOOOOOOOOOOOOOOO
20: 1.00 (n=03, f=0) OOOOOOOOO
21: 0.31 (n=03, f=0)
23: 1.40 (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)

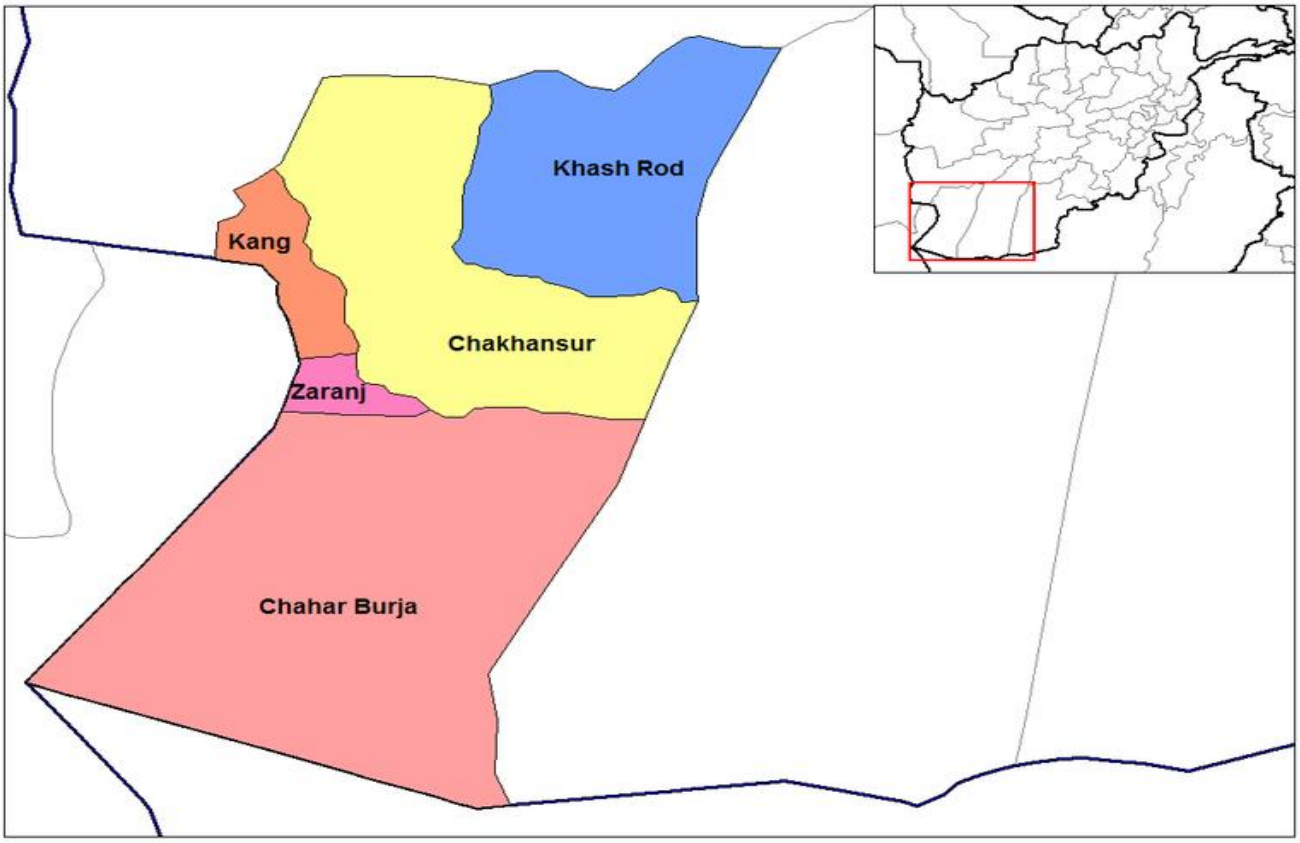
Team: 6

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: 1.35 (n=08, f=0) ######################
02: 1.35 (n=07, f=0) ######################
03: 0.75 (n=05, f=0)
04: 0.63 (n=07, f=0)
05: 0.90 (n=07, f=0) ####
06: 1.59 (n=08, f=0) ################################
07: 1.44 (n=08, f=0) ##########################
08: 1.26 (n=08, f=0) ###################
09: 0.96 (n=08, f=0) #######
10: 1.69 (n=08, f=0) ####################################
11: 0.83 (n=07, f=0) #
12: 1.52 (n=07, f=0) ##############################
13: 1.02 (n=08, f=0) #########
14: 0.83 (n=08, f=0) #
15: 1.33 (n=08, f=0) ######################
16: 1.00 (n=08, f=0) ########
17: 0.73 (n=07, f=0)
18: 0.70 (n=06, f=0)
19: 0.86 (n=07, f=0) ###
20: 1.39 (n=07, f=0) ########################
21: 1.13 (n=06, f=0) ##############
22: 1.14 (n=04, f=0) OOOOOOOOOOOOOO
23: 1.52 (n=04, f=0) OOOOOOOOOOOOOOOOOOOOOOOOOOOOOO
24: 1.26 (n=04, f=0) OOOOOOOOOOOOOOOOOO
25: 0.55 (n=03, f=0)
26: 0.05 (n=02, f=0)
27: 0.56 (n=03, f=0)
28: 1.50 (n=03, f=0) OOOOOOOOOOOOOOOOOOOOOOOOOOOO
29: 0.05 (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)

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

Annex 2: Nimroz physical maps.



Annex 3: Selected clusters in Nimroz province.

شماره	ولسوالی	نام قریه	نفوس مجموعی	Cluster
1	زرنج	شهرک و حاجی نذیر	390	1
2	زرنج	شهرک سیستان	16275	2,3
3	زرنج	خواجه کریم و اطراف آن	5861	4
4	زرنج	کوچه حج اوقاف و کریم براهویی	1896	5
5	زرنج	جاده فضایی سبز جنبش	5531	6
6	زرنج	معصوم آباد و علی آباد	8442	7
7	زرنج	کوچه خیرآباد اطراف مسجد ایوب انصاری	2475	8
8	زرنج	اسلام آباد	3677	9

9	زرنج	مهاجرآباد	7907	10,11
10	زرنج	حاجی یاسین وحاجی ظاهر	2384	12
11	زرنج	حاجی سید داوود	5582	13
12	زرنج	حاجی مومن	2487	14
13	زرنج	مالداران	910	15
14	زرنج	شهرک گلستان	9121	16,17
15	زرنج	کمپ هندیا	9066	18
16	زرنج	حاجی غفور	745	19
17	زرنج	غلام حیدر	4649	20
18	زرنج	قریه سیاه چشمان	4900	21
19	زرنج	کاگرای شمالی	9251	RC,22
20	زرنج	حاجی عبدالروف	1285	23
21	زرنج	نورمحمد خان بلوچ.ونوراباد	1056	24
22	زرنج	نهتانی حاجی خدارحم شرق وغرب	2529	25
23	زرنج	گلزار	2883	26
24	زرنج	سارنوالی	2842	27
25	زرنج	امنیت ملی	12328	28,29
26	زرنج	حاجی نادر وحاجی وکیل عرب	6372	30
27	زرنج	کوچه رودابه واطراف ان	3137	31
28	زرنج	حاجی غوث واطراف ان	5568	32
29	زرنج	اطراف لوأ	4182	RC
30	زرنج	پشت زندان میدان هوایی	5126	33
31	زرنج	گنج نو	4160	34
32	زرنج	کاکرا جنوبی	11545	35,36
33	زرنج	کارخانه یخ بلور	5329	37
34	زرنج	ملا اختروواطراف ان	3108	38
35	زرنج	ده خواجه واطراف ان	7416	39,40
36	زرنج	چاراهی محکمه	4060	RC
37	زرنج	کوچه ریاست معرف واطراف ان	6020	41
38	زرنج	قلعه محمد	4687	42
39	زرنج	شهرک انصاری	4311	43
40	دلآرام	دوراهی	1890	RC
41	دلآرام	محصل خان	1420	44
42	دلآرام	حاجی عارف خان	1234	RC
43	چخانسور	قلچه	398	RC
44	چخانسور	حاجی قادرخان.عبدالغنی	552	45
45	چخانسور	اخندزاده سراج الدین	834	46
46	چهاربورجک	زورآباد	260	47
47	کنگ	سارانی.حاجی اسماعیل .صالح محمد	1756	48

48	کنگ	عبدالرحمن	389	49
49	چاربرجک	پوگی	285	50

Annex 4 :**Report for Evaluation of Enumerators**

Weight:

	Precision: Sum of Square [W1-W2]	Accuracy: Sum of Square [Enum.(W1+W2)-(Superv.(W1+W2)]	No. +/- Precision	No. +/- Accuracy
Supervisor	0.19		5/2	
Enumerator 1	1.15 POOR	1.90 POOR	3/3	5/4
Enumerator 2	0.64 POOR	1.09 POOR	2/4	2/6
Enumerator 3	0.01 OK	3.34 POOR	1/0	3/5
Enumerator 4	0.28 OK	1.25 POOR	1/4	5/4
Enumerator 5	1.04 POOR	0.97 POOR	6/1	7/2
Enumerator 6	1.40 POOR	2.39 POOR	5/3	2/7
Enumerator 7	0.50 POOR	4.91 POOR	5/3	2/7
Enumerator 8	0.59 POOR	3.22 POOR	3/6	4/4
Enumerator 9	0.60 POOR	1.65 POOR	4/4	6/2
Enumerator 10	0.43 POOR	2.50 POOR	2/7	3/5
Enumerator 11	1.30 POOR	0.49 OK	6/3	5/4
Enumerator 12	2.08 POOR	1.97 POOR	5/3	6/3
Enumerator 13	3.38 POOR	2.29 POOR	4/5	4/5
Enumerator 14	0.94 POOR	1.41 POOR	2/1	5/3
Enumerator 15	1.43 POOR	2.70 POOR	6/3	5/4
Enumerator 16	0.26 OK	0.27 OK	3/4	3/4
Enumerator 17	1.03 POOR	1.62 POOR	5/3	5/4
Enumerator 18	2.11 POOR	6.00 POOR	3/5	4/5
Enumerator 19	4.05 POOR	1.98 POOR	6/3	6/3
Enumerator 20	3.60 POOR	2.45 POOR	5/0	7/1

Height:

	Precision: Sum of Square [H1-H2]	Accuracy: Sum of Square [Enum.(H1+H2)-Superv.(H1+H2)]	No. +/- Precision	No. +/- Accuracy
Supervisor	0.32		7/0	
Enumerator 1	0.19 OK	2.15 POOR	2/3	1/8
Enumerator 2	0.16 OK	3.72 POOR	3/2	0/8
Enumerator 3	4.14 POOR	3.16 POOR	4/5	3/6
Enumerator 4	0.39 OK	4.43 POOR	4/1	2/6

Enumerator 5	0.01 OK	10.15 POOR	0/1	2/7
Enumerator 6	0.43 OK	0.97 POOR	5/3	4/5
Enumerator 7	0.61 OK	3.77 POOR	6/2	4/5
Enumerator 8	1.01 POOR	3.29 POOR	4/5	1/7
Enumerator 9	0.44 OK	1.36 POOR	7/2	2/7
Enumerator 10	1.04 POOR	2.90 POOR	5/4	1/7
Enumerator 11	0.47 OK	3.09 POOR	4/5	2/7
Enumerator 12	3.84 POOR	14.48 POOR	7/0	7/2
Enumerator 13	2.92 POOR	1.90 POOR	8/1	7/2
Enumerator 14	2.13 POOR	1.29 POOR	3/5	4/3
Enumerator 15	4.69 POOR	3.11 POOR	6/3	5/4
Enumerator 16	1.52 POOR	3.56 POOR	6/2	5/4
Enumerator 17	0.47 OK	3.09 POOR	5/4	2/7
Enumerator 18	2.93 POOR	10.71 POOR	6/1	7/2
Enumerator 19	4.57 POOR	3.25 POOR	9/0	8/1
Enumerator 20	2.05 POOR	5.65 POOR	7/1	8/1

MUAC:

	Precision: Sum of Square [MUAC1-MUAC2]	Accuracy: Sum of Square [Enum.(MUAC1+MUAC2)-Superv.(MUAC1+MUAC2]	No. +/- Precision	No. +/- Accuracy
Supervisor	9.85		5/3	
Enumerator 1	10.00 OK	186.85 POOR	2/2	5/4
Enumerator 2	18.00 OK	359.05 POOR	4/2	3/6
Enumerator 3	24.00 POOR	196.85 POOR	1/6	2/7
Enumerator 4	76.00 POOR	469.05 POOR	4/2	5/4
Enumerator 5	26.00 POOR	308.05 POOR	4/3	1/8
Enumerator 6	19.00 OK	401.65 POOR	5/2	2/7
Enumerator 7	18.00 OK	255.45 POOR	4/5	2/7
Enumerator 8	17.00 OK	2226.05 POOR	4/2	4/5
Enumerator 9	18.00 OK	255.45 POOR	4/5	2/7
Enumerator 10	18.00 OK	2029.25 POOR	7/2	5/4
Enumerator 11	26.00 POOR	1880.25 POOR	4/3	6/3
Enumerator 12	267.00 POOR	473.05 POOR	8/1	7/2
Enumerator 13	170.00 POOR	363.25 POOR	6/3	5/4
Enumerator 14	119.00 POOR	164.45 POOR	4/5	4/5
Enumerator 15	43.00 POOR	296.45 POOR	3/6	2/7
Enumerator 16	15.00 OK	2022.25 POOR	3/6	7/2
Enumerator 17	25.00 POOR	1878.65 POOR	3/3	6/3
Enumerator 18	120.00 POOR	618.65 POOR	7/2	6/3
Enumerator 19	67.00 POOR	287.85 POOR	4/3	5/4
Enumerator 20	24.00 POOR	152.25 POOR	3/4	3/6

For evaluating the enumerators the precision and the accuracy of their measurements is calculated.
For precision the sum of the square of the differences for the double measurements is calculated. This value should be less than two times the precision value of the supervisor.
For the accuracy the sum of the square of the differences between the enumerator values (weight1+weight2) and the supervisor values (weight1+weight2) is calculated. This value should be less than three times the precision value of the supervisor.
To check for systematic errors of the enumerators the number of positive and negative deviations can be used.

5. References

- WHO 2000 thresholds (< 5 % acceptable, 5-9 % poor, 10-14 % serious, > 15 % critical**).**
- WHO emergency threshold of 2/10,000/day and 4/10,000/day respectively.
- Adopted from WFP *(Kabul Informal Settlement (KIS) Winter Needs Assessment FINAL REPORT ON FOOD SECURITY, December 8th, 2015)*
- Care international IYCF calculator, based on WHO, 2010.
- National Nutrition Survey of Afghanistan, UNICEF, 2013.
- Farah SMART survey March 2017
- CSO: updated population 1396 (2016-2017)
- WHO standard 2008