AFGHANISTAN

Integrated Nutrition, Mortality, IYCF, FSL and WASH SMART Survey

Final Report

Parwan Province, Afghanistan

03rd – 11th February 2020

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Abbreviation

ACF/AAH	Action Contre la Faim / Action Against Hunger
AIM-TWG	Assessment and Information Management Technical Working Group
ARDHO	Afghanistan Research Development and Health Organization
BPHS	Basic Package of Health Services
BSU	Basic Sampling Unit
CBA	Child-Bearing Age Women
CDR	Crude Death Rate
EASO	European Asylum Support Office
ECHO	European Commission for Humanitarian Aid
ENA	Emergency Nutrition Assessment
EPI	Expanded Program on Immunization
FCS	Food Consumption Score
GAM	Global Acute Malnutrition
HAZ	Height for Age Z-score
HHs	Households
ICRC	International Red Crescent Committee
IDPs	Internally Displaced People
IMNCI	Integrated Management of Neonatal and Childhood illness
IPC	Integrated Food Insecurity Phase Classification
IYCF	Infant and Young Child Feeding
M&EHIS	Monitoring and Evaluation - Health Information System
MCH	Maternal and Child Health
MM	Millimetre
MOPH	Ministry of Public Health
MUAC	Mid-Upper Arm Circumference
MW	Mean Weight
NSIA	National Statistics and Information Authorities
OPD-MAM	Outpatient Department for Moderate Acute Malnutrition
OPD-SAM	Outpatient Department for Severe Acute Malnutrition
OW	Observed Weight
PLW	Pregnant and Lactating Women
PND	Public Nutrition Directorate
PNO	Public Nutrition Officer
PPHD	Provincial Public Health Directorate
PPS	Probability Proportional to Size
PSS	Psychosocial Support
PSU	Primary Sampling Unit
RC	Reserve Cluster
rCSI	Reduced Coping Strategy Index
RRT	Rapid Response Teams
SAM	Severe Acute Malnutrition
SD	Standard Deviation
SMART	Standardized Monitoring and Assessment of Relief and Transitions
U5DR	Under-five Death Rate
UNICEF	United Nations Children's Fund
WASH	Water Sanitation and Hygiene
WAZ	Weight for Age Z-score
WFP	World Food Program
WHO	World Health Organization
WHZ	Weight for Height Z score

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1. EXECUTIVE SUMMARY

Parwan is one of the 34 provinces of Afghanistan, located in the north of the capital Kabul. It is the access strip connecting the central and eastern provinces to the northern highlands and through that to the Central Asian countries. The survey design was a cross-sectional population-representative survey following the Standardized Monitoring and Assessment of Relief and Transitions (SMART) methodology. The survey applied two-stage cluster sampling using the SMART methodology based on probability proportional to size (PPS). Stage one sampling involved the sampling of the Villages/clusters to be included in the survey while the second stage sampling involved the selection of the households from the sampled clusters. The smallest geographical unit in Parwan defined as a cluster is basically a village. A total of 487 children aged 0-59 months were assessed and among them, 456 were 6-59 months old. The data collection took place from 03rd February to 11th February, 2020 which at the end of the winter season in Afghanistan. Out of 440 households planned, 423 were successfully assessed.

The survey results indicated a Global Acute Malnutrition (GAM) rate for children 6-59 months old based on WHZ is 8.1% (5.8 – 11.2 95% C.I.). The results also indicated a very high rate of chronic malnutrition of 33.1% (29.3 – 37.1 95% C.I.). The results for wasted pregnant & lactating women based on MUAC (<230 mm) were 20.6%.

The final report presents the analysis and interpretation of the nutritional status of children under five, the nutritional status of women 15-49 years old, pregnant and lactating women (PLW), infant and young child feeding (IYCF) practices, measles's immunization coverage, water, sanitation, and hygiene (WASH) situation and retrospective mortality rates. The summary of the key findings are presented in table 1 below.

Table 1: Summary of Findings

Malnutrition prevalence – Children U5	
Indicator	Prevalence
GAM prevalence among children 6-59 months per WHZ <-2SD*	8.1 % (5.8 - 11.2 95% C.I.)
SAM prevalence among children 6-59 months per WHZ <-3SD	1.3 % (0.5 - 3.3 95% C.I.)
GAM prevalence among children 0-59 months per WHZ <-2SD	8.3 % (5.8 - 11.7 95% C.I.)
SAM prevalence among children 0-59 months per WHZ <-3SD	1.5 % (0.6 - 3.6 95% C.I.)
GAM prevalence among children 6-59 months per MUAC <125 mm	7.5 %

	(5.3 - 10.3 95% C.I.)
SAM prevalence among children 6-59 months per MUAC <115 mm	2.0 % (1.0 - 3.7 95% C.I.)
Combined GAM prevalence among children 6-59 months per WHZ <-2SD or MUAC <125mm	13.4 % (10.5 - 16.9 95% C.I.)
Combined SAM prevalence among children 6-59 months per WHZ <-3SD or MUAC <115 mm	2.9 % (1.5 - 5.2 95% C.I.)
Stunting among children 6-59 months per HAZ <-2SD (calculated with a SD of 1)	29.7 %
Underweight among children 6-59 months per WAZ <-2SD	20.7 % (16.4 - 25.7 95% C.I.)
Severe Underweight among children 6-59 months per WAZ <-3SD	4.4 % (2.8 - 6.9 95% C.I.)
Overweight among children 6-59 months per WHZ >2SD	0.4% (0.1 – 1.8 95% CI)
Severe Overweight among children 6-59 months per WHZ >3SD	0.0 (0.0 – 0.0 95% CI)

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

Nutritional status of Women 15-49 years old Women and PLW	
Indicator	Result
Malnutrition among all (CBA) women 15-49 years including PLW and Not PLW per MUAC <230mm	19.7%
Malnutrition among all pregnant and lactating women per MUAC <230mm	20.6%

Crude and Under Five Death Rate (Death/10,000/Day)	
Indicator	Result
Crude Death Rate (CDR)	0.48 (0.26-0.89)
Under five Death Rate (U5DR)	0.68 (0.21-2.11)

Infant and Young Children Feeding (IYCF) Practices	
Indicator	Result
Initiation of breastfeeding within 1 hour of birth among children 0-23 months	77.8%
Exclusive breastfeeding among infants 0-5 months	54.8%
Continued breastfeeding at 1 year among children 12-15 months	81.3%
Continued breastfeeding at 2 years among children 20-23 months	75.0%
Introduction of solid, semi-solid, or soft foods (6-8 months)	50.0%

Child Immunization	
Indicator	Result
First dose measles vaccination among children 9-59 months confirmed by vaccination card and caregiver recall.	81.1%
Second dose measles vaccination among children 18-59 months confirmed by vaccination card and caregiver recall.	77.4%

1. INTRODUCTION

The strategically situated Parwan is one of the known provinces of Afghanistan located about 64 kilometers to the north of Kabul. Parwan shares borders with Maidan Wardak, Bamyan, Baghlan, Panjshir and Kapisa provinces. Charikar is the capital city of the province.

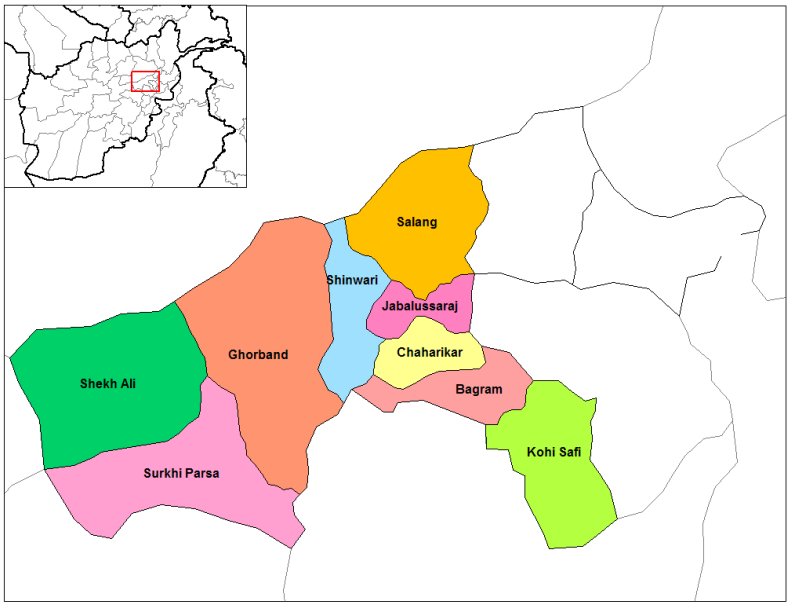

Figure 1: Parwan Province Map - Wikipedia

The province is divided into 10 districts: Bagram, Kohi Safi, Sayed Kheel, Jabal Seraj, Salang, Surkh Parsa, Shiekh Ali, Sya Gird, Shinwari and Charikar capital of the province. This province has an estimated population of 724,561[1] people and consists of a multi-ethnic population composed of Pashtun, Tajik, Uzbak, Qazilbash, Kuchi, and Hazara; the main ethnic groups living in the province are Pashtun and Tajik. Around three quarters (73%) of the population of Parwan lives in rural districts, while one quarter (27%) lives in urban areas, around 50% of the population is male and 50% is female. Dari and Pashto are the main languages spoken in the province.

According to the EASO report, Parwan is categorized in the Green Areas which means, Parwan is as one of the provinces which Afghan government has control on that, In 2019 the Parwan is considered to be relatively calm and secure but, as security conditions start deteriorating in some districts such as in Koh-e-Safi, Saydkhel, Shinwari, Siya Gird Ghorband and Surkh-e-Parsa.

a. Agriculture and Food Security

The overall farming situation in Parwan is very good, and the variety of crops grow up in the province; Most of the area is dedicated to wheat cultivation, along with grapes and other fruits and vegetables. Parwan mainly produces wheat, maize, grapes, apricots, mulberries, potatoes, garlic, onion, tomatoes, and clover. Due to the lack of food preservation facilities, farmers are not able to preserve their products to the last peak hunger period during the winter and lean-season in the spring. Most of the people with special reference women of Jabal-e-Saraj, Salang, Sayed Khel, and Bagram have expertise in making

[1] National Statistics and Information Authority – NSIA_ Update Population 1398

tomato paste, drying up tomatoes, onion and peppers and then they sell it in the open market. River valleys are prominent and crops are rain-fed around Charikar district, which includes many vineyards and gardens.

The majority of the territory is usable as rangeland, with some areas of intense irrigation. In Ghorband and Shinwari districts there, remains snow year-round. Related to markets, availability of land and water provide good conditions for the development of the horticulture sector. However, mechanization is still at a very low level, which may put Parwan's economic in risk.

As per the IPC report of September 2019, Parwan is one of the 11 provinces in Phase 2 of the food insecurity classification. The report states, 253,596 (35% of the local population) in Parwan province are living under stress food security situation and were likely to be in Phase 3 of IPC over the past winter (November 2019 to March 2020).

2.1. Description of the survey area

Parwan is a mountainous province with Kott-I-Baba Range in the southwest, Panjshir Range in the north; Paghman Range in the southeast. Parwan hosts the second-highest areas of Afghanistan, most of its districts and villages lay in the territories of Salang and Ghorband Valleys.

All 10 districts of the Parwan province considered safe for the fieldwork of this survey precisely, picked out in the center part of the province by the name of Charikar district except 64 villages in the Shinwari and Koh Safi districts. During the data collection period, the survey teams were able to explore all the assigned 44 clusters, collect quality Nutrition, Mortality, IYCF, FSL, and WASH data.

2.2. Demography and Economy

Parwan's capital, Charikar is the best place for trade in Afghanistan; good quality irrigated farmland and traditionally diverse agriculture with significant horticultural and livestock production made it more agricultural. Medium-sized industries, small and medium enterprises in the engineering sector and warehousing are already established and expanding. These sectors, in particular, attract investment because Parwan has the advantage of lower labor and land costs than Kabul.

Parwan is the business corridor connecting the Kabul to Baghlan and other northern provinces through Salang Pass, which is located in the peaks of the Hindukush Mountains. The highway from Kabul runs through the districts of Charikar, Jabalussaraj, and Salang to Kunduz province and the northern ports of Hairatan and Shirkhan Bandar; another highway connecting Parwan and Bamyan provinces runs through Charikar, Shinwari, Ghorband, Shekhali, and the Shibar Pass.

2.3. Health and Nutrition

Parwan is one of the three provinces[2] where the Afghan government directly provides health services. The Parwan Public Health Department has provided the Basic Package of Health Service (BPHS) for many years. Keeping in view the growing need for health services, 13 health facilities were newly established in 2019. Currently, the province has seven well-equipped hospitals (1 PH and 6 DHs) and 79 clinics (8 CHCs, 32 BHCs, 37 SHCs, 1 MHT and 1 Prison Health Center) which provide primary and secondary health care in OPD and IPD shifts. As per the available data, Charikar has an 80-bed hospital, Surkh Parsa 50 bed while the people of Kohi Safi, Bagram, Salang, and Syagerd districts get health benefits from the separate 20-bed hospitals. The tertiary hospital (Provincial Hospital) provides health facilities to the residents of Jabal-e-Saraj, Shinwari, Sayed Khil and Shaikh Ali districts in the capital city of Charikar. Besides, Action Against Hunger under the ECHO fund is deploying two Rapid Response Teams (RRTs) to Bagram and Jabal Seraj districts providing comprehensive nutrition (SAM & MAM treatment), Active community screening, IMNCI, and PSS services to the local communities in the most vulnerable and hard-to-reach areas.

In October 2016, an integrated nutrition and health SMART assessment was conducted in Parwan province. The survey revealed a GAM rate of 13.5% based on WHZ and 15.8% by MUAC cut-offs which is a serious nutrition status. The SAM prevalence by WHZ and MUAC was at 3.4% and 4.1% perspectively and 24.6% of the pregnant and lactating women were malnourished based on <230 mm MUAC cutoff.

[2] BPHS is operating by the provincial public health directorates in Parwan, Panjshir and Kapisa provinces.

2. SURVEY JUSTIFICATION

- The IPC Report (September 2019) classified Parwan province in Phase 2 of food insecurity. Based on the projections, between November 2019 and March 2020, Parwan is among the provinces likely to experience severe acute food insecurity due to the limited access to food and local markets over the winter season. Therefore, this assessment aims to assess the nutrition status of the local communities in the middle of the above-mentioned period.
- Since the implementation of the last SMART assessment in 2016, there has been no updated nutrition status data available from the Parwan province. This assessment will help capture the most recent snapshot of the nutrition status of the province and will enable the tracking of trends of malnutrition over the past four years.
- Under the ECHO fund, the Rapid Response Teams project is running in Parwan province (Jabal Seraj and Bagram Districts). Therefore, there is keen interest to assess the nutrition status of the province during the project implementation period.
- Given that Action Against Hunger has considerable years of expertise in conducting Nutrition Surveys in Afghanistan; is an active member of the AIM-TWG and lead agency for surveys and surveillance on behalf of the National Nutrition Cluster, AAH has continued to take the lead in carrying out assessments in the province diverse funding; the planned survey has ECHO financial support.

3. SURVEY OBJECTIVES

3.1 Primary objective

- The overall objective of the survey is to assess the nutrition situation of under-five children and women of childbearing age, crude and under-five retrospective death rates in Parwan province.

3.2. Specific objectives

- To estimate the prevalence of undernutrition (Stunting, Wasting, Underweight and Overweight) among children under 5 years of age.
- To estimate the Crude Death Rate (CDR) and under-five Death Rate (U5DR).
- To determine core Infant and Young Child Feeding (IYCF) practices among children aged <24 months.
- To estimate both dose measles vaccination coverage among children 9-59 months.
- To determine the nutritional status of pregnant and lactating women (PLW) as well as women of reproductive age (15-49 years) based on MUAC assessment.

- To assess Water, Sanitation, and Hygiene (WASH) proxy indicators: households level main drinking water sources and caregiver handwashing practices.
- To assess the food security situation through the Food Consumption Score (FCS) and the Reduced Coping Strategy Index (rCSI).

3. METHODOLOGY

3.1. Geographic target area and population group

This full SMART assessment targeted the whole of Parwan province. The surveyed population were children from the age of 0 to 59 months and Pregnant and Lactating Women (PLW) and Women from 15-49 years in addition to the households for WASH and Food security indicators. 64 (5.6%) inaccessible villages out of the total 1134 villages were excluded from the sampling frame due to pecks of insecurity in some areas of Shenwari and Kohi Safi districts.

3.2. Survey period

A seven days training was organized from 26th January to 02nd February 2020 and the data collection took place from 03-11th February 2020 in all 10 districts of the Parwan province.

3.3. Survey design

The survey design was cross-sectional using the SMART methodology, following two stages cluster sampling method for the province.

3.4. 4.6. Sample Size

The household sample size for this survey was determined by using ENA for SMART software version 2020 (updated 11th January 2020). The sample size used was 437 households. Tables 2, Table 3 highlights the parameters used for sample size calculation for anthropometric, and mortality surveys;

Table 2: Parameters for sample size calculation for anthropometry

Parameters for Anthropometry	Value	Assumptions Based on Context
The estimated prevalence of GAM (%)	**16.3%**	Based on, Oct 2016 shows a GAM prevalence of 13.5 % (11.1-16.3 95% CI). We used the upper confident interval for the planning stage, due the situation was expected be worsened from last year.
Desired precision	**±4.0**	As per the SMART guideline recommendation.
Design Effect	**1.3**	Based on the Parwan SMART survey, Oct 2016. Instead of 1.03, we used 1.3 to have a reasonable number of sample for the household's size.
Children to be	**464**	Minimum sample size-children aged 0-59 months in the selected

included		households were surveyed).
Average HH Size	**6**	Based on the Parwan SMART survey, Oct 2016.
% Children under five	**20.9**	Based on the Parwan SMART survey, Oct 2016.
%Non-response Households	**6**	The NNR observed in the previous SMART was very low (0.5%) because of the high acceptance of the survey by the local communities. The NNR is expected to be higher over the winter season, because cold weather, we, therefore, estimate 6% NNR.
Households to be included	**437**	A minimum number of households to be included in the survey for anthropometry results.

Table 3: Sample size calculation for mortality surveys

Parameters for Mortality	Value	Assumptions based on context
Estimated Death Rate /10,000/day	0.2	Based on the Parwan SMART survey, Oct 2016.
Desired precision /10,000/day	±0.3	As per the SMART guideline recommendation.
Design Effect	1.3	Based on the Parwan SMART survey, Oct 2016. Instead of 1.03, we used 1.3 to have a reasonable sample size for the HHS size.
Recall Period in days	90	The starting point of the recall period was 10th November 2019 (19th Aqrab 1398) (Milad Nabi – Birth Date of the Great Prophet of Islam) to the mid-point of data-collection was 7th February 2020.
Population to be included	**1,342**	The minimum number of people to be included in the survey for the mortality data.
Average HH Size	**6**	Based on the Parwan SMART survey, Oct 2016.
% Non-response Households	**6%**	The NNR observed in the previous SMART was very low (0.5%) because of the welcoming acceptance of the survey by the local communities. That the NNR was observed higher over the winter season, because cold weather, we assume a 6% NNR as a proxy for the Parwan province.
Households to be included	**238**	The minimum number of households to be included in the survey for the mortality data.

Based on the SMART methodology, between the calculated anthropometry and mortality sample sizes, the largest sample size was used for the survey. In this case, the larger sample size was 437 households. The number of households to be completed per day was determined according to the time the team could spend in the field excluding transportation, other procedures and break times. The details in table 4 below are taken into consideration when performing this calculation based on the given context:

Table 4: Household selection per daytime table

Total working time	8:00 AM to 4:00 PM (8.0 Hours (480 minutes))
Time for transportation (round trip)	120 minutes
Coordination with village elder and preparation of HH list	50 minutes
Time for a break and pray	60 minutes
The average duration of the HH interview	20 minutes
Distance from one HH to another HH	5 minutes

The above gives an average of 250 min of working time in each cluster. If on average teams spend 20 min in each HH and 5 min travelling from one HH to another, each team can comfortably reach 10 HH per day, (250/25=10HHs).

The total number of households in the sample divided by the number of households to be completed in one day to determine the number of clusters to be included in the survey. (437 HHs)/ (10HHs per cluster) =43.7 Clusters (when rounded up gives 44 clusters). Due to the result, by rounding up the final cluster into 44, for surveying 10 HHs per day the team has attempted to survey 440 HHS instead of 437 HHs accordingly.

3.5. Sampling Methodology

A two-stage cluster sampling methodology was adopted based on probability proportional to size (PPS); the villages with a large population had a higher chance of being selected than villages with a small population and vice versa. The village was the Primary Sampling Unit (PSU) while the household was the Basic Sampling Unit (BSU). The first stage involved the selection of clusters/villages from a total list of villages. A list of all updated villages was uploaded into the ENA for SMART software where PPS was applied. The list of villages/cluster was gathered from the Basic Package of Health Services (BPHS) providers in consultation with PPHD to finalize the sampling frame. Based on the latest EPI micro-plan, all insecure or inaccessible villages were identified and systematically excluded from the final sampling

frame; the final list consisted of 1134 out of 1198 villages (64 inaccessible villages were excluded). The clusters generated using the ENA software version included 5 Reserve Clusters (RCs). Reserve clusters were planned to be surveyed only if 10% or more clusters were not possible to be surveyed.

Based on the estimated time to travel to the survey area, select and survey the households, it was estimated that each team could effectively survey 10 HHs per day. (437/10=43.7 clusters, rounded up to 44 Clusters). In each selected village, one or more community member(s) was asked to help the survey teams to conduct the survey by providing information about the village with regard to the geographical organization or the number of households. In cases of large villages or semi-urban zones/small cities in a cluster, the village/zones were divided into smaller segments and a segment selected randomly (if similar in size) or using PPS to represent the cluster. This division was done based on existing administrative units e.g. neighborhoods, streets, or natural landmarks like a river, road, mountains or public places like schools, and masjid.

The second stage involved in the random selection of households from a complete and updated list of households. This was conducted at the field level. The **Household definition** adopted was; a group of people living under the same roof and sharing food from the same pot. In households with multiple wives, those living and eating in different houses were considered as separate HHs.

3.5.1. Field Procedures

Stage 2: selection of households:

The survey covered 423 households (44 clusters), and each team was responsible to effectively cover 10 households per day per cluster. Households were chosen within each cluster using systematic random sampling as described below. A total of 6 teams were engaged during the assessments, while data collection was conducted in 8 days.

On arrival at the Chief/Malik:

The survey team introduced themselves and the objective of the survey to the Chief/Malik leader.

- In collaboration with the Chief/Malik leader, the team prepared a list of all households in the cluster. Abandoned absent households were not listed/excluded.
- The required number of households were selected using systematic random sampling.
- The sampling interval was determined by:

$$\text{Sampling interval} = \frac{\text{Total number of sampling units in the population}}{\text{Number of sampling units in the sample (10)}}$$

Equation 1: Sampling Interval

Every household was asked to consent before any data was collected. All children 0 to 59 months living in the selected house was included for anthropometric measurements, including twins and orphans or

unrelated children living with the household. Children aged less than 24 months were included for the IYCF assessment. If a child of a surveyed household was absent due to enrolment in an IPD treatment center at the time the household was surveyed, teams were not visited any treatment center to measure the child. Households without children were still assessed for household-level questions (PLW nutritional status, WASH, food security, mortality).

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

3.6. Indicators: Definition, Calculation, and Interpretation

3.6.1. Overview of Indicators

The anthropometric indicators assessed by this survey and the corresponding target population are presented in Table 5 below.

Table 5: Standardized Integrated SMART Indicators

Indicator	Target Population
Anthropometry	
Acute Malnutrition by WHZ and/or Oedema	Children 0-59 and 6-59 months
Acute Malnutrition by MUAC and/or Oedema	Children 6-59 months
Acute Malnutrition by Combined Criteria (WHZ and/or MUAC and/or Oedema)	
Chronic Malnutrition by HAZ	
Underweight by WAZ	
Overweight by WHZ	
Mortality	
Crude Mortality Rate (CDR)	Entire population
Under Five Death Rate (U5DR)	Children under five
IYCF	
Early Initiation of Breastfeeding	Children <24 months
Exclusive Breastfeeding (EBF)	Infants 0-5 months
Continued Breastfeeding at 1 Year	Children 12-15 months
Continued Breastfeeding at 2 Years	Children 20-23 months
Health	

Measles Vaccination (First Dose and Second Dose)	Children 9-59 months
Women of Reproductive Age & PLW	
Nutritional Status of PLW by MUAC	Women (15-49 years) and PLW

3.6.2. Anthropometric, Immunization and IYCF Indicators

Age

Age was recorded among children 0-59 months as of the date of birth (Year/Month/Day) according to the Solar Calendar in the field, and later on, was converted to the Gregorian Calendar for analysis. The exact date of birth was recorded only if the information was confirmed by supportive documents, such as vaccination card or birth certificate. Where the above-mentioned documents were unavailable or questionable, age was estimated using a local calendar of events and recorded in months. In this assessment, the survey teams equally relied on the utilization of the event calendar and deriving the birth date from vaccination cards and/or birth certificate.

Weight

Weight was recorded among children 0-59 months in Kg to the nearest 0.1 kg using an electronic ADE scale with the 2-in-1 (mother/child) weighing function. Children who could easily stand up were weighed on their own. When children could not stand independently, the 2-in-1 weighing method was applied with the help of a caregiver. Two team members worked in unison to take the measurements of each child.

Height

Height was recorded among children 0-59 months in cm to the nearest 0.1 cm. A height board was used to measure bareheaded and barefoot children. Children less than two years old were measured lying down and those more than two years old were measured standing up. Two team members worked in unison to take the measurements of each child.

MUAC

MUAC was recorded among children 6-59 months[3] and women 15-49 years to the nearest mm. All subjects were measured on the left arm using standard MUAC tapes.

Oedema

The presence of oedema among children 0-59 months was recorded as “yes” or “no”. All children were checked for the presence of oedema by applying pressure with thumbs for three continuous seconds on the tops of both feet. Any suspected cases required confirmation by multiple team members, a supervisor if present, and photo-documented when possible.

[3] MUAC is not standardised for infants <6 months

3.6.3. Acute malnutrition

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

WHZ

A child's nutritional status is estimated by comparing it to the weight-for-height distribution curves of the 2006 WHO growth standards reference population. The expression of the weight-for-height index as a Z-score (WHZ) compares the observed weight (OW) of the surveyed child to the mean weight (MW) of the reference population, for a child of the same height. The Z-score represents the number of standard deviations (SD) separating the observed weight from the mean weight of the reference population: WHZ = (OW - MW) / SD.
During data collection, the weight-for-height index in Z-score was calculated in the field for each child to refer malnourished cases to the appropriate center if needed. Moreover, the results were presented in Z-score using WHO reference in the final report. The classification of acute malnutrition based on WHZ is well illustrated in Table 6.

Table 6: Definition of Acute Malnutrition, Chronic Malnutrition, and Underweight according to WHO Reference 2006

Severity	ACUTE MALNUTRITION (WHZ)	CHRONIC MALNUTRITION (HAZ)	UNDERWEIGHT (WAZ)	Overweight (WHZ)
GLOBAL	<-2 z-score and/or oedema	<-2 z-score	<-2 z-score	>2 z-score
MODERATE	<-2 z-score and ≥ -3 z-score	<-2 z-score and ≥ -3 z-score	<-2 z-score and ≥ -3 z-score	<3 z-score and >2 z-score
SEVERE	<-3 z-score and/or oedema	<-3 z-score	<-3 z-score	>3 z-score

MUAC

The mid-upper arm circumference does not need to be related to any other anthropometric measurement. It is a reliable indicator of the muscular status of the child and is mainly used to identify children with a risk of mortality. The MUAC is an indicator of malnutrition only for children greater or equal to 6 months. Table 7 provides the cut-off criteria for categorizing acute malnutrition cases.

Table 7: WHO Definition of Acute Malnutrition According to Cut-off Values for MUAC

Severity	MUAC (mm)
GLOBAL	<125 (and/or oedema)
MODERATE	≥ 115 and < 125
SEVERE	<115 (and/or oedema)

3.6.4. Oedema

Nutritional bilateral pitting Oedema is a sign of Kwashiorkor, one of the major clinical forms of severe acute malnutrition. When associated with Marasmus (severe wasting), it is called Marasmic-Kwashiorkor. Children with bilateral Oedema are automatically categorized as being severely malnourished, regardless of their weight-for-height index.

3.6.5. Combined GAM

In Afghanistan, but also at a worldwide level, it has been demonstrated that there is a large discrepancy between the prevalence of GAM by WHZ and GAM by MUAC. Therefore, Action Against Hunger routinely reports the prevalence of GAM by WHZ *or* MUAC as "combined GAM" among children 6-59 months. Combined GAM considers the cut-offs of both WHZ<-2 SD score and MUAC<125 mm and Presence of Oedema.

3.6.6. Chronic malnutrition

Chronic malnutrition is the physical manifestation of longer-term malnutrition which retards growth. Also known as stunting, it reflects the failure to achieve one's optimal height. In children 6-59 months, chronic malnutrition is estimated using the Height-for-Age z-score (HAZ).

HAZ is calculated using ENA Software for SMART by comparing the observed height of a selected child to the mean height of children from the reference population for a given age. When using HAZ, the distribution of the sample is compared against the 2006 WHO reference population. Global chronic malnutrition is the sum of moderate and severe chronic malnutrition.

3.6.7. 5.4. Underweight

Underweight is the physical manifestation of both acute malnutrition and chronic malnutrition. In children 6-59 months, underweight is estimated using Weight-for-Age (WAZ) z-score. WAZ is calculated using ENA Software for SMART by comparing the observed weight of a selected child to the mean weight of children from the reference population for a given age. When using WAZ, the distribution of the sample is compared against the 2006 WHO reference population. Global underweight is the sum of moderate and severe underweight. WAZ cut-offs are presented in Table 8 below.

The prevalence of malnutrition as identified by WHZ, HAZ and WAZ have also been classified by the WHO in terms of severity of public health significance. The thresholds are presented in table 8 below.

Table 8: Classification for Severity of Malnutrition by Prevalence among Children Under-Five

LABELS	PREVALENCE THRESHOLDS (%)			
	WASTING	OVERWEIGHT	STUNTING	UNDERWEIGHT[4]
Very low	<2.5	<2.5	<2.5	
Low	2.5-<5	2.5-<5	2.5-<10	<10
Medium	5-<10	5-<10	10-<20	10-19.9
High	10-<15	10-<15	20-<30	20-29.9
Very high	≥15	≥15	≥30	≥30

3.6.8. The proportion of acutely malnourished children enrolled in or referred to a Program

All children 6-59 months identified as severely acutely malnourished by MUAC and WHZ during the data collection were assessed for current enrolment status. All malnourished children not enrolled in a treatment program were referred to the nearest nutrition program if possible.

3.7. Malnutrition prevalence among women 15-49 years based on MUAC criterion

3.8. All women 15-49 years, including PLW, were assessed for nutritional status based on MUAC measurement. Low MUAC was defined as MUAC <230mm**Retrospective mortality**

Demography and mortality were assessed for all households, regardless of the presence of children. All members of the household were counted according to the household definition.

CDR refers to the number of persons in the total population that died over the mortality recall period (90 days). It is calculated by ENA Software for SMART using the following formula:

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

Equation 2: Crude Mortality Rate

U5DR refers to the number of children under five years that die over the same mortality recall period.

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

Equation 3: Under 5 Death Rate

[4] WHO threshold

3.9. IYCF indicators

3.9.1. Timely initiation of breastfeeding

Calculated as the proportion of children born in the last 24 months who were put to the breast within one hour of birth. Based on caregiver recall.

3.9.2. Exclusive Breastfeeding

Calculated as the proportion of infants 0-5 months who were fed exclusively with breast milk in the last day or night. This indicator aims to identify if breastmilk is being displaced by other liquids or foods before the infant reaches six months of age. Based on caregiver recall.

3.9.3. Continued Breastfeeding at 1 Year

Calculated as the proportion of children 12–15 months who were fed with breast milk in the past day or night. Based on caregiver recall.

3.9.4. Continued Breastfeeding at 2 Years

Calculated as the proportion of children 20–23 months who were fed with breast milk in the past day or night. Based on caregiver recall.

3.10. Measles Vaccination Coverage, first and second doses

Calculated as the proportion of children 9-59 months who received the first and second of the measles vaccine. Assessed based on vaccination card or caregiver recall. As part of the Expanded Program on Immunization (EPI), the first dose of measles immunization is given to infants aged between 9 to 18 months, and the second given at 18 months. As this is first and second vaccination dose given to a child 9-59 months as per the recommended immunization schedule, the second dose measles coverage indicator can also be used as a proxy for overall immunization status and access to healthcare.

4. ORGANIZATION OF THE SURVEY

4.1. SURVEY COORDINATION AND COLLABORATION

Survey methodology was shared with the AIM-TWG, Nutrition Small Scale Survey Steering committee for validation and presenting in the small-scale steering committee for their comments before deploying the SMART technical team to the province. Meetings were held with the respective administrative authorities on arrival by the survey team to brief them on the survey objective, methodology and procedures as well as get relevant updated information on security, access and village level population.

4.2. SURVEY TEAMS

Six teams each comprising of four members were collecting data in all the selected clusters in the province. Each team was composed of one team leader, two measures, and one interviewer. Each team will have one female surveyor to ensure acceptance of the team amongst the surveyed households, particularly for IYCF questionnaires. Each female member of the survey team was accompanied by a mahram to facilitate the work of the female data collectors at the community level. In each selected village, one or more community member (s) was asked to lead and guide the survey team within the village in locating the selected households.

4.3. TRAINING OF THE SURVEY TEAMS AND SUPERVISION

One out of four members of each survey team was a female surveyor to ensure acceptance of the team amongst the surveyed households, particularly for IYCF questionnaires and measuring the nutrition status of CBA women. Each female member of the survey team was accompanied by a mahram to facilitate the work of the female data collectors at the community level. The majority of the population speaks Pashto, Dari, Balochi, and Hazaragi languages. However, all the people were well familiar with Dari as share value for the local community. Therefore, the survey manager used Dari to conduct training. The Dari version of the questionnaires was also used. AAH technical team conducted monitoring and supportive supervision of the survey teams in some targeted villages in Parwan city, and most of all districts. Action Against Hunger technical staff remotely controlled and monitored survey teams in the field and shared productive feedbacks with teams via phone conversation.

The training took place in Charikar City, all the survey teams including supervisors and enumerators received 7-days training on the survey methodology and all its practical aspects; one Action Against Hunger technical staff facilitated the training session. A standardization test was also conducted over 1 day, each enumerator to evaluate the accuracy and the precision of the team members in taking the anthropometric measurements measured 10 children.

Additionally, the teams had conducted a one-day field test to evaluate their work in real field conditions, the field test was piloted in Sofian Laghmani village of Parwan city. Feedback was provided to the team regarding the results of the field test; particularly concerning digit preferences and data collection. Refresher training on anthropometric measurements and the filling of the questionnaires and the household's selection was organized on the last day of the training by Action Against Hunger to ensure overall comprehension before going to the field.

A field guidelines document with instructions including household definition and selection was provided to each team member. All documents, such as local event calendar, questionnaires, and informed consent letters were translated into Dari languages, for better understanding and to avoid direct translation during the data collection.

5. DATA ANALYSIS

The anthropometric and mortality data were analyzed using ENA for SMART software 2020 version (Updated 11th January 2020). Survey results were interpreted referencing to the WHO standards 2006; Analysis of other indicators to include IYCF and demographics was done using Microsoft Excel version 2016. Contextual information in the field and from routine monitoring was used in complementing survey findings and strengthening the analysis. Interpretation of each result was done based on the existing thresholds for different indicators as well as comparing with other available data sources at the national and provincial levels.

LIMITATION OF THE SURVEY:

In contrast to other provinces, in Parwan province a big mass of children were not caring vaccination cards, containing their exact birth date. About 71% OF children surveyed did not have proper documentation for the exact date of birth, therefore due to the lack of reliable and available documentation of birth, the teams partially relied on a local events calendar to estimate age. That may have reduced the quality of the age determination and may have biased the estimation of the stunting and underweight prevalence.

Parwan is among the safest and peaceful provinces, but it still suffers from insecurity in the Shinwari and Kohi Safi districts. And these areas were considered dangerous for survey teams in case of working and accessibility due to current insecurity. In consultation with the PPHD 64 (5.6 % of the total survey area) villages in these districts were excluded from the survey. A total list of the excluded villages is attached in Annex 3.

6. SURVEY FINDINGS

6.1. SURVEY SAMPLE & DEMOGRAPHICS

Overall, the survey assessed all 44 planned clusters, 423 households, 3021 individuals, 660 women 15-49 years old, 487 children under five, and 456 children 6-59 months. Among the 440 households the survey teams attempt to survey, 17 Households were absent and/or refused to participate in the survey, resulting in a non-response rate of 3.86%. Overall, 96.13% of the planned households and 4.96% more children 6-59 months were assessed which are presented in Table 9 below.

Table 9: Proportion of household and child sample achieved

Number of Cluster Planned	No. of Cluster Surveyed	% of Cluster surveyed	Number of households planned	Number of households surveyed	Number of children 6-59 months planned	Number of children 6-59 months surveyed	% of children surveyed
44	44	100%	440	423	464	487	104.96%

The mortality questionnaire was designed to gather demographic data and capture in- and out-migration. Household demographics and movement are presented in Table 10 below. The survey findings indicate that the average household size was 7.1 persons per household (compared to 6 used at the planning stage). The total number of people surveyed in 423 households was 3021, among them 48.97% (1479) were female, 51.02% (1541) were male; the proportion of children under five was 16.8%. The observed rate of in-migration (0.11) and the out-migration (0.37) during the recall period may have been influenced by the 90 recall period days.

Table 10: Demographic data summary

Indicator	Values
Total number of clusters	44
Total number of HHs	423
Total number of HHs with children under five	291
Average household size	7.1
Female % of the population	48.97
Male % of the population	51.02
Children under five % of the population	16.8
Birth Rate	0.81
In-migration Rate (Joined)	0.11
Out-migration Rate (Left)	0.38

Households were asked for their residential status. Among the 423 households surveyed, 95.7% of the respondents were residents of the area, and 4.0% IDPs, and 0.2% nomadic (Kuchi[5]).

Table 11: Household residential status by the proportion

Residential Status of Households N= 423	Resident	405	95.7%
	IDP	17	4.0%
	Refugee	0	0.0%
	Returnee	0	0.0%
	Nomad	1	0.2%

As the age and sex of all household members were assessed, it was possible to disaggregate the population by sex and five-year age interval, as presented in Figure 2 below. The pyramid is wide at the base and narrows towards the apex, indicating a generally youthful population.

The surveyed sample of children 6-59 months was 456. The distribution as disaggregated by age and sex are presented in Table 12 below. The overall sex ratio (male/female) 0.9, indicating a sample with almost equally represented of boys and girls. The exact birth date was not determined for 71.0% of the children as only 29.0% of the surveyed children had documentation of evidence their exact date of birth. This may have reduced the quality of the age determination, and therefore may have affect the estimation of the stunting and underweight prevalence as well.

[5] Kuchi is a local term refers to Nomad.

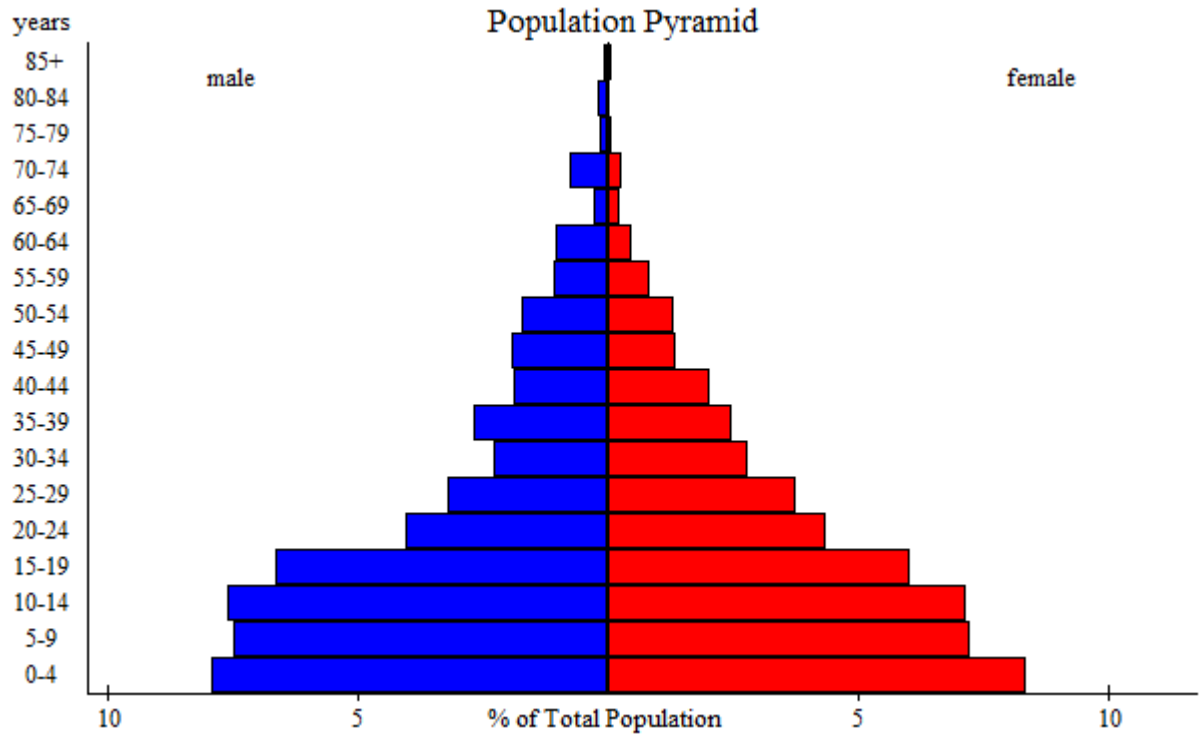

Figure 2: Parwan Province Population Pyramid.

Table 12: Distribution of Age and Sex among Children 6-59 months

	Boys		Girls		Total		Ratio
AGE (Months)	no.	%	no.	%	no.	%	Boy: girl
6-17	52	44.8	64	55.2	116	25.4	0.8
18-29	46	51.7	43	48.3	89	19.5	1.1
30-41	50	50.5	49	49.5	99	21.7	1.0
42-53	52	46.8	59	53.2	111	24.3	0.9
54-59	20	48.8	21	51.2	41	9.0	1.0
Total	220	48.2	236	51.8	456	100.0	0.9

DATA QUALITY

Eleven children were excluded from WHZ analysis per SMART flags[6], resulting in an overall percentage of flagged data of 2.4% and categorized as excellent by the ENA Plausibility Check. The standard deviation, design effect, missing values, and flagged values are listed for WHZ, HAZ, and WAZ in Table 13 below. The SD of WHZ was 1.02, the SD of HAZ was 1.24, and the SD of WAZ was 1.07. All WHZ, HAZ, and WAZ met the normal range (0.8 and 1.2) indicating an adequate distribution of data around the mean and data of good quality. The overall ENA

Plausibility Check score was 10%, which is considered a survey of good quality. However, there is an almost equal number of younger children (6-39m) compared to the older children aged 30-59 months with a ratio of 0.82 (p-value = 0.671). In most nutrition surveys, the younger children are over-represented compared to the older age group; this could be among other things the older children being in school or running errands outside homes. Some digit preference also observed for children age data, especially whose exact date of births were not available. A summary of the Parwan ENA Plausibility Check report is presented in Annex 4. The full plausibility report can be generated from the ENA dataset.

Table 13: Mean Z-scores, Design Effects, Missing and Out-of-Range Data of Anthropometric Indicators among Children 6-59 Months

Indicator	N	Mean z-scores ± SD	Design effect (z-score < -2)	Z-scores not available*	Z-scores out of range
Weight-for-Height*	444	-0.38±1.02	1.09	1	11
Weight-for-Age*	450	-1.08±1.07	1.43	1	5
Height-for-Age	432	-1.47±1.24	1.00	0	24

*one oedema case in the survey

6.2. Prevalence of Acute Malnutrition

6.2.1. Acute Malnutrition by WHZ

The prevalence of GAM per WHZ among children 6-59 months in Parwan was 8.1% (5.8 - 11.2 95% C.I.) as presented in Table 14 below and was categorized as of medium. This prevalence seems slightly higher in boys than girls, and the difference statistically significant (P-value 0.3645). The prevalence of SAM per WHZ among children 6-59 months was 1.3 % (0.5 - 3.3 95% C.I.). According to the national prioritization cut-off points, the threshold is less than 3%.

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

Indicators	All n = 445	Boys n = 215	Girls n = 230
Prevalence of global acute malnutrition (<-2 z-score and/or oedema)	(36) 8.1 % (5.8 - 11.2 95% C.I.)	(20) 9.3 % (6.2 - 13.8 95% C.I.)	(16) 7.0 % (4.1 - 11.6 95% C.I.)
Prevalence of moderate acute malnutrition (<-2 to ≥-3 z-score)	(30) 6.7 % (4.7 - 9.5 95% C.I.)	(17) 7.9 % (5.0 - 12.3 95% C.I.)	(13) 5.7 % (3.3 - 9.6 95% C.I.)
Prevalence of severe acute malnutrition (<-3 z-score and/or oedema)	(6) 1.3 % (0.5 - 3.3 95% C.I.)	(3) 1.4 % (0.3 - 6.0 95% C.I.)	(3) 1.3 % (0.4 - 4.0 95% C.I.)

* The prevalence of oedema is 0.2 %.

The prevalence of acute malnutrition by WHZ was also assessed among children 0-59 months. The GAM per WHZ was 8.3% (5.8 – 11.7 95% CI), as presented in Table 15 below. The prevalence of SAM per WHZ among children 0-59 months was 1.5% (0.6 – 3.6 95% CI).

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

Table 15: Prevalence of Acute Malnutrition by WHZ (and/or oedema) by Severity and Sex among Children 0-59 months, WHO 2006 Reference

Indicators	All n = 472	Boys n = 228	Girls n = 244
Prevalence of global acute malnutrition (<-2 z-score and/or oedema)	(39) 8.3 % (5.8 - 11.7 95% C.I.)	(22) 9.6 % (6.3 - 14.4 95% C.I.)	(17) 7.0 % (4.2 - 11.4 95% C.I.)
Prevalence of moderate acute malnutrition (<-2 to ≥-3 z-score)	(32) 6.8 % (4.7 - 9.8 95% C.I.)	(18) 7.9 % (4.9 - 12.5 95% C.I.)	(14) 5.7 % (3.3 - 9.8 95% C.I.)
Prevalence of severe acute malnutrition (<-3 z-score and/or oedema)	(7) 1.5 % (0.6 - 3.6 95% C.I.)	(4) 1.8 % (0.4 - 6.8 95% C.I.)	(3) 1.2 % (0.4 - 3.7 95% C.I.)

* The prevalence of oedema is 0.2 %.

When disaggregated by age group, the group with the highest MAM and SAM was 6-17 months, as presented in Table 16 below. The age group with the lowest MAM was 42-53 months and there was no SAM case in the age group of 18-29 months. Results of this disaggregation suggest that both younger age groups (6-29) and older groups (30-59) are vulnerable to develop acute malnutrition according to WHZ criterion (p-value 0.138).

Table 16: Prevalence of Acute Malnutrition per WHZ Severity and Age Group of 6-59 months

Age (months)	N	Severe wasting* (WHZ <-3)		Moderate wasting (WHZ ≥-3 to <-2)		Normal (WHZ ≥-2)		Oedema	
		N	%	N	%	N	%	n	%
6-17	114	1	0.9	9	7.9	104	91.2	0	0.0
18-29	87	0	0.0	10	11.5	77	88.5	0	0.0
30-41	96	1	1.0	4	4.2	91	94.8	0	0.0
42-53	109	2	1.8	4	3.7	102	93.6	1	0.9
54-59	39	1	2.6	3	7.7	35	89.7	0	0.0
Total	445	5	1.1	30	6.7	409	91.9	1	0.2

*There was 1 oedema cases in the sample

The WHZ distribution curve (in red) as compared to the WHO 2006 reference WHZ distribution curve (in green) and as presented in Figure 4 below demonstrates a shift to the left, suggesting a malnourished population. Figure 3 illustrates the mean WHZ for age categories and more affected children were 18-29 months.

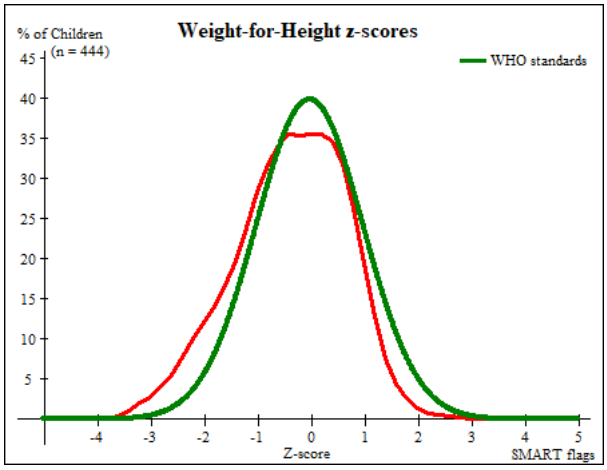

Figure 4: Distribution of WHZ Sample Compared to the WHO 2006 WHZ Reference Curve

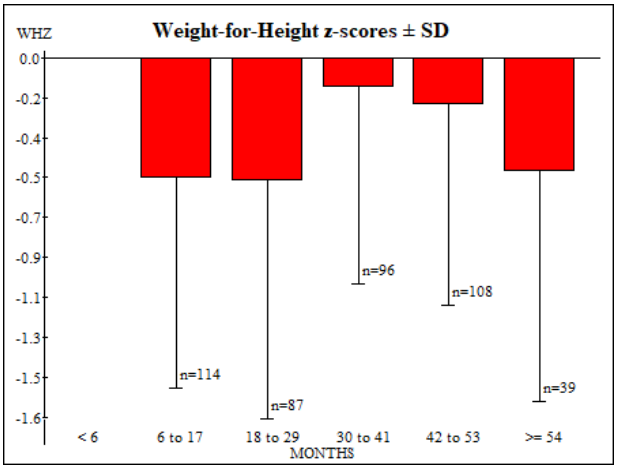

Figure 3: Means WHZ by age groups

6.2.2. Acute malnutrition by MUAC

The prevalence of GAM per MUAC among children 6-59 months in Parwan was 7.5 % (5.3 - 10.3 95% C.I.). The prevalence of SAM per MUAC among children 6-59 months was 2.0 % (1.0 - 3.7 95% C.I.); as presented in Table 17 below.

Table 17: Prevalence of Acute Malnutrition by MUAC (and/or oedema) by Severity and Sex among children 6-59 months

Indicators	All n = 456	Boys n = 220	Girls n = 236
Prevalence of global malnutrition (<125 mm and/or Oedema)[7]	(34) 7.5 % (5.3 - 10.3 95% C.I.)	(17) 7.7 % (4.7 - 12.4 95% C.I.)	(17) 7.2 % (4.5 - 11.3 95% C.I.)
Prevalence of moderate malnutrition (< 125 mm to ≥115 mm, no Oedema)	(25) 5.5 % (3.5 - 8.5 95% C.I.)	(14) 6.4 % (3.6 - 11.1 95% C.I.)	(11) 4.7 % (2.6 - 8.2 95% C.I.)
Prevalence of severe malnutrition (< 115 mm and/or Oedema)	(9) 2.0 % (1.0 - 3.7 95% C.I.)	(3) 1.4 % (0.3 - 5.5 95% C.I.)	(6) 2.5 % (1.2 - 5.3 95% C.I.)

* The prevalence of oedema is 0.2 %.

When disaggregated by age group, 6-17 months had the highest MAM and SAM, Table 18 shows the older age groups 42-53 and 54-59 months had no SAM cases. The younger age groups (6-29) were statistically more vulnerable to acute malnutrition compared to older groups (30-59) as per the MUAC criteria (p-value < 0.05).

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

Age (months)	N	Severe wasting* (MUAC<115 mm)		Moderate wasting (MUAC ≥115 mm and <125 mm)		Normal (MUAC ≥125 mm)		Oedema	
		N	%	N	%	N	%	n	%
6-17	116	8	6.9	12	10.3	96	82.8	0	0.0
18-29	89	0	0.0	5	5.6	84	94.4	0	0.0
30-41	99	0	0.0	3	3.0	96	97.0	0	0.0
42-53	111	0	0.0	4	3.6	107	96.4	1	0.9
54-59	41	0	0.0	1	2.4	40	97.6	0	0.0
Total	456	8	1.8	25	5.5	423	92.8	1	0.2

*There was 1 oedema case in the sample.

6.2.3. Acute Malnutrition by Oedema

No Oedema case was observed in the sample. Table 19 below illustrates data for the presence and absence of oedema cases.

Table 19: Distribution of Severe Acute Malnutrition per Oedema among Children 6-59 Months

	WHZ <-3	WHZ>=-3
Presence of Oedema*	Marasmic kwashiorkor. 0 (0.0 %)	Kwashiorkor. 1 (0.2 %)
Absence of Oedema	Marasmic No. 9(2.0 %)	Not severely malnourished. 446 (97.8 %)

*There was one oedema case in the sample

6.2.4. Combined Acute Malnutrition by WHZ and/or MUAC and/or Oedema

The prevalence of Combined GAM & SAM among children 6-59 months in Parwan was 13.4% and 2.9% respectively. Although there is not globally established threshold for Combined GAM, the GAM and SAM prevalence was slightly higher than for WHZ or MUAC separately, confirming that MUAC and WHZ are independent indicators for malnutrition. Table 20, below illustrates the results for combine GAM and combine SAM.

Table 20: Prevalence of Combine Acute Malnutrition by WHZ and/or MUAC and/or Oedema by Severity and Sex among Children 6-59 months

Indicators	All n = 456	Boys n = 220	Girls n = 236
Prevalence of Global Acute Malnutrition (MUAC<125 mm and/or WHZ<-2SD and/or Oedema)	(61) 13.4 % (10.5 - 16.9 95% C.I.)	(32) 14.5 % (10.6 - 19.7 95% C.I.)	(29) 12.3 % (8.6 - 17.3 95% C.I.)
Prevalence of Severe Acute Malnutrition (MUAC<115 mm+ and/or WHZ<-3SD and/or Oedema)	(13) 2.9 % (1.5 - 5.2 95% C.I.)	(6) 2.7 % (1.0 - 7.1 95% C.I.)	(7) 3.0 % (1.5 - 5.8 95% C.I.)

*There was 1 oedema case in the sample

To have better understanding of the combine GAM and SAM results, Table 21 illustrates the detailed number of combined GAM and SAM, and the number of children concurrently malnourished by both WHZ and MUAC.

Table 21: Detailed number for combined GAM and SAM

	GAM		SAM	
	no.	**%**	**no.**	**%**
MUAC	25	5.5	7	1.5
WHZ	27	5.9	4	0.9
Both	8	1.8	1	0.2
Oedema	1	0.2	1	0.2
Total	**61**	**13.4**	**13**	**2.9**

6.2.5. Enrolment in nutrition program: OPD/IPD for SAM/MAM cases

The proportion of children identified as acutely malnourished by MUAC and Oedema only and their corresponding treatment enrolment status are presented in Table 22 below.

Overall, out of 35 children 6-59 months old identified as acutely malnourished by MUAC and Oedema by the teams in the field, 27 were MAM cases and 8 were SAM cases. The proxy program coverage for all malnourished cases was 71.4%. 10 (28.5%) out of 35 children identified as malnourished were not in any program and were referred to as the appropriate program in their neighbourhood.

Table 22: Proportion of Acutely Malnourished Children 6-59 Months enrolled in a Treatment Program

Sample	Enrolled in an OPD SAM	Enrolled in an OPD MAM	Enrolled in an IPD SAM	Not Enrolled/Referred
Acutely malnourished children 6-59 months by MUAC and Oedema (N=35)	7	18	0	10

6.3. Prevalence of Chronic Malnutrition

In Parwan, a large number of children under the age of five did not have a real birth date. And survey teams used a local event calendar to determine the age of children under five. One of the limitations of using a local event calendar is that it cannot specify the exact date of birth, but it can estimate the child's month of birth. Such a data plays a crucial role in lowering data quality for the stunting prevalence. For this reason we report the stunting results within the standard deviation of 1. The stunting prevalence with 1 SD was 29.7%.

6.4. Prevalence of Underweight

The prevalence of underweight per WAZ among children 6-59 months in Parwan was 20.7%, as presented in Table 23 below. The prevalence of severe underweight per WAZ among children 6-59

months was 4.4%. According to WHO severity thresholds[8], prevalence falls under medium categorization.

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

Indicators	All n = 597	Boys n = 315	Girls n = 282
Prevalence of underweight (WAZ <-2 SD)	(93) 20.7 % (16.4 - 25.7 95% C.I.)	(54) 24.8 % (18.8 - 31.9 95% C.I.)	(39) 16.8 % (12.6 - 22.1 95% C.I.)
Prevalence of moderate underweight (WAZ <-2 and >=-3 SD)	(73) 16.2 % (12.7 - 20.5 95% C.I.)	(43) 19.7 % (14.7 - 25.9 95% C.I.)	(30) 12.9 % (9.1 - 18.0 95% C.I.)
Prevalence of severe underweight (WAZ <-3SD)	(20) 4.4 % (2.8 - 6.9 95% C.I.)	(11) 5.0 % (2.8 - 9.0 95% C.I.)	(9) 3.9 % (1.9 - 7.6 95% C.I.)

When disaggregated by age group, the age group with the highest severe underweight was 18-29 months, as presented in Table 24 below. The age groups with the lowest severe underweight were in 6-17, 30-41 and 42-53 months.

[8] <10 low, 10-<20 medium, 20-<30 high and ≥Very high

Table 24: Prevalence of Underweight per WAZ by Severity and Age Group

Age (months)	N	Severe underweight (WAZ <-3)		Moderate underweight (WAZ ≥-3 to <-2)		Normal (WHZ ≥-2)	
		n	%	n	%	N	%
6-17	115	2	1.7	13	11.3	100	87.0
18-29	88	8	9.1	22	25.0	58	65.9
30-41	97	3	3.1	15	15.5	79	81.4
42-53	109	5	4.6	17	15.6	87	79.8
54-59	41	2	4.9	6	14.6	33	80.5
Total	450	20	4.4	73	16.2	357	79.3

The WAZ distribution curve (in red) as compared to the WHO 2006 reference WAZ distribution curve (in Green) as presented in figure 6 below illustrate a shift to left, suggesting a very underweighted population in comparison to the normal population. . Further analysis suggests that linear underweight is at its highest in the group of children aged 6-17 months as shown in figure 5.

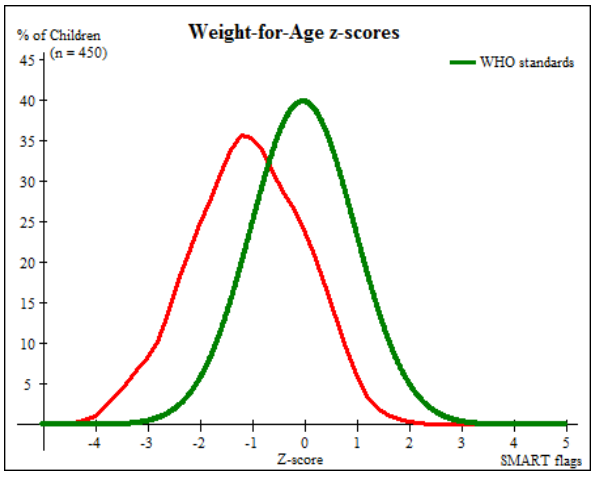

Figure 6: Distribution of WAZ Sample Compared to the WHO 2006 WAZ Reference Curve

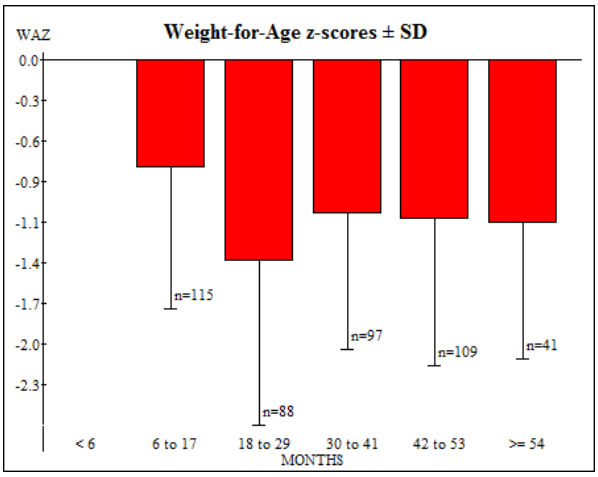

Figure 5: Mean WAZ by Age Group

6.5. Malnutrition prevalence among Women 15-49 years old based on MUAC criterion

All women of childbearing age (15-49 years) were included in the survey. A total of 660 women were assessed for nutrition status by MUAC. The analysis further disaggregating the sample by physiological status (pregnant, lactating, both); the prevalence of wasting was 19.7%; more details are presented in Table 25 below.

Table 25: Prevalence of Acute Malnutrition among Women per MUAC

Indicators	N	MUAC <230 mm	
		n	%
All women 15-49 years <230 mm	660	130	19.7%
Pregnant women <230 mm	44	10	22.7%
Lactating women <230 mm	164	31	18.9%
Both pregnant and lactating women (at the same time) <230 mm[9]	10	4	40.0%
Non-pregnant and non-lactating women <230 mm	442	85	19.2%
All PLWs <230 mm	218	45	20.6%

6.6. Retrospective Mortality

The overall death rate for the surveyed population was 0.48 (0.26-0.89) which is below the WHO emergency thresholds of 1.0/10,000/day. The death rate was slightly higher for males compared to females in the population. The age group with the highest death rate was 65-120 years, followed by the age group 0-4 years. In total, 19 deaths were recorded during the 90-day recall period in Parwan.

Table 26: Death Rate by Age and Sex with Reported Design Effect

Population	**Death Rate (/10,000/Day)**	**Design Effect**
Overall	0.48 (0.26-0.89)	1.25
By Sex		
Male	0.50 (0.25-1.03)	1.00

[9] **Women that were simultaneously pregnant and lactating*

Female	0.45 (0.18-1.13)	1.26
By Age Group (in years)		
'0-4	0.68 (0.21-2.11)	1.00
'5-11	0.00 (0.00-0.00)	1.00
'12-17	0.21 (0.03-1.63)	1.02
'18-49	0.39 (0.14-1.03)	1.00
'50-64	1.13 (0.15-8.03)	2.00
'65-120	5.01 (1.65-14.33)	1.00

Information collected about apparent causes of death showed most of the deaths attributed to illness[10] (53.8%). Figure 9 below summaries the causes of deaths.

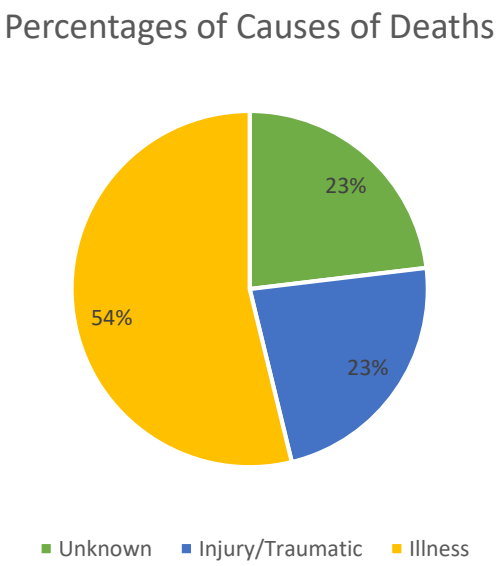

Figure 7: Percentages of causes of the deaths

[10] All kind of illnesses were calculated.

6.7. Infant and Young Child Feeding (IYCF) Practices

Indicators for IYCF practices were collected from all caregivers with children less than 24 months. 186 children under two years were included in the sample, with the core IYCF indicators assessed presented in Table 27 below. The proportion of infant's breastfed within one hour of birth was 77.5% suggesting that they likely received colostrum. Then two-thirds of the infants are fed replacements of breastmilk or other liquids or foods this critical stage when an infant should be receiving the protective benefits of exclusive breastfeeding. The proportion of children with continued breastfeeding at one year was 81.3% and at two years 75.0%.

Table 27: Infant and Young Child Feeding Practice

IYCF Indicator	Sample	N	n	Results
Timely initiation of breastfeeding	Children 0-23 months	186	134	77.8%
Exclusive breastfeeding	Infants 0-5 months	31	17	54.8%
Continued breastfeeding at one year	Children 12–15 months	32	26	81.3%
Continued breastfeeding at two years	Children 20-23 months	24	18	75.0%

While asking questions about breastfeeding practices, caregivers of infants 0-5 months were also asked the kind of liquids or soft, semi-soft, or solid foods consumed by the infant in the past day. Figure 8 below presents the liquids most frequently displacing breastmilk. Formula and other liquids (Tea) were among the highly consumed liquids/foods among the infants; this will guide the design of key messaging to guide adoption, promotion, and support of the recommended IYCF practices.

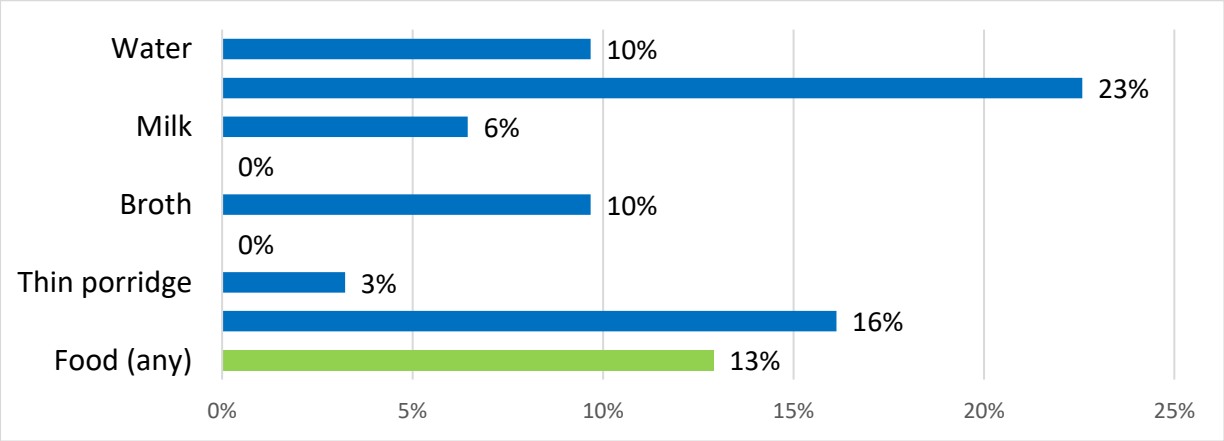

Figure 8: Liquids or Food Consumed by Infants 0-5 Months

6.8. Child Immunization Status

In Parwan, the survey results indicated that 77.4% of children 18-59 months had received the second dose measles immunization, as confirmed either by vaccination card or caregiver recall. Table 28 below illustrates data on first and second dose measles immunization coverage.

Table 28: First and Second Dose Measles Immunization Coverages among Children 9-59 Months

Response for the indicators	First Dose		Second Dose	
	Frequency	%	Frequency	%
Yes by card	110	25.9%	66	19.4%
Yes by recall	234	55.2%	197	57.9%
Yes by card *or* recall	**344**	**81.1%**	**263**	**77.4%**
No	73	17.2%	72	21.2%
Don't know	7	1.7%	5	1.5%
Total	**424**	**100%**	**340**	**100%**

6.8.1. Water, Sanitation, and Hygiene

Households were asked to identify their main source of drinking water, which was then categorized as improved or unimproved during analysis. Among all (423) households surveyed, 240 (56.7%) relied mainly on an improved water source, mostly Borehole/well with hand pump water, the remaining majority of 183 (43.3%) relied mainly on an unimproved water source, most commonly well with pond/reservior, and Unprotected springs, For more details refer to table 29.

Table 29: Household Main Drinking Water Source

Main Drinking Water Source N= 423	Frequency	%
Improved Water Source	240	56.7%
Unimproved Water Source	183	43.3%

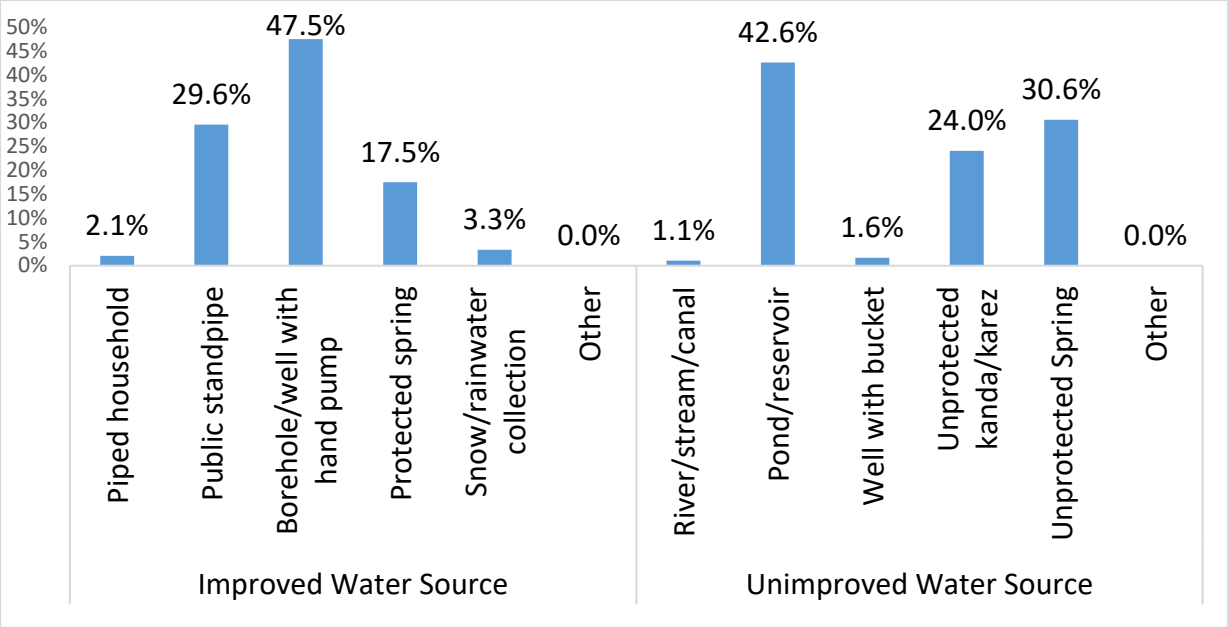

Figure 9: Household Use of Improved and Unimproved Drinking Water Sources

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

Caregivers demonstrated how they washed their hands for the interviewer. Overall, 61.5% of caregivers demonstrated washing their hands with soap/ash and water. For more details refer to table 30.

Table 30: Hand Washing Practices (Use of Soap or Ash) among Caregivers

Hand washing practices by caregivers N= 660	Frequency	%
Uses soap or ash with water	406	61.5%
Uses only water	254	38.5%
Nothing	0	0.0%
Other	0	0.0%

6.8.3. Hand Washing During Critical Moments among Caregivers

Caregiver responses about when they routinely wash their hands were assessed at five critical moments and further grouped into two categories: Hand washing after coming into contact with feces, and hand washing before coming into contact with food. Overall, 42.7% of caregivers reported washing their hands during the five critical moments that fell into these two categories, suggesting a low understanding of the importance of handwashing at these moments.

Table 27: Hand Washing Practices by Caregivers at Critical Moments

Hand washing during Five Critical Moments	N	n	Results	Critical Moments in Two Categories[11]	N	n	Results
After defecation	660	647	98.0%	Washes hands after contact with faeces	660	324	49.1%
After cleaning baby's bottom	660	332	50.3%				
Before food preparation	660	332	86.4%	Washes hands before contact with food	660	320	48.5%
Before eating	660	611	92.6%				
Before feeding or breastfeeding children	660	326	49.4%				
Reported washing hands during all five critical moments	660	282	42.7%	Reported washing hands during critical moments in both categories.	660	282	42.7%

6.8.4. Food Security

6.8.5. Food Consumption Score

In Parwan province, 9.7% of households reported consuming the frequency and quality of food groups suggesting a poor consumption score, 38.8% a borderline consumption score, and 51.5% an acceptable consumption score, as presented in Figure 10 below.

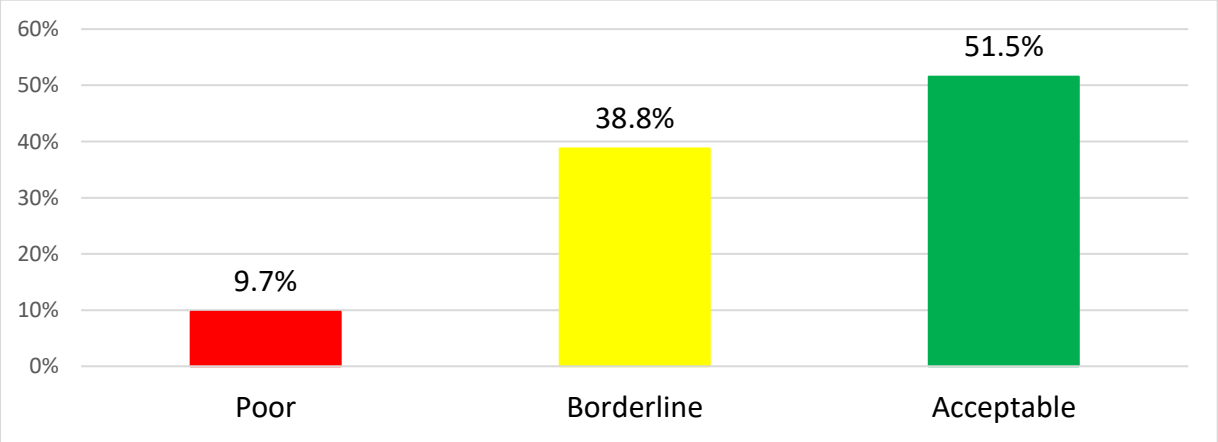

Figure 10: Household Food Consumption Score

[11] The Sphere Handbook 2018

Among surveyed households, the most frequently consumed food group was cereals and tubers (100.0%), Oil and Fats (98.8%), sugar and honey 98.6%. The least frequently consumed food group was Dairy (51.1%), as presented in Figure 11 below.

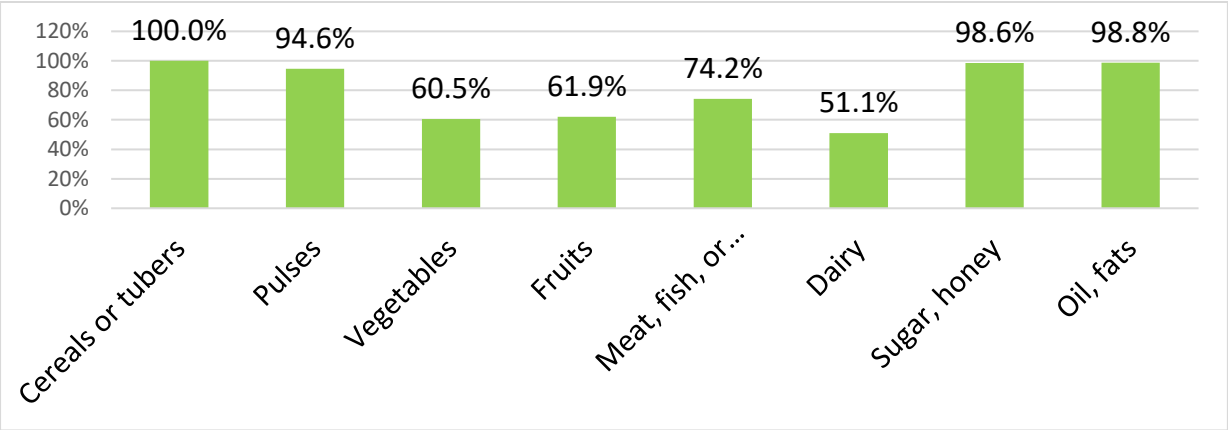

Figure 11: Frequency of Food Groups Consumed by Households

6.8.6. Reduced Coping Strategies Index

Among surveyed households, 24.1% reported not having sufficient food or money to buy food in the week prior to the survey. The most commonly reported food-related coping strategy was resorting to. Borrowed Foods 16.1%, followed by less preferred food 14.7%, or rely on restricted food for adults 5.4 %, and limited portion size 5.4% and reduced number of meals is 4.7% as presented in Table 32 below.

Table 28: Reduce Coping Strategy Index Categories

Household Coping Strategies N=423	Frequency	%
Reported insufficient food or money to buy food per 7-day recall	102	24.1%
Relying on less preferred and less expensive foods	62	14.7%
Borrowing food, or rely on help from a friend or relative	68	16.1%
Limiting portion size at mealtimes	23	5.4%
Restricting consumption by adults for small children to eat	23	5.4%
Reducing the number of meals eaten in a day	20	4.7%

Calculated and weighted as per the rCSI, it was estimated that 82.0% of households relied on none or low coping strategies, 12.5% relied on medium coping strategies, and 5.4% relied on high coping strategies, as presented in Figure 12 below.

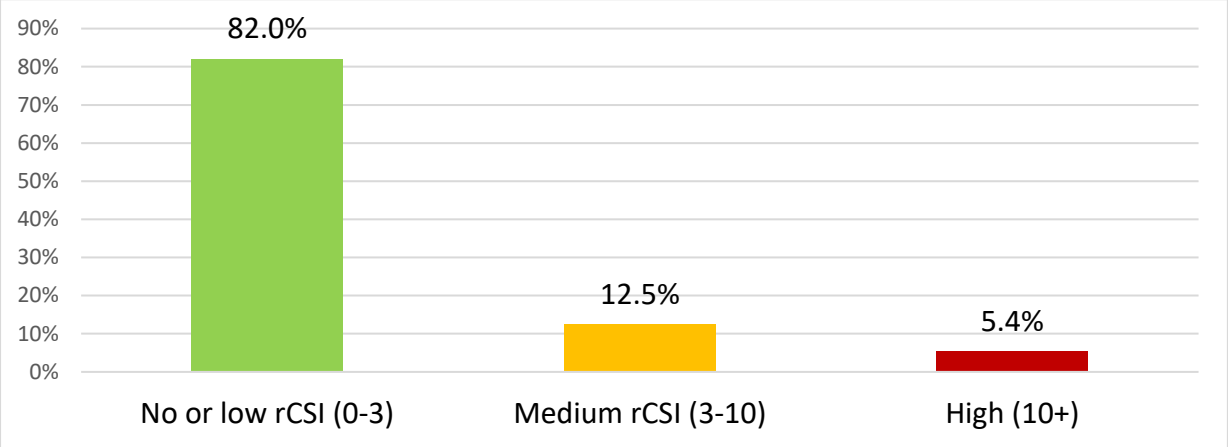

Figure 12: Household Reduced Coping Strategies Index

6.8.7. Food Security Classification

The triangulation of FCS and rCSI attempts to capture the interaction between household food consumption and coping strategies required to more appropriately reflect the food security situation in Parwan province. Based on this triangulation, 7.8% of households were classified as severely food insecure, 11.3% of households were moderately food insecure, and 80.9% of households were considered food secure, as presented in Figure 15.

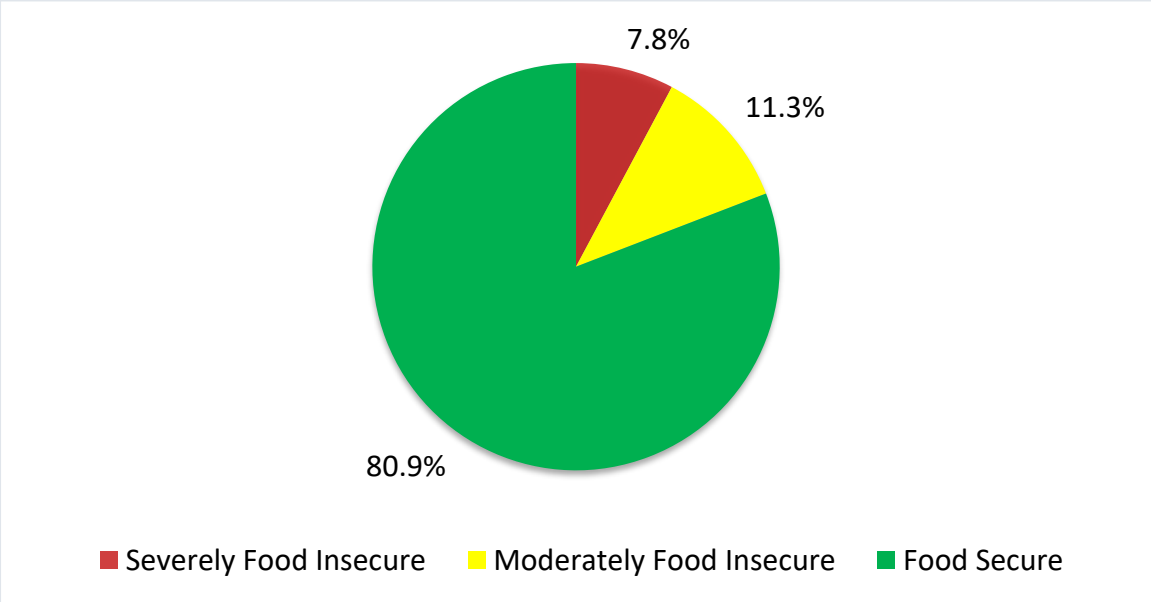

Figure 13: Food Security Classification Assessed by FCS & rSCI

7. DISCUSSION

7.1. Nutritional Status of children

This is to make clear the results of this survey are not a reflection of the national nutrition situation but are representative of the population living in all 10 districts of the Parwan province.
Interpreting the current results and comparing them with SMART 2016 findings in Parwan province, a highlighted decline is visible in the GAM rate. Overall, we can justify that the nutrition status in Parwan province is in good condition and makes optimistic hopes for an acceptable rate in the prevalence of the malnutrition in the province.

In 2016, after the publication of Parwan SMART results, an extensive, inclusive and specific nutritional interventions were implemented in Parwan province. Nutrition counsellors started working in all health centres, nutrition and health services were extended to remote villages and basic health centres through SHC, MHTs. In the past years, mobile health teams supported by the ICRC delivered services to impassable villages, and now the Action Against Hunger is covering a dozen of hard-to-reach villages in Jabal Seraj ad Bagram districts, and several new health facilities were established and equipped with nutrition services, including 13 health facilities established in 2019.

According to the 2016 SMART a GAM rate of 13.5% (11.1 - 16.3 95% C.I.) by WHZ was observed in the province, whereas, the GAM rate observed in the current survey is 8.1% (5.8 - 11.2 95% C.I.), indicating a 5.4% percent decline in the prevalence of wasting over the last four years. From this comparison, it can be concluded that the implemented community-based interventions were effective in the treatment and prevention of malnutrition through scaling-up the services and strengthen the IYCF practices. Declines are also visible in rates of chronic malnutrition, but still the stunting and underweight are the main challenges to the nutrition programs in Parwan province.

The high rate of stunting indicates a failure to achieve one's own genetic potential for height. It is a manifestation of the severe, irreversible physical and cognitive damage caused by chronic malnutrition

early in a child's life— often beginning before birth. The children who are stunted and wasted at the same time are the most vulnerable group for long-last diverse effects of malnutrition.

The combined rate informs the estimated SAM and MAM caseload in the province for better programming. All the children in the sample detected as acutely malnourished (either by MUAC or WHZ or Oedema) are reflected in this calculation according to combined criteria. To detect all acutely malnourished children eligible for treatment, the MUAC only detection is not enough according to Afghanistan IMAM Guidelines. This should be further investigated. See figure 14 in the actual acute malnutrition comparing WHZ <-2 Z-score with MUAC <125 mm and there is slightly difference respectively.

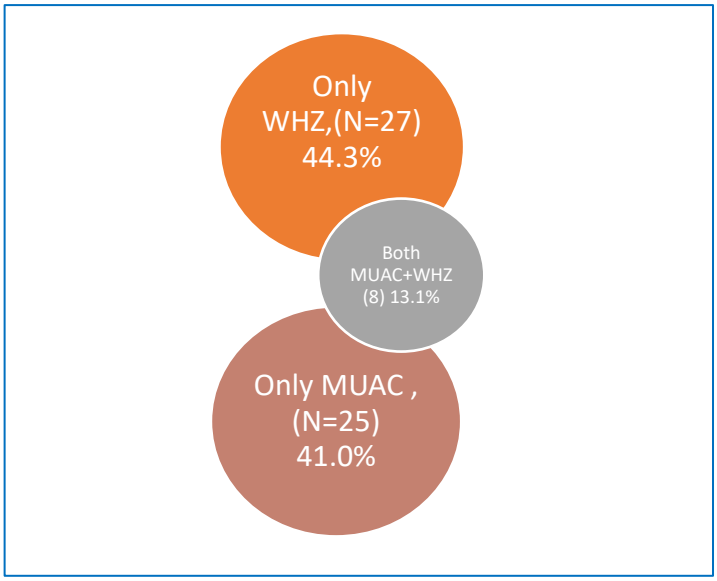

Figure 14: Overlapping WHZ and MUAC data

Maternal nutrition status typically, 21.1% of pregnant and lactating women were acutely malnourished, which shows a decline from the rates observed in 2016 (24.6%).

According to the current survey, 81.10% of the children had second dose of measles's vaccination. It is slightly low comparing to the 84.00% in 2016.

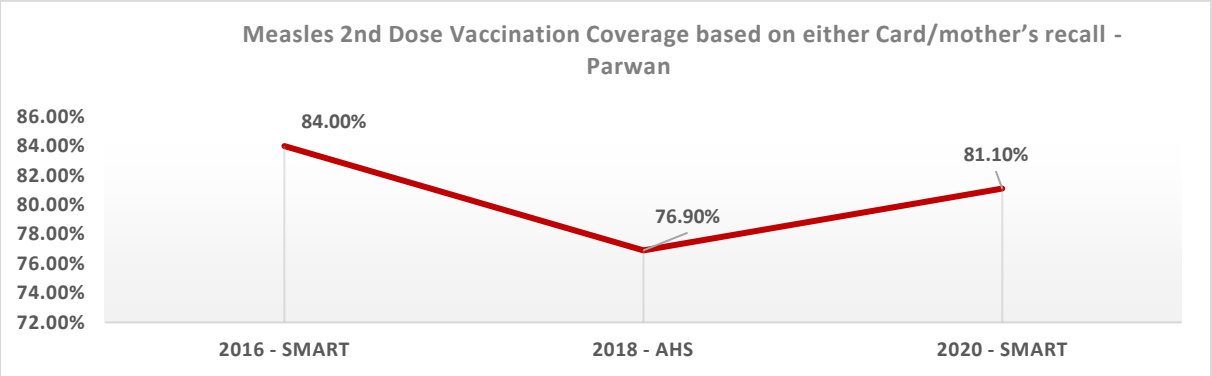

Figure 15: Measles 2nd dose vaccination coverage since 2018 – Parwan province.

8. RECOMMENDATIONS

Indicators	Recommendation	Actor	Timeline (Start date)
Child Health and Nutrition	1. Maternal undernutrition and child stunting are still high in the Parwan province, multi-sectoral interventions are needed to tackle the problem. The first 1000 days are crucial for both pregnant and lactating women and their infants and children up to two years of age. Therefore: • All the women attending the health facilities for ANC/PNA or other purposes have to be measured for acute malnutrition and to be admitted to the nutrition program. • Early Initiation to breastfeeding needs to be highly advised and strengthen for the mothers who are attending institutional deliveries, for the women who attend the health education sessions at health facilities level, and a community-level awareness raising for the traditional birth attendance (If possible). • The current survey finding shows, only 50.0% of the children 0-5 months were exclusively breastfed. Therefore, exclusive breastfeeding up to 6 months, timely introduction of complementary feeding and continuation of age-appropriate complementary feeding is highly recommended. • Implement long-term programming to facilitate behavior change at the household level in terms of maternal and child nutrition Review and strengthen IYCF programs aimed at ensuring dietary diversity of infants and feeding practices.	Ministry of Public Health (MoPH) and Parwan Provincial Public Health Directorate	Quarter 1-2, 2020

	2. Expand Nutrition services along with IMNCI and MCH services by using mobile health teams to the uncovered areas in Shenwari, Kohi-Safi and Salang [12]districts for SAM and MAM children and PLWs. 3. The survey findings show 28.5% of malnourished children in the rural context were not receiving nutrition services. Thus, we are recommending a further increase of the community screening and referral pathway from the community to HFs, active case-finding campaign through capacity building of community health workers (on job/formal training, and provision of MUAC tape and referral slips). through training of community health workers, FHAG (Family Health Action Groups) and Mother (Mother MUAC) on MUAC screening, identification of malnutrition and referrals. 4. Measles' second dose vaccination coverage shows a slight decline since 2016, moreover, it is still lower than the national target of 90.0%.		
WASH	1. Increase capacity of community members regarding WASH, conduction of WASH-related campaign, provision of IEC materials. 2. Address the hygiene practices of the communities, through using hygiene promotion activities rising soap (or adequate alternative) usage.	Ministry of Public Health (MoPH) and Parwan Provincial Public Health Directorate	Quarter 2, 2020

[12] Recommended by PPHD

9. ANNEXES

Annex 1: Standard Integrated SMART Survey Questionnaire (English)

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

Household Questionnaire

Start date/event of recall period: 90 days [Miladon Nabi **1398]**							
1	2	3	4	5	6	7	8
No.	Name	Sex (m/f)	Age (years)	Joined on or after	Left on or after	Born on or after	Died on or after
List all current household members*							
1	Head of household						
2							
3							
4							
5							
6							
7							
8							
9							
10							
11							
12							
13							
14							
15							
16							
17							
18							
19							
20							
List all household members which left since the start of the recall period							
1					Y		
2					Y		
3					Y		
4					Y		
5					Y		
Causes of died: 1= unknown , 2= Trauma/ Injury 3= Illnesses And 4= others					**Cause code**		
1							Y
2							Y

3							Y

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

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

Household Questionnaire

Q1. What is the household resident status?

1=Resident of this area
2=Internally displaced
3=Refugee
4=Nomadic

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

Child Questionnaire 0-59 months

1	2	3	4	5	6	7	8	9	10
Child ID	**Sex** (f/m)	**Birthday** (dd/mm/yyyy)	**Age** (months)	**Weight** (00.0 kg)	**Height or length** (00.0 cm)	**Measure** (l/h)*	**Bilateral edema**	**MUAC** (000 mm) *Left-arm*	**With clothes** (y/n)
1									
2									
3									
4									
5									
6									
7									
8									

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

Child (6-59 months) ID Number					
For any child that is identified as acutely malnourished (WHZ, MUAC, or oedema) **Q5. Is the child currently receiving any malnutrition treatment services?** *Probe, ask for enrollment card and observe the treatment food (RUTF / RUSF) to identify the type of treatment service*					

1=OPD SAM 2=OPD MAM 3=IPD SAM 4=No treatment 98=Don't know					
If the child is <u>not</u> enrolled in a treatment program, refer to a nearest appropriate treatment centre **Q6. Did you refer the child?** 1=yes 0=no					

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

Child Questionnaire

Child (9-59 months) ID Number					
Q7. Has the child received first and second <u>doses</u> of measles vaccination? (on the upper right arm) *Ask for vaccination card to verify if available* **First Dose** 1=Received two doses as confirmed by vaccination card 2=Received two doses as confirmed by caregiver recall 3=Has did not receive two doses 98=Dododon't know **Second Dose** 1=Received two doses as confirmed by vaccination card 2=Received two doses as confirmed by caregiver recall 3=Has did not receive two doses 98=Dododon't know					

Child (<24 months) ID Number					
Q8. How long after birth was the child first put to the breast? 1=Within one hour 2=In the first day within 24 hours 3=After the first day (>24 hours) 98=Dododon't know					
Q9. Was the child breastfed yesterday during the day or night? *This includes if the child was fed expressed breastmilk by the cup, bottle, or by another woman (these are also considered "yes")* 1=Yes 0=No 98=don't know					

Q10. Did the child have any liquid drink other than breastmilk yesterday during the day or night? *Do not read options, a probe by asking open questions and record all that apply. Vitamin drops, ORS, or medicine as drops are not counted* 1=Yes 0=No					
A. Plain water					
B. Infant formula					
C. Powdered or fresh animal milk					
D. Juice or soft drinks					
E. Clear broth					
F. Yoghurt					
G. Thin porridge					
H. Any other liquids (tea, coffee, etc.)					
Q11. Did the child have any solid, semi-solid, or soft foods yesterday during the day or night? 1=Yes 0=No 98=Dodon't know					

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

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

Annex 2: Geographical Units surveyed in Parwan province.

Selected Area For Parwan SMART					
Province_Pname	**HFs Name**	**Distract Name**	**Geographical unit**	**Population size**	**Cluster**
Parwan	PH	Charikar	Gazare Chrsoq/	4200	1
Parwan	ARCS	Charikar	Qualae Lala Mir Khan/	1190	2
Parwan	ARCS	Charikar	Myanshakh /	2370	3
Parwan	Synget Dara	Charikar	Deh Aftab /	700	4
Parwan	Synget Dara	Charikar	Khana Hai Darab /	460	5
Parwan	Synget Dara	Charikar	Makani(Shalla)	560	6,7
Parwan	Bayan	Charikar	Dwlana /	3240	8
Parwan	Bayan	Charikar	Tilanche /	5600	9
Parwan	Totumdara	Charikar	Jangal Bag	230	10
Parwan	Hofyan	Charikar	Parche 9	4350	11
Parwan	Sayadan	Charikar	Jamshadkhil	1850	12
Parwan	Gholam Ali	Bagram	Janqadame Myana	770	13
Parwan	Gholam Ali	Bagram	Amza khil Darab khil	1400	14
Parwan	Dawlatshahy	Bagram	Dawlat Sha-e-	840	15
Parwan	Khanaqua	Bagram	Ogati	1400	16
Parwan	Sar Sayad	Bagram	Sae Dokan	3050	17
Parwan	Dandar	Kohi Safi	Sadak	350	18
Parwan	Raegrashan	Saidkhil	Barakhn khil	749	19
Parwan	Inchoo	Saidkhil	Qalai Dasht	230	20
Parwan	Aquetash	Saidkhil	Chaqarkhil	980	21
Parwan	Sare Hawse	Jabalusseraj	Baini bage	700	22
Parwan	Monara	Jabalusseraj	Mala khil	3050	23
Parwan	Golbahar	Jabalusseraj	Sarkhak	350	24
Parwan	Golbahar	Jabalusseraj	Chqarak-e-	230	25
Parwan	Myanaguzar	Jabalusseraj	Galstn-e-	560	26
Parwan	Baghemaidan	Salang	Dey newChpraq	350	27
Parwan	Anamak	Salang	DeyLawn	630	28
Parwan	Orati	Salang	Lalma Sabzak	511	29
Parwan	Quaqueshal	Shinwari	Lavangi & Afghana	490	30
Parwan	Bagh Afghan	Shinwari	Choomar	3015	31
Parwan	Syagerd	syagerd	BalaQala Bala	350	32
Parwan	Syagerd	syagerd	Sade khil	168	33
Parwan	Fandaquistan	Syagerd	Lawi Takht	350	34
Parwan	Fandaquistan	Syagerd	Qulak	1980	35
Parwan	Char Deh	Syagerd	Char Bagh	350	36
Parwan	Char Deh	Syagerd	Aasmad khil	700	37
Parwan	Frenjal	Syagerd	Khingai	140	38
Parwan	Lolenje	Surkh Parsa	Khater-ha	460	39
Parwan	Surkh Parsa	Surkh Parsa	Rage Mazar	600	40

Parwan	Surkh Parsa	Surkh Parsa	Sya Sangak	230	41
Parwan	Sae Quala	Surkh Parsa	Dahanponduk-shibarak-kharak	700	42
Parwan	Shingaryan	Shekh ali	Charmak-Bolaghak	630	43
Parwan	Tawrige	Shekh ali	Godalak-Boyak-Naisar	670	44

Annex 3: Geographical units excluded for the overall survey sampling frame.

Excluded Area from Parwan SMART				
Province Name	**HF/Name**	**District Name**	**Villag Name**	**Total Pop**
Parwan	Mandiquol	Kohi Safi	Mandiqwl	460
Parwan	Mandiquol	Kohi Safi	Mandiqwl Payan	570
Parwan	Mandiquol	Kohi Safi	Jawzak	500
Parwan	Mandiquol	Kohi Safi	Asmayal khiil	260
Parwan	Mandiquol	Kohi Safi	Loy Kalae	430
Parwan	Mandiquol	Kohi Safi	Landa khil	160
Parwan	Mandiquol	Kohi Safi	Shokourwadana	570
Parwan	Mandiquol	Kohi Safi	Shabazkhil	430
Parwan	Mandiquol	Kohi Safi	Baratkhil	330
Parwan	Mandiquol	Kohi Safi	Nili	395
Parwan	Mandiquol	Kohi Safi	Chingai	360
Parwan	Mandiquol	Kohi Safi	Sagai	440
Parwan	Mandiquol	Kohi Safi	Kharoty	360
Parwan	Mandiquol	Kohi Safi	Ghafourwadana	360
Parwan	Mandiquol	Kohi Safi	Chemm	165
Parwan	Mandiquol	Kohi Safi	Taa Sara	375
Parwan	Mandiquol	Kohi Safi	Shahookhil	570
Parwan	Mandiquol	Kohi Safi	Solaiman	282
Parwan	Mandiquol	Kohi Safi	Karizgai	370
Parwan	Mandiquol	Kohi Safi	Jorghaty	670
Parwan	Mandiquol	Kohi Safi	Qualakhil	500
Parwan	Mandiquol	Kohi Safi	Adin khil	470
Parwan	Mandiquol	Kohi Safi	Sardarwala	249
Parwan	Mandiquol	Kohi Safi	Sardari	500
Parwan	Mandiquol	Kohi Safi	Ghafourkhil	530
Parwan	Mandiquol	Kohi Safi	Gadaikhil	460
Parwan	Mandiquol	Kohi Safi	Zyarat-e-gerghaty	225
Parwan	Mandiquol	Kohi Safi	Mousakhil	355
Parwan	Mandiquol	Kohi Safi	Khankhil	395
Parwan	Mandiquol	Kohi Safi	Nazdara	182
Parwan	Mandiquol	Kohi Safi	Bakhti	332
Parwan	Mandiquol	Kohi Safi	Khak khor	286

Parwan	Mandiquol	Kohi Safi	Mana	260
Parwan	Mandiquol	Kohi Safi	Paetab	530
Parwan	Mandiquol	Kohi Safi	Kandwan	390
Parwan	Mandiquol	Kohi Safi	Gadaikhil	360
Parwan	Mandiquol	Kohi Safi	Lakari	315
Parwan	Mandiquol	Kohi Safi	Dorani	376
Parwan	Mandiquol	Kohi Safi	Yasikhil	460
Parwan	Mandiquol	Kohi Safi	Ahmmadzai	560
Parwan	Quaqueshal	Shinwari	Kanji Patw	112
Parwan	Quaqueshal	Shinwari	Taik Mar	350
Parwan	Quaqueshal	Shinwari	Sakh Sang	350
Parwan	Quaqueshal	Shinwari	Mirai-Qalaibaie	460
Parwan	Quaqueshal	Shinwari	Afgania-e-Ushtor Shar	700
Parwan	Quaqueshal	Shinwari	Tajika-e-UshtwrShar	560
Parwan	Quaqueshal	Shinwari	Chalma	350
Parwan	Quaqueshal	Shinwari	Ali Zai	230
Parwan	Quaqueshal	Shinwari	Jawi Asiab	230
Parwan	Quaqueshal	Shinwari	Bawstan khil	230
Parwan	Quaqueshal	Shinwari	Abgart-Majakat	930
Parwan	Quaqueshal	Shinwari	Kashkand	230
Parwan	Quaqueshal	Shinwari	Dhani Namakab	350
Parwan	Quaqueshal	Shinwari	Gadari Namakab	230
Parwan	Quaqueshal	Shinwari	Wali M khil	460
Parwan	Quaqueshal	Shinwari	Qalai Mhammod	350
Parwan	Quaqueshal	Shinwari	Labi SarakiDarzgart	350
Parwan	Quaqueshal	Shinwari	Darzgare S-U-Mayan	1400
Parwan	Quaqueshal	Shinwari	LangasheAfganie	350
Parwan	Quaqueshal	Shinwari	Shatwt	350
Parwan	Quaqueshal	Shinwari	Kandwalo	305
Parwan	Quaqueshal	Shinwari	Mirzato	305
Parwan	Quaqueshal	Shinwari	Khana Queshlaque	304
Parwan	Quaqueshal	Shinwari	Panjtota	280

Plausibility check for: AFG_02122020_ACF_Parwan.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** (2.4 %)
Overall Sex ratio	Incl	p	>0.1	>0.05	>0.001	<=0.001	
(Significant chi square)			0	2	4	10	**0** (p=0.454)
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=0.671)
Dig pref score - weight	Incl	#	0-7	8-12	13-20	> 20	
			0	2	4	10	**0** (4)
Dig pref score - height	Incl	#	0-7	8-12	13-20	> 20	
			0	2	4	10	**4** (14)
Dig pref score - MUAC	Incl	#	0-7	8-12	13-20	> 20	
			0	2	4	10	**4** (16)
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** (1.02)
Skewness WHZ	Excl	#	<±0.2	<±0.4	<±0.6	>=±0.6	
			0	1	3	5	**1** (-0.35)
Kurtosis WHZ	Excl	#	<±0.2	<±0.4	<±0.6	>=±0.6	
			0	1	3	5	**1** (-0.21)
Poisson dist WHZ-2	Excl	p	>0.05	>0.01	>0.001	<=0.001	
			0	1	3	5	**0** (p=0.238)
OVERALL SCORE WHZ =			0-9	10-14	15-24	>25	**10** %

The overall score of this survey is 10 %, this is good.

There were no duplicate entries detected.

Percentage of children with no exact birthday: 71 %

Anthropometric Indices likely to be in error (-3 to 3 for WHZ, -3 to 3 for HAZ, -3 to 3 for WAZ, from observed mean - chosen in Options panel - these values will be flagged and should be excluded from analysis for a nutrition survey in emergencies. For other surveys this might not be the best procedure e.g. when the percentage of overweight children has to be calculated):

Line=5/ID=2:	**WHZ (2.884)**, Height may be incorrect
Line=30/ID=1:	HAZ (1.962), Age may be incorrect
Line=45/ID=2:	**WHZ (-3.562)**, Height may be incorrect
Line=80/ID=1:	**WHZ (-4.552)**, Weight may be incorrect
Line=116/ID=1:	**WHZ (3.476)**, HAZ (-4.456), Height may be incorrect
Line=123/ID=3:	**WHZ (3.409)**, HAZ (-5.359), Height may be incorrect
Line=129/ID=1:	**WHZ (-3.396)**, Weight may be incorrect
Line=132/ID=2:	**WHZ (2.660)**, Height may be incorrect
Line=139/ID=1:	HAZ (-4.513), Age may be incorrect
Line=181/ID=2:	HAZ (1.874), Age may be incorrect
Line=187/ID=2:	**WHZ (3.647)**, Height may be incorrect
Line=192/ID=1:	HAZ (-4.618), Age may be incorrect
Line=193/ID=1:	HAZ (-5.120), Age may be incorrect
Line=198/ID=1:	**WHZ (-3.721)**, Weight may be incorrect
Line=230/ID=1:	HAZ (2.701), Age may be incorrect
Line=242/ID=1:	HAZ (-4.485), Height may be incorrect
Line=257/ID=1:	**WHZ (3.892)**, WAZ (2.110), Weight may be incorrect
Line=264/ID=2:	HAZ (6.634), WAZ (2.844), Age may be incorrect
Line=265/ID=3:	HAZ (5.844), WAZ (2.626), Age may be incorrect
Line=273/ID=2:	HAZ (2.483), Height may be incorrect
Line=281/ID=1:	HAZ (-6.235), WAZ (-4.164), Age may be incorrect

Line=286/ID=1: HAZ (-7.157), WAZ (-4.640), Age may be incorrect
Line=309/ID=1: HAZ (-4.706), Age may be incorrect
Line=312/ID=1: HAZ (-5.080), Age may be incorrect
Line=323/ID=2: **WHZ (2.840)**, Weight may be incorrect
Line=347/ID=3: HAZ (1.709), Age may be incorrect
Line=371/ID=1: HAZ (2.475), Age may be incorrect
Line=372/ID=2: HAZ (2.052), Age may be incorrect
Line=376/ID=1: HAZ (4.438), Height may be incorrect
Line=380/ID=3: HAZ (-4.875), Age may be incorrect
Line=382/ID=1: HAZ (2.004), Age may be incorrect
Line=386/ID=2: HAZ (2.337), Height may be incorrect
Line=421/ID=3: HAZ (-4.589), Age may be incorrect

Percentage of values flagged with SMART flags:WHZ: 2.4 %, HAZ: 5.3 %, WAZ: 1.1 %

Age distribution:

Month 6 : ########
Month 7 : ###########
Month 8 : ##########
Month 9 : ############
Month 10 : ##############
Month 11 : #########
Month 12 : ################
Month 13 : #####
Month 14 : ##########
Month 15 : ####
Month 16 : ########
Month 17 : #######
Month 18 : #########
Month 19 : #######
Month 20 : #######
Month 21 : ####
Month 22 : ####
Month 23 : ##########

Month 24 : ##################
Month 25 : #####
Month 26 : #####
Month 27 : #######
Month 28 : ########
Month 29 : ######
Month 30 : ######
Month 31 : #####
Month 32 : #######
Month 33 : #######
Month 34 : ######
Month 35 : ###########
Month 36 : ################
Month 37 : ###########
Month 38 : ###########
Month 39 : ######
Month 40 : #######
Month 41 : #####
Month 42 : ############
Month 43 : ######
Month 44 : ######
Month 45 : ########
Month 46 : ###############
Month 47 : ##############
Month 48 : ######
Month 49 : ############
Month 50 : ###########
Month 51 : ############
Month 52 : #######
Month 53 : ###
Month 54 : ##########
Month 55 : ####
Month 56 : ######
Month 57 : #####
Month 58 : #####
Month 59 : ############

Age ratio of 6-29 months to 30-59 months: 0.82 (The value should be around 0.85).: p-value = 0.671 (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	52/51.2 (1.0)	64/54.9 (1.2)	116/106.0 (1.1)	0.81
18 to 29	12	46/49.4 (0.9)	43/53.0 (0.8)	89/102.3 (0.9)	1.07
30 to 41	12	50/48.3 (1.0)	49/51.9 (0.9)	99/100.2 (1.0)	1.02
42 to 53	12	52/47.6 (1.1)	59/51.0 (1.2)	111/98.6 (1.1)	0.88
54 to 59	6	20/23.5 (0.8)	21/25.2 (0.8)	41/48.8 (0.8)	0.95
6 to 59	54	220/228.0 (1.0)	236/228.0 (1.0)		0.93

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

Overall sex ratio: p-value = 0.454 (boys and girls equally represented)
Overall age distribution: p-value = 0.241 (as expected)
Overall age distribution for boys: p-value = 0.871 (as expected)
Overall age distribution for girls: p-value = 0.240 (as expected)
Overall sex/age distribution: p-value = 0.114 (as expected)

Distribution of month of birth

Jan: ##################################
Feb: ##
Mar: ##
Apr: ##
May: ##################################
Jun: ####################################
Jul: ##################################
Aug: ##
Sep: ###################
Oct: ##############################
Nov: ############################

Dec: ####################################

Digit preference Weight:

Digit .0 : ##
Digit .1 : ##
Digit .2 : ##
Digit .3 : ##
Digit .4 : ##
Digit .5 : ##
Digit .6 : ##
Digit .7 : ##
Digit .8 : ##
Digit .9 : ##

Digit preference score: **4** (0-7 excellent, 8-12 good, 13-20 acceptable and > 20 problematic)
p-value for chi2: 0.818

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: **14** (0-7 excellent, 8-12 good, 13-20 acceptable and > 20 problematic)
p-value for chi2: 0.000 (significant difference)

Digit preference MUAC:

Digit .0 : ##
Digit .1 : ####################
Digit .2 : ########################
Digit .3 : ########################
Digit .4 : ####################
Digit .5 : ##
Digit .6 : ##################
Digit .7 : ###############
Digit .8 : ##########
Digit .9 : ########

Digit preference score: **16** (0-7 excellent, 8-12 good, 13-20 acceptable and > 20 problematic)
p-value for chi2: 0.000 (significant difference)

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

3 exclusion (Flag) procedures

.	no exclusion	exclusion from reference mean (WHO flags)	exclusion from observed mean (SMART flags)
WHZ			
Standard Deviation SD:	1.16	1.16	1.02
(The SD should be between 0.8 and 1.2)			
Prevalence (< -2)			
observed:	8.6%	8.6%	7.9%
calculated with current SD:	7.7%	7.7%	5.7%
calculated with a SD of 1:	5.0%	5.0%	5.3%
HAZ			
Standard Deviation SD:	1.56	1.48	1.24
(The SD should be between 0.8 and 1.2)			
Prevalence (< -2)			
observed:	34.0%	33.8%	33.1%
calculated with current SD:	36.1%	35.2%	33.4%
calculated with a SD of 1:	28.9%	28.7%	29.7%
WAZ			
Standard Deviation SD:	1.12	1.12	1.07
(The SD should be between 0.8 and 1.2)			
Prevalence (< -2)			
observed:	20.9%	20.9%	20.7%
calculated with current SD:	20.4%	20.4%	19.4%
calculated with a SD of 1:	17.6%	17.6%	17.9%
Results for Shapiro-Wilk test for normally (Gaussian) distributed data:			
WHZ	p= 0.000	p= 0.000	p= 0.001
HAZ	p= 0.000	p= 0.000	p= 0.036
WAZ	p= 0.582	p= 0.582	p= 0.372

(If p < 0.05 then the data are not normally distributed. If p > 0.05 you can consider the data normally distributed)

Skewness			
WHZ	-0.05	-0.05	-0.35
HAZ	0.53	0.45	0.09
WAZ	-0.01	-0.01	-0.11

If the value is:

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

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

subjects in the sample.

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

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

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

Kurtosis

WHZ	1.11	1.11	-0.21
HAZ	2.81	1.51	-0.37
WAZ	0.25	0.25	-0.31

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=1.14 (p=0.238)

WHZ < -3: ID=1.32 (p=0.080)

Oedema: ID=1.00 (p=0.471)

GAM: ID=1.10 (p=0.308)

SAM: ID=1.22 (p=0.148)

HAZ < -2: ID=0.92 (p=0.626)

HAZ < -3: ID=0.93 (p=0.602)

WAZ < -2: ID=1.33 (p=0.075)

WAZ < -3: ID=0.97 (p=0.532)

Subjects with SMART flags are excluded from this analysis.

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

estimates.

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

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

```
Time                                          SD for WHZ
point                0.8 0.9 1.0 1.1 1.2 1.3 1.4 1.5 1.6 1.7 1.8 1.9 2.0 2.1 2.2 2.3
01: 1.14 (n=43, f=1)  ###############
02: 0.85 (n=42, f=0)  ##
03: 1.05 (n=44, f=1)  ###########
04: 1.10 (n=42, f=1)  #############
05: 0.94 (n=41, f=0)  ######
06: 1.22 (n=40, f=1)  ##################
07: 1.33 (n=37, f=1)  ######################
08: 1.12 (n=36, f=1)  #############
09: 1.31 (n=30, f=2)  ####################
10: 1.41 (n=24, f=1)  ########################
11: 1.36 (n=17, f=0)  ######################
12: 1.33 (n=14, f=1)  OOOOOOOOOOOOOOOOOOOO
13: 0.89 (n=13, f=0)  OOOO
14: 1.20 (n=11, f=0)  OOOOOOOOOOOOOOO
15: 1.01 (n=07, f=0)  ~~~~~~~~~
16: 0.56 (n=05, f=0)
17: 0.67 (n=02, f=0)
18: 1.42 (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 =	79	65	109	58	79	66
Percentage of values flagged with SMART flags:						
WHZ:	2.6	3.1	5.5	1.7	0.0	1.5
HAZ:	3.8	7.7	3.7	6.9	3.8	7.6
WAZ:	1.3	0.0	0.0	3.4	0.0	4.5
Age ratio of 6-29 months to 30-59 months:						
	0.76	0.71	0.82	0.81	0.88	0.94
Sex ratio (male/female):						
	0.93	1.10	1.14	0.66	1.03	0.69
Digit preference Weight (%):						
.0 :	11	12	16	10	16	3
.1 :	14	9	6	5	9	12
.2 :	11	14	11	10	9	9
.3 :	8	12	7	9	13	6
.4 :	10	9	14	12	9	14
.5 :	5	12	10	9	10	9
.6 :	10	9	13	10	10	5
.7 :	11	9	6	9	9	12
.8 :	11	5	10	9	9	20
.9 :	8	8	7	17	6	11
DPS:	8	9	11	10	9	15
Digit preference score (0-7 excellent, 8-12 good, 13-20 acceptable and > 20 problematic)						
Digit preference Height (%):						
.0 :	14	17	29	10	30	18
.1 :	5	5	9	9	1	12
.2 :	11	23	9	10	10	11
.3 :	13	11	9	9	11	12
.4 :	14	3	6	12	9	9
.5 :	8	11	11	10	10	12

.6 :	13	17	5	9	4	11
.7 :	10	6	10	7	15	8
.8 :	9	6	6	9	5	3
.9 :	4	2	6	16	4	5
DPS:	11	22	23	8	26	14

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

Digit preference MUAC (%):

.0 :	6	3	32	29	14	12
.1 :	11	15	6	9	6	6
.2 :	8	14	12	10	15	9
.3 :	14	6	5	9	18	20
.4 :	8	17	5	3	11	14
.5 :	14	11	29	28	18	15
.6 :	16	11	5	7	6	5
.7 :	9	9	5	2	6	9
.8 :	3	11	1	3	3	9
.9 :	11	3	1	0	3	2
DPS:	13	15	36	32	19	17

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

Standard deviation of WHZ:

SD	0.96	1.26	1.20	1.09	1.20	1.11
Prevalence (< -2) observed:						
%		15.4	4.6	5.2	13.9	7.6
Prevalence (< -2) calculated with current SD:						
%		13.5	5.2	6.3	11.3	6.4
Prevalence (< -2) calculated with a SD of 1:						
%		8.2	2.6	4.8	7.2	4.5

Standard deviation of HAZ:

SD	1.44	1.65	1.34	1.68	1.41	1.93
observed:						
%	43.0	36.9	33.0	27.6	31.6	30.3
calculated with current SD:						
%	42.4	34.7	38.3	36.3	29.9	33.9
calculated with a SD of 1:						
%	39.1	25.8	34.4	27.7	22.8	21.2

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

Team 1:

Age cat.	mo.	boys	girls	total	ratio boys/girls
6 to 17	12	8/8.8 (0.9)	14/9.5 (1.5)	22/18.4 (1.2)	0.57
18 to 29	12	6/8.5 (0.7)	6/9.2 (0.7)	12/17.7 (0.7)	1.00
30 to 41	12	11/8.4 (1.3)	12/9.0 (1.3)	23/17.4 (1.3)	0.92
42 to 53	12	12/8.2 (1.5)	8/8.9 (0.9)	20/17.1 (1.2)	1.50
54 to 59	6	1/4.1 (0.2)	1/4.4 (0.2)	2/8.5 (0.2)	1.00
6 to 59	54	38/39.5 (1.0)	41/39.5 (1.0)		0.93

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

Overall sex ratio: p-value = 0.736 (boys and girls equally represented)
Overall age distribution: p-value = 0.044 (significant difference)
Overall age distribution for boys: p-value = 0.221 (as expected)
Overall age distribution for girls: p-value = 0.142 (as expected)
Overall sex/age distribution: p-value = 0.012 (significant difference)

Team 2:

Age cat.	mo.	boys	girls	total	ratio boys/girls
6 to 17	12	6/7.9 (0.8)	8/7.2 (1.1)	14/15.1 (0.9)	0.75
18 to 29	12	9/7.6 (1.2)	4/7.0 (0.6)	13/14.6 (0.9)	2.25
30 to 41	12	9/7.5 (1.2)	5/6.8 (0.7)	14/14.3 (1.0)	1.80
42 to 53	12	5/7.4 (0.7)	13/6.7 (1.9)	18/14.1 (1.3)	0.38
54 to 59	6	5/3.6 (1.4)	1/3.3 (0.3)	6/7.0 (0.9)	5.00
6 to 59	54	34/32.5 (1.0)	31/32.5 (1.0)		1.10

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

Overall sex ratio: p-value = 0.710 (boys and girls equally represented)
Overall age distribution: p-value = 0.827 (as expected)
Overall age distribution for boys: p-value = 0.684 (as expected)

Overall age distribution for girls: p-value = 0.053 (as expected)
Overall sex/age distribution: p-value = 0.022 (significant difference)

Team 3:

Age cat.	mo.	boys	girls	total	ratio boys/girls
6 to 17	12	17/13.5 (1.3)	12/11.9 (1.0)	29/25.3 (1.1)	1.42
18 to 29	12	10/13.0 (0.8)	10/11.4 (0.9)	20/24.5 (0.8)	1.00
30 to 41	12	10/12.7 (0.8)	9/11.2 (0.8)	19/24.0 (0.8)	1.11
42 to 53	12	14/12.5 (1.1)	12/11.0 (1.1)	26/23.6 (1.1)	1.17
54 to 59	6	7/6.2 (1.1)	8/5.5 (1.5)	15/11.7 (1.3)	0.88
6 to 59	54	58/54.5 (1.1)	51/54.5 (0.9)		1.14

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

Overall sex ratio: p-value = 0.503 (boys and girls equally represented)
Overall age distribution: p-value = 0.467 (as expected)
Overall age distribution for boys: p-value = 0.649 (as expected)
Overall age distribution for girls: p-value = 0.756 (as expected)
Overall sex/age distribution: p-value = 0.303 (as expected)

Team 4:

Age cat.	mo.	boys	girls	total	ratio boys/girls
6 to 17	12	4/5.3 (0.7)	9/8.1 (1.1)	13/13.5 (1.0)	0.44
18 to 29	12	8/5.2 (1.5)	5/7.9 (0.6)	13/13.0 (1.0)	1.60
30 to 41	12	6/5.1 (1.2)	8/7.7 (1.0)	14/12.7 (1.1)	0.75
42 to 53	12	4/5.0 (0.8)	6/7.6 (0.8)	10/12.5 (0.8)	0.67
54 to 59	6	1/2.5 (0.4)	7/3.7 (1.9)	8/6.2 (1.3)	0.14
6 to 59	54	23/29.0 (0.8)	35/29.0 (1.2)		0.66

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

Overall sex ratio: p-value = 0.115 (boys and girls equally represented)
Overall age distribution: p-value = 0.882 (as expected)
Overall age distribution for boys: p-value = 0.535 (as expected)

Overall age distribution for girls: p-value = 0.367 (as expected)
Overall sex/age distribution: p-value = 0.038 (significant difference)

Team 5:

Age cat.	mo.	boys	girls	total	ratio boys/girls
6 to 17	12	8/9.3 (0.9)	11/9.1 (1.2)	19/18.4 (1.0)	0.73
18 to 29	12	9/9.0 (1.0)	9/8.8 (1.0)	18/17.7 (1.0)	1.00
30 to 41	12	7/8.8 (0.8)	6/8.6 (0.7)	13/17.4 (0.7)	1.17
42 to 53	12	10/8.7 (1.2)	10/8.4 (1.2)	20/17.1 (1.2)	1.00
54 to 59	6	6/4.3 (1.4)	3/4.2 (0.7)	9/8.5 (1.1)	2.00
6 to 59	54	40/39.5 (1.0)	39/39.5 (1.0)		1.03

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

Overall sex ratio: p-value = 0.910 (boys and girls equally represented)
Overall age distribution: p-value = 0.799 (as expected)
Overall age distribution for boys: p-value = 0.836 (as expected)
Overall age distribution for girls: p-value = 0.771 (as expected)
Overall sex/age distribution: p-value = 0.514 (as expected)

Team 6:

Age cat.	mo.	boys	girls	total	ratio boys/girls
6 to 17	12	9/6.3 (1.4)	10/9.1 (1.1)	19/15.3 (1.2)	0.90
18 to 29	12	4/6.1 (0.7)	9/8.8 (1.0)	13/14.8 (0.9)	0.44
30 to 41	12	7/5.9 (1.2)	9/8.6 (1.1)	16/14.5 (1.1)	0.78
42 to 53	12	7/5.8 (1.2)	10/8.4 (1.2)	17/14.3 (1.2)	0.70
54 to 59	6	0/2.9 (0.0)	1/4.2 (0.2)	1/7.1 (0.1)	0.00
6 to 59	54	27/33.0 (0.8)	39/33.0 (1.2)		0.69

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

Overall sex ratio: p-value = 0.140 (boys and girls equally represented)
Overall age distribution: p-value = 0.138 (as expected)
Overall age distribution for boys: p-value = 0.268 (as expected)

Overall age distribution for girls: p-value = 0.587 (as expected)

Overall sex/age distribution: p-value = 0.045 (significant difference)

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

Team: 1

```
Time                                              SD for WHZ
point                 0.8 0.9 1.0 1.1 1.2 1.3 1.4 1.5 1.6 1.7 1.8 1.9 2.0 2.1 2.2 2.3
01: 0.85 (n=07, f=0)  ##
02: 1.08 (n=08, f=0)  ############
03: 0.92 (n=08, f=0)  #####
04: 0.53 (n=08, f=0)
05: 0.80 (n=08, f=0)
06: 0.79 (n=06, f=0)
07: 0.85 (n=06, f=0)  ##
08: 0.80 (n=07, f=0)
09: 1.68 (n=04, f=1)  ####################################
10: 0.76 (n=04, f=0)
11: 0.69 (n=03, f=0)
12: 1.87 (n=02, f=0)  OOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOO
13: 1.05 (n=03, f=0)  OOOOOOOOOO
14: 1.69 (n=02, f=0)  OOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOO
```

(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: 0.94 (n=07, f=0)  ######
02: 0.78 (n=06, f=0)
03: 0.55 (n=07, f=0)
04: 1.59 (n=06, f=1)  ##################################
05: 1.66 (n=05, f=0)  ####################################
06: 1.29 (n=06, f=0)  ####################
07: 1.26 (n=06, f=0)  ####################
08: 0.38 (n=04, f=0)
```

```
09: 1.07 (n=05, f=0)  ###########
10: 3.38 (n=03, f=1)  OOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOO
11: 1.03 (n=02, f=0)  OOOOOOOOOO
12: 0.17 (n=02, f=0)
13: 1.21 (n=02, f=0)  OOOOOOOOOOOOOOOOO
14: 0.63 (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: 0.66 (n=08, f=0)
02: 0.64 (n=08, f=0)
03: 1.21 (n=08, f=1)  #################
04: 0.65 (n=08, f=0)
05: 0.66 (n=08, f=0)
06: 1.75 (n=08, f=1)  ########################################
07: 1.18 (n=08, f=0)  ################
08: 1.31 (n=08, f=0)  #####################
09: 1.62 (n=08, f=0)  ##################################
10: 1.33 (n=07, f=0)  ######################
11: 1.48 (n=04, f=0)  ############################
12: 1.80 (n=05, f=0)  ##########################################
13: 0.38 (n=05, f=0)
14: 1.33 (n=04, f=0)  ######################
15: 0.17 (n=02, f=0)
16: 0.21 (n=02, f=0)
17: 0.67 (n=02, f=0)
```

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

Team: 4

```
Time                                                SD for WHZ
point                0.8 0.9 1.0 1.1 1.2 1.3 1.4 1.5 1.6 1.7 1.8 1.9 2.0 2.1 2.2 2.3
01: 1.57 (n=07, f=1) ################################
02: 0.69 (n=07, f=0)
03: 1.38 (n=07, f=0) ########################
04: 1.24 (n=06, f=0) ##################
05: 0.67 (n=07, f=0)
06: 0.74 (n=07, f=0)
07: 0.65 (n=06, f=0)
08: 1.10 (n=05, f=0) #############
09: 0.43 (n=03, f=0)
10: 0.44 (n=02, f=0)
```

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

Team: 5

```
Time                                                SD for WHZ
point                0.8 0.9 1.0 1.1 1.2 1.3 1.4 1.5 1.6 1.7 1.8 1.9 2.0 2.1 2.2 2.3
01: 1.66 (n=07, f=0) ###################################
02: 1.06 (n=06, f=0) ###########
03: 1.27 (n=07, f=0) ####################
04: 1.07 (n=07, f=0) ###########
05: 0.98 (n=07, f=0) ########
06: 1.20 (n=07, f=0) ################
07: 1.65 (n=06, f=0) ###################################
08: 1.45 (n=07, f=0) ############################
09: 0.92 (n=06, f=0) #####
10: 0.80 (n=05, f=0)
11: 1.02 (n=04, f=0) #########
12: 0.41 (n=03, f=0)
13: 0.83 (n=02, f=0) O
14: 0.37 (n=02, f=0)
15: 2.06 (n=02, f=0) OOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOO
```

(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: 1.01 (n=07, f=0)  #########
02: 0.75 (n=07, f=0)
03: 0.62 (n=07, f=0)
04: 1.32 (n=07, f=0)  ######################
05: 0.94 (n=06, f=0)  ######
06: 1.15 (n=06, f=0)  ###############
07: 2.20 (n=05, f=1)  ############################################################
08: 1.35 (n=05, f=0)  ######################
09: 0.68 (n=04, f=0)
10: 1.22 (n=03, f=0)  OOOOOOOOOOOOOOOOO
11: 0.54 (n=03, f=0)
12: 1.03 (n=02, f=0)  OOOOOOOOOO

(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 Exce

Annex 5: Local Events Calendar developed and used in Parwan SMART 2020

1398	ماه ها	1397	ماه ها	1396	ماه ها	1395	ماه ها	1394	ماه ها	ماه
نوروز، حمل برداری حیوانات، زنده شدن نباتات، جشن بزگشی در تپه سرخ جبل السراج، جنده بالا شگوفه گرفتن درخت ها، میله نوروز، شروع گل ارغوان ، چشن گودی پران بازی، جشن شعراء غرس نهال ، روز و چشن دهقان شروع مکاتب، هفت میوه، سمنک ، کشت ترکاری، برامدن سیلاب های بهاری	11	نوروز، حمل برداری حیوانات، زنده شدن نباتات، جشن بزگشی در تپه سرخ جبل السراج، جنده بالا شگوفه گرفتن درخت ها، میله نوروز، شروع گل ارغوان ، چشن گودی پران بازی، جشن شعراء غرس نهال ، روز و چشن دهقان شروع مکاتب، هفت میوه، سمنک ، کشت ترکاری، برامدن سیلاب های بهاری	23	نوروز، حمل برداری حیوانات، زنده شدن نباتات، جشن بزگشی در تپه سرخ جبل السراج، جنده بالا شگوفه گرفتن درخت ها، میله نوروز، شروع گل ارغوان ، چشن گودی پران بازی، جشن شعراء غرس نهال ، روز و چشن دهقان شروع مکاتب، هفت میوه، سمنک ، کشت ترکاری، برامدن سیلاب های بهاری	35	نوروز، حمل برداری حیوانات، زنده شدن نباتات، جشن بزگشی در تپه سرخ جبل السراج، جنده بالا شگوفه گرفتن درخت ها، میله نوروز، شروع گل ارغوان ، چشن گودی پران بازی، جشن شعراء غرس نهال ، روز و چشن دهقان شروع مکاتب، هفت میوه، سمنک ، کشت ترکاری، برامدن سیلاب های بهاری	47	نوروز، حمل برداری حیوانات، زنده شدن نباتات، جشن بزگشی در تپه سرخ جبل السراج، جنده بالا شگوفه گرفتن درخت ها، میله نوروز، شروع گل ارغوان ، چشن گودی پران بازی، جشن شعراء غرس نهال ، روز و چشن دهقان شروع مکاتب، هفت میوه، سمنک ، کشت ترکاری، برامدن سیلاب های بهاری	59	حمل
فصل گل ها، روز هشت ثور ، کشت ترکاری رمضان، چیدن شفتل، میله ماهی صیاد، فصل شکار ،	10	فصل گل ها، روز هشت ثور ، کشت ترکاری رمضان، چیدن شفتل، میله ماهی صیاد، فصل شکار ،	22	فصل گل ها، روز هشت ثور ، کشت ترکاری رمضان، چیدن شفتل، میله ماهی صیاد، فصل شکار ،	34	فصل گل ها، روز هشت ثور ، کشت ترکاری رمضان، چیدن شفتل، میله ماهی صیاد، فصل شکار ،	46	فصل گل ها، روز هشت ثور ، کشت ترکاری رمضان، چیدن شفتل، میله ماهی صیاد، فصل شکار ،	58	ثور
گندم دروی . روز مادر (۲۴ جوزا) . پخته شدن رزدالو . گیلاس، الوبالو ، پخته شدن توت ، شیریخ	9	گندم دروی . روز مادر (۲۴ جوزا) . پخته شدن رزدالو . گیلاس، الوبالو ، پخته شدن توت ، شیریخ	21	گندم دروی . روز مادر (۲۴ جوزا) . پخته شدن رزدالو . گیلاس، الوبالو ، پخته شدن توت ، شیریخ	33	گندم دروی . روز مادر (۲۴ جوزا) . پخته شدن رزدالو . گیلاس، الوبالو ، پخته شدن توت ، شیریخ	45	گندم دروی . روز مادر (۲۴ جوزا) . پخته شدن رزدالو . گیلاس، الوبالو ، پخته شدن توت ، شیریخ	57	جوزا
شروع فصل تابستان . پخته شدن میوه های فصل سیاحت و میله، امتحان های چهارنیم ماهه	8	شروع فصل تابستان . پخته شدن میوه های فصل سیاحت و میله، امتحان های چهارنیم ماهه	20	شروع فصل تابستان . پخته شدن میوه های فصل سیاحت و میله، امتحان های چهارنیم ماهه	32	شروع فصل تابستان . پخته شدن میوه های فصل سیاحت و میله، امتحان های چهارنیم ماهه	44	شروع فصل تابستان . پخته شدن میوه های فصل سیاحت و میله، امتحان های چهارنیم ماهه	56	سرطان
گرمی شدید ، . رخصتی مکاتب . جشن ازادی . کم ابی ، ۲۸ اسد روز استقلال	7	گرمی شدید ، . رخصتی مکاتب . جشن ازادی . کم ابی ، ۲۸ اسد روز استقلال	19	گرمی شدید ، . رخصتی مکاتب . جشن ازادی . کم ابی ، ۲۸ اسد روز استقلال	31	گرمی شدید ، . رخصتی مکاتب . جشن ازادی . کم ابی ، ۲۸ اسد روز استقلال	43	گرمی شدید ، . رخصتی مکاتب . جشن ازادی . کم ابی ، ۲۸ اسد روز استقلال	55	اسد
روز شهادت امر صاحب هفته شهدا . وفت جواری . شروع پخته شدن انگور	6	روز شهادت امر صاحب هفته شهدا . وفت جواری . شروع پخته شدن انگور	18	روز شهادت امر صاحب هفته شهدا . وفت جواری . شروع پخته شدن انگور	30	روز شهادت امر صاحب هفته شهدا . وفت جواری . شروع پخته شدن انگور	42	روز شهادت امر صاحب هفته شهدا . وفت جواری . شروع پخته شدن انگور	54	سنبله
ماه خزان . برگ ریزی 13 میزان . روز عاشورا جمع آوری انگور، خشک کردن انگور، فصل میوه چینی، کشت گلپی، جمع آوری حبوبات (ماش، نخود، لوبیا)	5	ماه خزان . برگ ریزی 13 میزان . روز عاشورا جمع آوری انگور، خشک کردن انگور، فصل میوه چینی، کشت گلپی، جمع آوری حبوبات (ماش، نخود، لوبیا)	17	ماه خزان . برگ ریزی 13 میزان . روز عاشورا جمع آوری انگور، خشک کردن انگور، فصل میوه چینی، کشت گلپی، جمع آوری حبوبات (ماش، نخود، لوبیا)	29	ماه خزان . برگ ریزی 13 میزان . روز عاشورا جمع آوری انگور، خشک کردن انگور، فصل میوه چینی، کشت گلپی، جمع آوری حبوبات (ماش، نخود، لوبیا)	41	ماه خزان . برگ ریزی 13 میزان . روز عاشورا جمع آوری انگور، خشک کردن انگور، فصل میوه چینی، کشت گلپی، جمع آوری حبوبات (ماش، نخود، لوبیا)	53	میزان
کشت گندم تیر ماه . هوا سرد می شود ، انداختن ترشی، ساختن گل خانه ، تهیه کردن مواد سوخت برای زمستان ، میلاد نبی ص ، باران های شدید و ژاله خزانی وقت گوشت قاق (لاندي)	4	کشت گندم تیر ماه . هوا سرد می شود ، انداختن ترشی، ساختن گل خانه ، تهیه کردن مواد سوخت برای زمستان ، میلاد نبی ص ، باران های شدید و ژاله خزانی وقت گوشت قاق (لاندي)	16	کشت گندم تیر ماه . هوا سرد می شود ، انداختن ترشی، ساختن گل خانه ، تهیه کردن مواد سوخت برای زمستان ، میلاد نبی ص ، باران های شدید و ژاله خزانی وقت گوشت قاق (لاندي)	28	کشت گندم تیر ماه . هوا سرد می شود ، انداختن ترشی، ساختن گل خانه ، تهیه کردن مواد سوخت برای زمستان ، میلاد نبی ص ، باران های شدید و ژاله خزانی وقت گوشت قاق (لاندي)	40	کشت گندم تیر ماه . هوا سرد می شود ، انداختن ترشی، ساختن گل خانه ، تهیه کردن مواد سوخت برای زمستان ، میلاد نبی ص ، باران های شدید و ژاله خزانی وقت گوشت قاق (لاندي)	52	عقرب
اغاز امتحانات . ختم مکاتب . . شاندن بخاری و صندلی	3	اغاز امتحانات . ختم مکاتب . . شاندن بخاری و صندلی	15	اغاز امتحانات . ختم مکاتب . . شاندن بخاری و صندلی	27	اغاز امتحانات . ختم مکاتب . . شاندن بخاری و صندلی	39	اغاز امتحانات . ختم مکاتب . . شاندن بخاری و صندلی	51	قوس
شب یلدا ، چله کلان یا چله خشک ، سردی هوا ۸ جدی روز تجاوز روس ها، شروع کورس ها	2	شب یلدا ، چله کلان یا چله خشک ، سردی هوا ۸ جدی روز تجاوز روس ها، شروع کورس ها	14	شب یلدا ، چله کلان یا چله خشک ، سردی هوا ۸ جدی روز تجاوز روس ها، شروع کورس ها	26	شب یلدا ، چله کلان یا چله خشک ، سردی هوا ۸ جدی روز تجاوز روس ها، شروع کورس ها	38	شب یلدا ، چله کلان یا چله خشک ، سردی هوا ۸ جدی روز تجاوز روس ها، شروع کورس ها	50	جدی
چله خورد یا تر . تر برف . بامن دامن . یخ بندان . وفت شکار . میله سمنک	1	چله خورد یا تر . تر برف . بامن دامن . یخ بندان . وفت شکار . میله سمنک	13	چله خورد یا تر . تر برف . بامن دامن . یخ بندان . وفت شکار . میله سمنک	25	چله خورد یا تر . تر برف . بامن دامن . یخ بندان . وفت شکار . میله سمنک	37	چله خورد یا تر . تر برف . بامن دامن . یخ بندان . وفت شکار . میله سمنک	49	دلو
		شصت و شکست، نهال شانی ، اول حوت . ۱۵ حوت . اخر حوت ، شروع	12	شصت و شکست، نهال شانی ، اول حوت . ۱۵ حوت . اخر حوت ، شروع	24	شصت و شکست، نهال شانی ، اول حوت . ۱۵ حوت . اخر حوت ، شروع	36	شصت و شکست، نهال شانی ، اول حوت . ۱۵ حوت . اخر حوت ، شروع	48	حوت

Annex 6: Results of the Standardization text

Standardisation test results					Precision				Accuracy		OUTCOME			
Weight			mean	SD	max	Technical error	TEM/mean	Coef of reliability	Bias from superv	Bias from median			From	From
		#	kg	kg	kg	TEM (kg)	TEM (%)	R (%)	Bias (kg)	Bias (kg)			Supervisor	Median
	Supervisor	11	16.5	4.8	0.1	0.03	0.2	100	0	0.01	TEM good	R value good	Bias good	Bias good
	Enumerator 1	11	16.4	4.8	0.1	0.06	0.3	100	0.02	0.03	TEM acceptable	R value good	Bias good	Bias good
	Enumerator 2	11	16.4	4.8	0.1	0.05	0.3	100	0.02	0.03	TEM acceptable	R value good	Bias good	Bias good
	Enumerator 3	11	16.4	4.8	0.1	0.06	0.3	100	0.03	0.03	TEM acceptable	R value good	Bias good	Bias good
	Enumerator 4	11	16.5	4.8	0.1	0.04	0.2	100	0.01	0.02	TEM good	R value good	Bias good	Bias good
	Enumerator 5	11	16.5	4.8	0.1	0.02	0.1	100	0.01	0.02	TEM good	R value good	Bias good	Bias good
	Enumerator 6	11	16.4	4.8	0.2	0.09	0.5	100	0.02	0.02	TEM acceptable	R value good	Bias good	Bias good
	Enumerator 7	11	16.5	4.8	0.3	0.09	0.6	100	0.03	0.03	TEM acceptable	R value good	Bias good	Bias good

	Enumerator 8	11	16.4	4.8	0.1	0.03	0.2	100	0.02	0.01	TEM good	R value good	Bias good	Bias good
	Enumerator 9	11	16.4	4.8	0.1	0.03	0.2	100	0.02	0.01	TEM good	R value good	Bias good	Bias good
	Enumerator 10	11	16.4	4.8	0.1	0.02	0.1	100	0.02	0.01	TEM good	R value good	Bias good	Bias good
	Enumerator 11	11	16.4	4.8	0.1	0.04	0.2	100	0.02	0.01	TEM good	R value good	Bias good	Bias good
	Enumerator 12	11	16.4	4.8	0.1	0.04	0.2	100	0.02	0.01	TEM good	R value good	Bias good	Bias good
	Enumerator 13	11	16.4	4.8	0.1	0.04	0.2	100	0.02	0.01	TEM good	R value good	Bias good	Bias good
	Enumerator 14	11	16.4	4.8	0.1	0.04	0.2	100	0.02	0.02	TEM good	R value good	Bias good	Bias good
	Enumerator 15	11	16.4	4.8	0	0	0	100	0.02	0.02	TEM good	R value good	Bias good	Bias good
	Enumerator 16	11	16.4	4.8	0.2	0.05	0.3	100	0.02	0.02	TEM acceptable	R value good	Bias good	Bias good
	Enumerator 17	11	16.5	4.7	0	0	0	100	0.03	0.03	TEM good	R value good	Bias good	Bias good
	Enumerator 18	11	16.4	4.8	0	0	0	100	0.04	0.03	TEM good	R value good	Bias good	Bias good
	Enumerator 19	11	16.4	4.8	0	0	0	100	0.02	0.02	TEM good	R value good	Bias good	Bias good
	Enumerator 20	11	16.4	4.8	0	0	0	100	0.02	0.02	TEM good	R value good	Bias good	Bias good
	enum inter 1st	20x11	16.4	4.7	-	0.04	0.3	100	-	-	TEM good	R value good		

	enum inter 2nd	20x11	16.5	4.7	-	0.04	0.3	100	-	-	TEM good	R value good		
	inter enum + sup	21x11	16.4	4.7	-	0.04	0.2	100	-	-	TEM good	R value good		
	TOTAL intra+inter	20x11	-	-	-	0.06	0.4	100	-	-	TEM good	R value good		
	TOTAL+ sup	21x11	-	-	-	0.06	0.4	100	-	-	TEM good	R value good		
Height		subjects	mean	SD	max	Technical error	TEM/mean	Coef of reliability	Bias from superv	Bias from median			From	From
		#	cm	cm	cm	TEM (cm)	TEM (%)	R (%)	Bias (cm)	Bias (cm)			Supervisor	Median
	Supervisor	11	100.7	12.6	0.9	0.22	0.2	100	0	0.19	TEM good	R value good	Bias good	Bias good
	Enumerator 1	11	100.7	12.7	0.2	0.11	0.1	100	0.24	0.09	TEM good	R value good	Bias good	Bias good
	Enumerator 2	11	100.8	12.8	0.5	0.2	0.2	100	0.29	0.14	TEM good	R value good	Bias good	Bias good
	Enumerator 3	11	100.9	12.6	1.1	0.41	0.4	99.9	0.34	0.31	TEM acceptable	R value good	Bias good	Bias good
	Enumerator 4	11	100.7	12.5	3.4	0.8	0.8	99.6	0.22	0.26	TEM poor	R value good	Bias good	Bias good
	Enumerator 5	11	100.8	12.7	0.8	0.27	0.3	100	0.35	0.21	TEM good	R value good	Bias good	Bias good
	Enumerator 6	11	100.7	12.7	0.6	0.21	0.2	100	0.27	0.16	TEM good	R value good	Bias good	Bias good

	Enumerator 7	11	100.8	12.6	2.1	0.58	0.6	99.8	0.4	0.26	TEM acceptable	R value good	Bias acceptable	Bias good
	Enumerator 8	11	100.8	12.5	2.9	0.69	0.7	99.7	0.26	0.26	TEM poor	R value good	Bias good	Bias good
	Enumerator 9	11	99.8	13.6	20.3	4.33	4.3	89.9	1.07	1.01	TEM reject	R value reject	Bias poor	Bias poor
	Enumerator 10	11	100.6	12.8	2.8	0.61	0.6	99.8	0.37	0.29	TEM poor	R value good	Bias good	Bias good
	Enumerator 11	11	100.7	12.7	0.4	0.16	0.2	100	0.29	0.17	TEM good	R value good	Bias good	Bias good
	Enumerator 12	11	100.6	12.6	0.7	0.21	0.2	100	0.28	0.16	TEM good	R value good	Bias good	Bias good
	Enumerator 13	11	102.2	10.8	0.6	0.17	0.2	100	1.72	1.77	TEM good	R value good	Bias reject	Bias reject
	Enumerator 14	11	100.7	12.7	0.8	0.2	0.2	100	0.36	0.23	TEM good	R value good	Bias good	Bias good
	Enumerator 15	11	100.7	12.7	0.5	0.18	0.2	100	0.39	0.24	TEM good	R value good	Bias good	Bias good
	Enumerator 16	11	100.8	12.8	0.3	0.12	0.1	100	0.61	0.48	TEM good	R value good	Bias acceptable	Bias acceptable
	Enumerator 17	11	100.9	12.7	1.1	0.45	0.4	99.9	0.35	0.33	TEM acceptable	R value good	Bias good	Bias good
	Enumerator 18	11	100.5	12.6	0.9	0.23	0.2	100	0.33	0.26	TEM good	R value good	Bias good	Bias good
	Enumerator 19	11	100.7	12.7	0.6	0.26	0.3	100	0.27	0.16	TEM good	R value good	Bias good	Bias good
	Enumerator 20	11	100.8	12.8	0.6	0.25	0.2	100	0.32	0.21	TEM good	R value good	Bias good	Bias good

	enum inter 1st	20x11	100.7	12.4	-	1.24	1.2	99	-	-	TEM poor	R value acceptable		
	enum inter 2nd	20x11	100.8	12.4	-	1.85	1.8	97.8	-	-	TEM reject	R value acceptable		
	inter enum + sup	21x11	100.7	12.4	-	1.51	1.5	98.5	-	-	TEM reject	R value acceptable		
	TOTAL intra+inter	20x11	-	-	-	1.89	1.9	97.7	-	-	TEM reject	R value acceptable		
	TOTAL+ sup	21x11	-	-	-	1.84	1.8	97.8	-	-	TEM reject	R value acceptable		
MUAC		subjects	mean	SD	max	Technical error	TEM/mean	Coef of reliability	Bias from superv	Bias from median			From	From
		#	mm	mm	mm	TEM (mm)	TEM (%)	R (%)	Bias (mm)	Bias (mm)			Supervisor	Median
	Supervisor	11	156.5	14.4	1	0.45	0.3	99.9	0	0.41	TEM good	R value good	Bias good	Bias good
	Enumerator 1	11	156.4	14.7	4	1.75	1.1	98.6	1.34	1.13	TEM good	R value acceptable	Bias acceptable	Bias acceptable
	Enumerator 2	11	156.1	14.7	5	2.08	1.3	98	1.09	1.27	TEM acceptable	R value acceptable	Bias acceptable	Bias acceptable
	Enumerator 3	11	155.7	14.6	7	3.19	2	95.2	0.99	1.05	TEM poor	R value acceptable	Bias good	Bias acceptable
	Enumerator 4	11	159.3	15.3	5	1.94	1.2	98.4	3.1	3.28	TEM good	R value acceptable	Bias reject	Bias reject
	Enumerator 5	11	156.5	13.7	5	2.09	1.3	97.7	1.36	1.42	TEM acceptable	R value acceptable	Bias acceptable	Bias acceptable

	Enumerator 6	11	156.7	15.5	10	3.74	2.4	94.2	1.25	1.31	TEM reject	R value poor	Bias acceptable	Bias acceptable
	Enumerator 7	11	154.2	14.5	10	3.16	2	95.2	2.52	2.12	TEM poor	R value acceptable	Bias poor	Bias poor
	Enumerator 8	11	156.7	13.7	5	1.82	1.2	98.2	1.22	1.28	TEM good	R value acceptable	Bias acceptable	Bias acceptable
	Enumerator 9	11	156.4	13.8	5	1.72	1.1	98.4	1.24	1.3	TEM good	R value acceptable	Bias acceptable	Bias acceptable
	Enumerator 10	11	157.2	15	6	2.36	1.5	97.5	2.12	2.12	TEM acceptable	R value acceptable	Bias poor	Bias poor
	Enumerator 11	11	156.5	15.5	5	1.77	1.1	98.7	1.74	1.74	TEM good	R value acceptable	Bias acceptable	Bias acceptable
	Enumerator 12	11	155.9	14.7	6	2.65	1.7	96.8	1.21	1.13	TEM acceptable	R value acceptable	Bias acceptable	Bias acceptable
	Enumerator 13	11	156.2	14.5	7	2.15	1.4	97.8	1.11	0.8	TEM acceptable	R value acceptable	Bias acceptable	Bias good
	Enumerator 14	11	157.4	14.3	3	1.41	0.9	99	1.79	1.94	TEM good	R value good	Bias acceptable	Bias acceptable
	Enumerator 15	11	156.5	14.1	3	1.48	0.9	98.9	1.19	1.51	TEM good	R value acceptable	Bias acceptable	Bias acceptable
	Enumerator 16	11	158.6	14.6	3	1.13	0.7	99.4	3.05	3.18	TEM good	R value good	Bias reject	Bias reject
	Enumerator 17	11	154.8	14.7	4	1.62	1	98.8	2.42	2.33	TEM good	R value acceptable	Bias poor	Bias poor
	Enumerator 18	11	155.9	14.5	2	0.93	0.6	99.6	1.96	2.03	TEM good	R value good	Bias acceptable	Bias poor
	Enumerator 19	11	157.3	15.5	6	1.92	1.2	98.5	1.76	2	TEM good	R value acceptable	Bias acceptable	Bias poor

	Enumerator 20	11	155	13.6	3	1.26	0.8	99.1	1.75	1.62	TEM good	R value good	Bias acceptable	Bias acceptable
	enum inter 1st	20x11	156.2	14.2	-	2.69	1.7	96.4	-	-	TEM acceptable	R value acceptable		
	enum inter 2nd	20x11	156.7	14.4	-	2.75	1.8	96.4	-	-	TEM poor	R value acceptable		
	inter enum + sup	21x11	156.5	14.3	-	2.65	1.7	96.6	-	-	TEM acceptable	R value acceptable		
	TOTAL intra+inter	20x11	-	-	-	3.45	2.2	94.2	-	-	TEM reject	R value poor		
	TOTAL+ sup	21x11	-	-	-	3.37	2.2	94.5	-	-	TEM reject	R value poor		

Resources:

- ENA software 2020 updated 11th January 2020.
- Afghanistan Health Survey 2018.
- WHO Child Growth Standard 2006.
- Myatt, M. et al (2018) Children who are both wasted and stunted are also underweight and have a high risk of death: descriptive epidemiology of multiple anthropometric deficits using data from 51 countries.
- WHO mortality emergency threshold.
- WHO Emergency Severity classification for underweight.
- NSIA updated population 1398 (2019).