AFGHANISTAN

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

Balkh Province, Afghanistan

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Abbreviations

ACF/AAH	Action Contre la Faim/Action Against Hunger
ANC	Anténatal care
BCG	Bacillus Calmette Guerin
BDN	Bakhtar Development Network
BPHS	Basic Package of Health Services
BSU	Basic Sampling Unit
CBNP	Community Basic Nutrition Package
CDR	Crude Death Rate
CSO	Central Statistics Organization
ENA	Emergency Nutrition Assessment
EPI	Expended Program on Immunization
EPHS	Essential Public Health services
FCS	Food Consumption Score
FSL	Food Security and livelihood
GAM	Global Acute Malnutrition
GM	Growth Monitoring
HFs	Health Facilities
HH	Household
IYCF	Infant and Young Child Feeding
MAM	Moderate Acute Malnutrition
MUAC	Mid Upper Arm Circumference
MW	Mean Weight Management of Child
NIMCI	Nutrition Integrated Management of Child hood Illness
NNS	National Nutrition Survey
OPD SAM	Outpatient Department of Sever Acute Malnutrition

PENTA	Pertussis, Diphtheria, Tetanus, Hepatitis B and Hemophilia's influenza type B
PNC	Postnatal Care
PLW	Pregnant and Lactating Women
PPS	Proportional Population to Size
PSU	Primary Sampling Unit
RC	Reserve Cluster
rCSI	Reduced Coping Strategies Index
SAM	Severe Acute Malnutrition
SBA	Skilled Birth Attendant
SD	Standard Deviation
SMART	Standardized Monitoring and Assessment of Relief and Transition
U5DR	Under five Death Rate
U5	Under five children
UNICEF	United Nation Children's Fund
WASH	Water Sanitation and Hygiene
WFP	World Food Program
WHZ	Weight for Height Z score
W/H	Weight for height
WHO	World Health Organization

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1. EXECUTIVE SUMMARY

Balkh is one of the 34 provinces of Afghanistan. It is situated in the northern part of the country, bordering Turkmenistan in the northwest, Uzbekistan in the north, Tajikistan to the north-east, Kunduz Province to the east, Samangan Province to the south-east, Sar-e Pol Province to the south-west and Jowzjan Province to the west.

The standardized Monitoring and Assessment of Relief and Transition (SMART) nutrition survey was conducted in fall from 8th to 17th October 2018 (Meezan 1397 according to solar calendar) covering the entire province. Action Against Hunger (AAH) technically supported Balkh Basic Package of Health Services (BPHS) implementer organization Bakhtar Development Network (BDN) to carry out this survey in all the districts of the province and it was good opportunity to build capacity of the organization (contingent upon the security situation). It was a cross sectional population-representative survey following a two-stage cluster sampling method, based on SMART methodology. The final report shows the analysis of under-five children's nutritional status, morbidity, mortality, immunization, the nutrition status of pregnant and lactating women (PLWs) , water, sanitation and hygiene (WASH) and food security and livelihoods (FSL) indicators. The summary of the key findings are shown in the table below.

1.1. Summary Findings

Children Nutritional Status	
Indicators	**Results**
GAM rate among children 6-59 months old children based on WHZ <-2SD	9.4% (6.3-13.8 95% CI)
SAM rate among children 6-59 months old children based on WHZ <-3SD	2.1% (1.0- 4.3 95% CI)
GAM rate among children 6-59 months old children based on MUAC <125mm	4.5% (2.8- 7.1 95% CI)
SAM rate among children 6-59 months old children based on MUAC <115 mm	1.3% (0.6- 2.9 95% CI)
GAM rate among children 0-59 months old children based on WHZ <-2SD	10.6% (7.6-14.5 95% CI)
SAM rate among children 0-59 months old children based on WHZ <-3SD	2.1% (1.0- 4.1 95% CI)
GAM rate among children 6-59 months old children based on combined criteria (MUAC <125mm and/or WHZ <-2 and/or Oedema)	11.5% (8.3-15.8 95% CI)

SAM rate among children 6-59 months old children based on combined criteria (MUAC <115mm and/or WHZ <-3 and/or Oedema)	2.6% (1.2- 5.5 95% CI)
Stunting among 6-59 months old children based on HAZ <-2SD	32.3% (27.3-37.7 95% CI)
Severe Stunting among 6-59 months old children based on HAZ <-3SD	9.4% 6.7-12.9 95% CI)
Underweight among children 6-59 months based on WAZ <-2SD	18.9% (14.5-24.3 95% CI)
Severe Underweight among children 6-59 months based on WAZ <-3SD	4.1% (2.6- 6.5 95% CI)

Child Health and Immunization	
Indicator	**Results**
Children 0-59 months reporting symptoms of illness* based on 2 week recall	55.3%
Children aged 0-59 months that reported of having Fever based on 2 week recall	33.9%
Children aged 0-59 months that reported of having ARI based on 2 week recall	37.8%
Children aged 0-59 months that reported of having Diarrhea based on 2 week recall	18.5%
Measles vaccination status of the children aged 9-59 months confirmed by recall or vaccination card	87.5%
BCG vaccination status based on scar confirmation for children aged 0-59 months	81.5%
Polio vaccination status confirmed by recall or vaccination card among children aged 0-59 months	92.0%
PENTA 3 vaccination status confirmed by recall or vaccination card among children aged 4–59 months	79.5%
Deworming of children aged 24-59 months received in the last six months confirmed by recall	57.6%
Vitamin A received in the last six months for children 6-59 months confirmed by recall	61.3%

*cough, fever, diarrhea, fever, rash, infection, headache, nausea, vomiting, etc.

Nutrition status among Pregnant and Lactating Women (PLW)

Indicator	Results
Undernutrition among pregnant women based on MUAC <230 mm	20.9%
Undernutrition among lactating women based on MUAC <230 mm	16.2%
Undernutrition among pregnant and lactating women (PLWs) based on MUAC <230mm	17.3%
Undernutrition among pregnant and lactating women (PLWs) based on MUAC <185mm	0.7%

Infant and Young Children Feeding (IYCF) Practices	
Indicator	**Results**
Children ever breastfed (children 0-23 months)	94.0%
Initiation of breastfeeding within 1 hour of birth (children 0-23 months)	68.9%
Exclusive breastfeeding (EBF) of children less than 6 months	35.7%
Provision of colostrum in the first 3 days of birth (children 0-23 months)	92.7%
Continued breastfeeding at 1 year of age (children 12-15 months)	86.8%
Continued breastfeeding at 2 year of age (children 20-23 months)	76.2%
Introduction of solid, semi-solid or soft foods (children 6-8 months)	63.6%

Crude and U5 Death Rate (Death/10,000/Day)	
Indicator	**Results**
Crude death rate (CDR)	0.23 (0.11-0.46,95% CI)
Under five death rate (U5DR)	0.28 (0.07-1.13,95% CI)

2. INTRODUCTION

Balkh is one of the 34 provinces of Afghanistan located in the northern highlands of the country, Balkh has 15 districts, namely Nahri Shahi, Dehdadi, Char Kent, Marmu, Balkh, Sholgara, Chimtal, Dawlat Abad, Khulm, Char Bolak, Shortepa, Kaldar, Khishindeh, Zari and the capital city of Mazar-e- Sharif.

As illustrated in the map, Balkh Province is situated in the northern part of the country, bordering Turkmenistan in the northwest, Uzbekistan in the north, Tajikistan to the north-east, Kunduz Province to the east, Samangan Province to the south-east, Sar-e Pol Province to the south-west and Jowzjan Province to the west. The province covers an area of 16,840 km2. Nearly half of the province is mountainous or semi-mountainous terrain (48.7%) while half of the area (50.2%) is made up of flat land. The city of Balkh and the area of Balkh Province was considered a part of various historical regions in history including Ariana and Greater Khorasan. It serves today as Afghanistan's second but main gateway to Central Asia, the other being Sherkhan Bandar in the Kunduz Province.

The population of the province is around 1,442,847[1]. The majority of the population of Mazar-e-Sharif city and its neighboring districts (Dawlat Abad and Balkh districts) speak Dari and Pashto. Uzberki and Tatar languages are also common amongst the local minorities. Ethnic diversity was highly visible in Balkh province, which is a multi-ethnic and mostly Persian-speaking (40% Tajik, 25% Hazara) society.

According to the Naval Postgraduate School Balkh is ethnically diverse, including substantial Tajik, Hazara, Pashtuns, Arab, Uzbek, Turkomen, and Sunni Hazara (Kawshi) communities.

Around 66% of the population of Balkh lives in rural districts while 34% lives in urban areas. The population is approximately 51% male and 49% female.

[1] CSO: updated population 1397 (2018-2019)

2.1. Economic and Agriuclturs

Although the province of Balkh, especially the city of Mazar, has become a focal point of economic activities in recent years, agriculture still remains the predominant economic sector. The province, similar to the other northern provinces, has traditionally been a food grain surplus area. Agriculture, including animal husbandry, provides livelihood to the majority of the province's population. The main crops grown in the province are wheat, cotton, barley, rice and a variety of fruits and vegetables. The province is famous for its melon, almond, and pomegranates. However, damage to irrigation facilities due to the war, lack of proper maintenance of irrigation canals and disrupted flow of agricultural inputs have unfavourably affected agricultural output and productivity.[i2] The province was poorly affected by drought in early 2017 and late 2018 and the province was catagorized on stress based on Afgahanistan Food Sedurity outlook June 2018 FEWSNET report.

2.2.Humanitarian Assistance

Eight national and international organizations are providing the health services in the province such as UNICEF, WHO, YHDO, MSI, BDN, Health Net, Hilal Ahmar, Health Prom, jhpiego and PPHD is the implementer of Essential Package of Hospital Services (EPHS) and BDN is the implementer of Basic Health Package of Services (BPHS) in the province. There are 115 operational health facilities in the province (1 RH, 5 DHs, 3 CHC+, 11 CHCs, 44 BHCs, 52 SHC) that provide health services. OPD MAM program was not present in the province only OPD SAM treatment center were present in the CHCs and some BHCs that is implanting by BHPS in the province.

The SMART nutrition survey was conducted in fall (October 2018 - Meezan 1397 according to solar calendar) covering the entire province (15 districts). ACF provided technical support to the Balkh BPHS implementer, BDN to conduct this survey to investigate nutrition status of all vulnerable population in the entire districts (15) of the province. This offered a good opportunity to build the capacity of the organization.

3. SURVEY OBJECTIVES

3.1. Broad objective

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

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[2] AFGHANISTAN BALKH PROVINCE SOCIO ENOMIC PROFILE UN DATA

3.2. Specific objective

- To determine the prevalence of undernutrition (stunting, wasting, underweight) among children aged 6-59 months
- To determine the nutritional status of pregnant and lactating women (PLW) based on mid-upper arm circumference (MUAC) assessment.
- To estimate Crude Death Rate (CDR) and Under Five Death Rate (U5DR)
- To assess institutional birth attendance in the province.
- To assess the antenatal care practice among the childbearing age during their last pregnancy.
- To assess morbidity among children 0-59 months based on a two weeks recall period.
- To assess immunization (Measles, BCG, PENTA3 and Polio among children 0-59 months.
- To determine core Infant and Young Child Feeding (IYCF) practices among children aged <24months.
- To assess water, sanitation and hygiene (WASH) proxy indicators: household water storage, water use and caregiver hand washing practices.
- To assess the food security situation through Food Consumption Score (FCS) and reduced Coping strategy Index (rCSI).

3.3. Justification

- Since more than 5 years, there has been no nutrition assessment in Balkh. The most recent provincial level representative nutrition data available for Balkh is the 2013 National Nutrition Survey (NNS) with a GAM rate of 5.7% (3.43 – 9.17 95% CI) and SAM rate of 1.4% (0.44 – 4.38 95% CI) based on WHZ. Therefore, AIM-WG and the Public Nutrition Department (PND) have prioritized this province to conduct Standardized Monitoring and Assessment in Relief and Transition (SMART) survey.
- There **was** a need to investigate the current prevalence of under-nutrition in the province. The Survey findings will be used to inform future programming in the province.
- It was also a good opportunity of building the capacity of the BDN (BPHS IP and EPHS IP) among other stakeholders.

4. METHODOLOGY

4.1. Sample Size

The sample size of households to be surveyed was determined using ENA software for SMART version 2011 (up dated 9th July 2015). A **two-stage cluster sampling methodology** was applied.. Villages were the Primary Sampling Unit (PSU) for the proposed survey. In the first stage, clusters/villages (47 clusters) were selected

from a total list of villages (2968[3]) using the probability proportional to size (PPS) method. This was done before starting data collection in the field office or training hall. The second stage of the methodologyinvolved the random selection of household from a complete and updated list of households. This was conducted at field level. Households were the basic sampling unit (BSU) for the proposed survey. The tables 1 and 2 highlight the parameters used for sample size calculation for anthropometric and mortality surveys.

Table 1: Parameters for sample size calculation of anthropometric indicators

Parameters for Anthropometry	Value	Assumptions based on context
Estimated prevalence of GAM (%)	9.2%	Based on the 2013 NNS Nutrition Survey 2013 with results indicating GAM 5.7% (3.4–9.2; 95% CI). Although with a standard deviation of 2.0 (outside of the normal range [0.8-1.2] this GAM prevalence was slightly underestimated at the time. However, the upper confidence interval of 9.2% was selected as a more conservative estimate, particularly given the influence of drought on the province and recent SMART surveys in neighboring provinces (Jawzjan, Samangan and Kunduz) with a GAM by WHZ exceeding 10%.
Desired precision	±3.0	Based on SMART recommendation and consistent with survey objectives and the estimated the prevalence.
Design Effect	1.5	Based on SMART recommendation and considering the population living in the province was relatively homogenous.
Children to be included	**582**	Minimum sample size for children aged 6-59 months. (However to avoid possible bias of selection for younger age group, all children from 0 to 59 months old found in the selected households was surveyed.)

[3] Balkh EPI Micro plan 2018

Average HH Size	7.0	Based on reported average household size from recent SMART surveys in neighboring provinces (Jawzjan, Samangan and Kunduz SMART surveys 2018.
% Children 0 – 59 Months	17.3 %	Based on CSO updated population for Afghanistan 1397 (2018)
% Non-response Households	4%	Based on results of recent SMART surveys in the nearby provinces (Jawzjan, Samangan and Kunduz).
Households included	**556**	Minimum sample size of households to be surveyed. Households was the BSU for the SMART survey.

Table 2: Sample size calculation for mortality surveys

Parameters for Mortality	Value	Assumptions based on context
Estimated Death Rate /10,000/day	0.5/10,000/day	There is no updated mortality data available, therefore based on the SMART recommendation of 0.5 CDR for the planning stage.
Desired precision /10,000/day	±0.3	Based on SMART recommendation and supportive of survey objectives to the estimated death rate.
Design Effect	1.5	Based on SMART recommendation and considering the population living in the province is relatively homogenous.
Recall Period in days	**121**	Starting point of recall period is 15th Jun, 2018 and the mid-point of data collection is 13th October Eid-ul Feter [Eid of Ramadan] 25th Jawza 1397 is equal to 15th Jun 2018).
Population to be included	**2,880**	**Population**
Average HH Size	**7.0**	Based on reported average household size from recent SMART surveys in neighboring provinces (Jawzjan, Samangan and Kunduz SMART surveys 2018.
% Non-response Households	**4%**	Based on results of recent SMART surveys in the nearby provinces (Jawzjan, Samangan and Kunduz)

Households to be included	**429**	Households

Note: Based on the SMART methodology, between the calculated anthropometry and mortality sample sizes, the largest sample size was used for this survey. In this case, the larger sample size was 556 households.

4.2. Sampling Methodology

Stage 1: Random selection of clusters/villages were chosen by applying (PPS) using ENA for SMART software version 2011 (updated 9th July, 2015). A list of all updated villages were added into the ENA for SMART software where the PPS method was applied. The list of villages/clusters were gathered from BPHS IP (i.e. BDN) in consultation with PPHD and local government to finalize the sampling frame. For Mazar-e-Sharif district (capital of Balkh) which is a mixed of semi-urban and rural area the list of villages was gathered based on the zone/street/Guzar from semi-urban place while list of villages was gathered from rural site of the district based on the latest EPI micro-plan. All the insecure and inaccessible villages/clusters were identified. Then all the insecure/inaccessible villages (if any) were systematically excluded from the final sampling frame. The villages with large population had a higher chance of being selected than villages with small population and vice versa. Considering time for travel, sampling, and household surveys it was estimated that 12 HHs could be visited per team per day, with a sample size of 556 HHs, 556/12=46.33 rounded up to 47 total clusters to be surveyed. However, a total of 46 clusters were covered out 47 Clusters: one cluster (cluster 15, yaqob boy village, Khulam District) was inaccessible due to ongoing conflict on the way to village, so the teams had access to only 46 clusters. Reserve Clusters (RCs) were not used as the one missed cluster (2.12%) was less than 10% of selected clusters.

In each selected village, one or more community member(s) were asked to help the survey teams to conduct their work by providing information about the village with regard to the geographical organization or the number of households. In cases where there were large villages or semi-urban zones/small city in a cluster, the village/zone was divided into smaller segments and a segment was selected randomly to represent the cluster. This division was done based on existing administrative unit's e.g. streets or natural landmarks like rivers, roads, or public places like the Masjid, hills and mountains.

Stage 2 Random selection of households from updated and complete list of households within a given village. The actual survey data collectionincorporated 47 *12 564 households randomly selected based on survey parameters calculation for anthropometric survey since anthropometry has the highest sample (564 HHs for anthropometric sample size) compare to mortality (429 HHs for mortality sample size) component. Based on total sample size each team can cover effectively 12 households in a day. In this assessment, 6 teams were engaged during the assessment, while data collection is expected to last a maximum of 10 days. All households

were enumerated and given numbers by the survey team. The 12 households were chosen randomly from the total households in the selected cluster or village by systematic random sampling was used to identify the surveyed households. The teams were trained on both methods of sampling (simple and systematic random sampling) and they were also offered with materials to assist in determining the households during the data collection exercise. For the small semi urban/city in Mazar-e-Sharif district, the team took into account multi-storeyed building as multiple HHs depending on the HHs definition. In the case of a multi-storeyed building containing multiple households was accidentally counted as one HH during the initial listing process, the enumerators did another round of randomization to select one HH.

All children living in the selected house aged 0-59 months old were included for anthropometric measurements. Children aged <24 months were included for IYCF investigation. If more than one eligible child was found in a household, both were included, even if there were twins. Eligible orphans living in the selected Households were also surveyed. All of the selected HHs were included in the mortality survey as well as responded to questions concerning the HH as a whole (ex. water storage and FSL).

Any empty households, or households with missing or absent children were revisited at the end of the sampling day in each cluster; any missing or absent children that were not subsequently found were not included in the survey. A cluster control form was used to record all missed and absent households, however, abandoned HHs were ideally excluded from the total HHs list at the beginning in the field. An elder in the village often provided this information to the teams. In the semi-urban city like Mazar e Sharif, assistance was taken from Wakeele-Guzar in this process.

The term household was defined as all people eating from the same pot and living together World food Program (WFP) definition. In Afghanistan, the term household is often defined and/or used synonymous with a compound – which potentially represents more than one household as defined here. In this case, a two-step process was ensured with the village leaders/community elders and to identify compounds from the household list in advance and asking if there were multiple cooking areas to determine the number of households.

4.3. Training, team composition and supervision

Six teams of four members conducted the field data collection. Each team was composed of one supervisor (mostly BDN nutrition officers) one team leader and two data collectors. Most of the data collectors were midwives or nurses. Each team had at least one female data collector to ensure acceptance of the team amongst the surveyed households; particularly for IYCF questions. Each female member of the survey team

was accompanied with a mahram[4] to facilitate the work of the female data collectors at the community level. The majority of the people in Balkh speak and understand Dari language; therefore, the survey manager conducted the training in Dari as well as the Dari version of the questionnaire was used. The teams were supervised by ACF, Partner BDN Organization of the province.

The entire teams received a 7-day training in Dari language on the SMART survey methodology and all its practical aspects Two ACF technical staff facilitated the training. A standardization test was conducted over the course of 1 day, measuring 10 children, in order to evaluate the accuracy and the precision of the team members in taking the anthropometric measurements. The teams also conducted a one-day field test in order to evaluate their work in real field conditions. Feedback was provided to the team about the results of the field test; particularly in relation to digit preferences and data collection. Refresher training on the anthropometric measurement and on the filling out of the questionnaires household selection was organized on the last day of the training by ACF to ensure overall comprehension before data collection began.

Each team member was provided with two documents: one field guidelines document with instructions and another household definition and selection document. All documents, such as the local event calendar, questionnaires or consent forms were translated in Dari for better understanding and to avoiding direct translation during the field data collection. The questionnaires were back translated using a different translator and were pre-tested during the field test. Alterations were made as necessary.

Daily data entry and analysis were done using ENA for anthropometric data, plausibility check, and feedback provided to the data collection teams. All anthropometric data was directly entered into ENA while IYCF and other data were analyzed using an excel spreadsheet.

4.4. Data analysis

The anthropometric and mortality data was analyzed using ENA for SMART software 2011 version (9th July 2015). Survey results were interpreted in reference to WHO standards, the analysis of the other indicators related to IYCF, WASH, demographics and food security was done using Microsoft excel version 2016. Information generated from these indicators was used to explain the outcome indicators to include; nutritional status of children under five and mortality (CDR and U5DR). Contextual information generated from routine monitoring complemented survey findings. The ACF Afghanistan surveillance team has a standardized excel based data entry and analysis sheet to enter data and analyze additional variables indicators like IYCF,

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

Morbidity, Maternal nutrition by MUAC, EPI vaccination for children, WASH and FSL indicators. Interpretation of each result was done based on the existing threshold for different indicators as well as comparing with other available data sources at national and provincial level.

4.5. INDICATORS: DEFINITION, CALCULATION and INTERPRETATION

4.5.1. Anthropometric Indicators: Definition of nutritional status of children 6-59 months

Acute Malnutrition

Acute malnutrition in children 6-59 months identified using three indicators; Weight for Height Index (W/H), Mid Upper Arm Circumference (MUAC), or bilateral pitting oedema as described below.

Weight-for-Height Index (W/H)

A child's nutritional status estimated by comparing it to the weight-for-height curves of a reference population (WHO standards data[5]). These curves have a normal shape and characterized by the median weight (value separating the population into two groups of the same size) and its standard deviation (SD). The expression of the weight-for-height index as a Z-score (WHZ) compares the observed weight (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 the field data collection, the WHZ was calculated in the field for each child in order to refer malnourished cases to appropriate center if needed. Moreover, the results were presented in Z-scores using WHO reference in the final report. The classification of acute malnutrition based on WHZ illustrated in table 4.

Mid Upper Arm Circumference (MUAC)

The mid upper arm circumference does not need to be related to any other anthropometric measurement. It is a reliable indicator of the muscular status of the child and is mainly use to identify children with a risk of mortality. The MUAC is an indicator of malnutrition only for children greater or equal to 6 months. Table 3 provides the cut-off criteria for categorizing acute malnutrition cases.

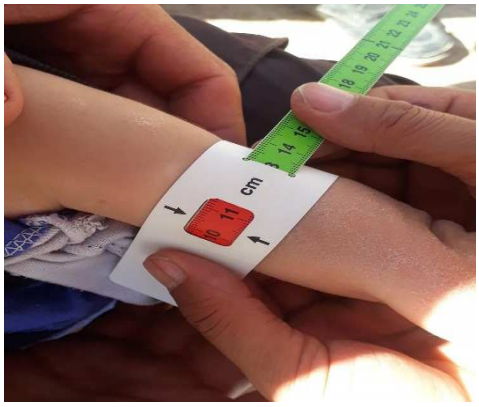

Table 3: MUAC cut-offs points for children aged 6-59 months

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

Nutritional Bilateral "Pitting" Oedema

Nutritional bilateral pitting oedema is a sign of Kwashiorkor, one of the major clinical forms of severe acute malnutrition. When associated with Marasmus (severe wasting), it is called Marasmic-Kwashiorkor. Children with bilateral oedema are automatically categorized as being severely malnourished, regardless of their weight-for-height index. The table 4 below defines the acute malnutrition according to W/H index, MUAC criterion and oedema.

Table 4: Definition of acute malnutrition according to weight-for-height index (W/H), expressed as a Z-score based on WHO standards and considering the presence of oedema

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

Combined GAM

In Afghanistan, it has been demonstrated that there is a large discrepancy between the prevalence of GAM by WHZ and GAM by MUAC. Therefore, AAH/ACF 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 and MUAC.

Age

Age was recorded among children 0-59 months as a date of birth (day/month/year) according to the Solar Calendar in the field, and later converted to the Gregorian Calendar for analysis. The exact date of birth was recorded only if the information was confirmed by supportive documentation such as vaccination card or

birth certificate. Where documentation was unavailable or questionnable, age was estimated using a local calendar of events and recorded in months.

Chronic Malnutrition

The Height-for-Age Index (H/A)

The height-for-age measure indicates if a child of a given age is stunted. This index reflects the nutritional history of a child rather than his/her current nutritional status and mainly used to identify chronic malnutrition. The same principle is used as for weight-for-height; except that a child's chronic nutritional status is estimated by comparing its height with WHO standards height-for-age curves, as opposed to weight-for-height curves. The height-for-age index of a child from the studied population expressed in Z-score (HAZ). The HAZ cut-off points presented in table 5.

Table 5: Cut offs points of the Height for Age index (HAZ) expressed in Z-score, WHO standards

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

Underweight

Underweight is the physical manifestation of both acute malnutrition and chronic malnutrition. In children 6-59 months, underweight is estimated using Weight-for-Age 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 6 below.

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

Not undewieght	≥ -2 z-score
Moderate undewieght	≥-3 z-score ≤ W/A < -2 z-score
Severe **undewieght**	< -3 z-score

4.5.2. Mortality Indicator Calculation

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

Crude death rate (CDR)

CDR refers to the number of persons in the total population that died over the specified period of time (121 days) Refer to Table 2 above for the sample size calculation for mortality surveys.

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

Under-5 death rate (U5DR)

U5DR refers to the number of children aged (0-5) years that died over the specified period of time (121 days).

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

4.6. Health

In addition to anthropometric data, the following health information was collected:

- **Immunization Status, Deworming and Vitamin A Supplementation**

Mothers/caretakers of children were asked if the children received all the necessary vaccinations (Measles, BCG, PENTA3 and Polio), which will subsequently be verified by reviewing the vaccination card, if available. In the case of PENTA 3 although this vaccination should be given on 14 weeks (3.5months), consistent with SMART methodology age data without documentation of exact birth date, age is rounded down to the nearest month, therefore, PENTA3 was assessed from 4-59 months. If the vaccination card was not available, then recall of the caregiver considered. Confirming the deworming and the Vitamin A supplementation status of children were also verified showing example products.

- **Morbidity**

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

4.6.1. WASH

- **Water Storage, Treatment and Usage**

Household heads were asked what type of container and treatment method they use for storing and purifying drinking water. They also asked how much water they used in the HH in the last 24 hours to assess the water use per person per day. The HH head was asked about what sources of water was used for HH use, excluding water used for animals.

- **Hand Washing Practices**

Mothers/caretakers were asked on what occasions they wash their hands and what they used to wash their hands to determine the hand washing practices in the surveyed area.

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

The IYCF questionnaire was asked of caregivers of children aged <24 months to assess the IYCF practices as described below:

- **Child Ever Breastfed**

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

- **Timely Initiation of Breastfeeding**

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

- **Provision of Colostrum in the First 3 Days of Life**

Proportion of children who received colostrum[6] within the first 3 days after birth. This indicator assessed the number of mothers with children <24months who fed their children with colostrum within the first 3 days after birth.

- **Exclusive Breastfeeding under 6 Months**

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

- **Introduction of Solid, Semi-solid or Soft foods:**

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

- **Continued Breastfeeding at 1 Year**

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

- **Continued Breastfeeding at 2 Years**

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

4.6.3. Maternal Health and Nutrition

- Pregnant and lactating women's were assessed for their nutritional status based on MUAC measurements. The nutritional status of pregnant and lactating mothers were derived using the MUAC cut-off of 230 mm.
- **Antenatal care:** Caregivers between the ages of 15-49 years at household level were asked on whether they sought at least one antenatal care during their last pregnancy. In this case, the last pregnancy was considered of the last child who is still between 0-59 months for the purpose of having a more precise recall period.

[6] The yellow or golden first milk produced in the first days. It is an important source of nutrition and immune protection for the newborn.

- **Delivery assisted by a Skilled Birth Attendant (SBA)**: caregiver who confirms receiving assistance from a skilled birth attendants (i.e. mid-wives, nurse, doctor who are certified by MoPH) during the last delivery.
- The indicator for **Iron-folate supplementation** was derived from dividing the total number of pregnant mothers supplemented with Iron-folate in the last 90 days by total number of pregnant mothers.

4.7. Food Security

- Questions were asked to assess the food groups consumed by the household in the past 7 days to calculate the FCS.
- Questions were also asked to understand if during the past 7 days, the household did not have enough food to eat, and what coping strategies were used in response to this to calculate the rCSI.

4.7. Survey limitations

- Insecurity was one of the limitations for the assessment in the province. Due to this issue, one cluster was not accessed and surveyed.
- The ACF survey managers were not able to provide regular direct supervision and on the job training activities to the teams during data collection due to insecurity in the field.
- During the last six days of data collection AAH/ACF team was forced to leave the province because of the parliamentary election.
- The survey did not started at the expected date and it was delayed for 9 days, because of a lack cooperation from the Balkh PPHD.
- BDN office did not provide some requirements such as transportation timely for the first day of data collection.
- The hiring process was also a challenged and delayed the survey.

5. SURVEY FINDINGS

5.1. Demography

The mortality questionnaire of the SMART methodology is designed in a way that some additional useful demography data are gathered. Data was collected from 46 clusters, 516 households[7]. 3,640 Individuals (1,922

[7] One limitation of the ENA software for analyzing demographic data is the maximum number of household members that can be entered is 20. During data collection, household ;number 9 in Cluster number 46 had more than 20 members which need separate row / line in Enal mortality part so this HHs was calculated as two HHS by ENA . Ultimately, the number of households, the average household size, and the number of households with children under five have calculated manually.

male and 1,718 female) who were members of the households. Among these, 380 households had children under five. The summary is highlighted in table 6 below.

Table 7: Summary of the demographic Summary

Indicators	Values
Total number of HHs with children under five	380
Average household size	6.9
Percentage of children under five	16.9%
Birth Rate	0.51/10000/Day
In-migration Rate (Joined)	0.18/10000/Day
Out-migration Rate (Left)	0.48/10000/Day
Number of clusters surveyed	46

5.1.1 Residential Status

The assessed households were categorized as either resident (85.6%), internally displaced (14.2%) or returnee's (0.2%). The information collected from households regarding returnees and IDPs is presented in table below.

Residential status of households N= 515	Permanent residential	441	85.6%
	Internal displacement	73	14.2%
	Returnees	1	0.2%

5.2 Description of sample

Among the 47 clusters that were planned to be surveyed, one cluster was missed due to the security problem in the Sorkh kocha village, Charkint district. Data was collected from 46 clusters, 516 households, 3,640 individuals, 530 children aged 6-59 months. four children excluded per SMART Flags of WHZ, 590 children aged 0-59 months, 252 children aged 0-23 months and 488 women of reproductive age (15-49 years) were surveyed.

Although 47 clusters and 556 HHs were calculated from ENA, with one inaccessible cluster the teams ultimately attempted to survey (46*12=552) households. Of these, 516 (93.5%) were surveyed, meaning a 6.5% (36/552) non-response rate (absent and rejected).

Table 8: Distribution of age and sex of children 6-59 months

	Boys		Girls		Total		Ratio
AGE (mo)	no.	%	no.	%	no.	%	Boy:girl
6-17	75	54.7	62	45.3	137	25.7	1.2
18-29	74	54.0	63	46.0	137	25.7	1.2
30-41	61	52.1	56	47.9	117	21.9	1.1
42-53	43	44.8	53	55.2	96	18.0	0.8
54-59	26	55.3	21	44.7	47	8.8	1.2
Total	279	52.2	255	47.8	534	100.0	1.1

Figure 1 below shows the population pyramid of the surveyed population, It is important to note the age data is not exact, given that age data from household members five years and older were based on recall. Also, that 43% of surveyed children <5 did not have proper documents to confirm their exact date of birth. This may have reduced the quality of the collected age data somewhat.

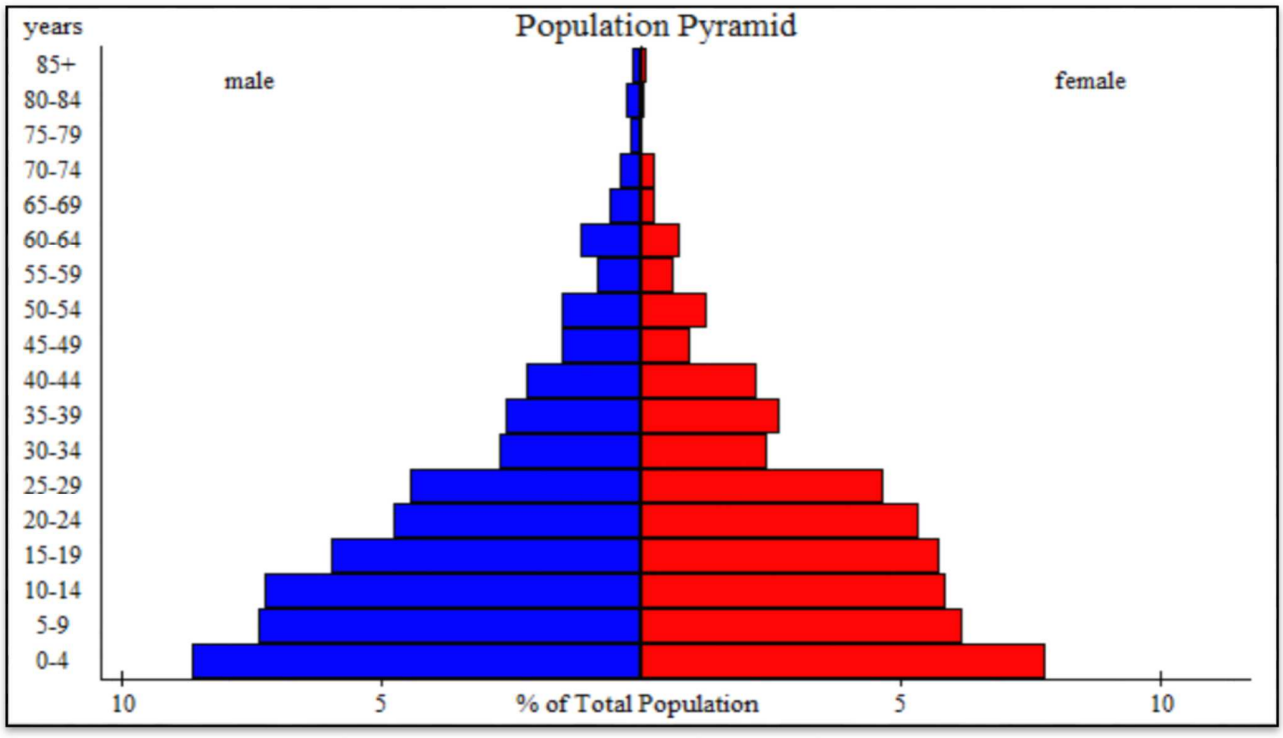

Figure 1: Distribution of age and sex pyramid

The number of households and children from 6-59 months planned and the number of households with completed interviews and measured children are shown in Table 9.

Table 9: Details of proposed and actual sample size achieved

Number of households **logistically** planned	Number of households Surveyed	% of HHs surveyed of planned	Number of children 6-59 months Planned	Number of children 6-59months surveyed	% of surveyed
564	516	**91.5 %**	582	534	**91.8 %**

Because only 91,5% of households were surveyed, 91.8% of planned children were surveyed during the assessment. This is probably due to an inadequate estimation of the proportion of children under five (17.3%) in the planning stage. Actually, during the survey we found a lower percentage of children under five (16.9%) compare to the assumption.

5.3 Data quality

The plausibility check indicated the weight and height measurements were of acceptable quality with an overall score of 17%. The proportion of SMART flags for WHZ of 0.7% was categorized as acceptable. The proportion of SMART flags for HAZ was 1.9 % and for WAZ was 0.2 %.

The overall sex ratio indicated that boys and girls were equally represented (p=0.299). However, Age ratio of 6-29 months to 30-59 months was 1.05, suggesting a significant difference (p=0.013). The expected value to indicate an equal distribution should be around 0.85, meaning that there were far more children aged 6-29 months surveyed than children 30-59 months. Further, there were fewer female children aged 54-59 months surveyed than expected. one of the limit of the survey was that only 57% of surveyed children were found to have an exact birth date (day month and year) as confirmed by documentation (vaccination cards, birth certificates and documented by fathers or mothers if available) while the rest of the children's ages were estimated using a local event calendar.

Standard deviation for the distribution of WHZ (1.15) and WAZ (1.10), both were classified as good. However, HAZ (1.22) was classified as a problematic. Therefore, the estimate of the prevalence of the stunting (32.3%) should be interpreted with caution.

5.4 Undernutrition

The nutritional status of children 6-59 months was analyzed in reference to the 2006 WHO Child Growth Standards. Table 9 shows the Z-scores, design effect, and the number of children with missing and flagged data.

Table 10: Mean z-scores, design effects, missing and out of range data

Indicator	N	Mean z-scores ± SD	Design Effect (z-score < -2)	z-scores not available*	z-scores out of range
Weight-for-Height	530	-0.40±1.15	2.07	0	4
Weight-for-Age	533	-1.02±1.10	2.05	0	1
Height-for-Age	524	-1.37±1.22	1.61	0	10

* contains for WHZ and WAZ the children with edema.

The design effect of 2.07 of HAZ is reflecting heterogeneity of the surveyed population. The index of dispersion does suggest that there are pockets of under nutrition within the sample areas as WHZ < -2: ID=2.00 (p=0.000) and WAZ < -2: ID=2.16 (p=0.000).

5.4.1. Prevalence of Global Acute Malnutrition (GAM)

Acute malnutrition is the condition represented by measures of wasted body muscles and thinness or bilateral pitting oedema and acts as proxy for the current nutritional status of the population. It represents child's failure to receive adequate nutrition and may be the result of inadequate food intake or a recent episode of illness causing loss of weight. The analysis of GAM rate was generated on children aged 6-59 months (table 11).

Table 11: Prevalence of acute malnutrition based on weight-for-height z-scores (and/or edema) and by sex among children 6-59 months

Indicators	All n = 530	Boys n = 276	Girls n = 254
Prevalence of global acute malnutrition (<-2 z-score and/or oedema)	(50) 9.4 % (6.3 - 13.8 95% C.I.)	(29) 10.5 % (6.8 - 15.9 95% C.I.)	(21) 8.3 % (5.2 - 12.9 95% C.I.)
Prevalence of moderate acute malnutrition (<-2 z-score to ≥-3 z-score, no oedema)	(39) 7.4 % (4.9 - 11.0 95% C.I.)	(20) 7.2 % (4.6 - 11.2 95% C.I.)	(19) 7.5 % (4.5 - 12.3 95% C.I.)
Prevalence of severe acute malnutrition (<-3 z-score and/or oedema)	(11) 2.1 % (1.0 - 4.3 95% C.I.)	(9) 3.3 % (1.4 - 7.7 95% C.I.)	(2) 0.8 % (0.2 - 3.1 95% C.I.)

The prevalence of oedema was 0.0 %

The Weight-for Height in Z-scores distribution curve **(figure 2) slightly shifted the left (Shapiro-Wilk test: P Value is = 0.001) suggest that the data are not normally distributed.**

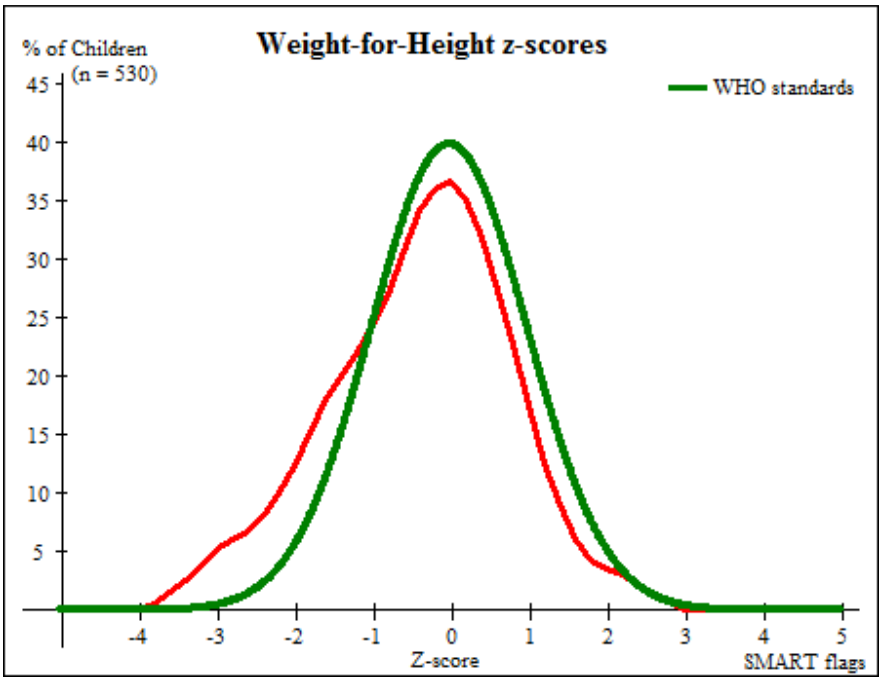

Figure 2: Weight for Height Curve

Table 12: Prevalence of acute malnutrition by age, based on weight-for-height z-scores and/or oedema

		Severe wasting (<-3 z-score)		Moderate wasting (≥-3 and <-2 z-score)		Normal (> = -2 z score)		Oedema	
Age (mo)	**Total no.**	**No.**	**%**	**No.**	**%**	**No.**	**%**	**No.**	**%**
6-17	136	5	3.7	16	11.8	115	84.6	0	0.0
18-29	134	2	1.5	11	8.2	121	90.3	0	0.0
30-41	117	1	0.9	4	3.4	112	95.7	0	0.0
42-53	96	1	1.0	3	3.1	92	95.8	0	0.0
54-59	47	2	4.3	5	10.6	40	85.1	0	0.0
Total	530	11	2.1	39	7.4	480	90.6	0	0.0

A further analysis of the GAM rate based on WHZ showed a significant difference between children 6-23 months (15.9%) and children aged 24-59 months (6.0%). Suggesting that children less than 24 months were more affected than older children were. For more details, refer to tables below.

Table 13: Prevalence of acute malnutrition based on WHZ (and/or oedema) disaggregated by sex and age

6-23 months aged	All (195)	Boys (109)	Girls (86)
Prevalence of global acute malnutrition (GAM) (<-2 z-score and/or Oedema)	(31) 15.9% (11.0-22.4 95% CI)	(21) 19.3% (12.8-28.0 95% CI)	(10) 11.6% (6.5-19.9 95% CI)
Prevalence of Severe acute malnutrition (SAM) (<-3 z-score and/or Oedema)	(8) 4.1 % (2.0-8.1 95% C.I.)	(7) 6.4 % (2.9-13.8 95% C.I.)	(1) 1.2 % (0.2-7.9 95% C.I.)
24-59 months aged	**All (336)**	**Boys (168)**	**Girls (168)**
Prevalence of global acute malnutrition (GAM) (<-2 z-score and/or Oedema)	(20) 6.0% (3.3-10.5 95% CI)	(9) 5.4% (2.5-11.1 95% CI)	(11) 6.5% (3.3-12.5 95% CI)
Prevalence of severe acute malnutrition (SAM) (<-3 z-score and/or Oedema)	(4) 1.2% (0.5-3.1 95% CI)	(3) 1.8% (0.6-5.3 95% CI)	(1) 0.6% (0.1-4.3 95% CI)

*There were no cases of Oedema

Table 14: Distribution of severe acute malnutrition based on Oedema among children 6-59 months

	<-3 z-score	>=-3 z-score
Oedema present	Marasmic kwashiorkor No. 0 (0.0 %)	Kwashiorkor No. 0 (0.0 %)
Oedema absent	Marasmic No. 14 (2.6 %)	Not severely malnourished No. 520 (97.4 %)

Cases of Oedema were not found.

Table 15: Prevalence of acute malnutrition based on MUAC cut off (and/or oedema) disaggregated by sex among children 6-59 months

Indicators	All n = 532	Boys n = 278	Girls n = 254
Prevalence of global malnutrition (<125 mm and/or Oedema)	(24)4.5 % (2.8-7.1 95% C.I.)	(12) 4.3 % (2.1-8.6 95% C.I.)	(12)4.7 % (2.5-8.8 95% C.I.)
Prevalence of moderate malnutrition (< 125 mm to ≥115 mm, no Oedema)	(17)3.2 % (1.9-5.3 95% C.I.)	(9)3.2 % (1.3-7.9 95% C.I.)	(8) 3.1 % (1.7-5.9 95% C.I.)
Prevalence of severe malnutrition (< 115 mm and/or Oedema)	(7)1.3 % (0.6 - 2.9 95% C.I.)	(3) 1.1 % (0.3-3.3 95% C.I.)	(4) 1.6 % (0.6-4.1 95% C.I.)

Table 16: Prevalence of acute malnutrition based on MUAC disaggregated by sex and two group's age

6-23 months aged	All (194)	Boys (109)	Girls (85)
Prevalence of global acute malnutrition (GAM) based on MUAC	(20)10.3% (6.5-16.0 95% CI)	(9)8.3% (3.9-16.7 95% CI)	(11)12.9% (7.4-21.7 95% CI)
Prevalence of Severe acute malnutrition (SAM) based on MUAC	(7) 3.6% (1.7-7.4 95% CI)	(3) 2.8% (0.9-7.8 95% CI)	(4) 4.7% (1.9-11.2 95% CI)
24-59 months aged	**All (336)**	**Boys (168)**	**Girls (168)**
Prevalence of global acute malnutrition (GAM) based on MUAC	(20) 6.0% (3.3-10.5 95% CI)	(9) 5.4% (2.5-11.1 95% CI)	(11) 6.5% (3.3-12.5 95% CI)
Prevalence of severe acute malnutrition (SAM) based on MUAC	(4)1.2% (0.5- 3.1 95% CI)	(3)1.8% (0.6- 5.3 95% CI)	(1) 0.6% (0.1- 4.4 95% CI)

Table 17: Prevalence of acute malnutrition by age, based on MUAC cut off's and/or oedema

		Severe wasting (< 115 mm)		Moderate wasting (≥115 mm and <125 mm)		Normal (> = 125 mm)		Oedema	
Age (mo)	**Total no.**	**No.**	**%**	**No.**	**%**	**No.**	**%**	**No.**	**%**
6-17	135	6	4.4	6	4.4	123	91.1	0	0.0
18-29	137	1	0.7	9	6.6	127	92.7	0	0.0
30-41	117	0	0.0	1	0.9	116	99.1	0	0.0
42-53	96	0	0.0	1	1.0	95	99.0	0	0.0
54-59	47	0	0.0	0	0.0	47	100.0	0	0.0
Total	532	7	1.3	17	3.2	508	95.5	0	0.0

Weight for Height Z score considered key indicator for acute malnutrition, but it should be noted that there is no gold standard measure for acute malnutrition. Based on the 2009 WHO and UNICEF Joint Statement on Child Growth Standards and the identification of SAM in Infants and Children, a MUAC measurement of less than 115mm among children 6 to 59 months old documented as severe acute malnutrition. MUAC less than 115mm indicates a high-elevated risk of mortality and morbidity than weight for height. Hence, it is important to use both criteria (MUAC+WHZ) of malnutrition for Integrated Management of Acute Malnutrition (IMAM) case loading. Table 17 shows the GAM and SAM rate on both criteria.

Table 18: Prevalence of acute malnutrition based on combined criteria (WHZ+ MUAC+ Oedema among children 6-59 months

GAM and SAM based on combined criteria*	All n = 531	Boys n = 277	Girls n = 254
Prevalence of Global Acute Malnutrition (MUAC<125 mm and/or WHZ <-2 and/or Oedema)	(61) 11.5 % (8.3-15.8 95% C.I)	(35) 12.6 % (8.3-18.8 95% C.I)	(26) 10.2 % (6.9-14.8 95% C.I)
Prevalence of Severe Acute Malnutrition (MUAC <115 mm and/or WHZ <-3 and/or Oedema)	(14) 2.6% (1.2-5.5 95% CI)	(9) 3.2% (1.3-7.6 95% CI)	(5) 2.0% (0.8-4.5 95% CI)

*the cases of oedema were not found.

5.4.2. Prevalence of chronic malnutrition (stunting)

Stunting indicates a failure to achieve one's genetic potential for height. It usually reflects the persistent, cumulative effects of long-term poor micro and macronutrients intake and other deficits that often persist across generations. It is caused by the failure to receive adequate nutrition over a long period and is affected by recurrent and chronic illness. It is not sensitive to recent/short-term changes in dietary intake and multi sectorial approach is needed to contribute to the prevention of stunting: Table 18 shows stunting rate based on height for age and by sex among children 6-59 months old.

Table 19: Prevalence of stunting based on height-for-age z-scores (HAZ) disaggregated by sex

	All n = 524	Boys n = 275	Girls n = 249
Prevalence of stunting (<-2 z-score)	(169) 32.3 % (27.3 - 37.7 95% C.I.)	(95) 34.5 % (28.6 - 41.0 95% C.I.)	(74) 29.7 % (23.3 - 37.0 95% C.I.)
Prevalence of moderate stunting (<-2 z-score to ≥-3 z-score)	(120) 22.9 % (18.8 - 27.6 95% C.I.)	(70) 25.5 % (20.2 - 31.5 95% C.I.)	(50) 20.1 % (15.1 - 26.2 95% C.I.)
Prevalence of severe stunting (<-3 z-score)	(49) 9.4 % (6.7 - 12.9 95% C.I.)	(25) 9.1 % (5.9 - 13.8 95% C.I.)	(24) 9.6 % (6.3 - 14.5 95% C.I.)

The distribution of HAZ of the observed population (SMART flags excluded) compared to WHO Reference curve shows that it was strongly shifted to the left, suggesting restricted linear growth of the observed population. Further analysis suggests that linear growth retardation is at its highest in the group of children aged 6-17 months (n=134) to then decrease with older age group . However, the HAZ SD (1.22) was classified as problematic and higher than the normal range (0.80-1.2), therefore, estimate of the prevalence of the stunting (32.3%) should be interpreted with caution. As a reminder, only 57% of children interviewed were found to have an exact birth date.

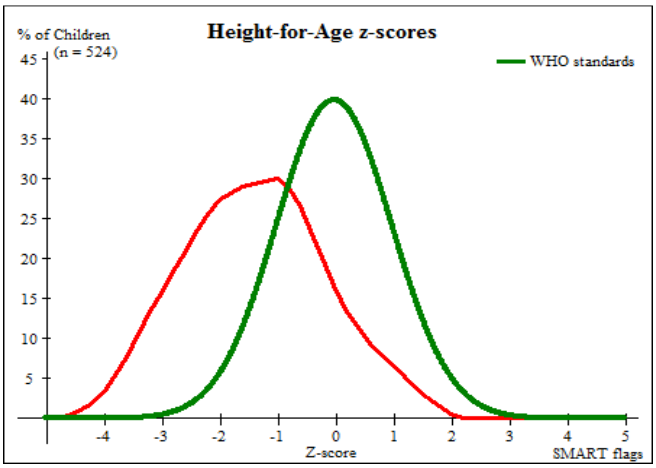

Figure 4: Gaussian Distributed Curve HAZ

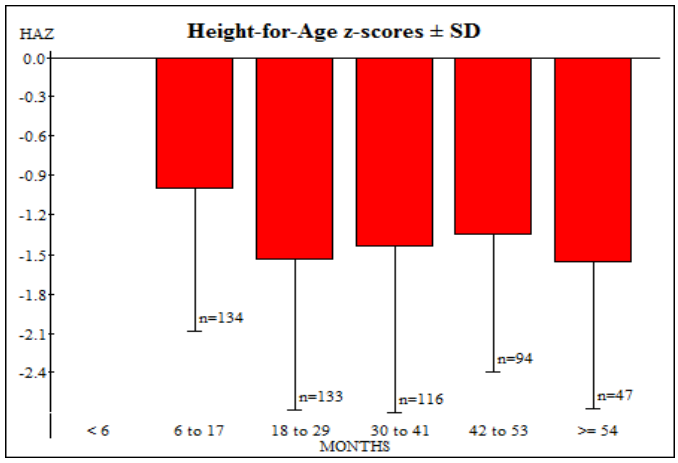

Figure 3: Trend of Stunting over the age distribution

		Severe stunting (<-3 z-score)		Moderate stunting (>= -3 and <-2 z-score)		Normal (> = -2 z score)	
Age (mo)	Total no.	No.	%	No.	%	No.	%
6-17	134	8	6.0	19	14.2	107	79.9
18-29	133	16	12.0	33	24.8	84	63.2
30-41	116	11	9.5	35	30.2	70	60.3
42-53	94	8	8.5	20	21.3	66	70.2
54-59	47	6	12.8	13	27.7	28	59.6
Total	524	49	9.4	120	22.9	355	67.7

5.4.3. Prevalence of underweight

Underweight is a compound index of height-for-age and weight-for-height. It takes into account both acute and chronic forms of malnutrition. While underweight or weight-for-age was used for monitoring the previous Millennium Development Goals, it is no longer use for monitoring individual children, as it cannot detect children who are stunted. Furthermore, it does not detect life-threating acute malnutrition among children. The underweight results are presented in **table 20** for more details.

Table 20: Prevalence of underweight based on weight-for-age z-scores (WAZ) among children 6-59 months

	All n = 533	Boys n = 278	Girls n = 255
Prevalence of underweight (<-2 z-score)	(101) 18.9 % (14.5 - 24.3 95% C.I.)	(57) 20.5 % (14.8 - 27.7 95% C.I.)	(44) 17.3 % (12.5 - 23.3 95% C.I.)
Prevalence of moderate underweight (<-2 z-score and >=-3 z-score)	(79) 14.8 % (11.5 - 18.9 95% C.I.)	(45) 16.2 % (12.0 - 21.5 95% C.I.)	(34) 13.3 % (9.4 - 18.5 95% C.I.)
Prevalence of severe underweight (<-3 z-score)	(22) 4.1 % (2.6 - 6.5 95% C.I.)	(12) 4.3 % (2.4 - 7.6 95% C.I.)	(10) 3.9 % (2.3 - 6.7 95% C.I.)

Table 21: Prevalence of underweight disaggregated by age, based on weight-for-age z-scores

		Severe underweight (<-3 z-score)		Moderate underweight (>= -3 and <-2 z-score)		Normal (> = -2 z score)		Oedema	
Age (mo)	**Total no.**	**No.**	**%**	**No.**	**%**	**No.**	**%**	**No.**	**%**
6-17	136	4	2.9	25	18.4	107	78.7	0	0.0
18-29	137	8	5.8	24	17.5	105	76.6	0	0.0
30-41	117	3	2.6	17	14.5	97	82.9	0	0.0
42-53	96	2	2.1	5	5.2	89	92.7	0	0.0
54-59	47	5	10.6	8	17.0	34	72.3	0	0.0
Total	533	22	4.1	79	14.8	432	81.1	0	0.0

5.5. Women health and nutrition status

All women of childbearing age (15-49 years) were included. A total of 488 women were assessed for nutrition status, antenatal care (ANC) and iron folate supplementation. The analysis focused on pregnant and lactating women, iron folate supplementation only from pregnant women, while last child delivery status was asked of all the women. Adequate nutrition is critical for women especially during pregnancy and lactation because

inadequate nutrition causes damage not only to women's own health but also to their children and the development of the next generation. The results for PLWs are presented in tables 22 and figure 23.

Table 22: Prevalence of malnutrition among PLWs based on MUAC cut-off

Physiological Status	Frequency (MUAC <230 mm)	Results
Malnutrition among Pregnant women (N=67)	14	20.9%
Malnutrition among Lactating women (N=204)	33	16.2%
Malnutrition among PLWs (N=271)	47	17.3%

Table 23: Iron folate supplementation for pregnant women

Iron- folate for pregnant women (n= 67)	Frequency	Results
Yes	24	35.8%
No	43	64.2%
Do not know	0	0.0%

Table 24: Status of ANC visits in the last pregnancy

ANC Visits in the last pregnancy (N=441)	Frequency	Results
Yes	404	91.6%
No	37	8.4%
ANC visits by Whom? (N=397)		
Health professional	364	91.7%
Traditional birth attendant (TBA)	23	5.8%
Community health worker (CHW)	3	0.8%
Relative/ friend	7	1.8%

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

Table 25: Skill Births Attendance (SBA) status for the last baby

Status of Skill Birth Attendance during last delivery (N=427)		Frequency	Results %
Last delivery at the health facilities		314	73.5%
Last Delivery at home	Professionals (Nurses, midwifes, Doctors and community midwifes)	14	3.3%
	Non-Professionals (CHWs, TBA and relatives)	99	23.2%

5.6. Crude and Under 5 Years Death Rate

The mortality data was also included in the survey to calculate the CDR and U5DR. It planned to survey 2,880 individuals in 429 households, however, relaying on the anthropometric sample size. Ultimately, 516 households with 3,640 individuals (1,718 female and 1,922 male) assessed. The CDR and U5DR were lower than WHO emergency threshold[8] as shown in the table (26) below. However the U5DR is still relatively high (0.28 Death/10,000/Day) in Balkh province.

Table 26: Death rates by age and sex category with design effect

Population	(Death rate /10,000/Day	Design Effect
'Overall	0.23 (0.11-0.46)	1.21
'Sex		
'Male	0.26 (0.10-0.66)	1.27
'Female	0.19 (0.07-0.51)	1.00
'Years		
'0-4	0.28 (0.07-1.13)	1.00
'5-11	0.00 (0.00-0.00)	1.00
'12-17	0.00 (0.00-0.00)	1.00
'18-49	0.11 (0.03-0.45)	1.00
'50-64	1.11 (0.37-3.33)	1.00
'65-120	2.82 (0.85-8.81)	1.03

[8] WHO's emergency thresholds of CDR 1/10,000/day and U5DR 2/10,000/day respectively,

5.8. Child Health and Immunization

5.7.1 Morbidity

The survey found that, among 584 children under five, 55.3% (323 out of 584) of children reported symptoms of illness (cough, fever, diarrhea, fever, rash, infection, headache, nausea, vomiting, etc.) the 2 weeks prior to the survey. The major illnesses reported were diarrhea, ARI and fever as highlighted in the table below (27).

Table 27: Morbidity status among under-five year's children

Parameter (N=584)	Frequency	Results (%)
Acute Respiratory Infection (ARI)	221	37.8%
Fever	198	33.9%
Diarrhea	108	18.5%

5.7.2 Child Health and Immunization

Immunization is an important public health intervention that protects children from illness and disability. As part of the Expanded Program on Immunization (EPI), measles vaccination is given to infants aged between 9-18 months, Bacillus Chalmette Guerin (BCG) is given to infants at birth and Pertussis, Diphtheria, Tetanus, Hepatitis B and Hemophilia's Influenza Type B (PENTA 3) is given to infant at 14 weeks of age. 590 under five children were assessed for their immunization history. These results are present in the table 28 below.

Table 28: Immunization coverages for BCG, Measles, PENTA 3 and Polio vaccines among children U5

Indicators	Class	Frequency	Results
Measles (children aged 9-59 months) (N= 487)	Yes by cards	207	42.5%
	Yes by recall	219	45.0%
	Both by card and recall	**426**	**87.5%**
	No	49	10.1%
	Don't know	12	2.5%
Polio (children aged 0-59 months) (N= 590)	Yes by cards	280	47.5%
	Yes by recall	263	44.6%
	Both by card and recall	**543**	**92.0%**
	No	45	7.6%
	Don't know	2	0.3%
PENTA 3 (children aged 4-59 months)	Yes by cards	227	42.3%

(N=537)	Yes by recall	200	37.2%
	Both by card and recall	**427**	**79.7%**
	No	84	15.6%
	Don't know	26	4.8%
BCG scar (children aged 0-59 months) (N=590)	Only by scar confirmation	481	81.5%
	No	109	18.5%

5.7.3 Vitamin A Supplementation for children

Provision of Vitamin A supplementation among children 6-59 months every 6 months can help protect a child from mortality and morbidity associated with Vitamin A deficiency and documented as being one of the most cost-effective approaches to improve child health. The coverage of Vitamin A supplementation in the last 6 months presented in the table 29 below.

Table 29: Vitamin A supplementation among children 6-59 months

Indicators	Class	Frequency	Results
Vitamin A supplementation 6-59 months (N= 533)	**Yes**	328	61.5%
	No	163	30.5%
	Don't know	44	8.2%

5.7.4 Deworming of children aged 24-59 months

Helminths or intestinal worms represent a serious public health problem in areas where climate is tropical, sanitation inadequate and unhygienic. Helminths cause significant malabsorption of vitamin A and aggravate malnutrition and anemia, which eventually contributes to retarded growth and poor performance in school. Children under five years old are extremely vulnerable to the deficiencies induced by parasitic infections. This means deworming is critical for the reduction of child morbidity and mortality. The proportion of children who received deworming the past 6 months presented in table 30.

Table 30: Deworming among children 24-59 months

Indicators	Class	Frequency	Results
Deworming (24-59 months children) (N=337)	**Yes**	194	57.6%
	No	107	31.8%
	Don't know	36	10.7%

5.6. Infant and Young Child Feeding (IYCF) Practices

Indicators for infant and young child feeding (IYCF) practices were also included in the survey for all children 0-23 months old. A total of 248 children under two years were included in the sample. The results are presented in percentage of the total answers available.

Table 30: Infant and Young Child Feeding (IYCF) Practices (0-23 month's children)

IYCF indicators	Definition	Frequency	Results
Children ever breastfed (N=248)	Proportion of children (0-23 months) who have ever received breast milk	233	94.0%
Timely initiation of breastfeeding (N=248)	Proportion of children born in the last 23 months who were put to the breast within one hour of birth	170	68.5%
Provision of colostrum within first 3 days of delivery (N=246)	Proportion of children (0-23 months) who received colostrum (yellowish liquid milk) within the first 3 days after birth	228	92.7%
Continued breastfeeding at one year (N=38)	Proportion of children 12–15 months of age who fed breast milk.	32	84.2%
Continued breastfeeding at two years year (N=21)	Proportion of children 20-23 months of age who fed breast milk.	15	71.4%
Exclusive breastfeeding for children <6 months (N=56)	Proportion of infants 0–5 months of age who fed exclusively with breast milk.	19	33.9%
Introduction of solid, semi solid or soft foods (N=33)	Proportion of infants 6–8 months of age who receive solid, semi-solid or soft foods.	21	63.6%

6.8. WASH

6.8.1 Water Availability and Consumption

516 households and 3,640 individuals (1922 male and 1718 female) were surveyed on water consumption practices. Figure 4 and 5 shows the total amount of water consumption in liters per individual and per household.

Analysis excluded the water used by animals. Data were displayed according to the proportion of liters used. The results were then divided in quantity of water in liters available to each household's member per day and liters to each person per day.

Sphere Standards recommends a minimum of 15L of water/person/day during a humanitarian emergency. According to national standards, a minimum consumption of 25L of water/person/day is recommended.

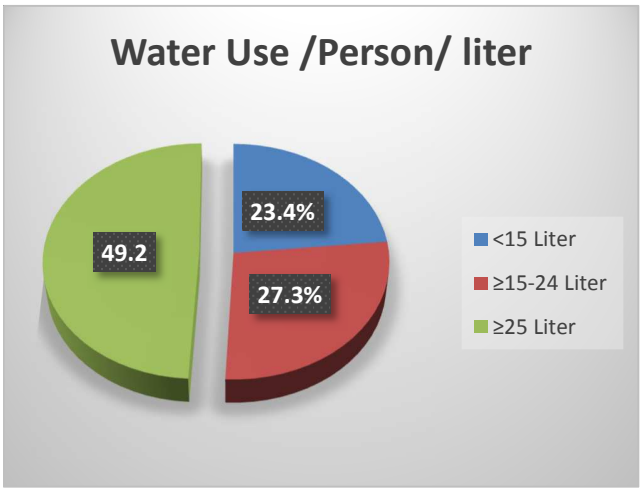

Figure 6: Percentage of water usage in liter/ person/day

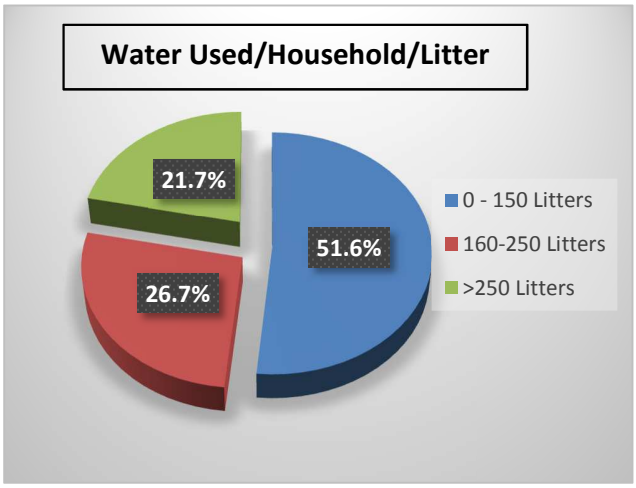

Figure 5: Percentage of HH water usage in liter/day

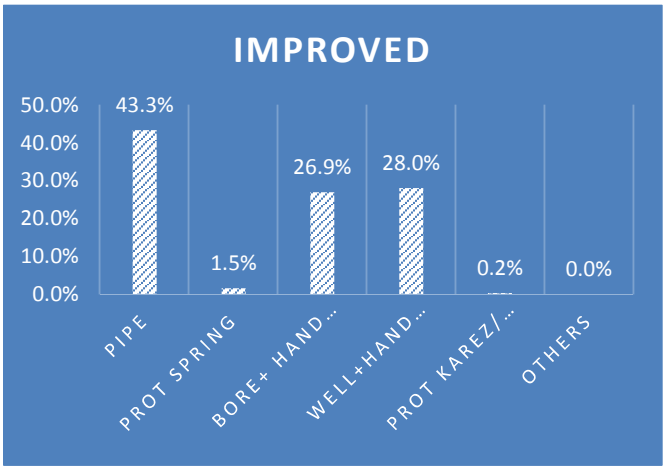

Figure 7: HHs level improved water usage

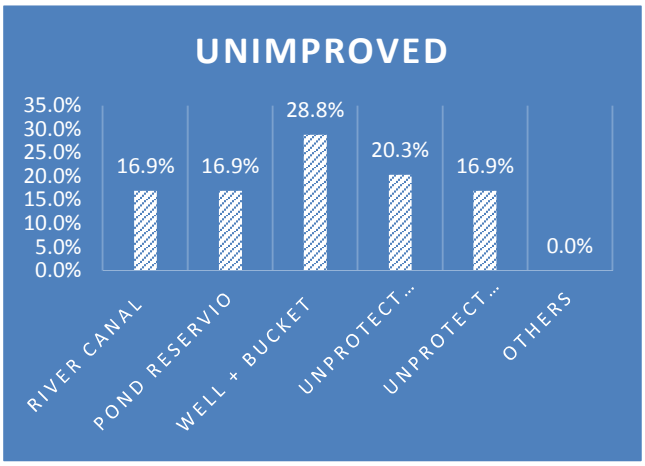

Figure 8: HHs level unimproved water usage

6.8.2 Houesholds Water Sources and Treatment

88.5% (456 HHs out of 515 HHs) of the households in the province were found using safe water sources and 11.5% were found using unsafe water sources with the specific sources illustrated in Figures 6 and 7. Analysis

of water treatment methods (table 31) indicated that (68.8%) housholds used only settled the water for drinking prior to consumption.

Among HHs surveyed, 161 (31.2%) used water treatment methods to improve the quality of their drinking water. The most common method of water treatment was boiling.

Table 31: Percentage of households with access to water treatment

Water treatment methods (N=516)	Frequency	Results
Boiling	112	21.7%
Chlorine	14	2.7%
Straining through a cloth	5	1.0%
Water filter	30	5.8%
Stand and settle (sedimentation)	355	68.8%

6.8.3 Caregiver's Hand washing practice

Hand washing practices were also included in the survey. This information was largely knowledge/recall based, there is no practical verification process to know if caretakers actually practiced hand washing at all critical points. Appropriate hand washing is a general measure that contributes to the prevention and control of communicable diseases. 23.2% of caregivers reporting washing their hands at the five critical points (see tables (33) below).

Table 32: Hand-washing practices by the mothers/caretakers

Hand washing practices by mothers/caretakers	Frequency	Results
Only clean with water (N=487)	328	67.4%
Soap/ash with clean water (N=488)	261	53.5%
Washes both hands (N=486)	338	69.5%
Rubs hands together at least 3 times (N=483)	120	24.8%
Dries hands hygienically by air-drying or using a clean cloths (N=487)	196	40.2%

Table 33: Hand washing practice by mothers/caretakers at critical time

Hand washing practices at critical moments	Frequency	Results
Washes hands at all 5 critical moments (488)	113	23.2%
After defecation (N=488)	480	98.4%

After cleaning baby's bottom (N=485)	237	48.9%
Before food preparation (N=485)	306	63.1%
Before eating (N=485)	402	82.9%
Before feeding children (including breastfeeding) (N=488)	202	41.4%

7.10. Households Food Security and Livelihoods (FSL)

7.10.1. Food Consumption Scores and Food Based Coping Strategies

Food security exists when all people, at all times have physical, social and economic access to sufficient, safe and nutritious food for a healthy and active life. In this survey, the *Food Consumption Score* (FCS)[9] was used to describe the current short-term household food security situation. The score was triangulated with the food-based or *reduced Coping Strategy Index* (rCSI)[10] to provide an indication of the food security status of the household. The triangulation of these two food security proxy indicators allows for capturing the interaction between household food consumption and coping strategies adopted, and hence, more properly reflects the food security situation in Balkh province.

Classification for food security: households having poor food consumption with high or medium coping strategies and those with borderline food consumption but with high coping are considered as ***severely food insecure (in red in the table below)***. Households having poor food consumption with low coping strategies, households having borderline food consumption with medium coping strategies and those having acceptable consumption but with high coping strategies are considered as ***moderately food insecure (in yellow in the table below).*** Households having borderline or acceptable food consumption with low or medium coping are considered as Food Security ***(in green in the Table below)***[11]**.**

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

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

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

Table 34: food consumption score

Food consumption groups (based on FCS)	Coping group (based on CSI)		
	High coping	Medium coping	No or low coping
Poor	Severely food insecure	Severely food insecure	Moderately food insecure
Border line	Severely food insecure	Moderately food insecure	Food secure
Acceptable	Moderately food insecure	Food secure	Food secure

7.10.2 Food security situation

Based on triangulation of the FSC with the food-based rCSI, the survey finding shows that out of 513 HHs 97 (18.9 %%) households had moderate and severe food insecurity for more details see figure bellow (8).

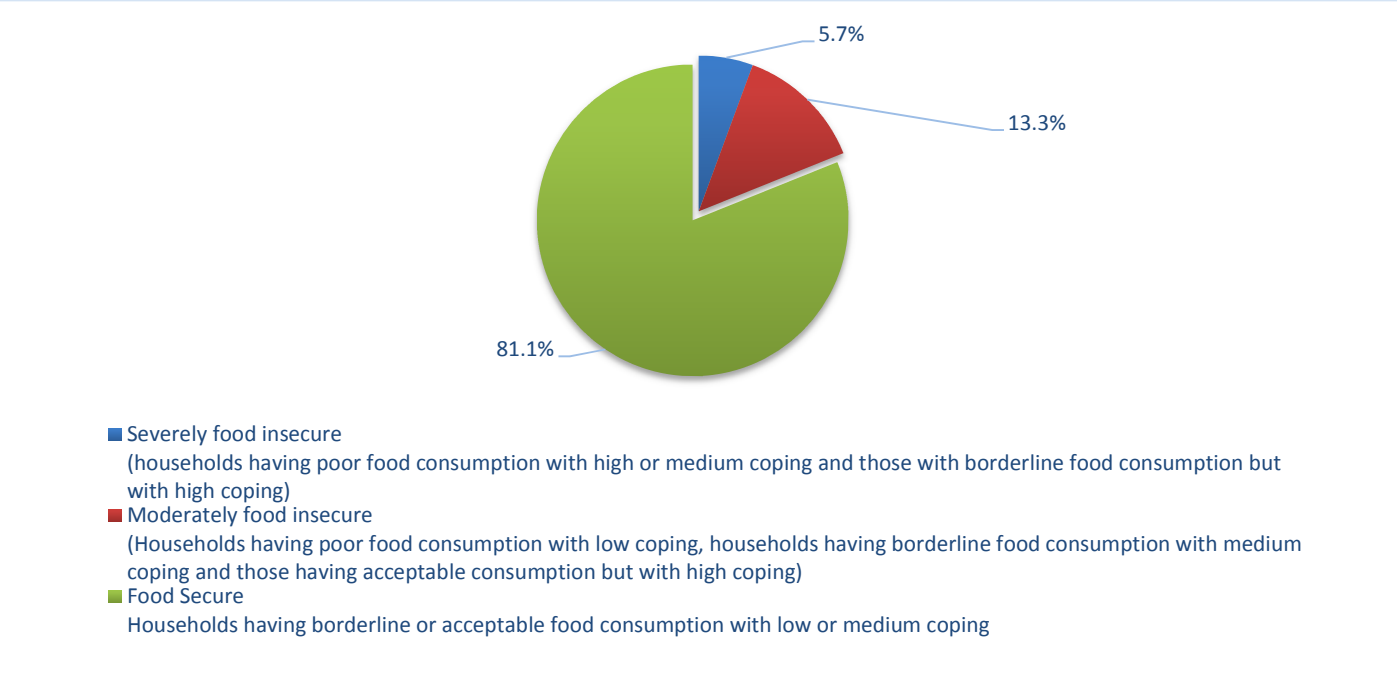

Figure 9: Food security situation (Based on FCS & rSCI)

7.10.3 Reduced Coping Strategy Index[12]

The Food Based Coping Strategy Index is based on measures of the frequency of use of food deprivation, such as the recourse to cheaper food, reductions of the quantity of meals, the act of borrowing food, as well as alterations in food distribution within the household to favor children. Each strategy is weight as per its severity with borrowing food and altering the distribution of food within the household regarded as the most severe strategies. Categories are then defined based upon these scores varying from low coping (0-9) to medium coping (10-17) and high coping (>18).

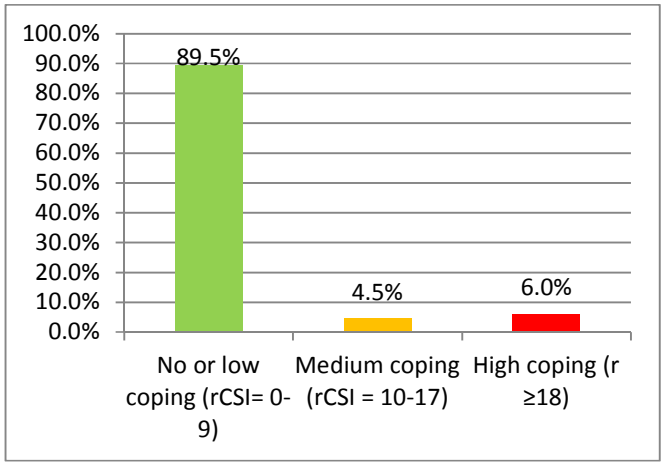

Figure 10: Reduced Coping Stratigy Index levels.

As per our observation and suvery result the proportion of no or low coping strategy index is 89.5%(240 out of 513 interviews) .

6.0% of HHs with a high level of coping (rCSI ≥18 score).

4.5% of HHs with a medium level of coping (rCSI= 10-17 score).

89.5% % of HHs with No or Low-level coping (rCSI=0-9 score).

The survey result revealed that the common coping mechanism were relay and less prepared and less expensive foods and borrow food on help rom a friends or relatives which the food security was highly effected, so based on bellow percentage most of the HHs were using weak coping stratigies which can directly affect nutrional situation in Balkh province see figure 11.

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

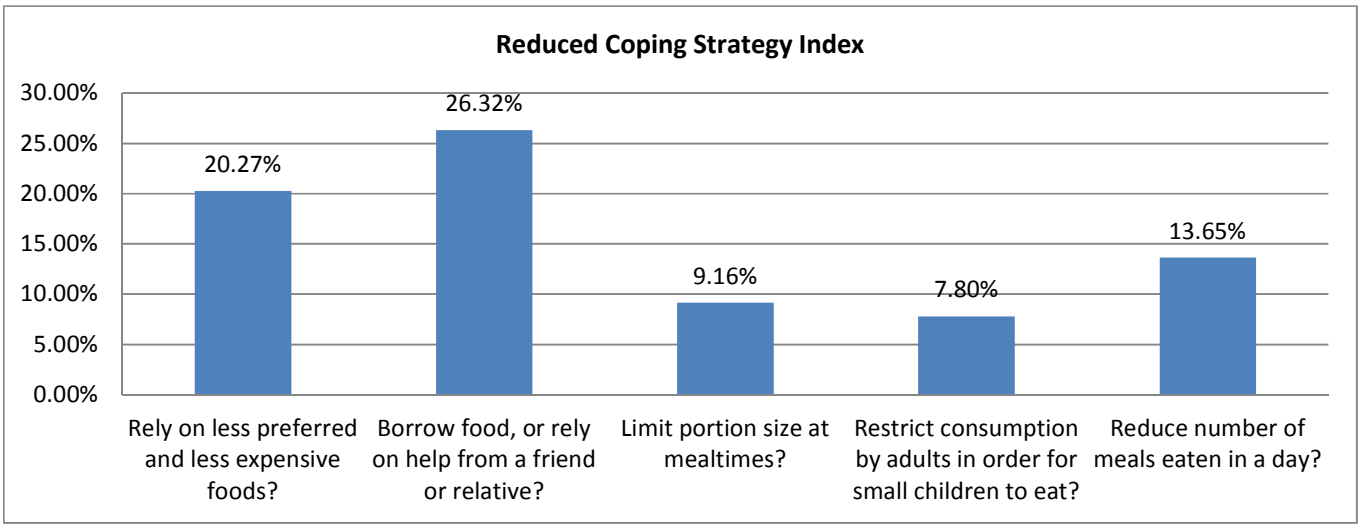

Figure 11: Reduced Coping Stratigy Index

7.10.4 Food Consumption Score:

Food Consumption Scores are the sum of the frequency of consumption (in the 7 days prior to the interview) of each type of food item (cereal, pulses, vegetables, meat fish and eggs, dairies, oil and sugar) weighted by their nutritional value (proteins are weighted 4, cereals 2, pulses 3, and vegetables and fruits 1, while sugar is weighted 0.5). Households are then grouped into "Poor" food consumption (0-28), "Borderline" (28.5 – 42) and acceptable (> 42). Food consumption groups are a proxy of food consumption and reflect both the frequency and quality of food consumption.

12.7% households surveyed have Poor consumption scores (FCS = 0 to 28).

35.7% households surveyed have Borderline consumption scores (FCS = 28.5 to 42).

51.6% households surveyed have acceptable food consumption scores (FCS = >42.0).

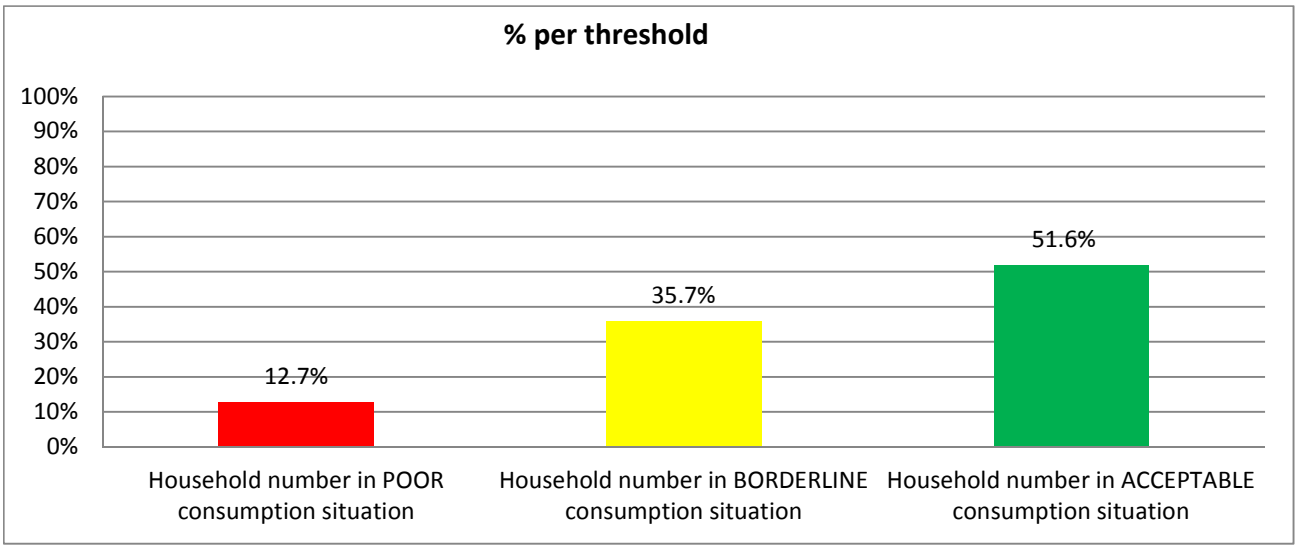

Figure 12: HHs level Consumption Score

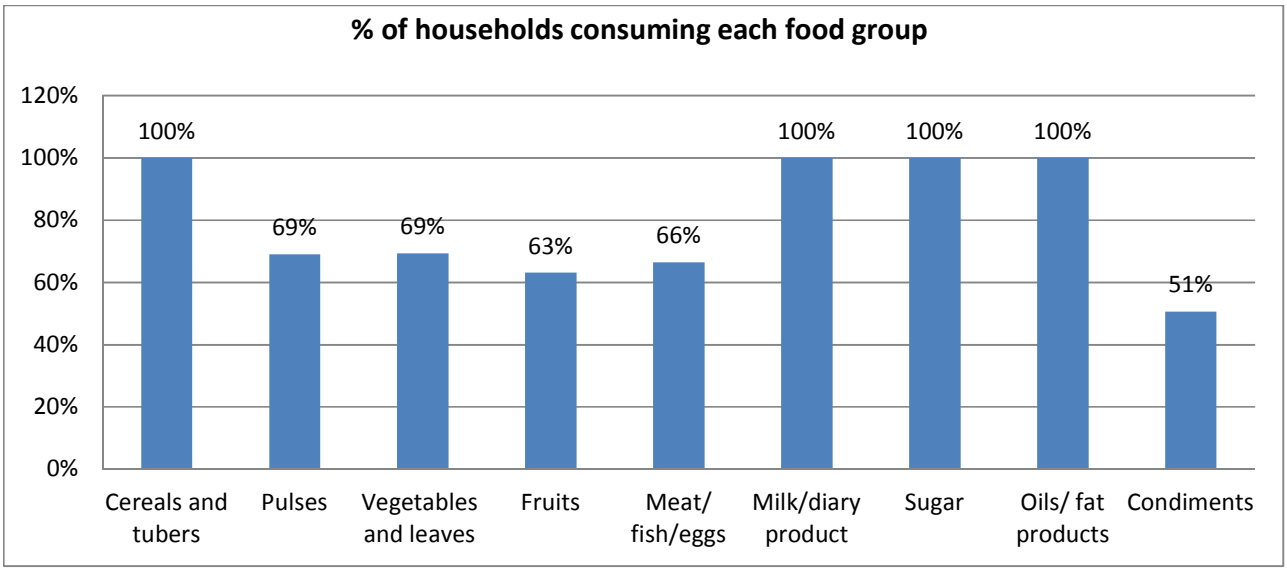

Figure 13: Households consuming different food items/group.

Figure 14: Households consuming different food items/group.

7.10.5 Food stock

The table below shows the HHs percentages with duration of food stock in HHs, where staggering 28.4% households responded that there is no food stock in the house.

Table 35: Status of food stock in the household

Status, N=507 Respondents	N	Results
No food stock in the households	144	28.4%

Less than a week food stock in household	95	18.7%
Food stock in household from 1-3 weeks	178	35.1%
Stock food in household up to 1-3 months	37	7.3%
Stock food in household for more than 3 months	53	10.5%

7.10.6 Food main sources

The survey finding shows that most of the food that households used in the last 7 days prior to the survey was obtaining using cash see table (36) below for more details.

Table 36: Food main sources that the households consumed

	Own production	Cash	Credit	Bartering	Gift/ charity	Wild food	Food Aid	Total
Cereals and tubers	51	444	7	1	1	0	4	**508**
Pulses/ Nuts	13	333	10	0	2	0	0	**358**
Vegetables and leaves	72	273	2	0	6	0	3	**356**
Fruits	58	252	0	0	12	0	1	**323**
Meat/ fish/eggs	18	316	2	0	8	0	0	**344**
Milk/diary product	144	174	2	0	8	2	0	**330**
Sugar / Honey	10	386	5	1	1	0	5	**408**
Oils/ fat products	4	468	15	0	1	0	9	**497**
Condiments	6	247	0	0	3	0	4	**260**

8. CONCLUSION

8.1. Undernutrition

Results of this survey are not a reflection of national nutrition situation but are representative of only for the Province of Balkh. The results of the survey showed, that GAM prevalence among children 6-59 months based on WHZ was **9.4% (6.3-13.8 95% CI)** and for SAM was **2.1% (1.0- 4.3 95% CI)**. This level of severity per WHZ

was classified as a 'Poor' nutrition situation in the province according to the WHO severity-classification[13]. The 3.0% SAM by WHZ threshold, established by MoPH, Nutrition Cluster and AIM-WG as the cut-off after which a response should be prioritized in the Afghanistan context, was/was not exceeded. SAM prevalence by WHZ (2.1%) is slightly below what is consideedr a priority (=>3.0%) for the Afghanistan context. The last National Nutrition Survey conducted in 2013, the prevalence of GAM was 5.7 %(3.43 – 9.17 95% CI) and SAM was 1.4% (0.44 – 4.38 95% CI).The GAM prevalence based on MUAC was **4.5% (2.8- 7.1 95% CI)** and SAM was 1.3% (0.6- 2.9 95% CI) which was lower than GAM based on WHZ.

Combined GAM captures a greater proportion of acutely malnourished children 6-59 months, and may inform better estimations of SAM and MAM caseloads in the province; ultimately strengthening planning and programming. All the children in the sample detected as acutely malnourished by either by WHZ, MUAC, or oedema are reflected in this prevalence according to combined criteria. To detect all acutely malnourished children eligible for treatment, WHZ or MUAC only screening, admission, and planning are not sufficient according to Afghanistan IMAM Guidelines. figure 14 shows that the GAM prevalence was **9.4% (6.3-13.8 95% CI)** by WHZ and **4.5% (2.8- 7.1 95% CI)** by MUAC .

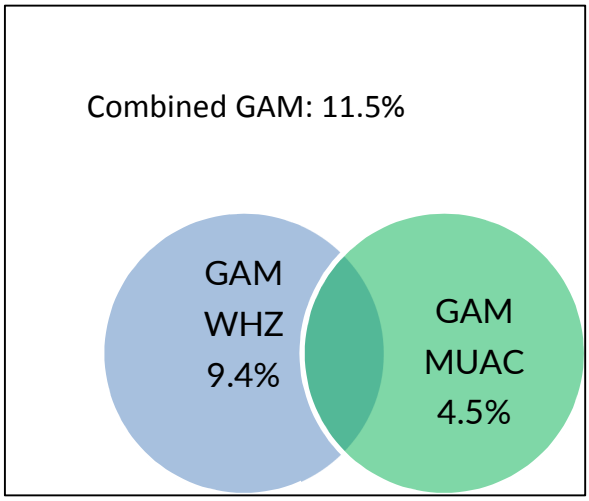

Figure 15: GAM prevalence base on WHz and MUAC.

GAM based on both WHZ and MUAC criteria have been more prevalent in children under 2 years **WHZ based 15.9% (11.0-22.4 95% CI)**, **MUAC based 10.3% (6.5-16.0 95% CI)** compared to children over 2 years children **WHZ based: 6.0% (3.3-10.5 95% CI)** and **MUAC based 1.2% (0.5- 3.1 95% CI)**. This suggests higher vulnerability of wasting among younger children. **GAM and SAM prevalence among children aged 0–59 months based on WHz was 10.6% (7.6-14.5 95% CI) and 2.1% (1.0- 4.1 95% CI) respectively**

Chronic malnutrition in the province continues to be worrying. The results of the present survey clearly showed that, based on WHO classification of severity of malnutrition, the overall prevalence of stunting is high with a prevalence of **32.3% (27.3-37.7 95% CI) it means, each one in three children were suffering from stunting.** Further, in this survey some children were diagnosed simultaneously as both wasted and stunted. These types of malnutrition tend to be addressed as different issues, despite evidence of common causality[14]. Recent

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

[14] Briend, A., Khara, T., Dolan, C. (2015) Wasting and Stunting—Similarities and Differences: Policy and Programmatic Implications. *Food and Nutrition Bulletin*, vol. 36, no. 1

research has demonstrated that children that arewasted and stunted in the same time have a high mortality association, suggesting that children which are both stunted and wasted should be considered a priority group for nutrition interventions[15]. Further analysis of children that are both wasted and stunted is presented in **Figure 13** and revealed that out of 169 stunted children 24 children were wasted and stunted , **14.1% (9.2-21.1 95% CI)**. Of potentially greater concern, 4 children **2.4% (0.9- 6.2 95% CI)** were WaSt with severe wasting.

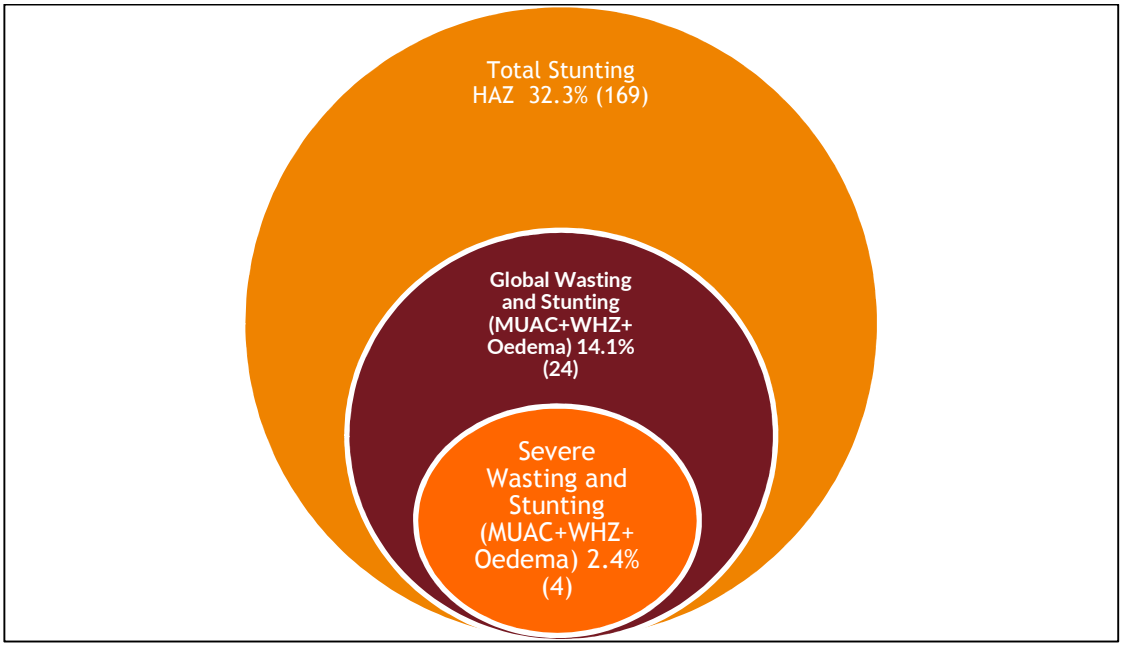

Figure 16: wasted in the same time stunted.

Maternal nutrition status

There are no commonly accepted standards for maternal nutrition status. In line with the Afghanistan National Guideline, the MUAC cutoff for women of 230 mm is used to approximately identify their status. In this survey 17.3 % of the mothers were found to have a MUAC<230mm, which suggest that a considerable number of PLWs in Bnalkh are Malnourished. The main concern was iron supplementation among pregnant women which the survey found to be very low (35.8%). The Iron supplementation prevent anemia during pregnancy and eventual life-threatening complications during delivery. Therefore it decreases maternal mortality, prenatal and perinatal infant loss and prematurity which can be directly related to child stunting in the first 2 years of lif

[15] Myatt, M., et al. (2018) Children Who are Both Wasted and Stunted are also Underweight and have a High Risk of Death: a Descriptive Epidemiology of Multiple Anthropometric Deficits Using Data from 51 Countries. *Archives of Public Health*, vol. 76, no. 28.

Annex- 1: Physical Map Balkh

Recommendation and action plan:

Key Findings	Actions To Be Taken	By Who?	Resources Required	Timeline Of Implementation
- GAM Prevalence based of WHZ =9.9% and SAM prevalence based on WHZ=2.2%. -GAM prevalence based on MUAC 4.6% and SAM prevalence based on MUAC=1.3%. -Combine GAM prevalence based on both criteria 11.3% Combine SAM prevalence based on both criteria	➢ Strengthen coordination between Health partners. ➢ Improve supportive supervision. ➢ Screen all U5 children ➢ Strengthen growth monitoring of all under two children and apply proper IYCF counseling for mothers of children in each visit ➢ Apply the OPD SAM program to all BHCs ➢ Strengthen Health education. ➢ Launch Food demonstration program in all HFs ➢ Implement CBNP program ➢ Ensure community behavior change - community involvement	PNO/BPHS implementer And all partners	IEC materials, Food commodities All nutrition registers	01-01-2019
Chronic Malnutrition=32.3%	➢ To strengthen GM and IYCF counseling for all U2 children to improve nutrition of first 1000 days of life to prevent stunting. ➢ To improve health education in HFs & community level. ➢ Strictly follow up of GM& IYCF counseling. ➢ To implement CBNP program and properly follow up ➢ To strengthen Food demonstration program in all HFs.	PNO/BPHS	IEC materials, All nutrition registers	30/6/2021

Low coverage of Immunization(PENTA 3)=79.7%	➢ To strengthen health education in HFs level. ➢ To strengthen on the job training EPI Micro planning. ➢ To strengthen supportive supervision. ➢ To strengthen outreach and Mobil team activity.	REMT/BPHS implementer	IEC materials On time supply	01-01-2019
PLWs malnutrition based on MUAC =18.1%	➢ To conduct Food demonstration for PLWs ➢ To strengthen the health education session specialty in maternal nutrition during pregnancy and lactation and usage local food recipe ➢ initiation of TSFP program in Balkh province to treat malnourished cases	PNO/BPHS implementer and Health partners	IEC materials, Food commodities (TFSP)	01-01-2019
Child health status **Child illness (56.0%)** **Vit A supplementation =61.0%** **Pregnant iron folate supplementation =35.4%**	➢ To strengthen supportive supervision. ➢ To improve NIMCI implementation. ➢ To strengthen community shura. ➢ To conduct Health education regarding the Micronutrients topic ➢ To strengthen referral system ➢ Strictly follow up ANC/PNC during supervision	PNO/BPHS implementer	IEC materials	01-01-2019

Annex- 2: selected Clusters in the Balkh province

Province_Name	Distract Name	Geographical unit	Population size	Cluster
Balkh	Balkh	Kushk Abdul	350	1
Balkh	Balkh	Alam khill	686	2
Balkh	Balkh	Naseri	623	3
Balkh	Balkh	Samarqandian	1106	4
Balkh	Charbulak	Wakil sarwar	420	5
Balkh	Charbulak	Ahmad Abad	350	6
Balkh	Charkint	sorkh kochae dara payeen	399	7
Balkh	Chemtal	yangi qala	651	8
Balkh	Chemtal	asiab ferqa	602	RC
Balkh	Dawlatabad	Khushalabad	630	9
Balkh	Dehdadi	Hussin Abad	826	10
Balkh	Dehdadi	Sarjang	994	11
Balkh	Dehdadi	Kood e Barq	1267	12
Balkh	Dehdadi	Chel Dukhtaran	700	RC
Balkh	Kaldar	Qaraja	420	13
Balkh	Keshendeh	Aqkamar sulfa	280	14
Balkh	Khulm	Rahim Yaqob Bay	665	15
Balkh	Khulm	Ghazi Abad Payan	763	16
Balkh	Mazar	Guzar Tandorak	1050	17
Balkh	Mazar	Baba Qamber	350	18
Balkh	Mazar	Qalai mer	672	19
Balkh	Mazar	Etefaq Awal	882	20
Balkh	Mazar	Qaalai Mula ha	700	21
Balkh	Mazar	Qalandar shah	595	22
Balkh	Mazar	Guzar Gul Darai ha	784	23
Balkh	Mazar	Prozhe Hamdard wa Yadgar Wali	1442	RC
Balkh	Mazar	Hassan Abad	770	24
Balkh	Mazar	Adena	539	25
Balkh	Mazar	Kartai solh sawom gharbi	903	26

Balkh	Mazar	Ansari 4	700	27
Balkh	Mazar	Ali abad	700	28
Balkh	Mazar	Nawshad Sawom	770	29
Balkh	Mazar	Block4 kocha 7-10	1295	30
Balkh	Mazar	Hematabad	1225	31
Balkh	Mazar	Kartai sena	595	32
Balkh	Mazar	Sajadia	1400	RC
Balkh	Mazar	Proja khalid ebnewalid	980	33
Balkh	Mazar	Adalat 2-3	630	RC
Balkh	Mazar	Koche Madrase Jaafar	973	34
Balkh	Mazar	Ali chopan	966	35
Balkh	Mazar	Kamarband seyagord	623	36
Balkh	Nahr e Shahi	Takhta Pul	350	37
Balkh	Nahr e Shahi	Joy shahr	630	38
Balkh	Nahr e Shahi	Proje Omar farooq	700	39
Balkh	Nahr e Shahi	Uzbiki Afghania	322	40
Balkh	Nahr e Shahi	Nawabad yaka bagh	1225	41
Balkh	Nahr e Shahi	Goremar	630	42
Balkh	Shulgarah	kamp e kandak	420	43
Balkh	Shulgarah	sayed hay qorbaqa khana	595	44
Balkh	Shulgarah	sang e sorakh	280	45
Balkh	zari	beland aregh bala	1155	46
Balkh	zari	khwaja roshnayee	623	47

Annex- 3: Plausibility check for: Balkh SMART ENA 2018.as

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

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

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

Overall data quality

Criteria	Flags*	Unit	Excel.	Good	Accept	Problematic	**Score**
Flagged data	Incl	%	0-2.5	>2.5-5.0	>5.0-7.5	>7.5	
(% of out of range subjects)			0	5	10	20	**0** (0.7 %)
Overall Sex ratio	Incl	p	>0.1	>0.05	>0.001	<=0.001	
(Significant chi square)			0	2	4	10	**0** (p=0.299)
Age ratio (6-29 vs 30-59)	Incl	p	>0.1	>0.05	>0.001	<=0.001	
(Significant chi square)			0	2	4	10	**4** (p=0.013)
Dig pref score - weight	Incl	#	0-7	8-12	13-20	> 20	
			0	2	4	10	**2** (9)
Dig pref score - height	Incl	#	0-7	8-12	13-20	> 20	
			0	2	4	10	**0** (7)
Dig pref score - MUAC	Incl	#	0-7	8-12	13-20	> 20	
			0	2	4	10	**0** (7)
Standard Dev WHZ	Excl	SD	<1.1	<1.15	<1.20	>=1.20	
.			and	and	and	or	
.	Excl	SD	>0.9	>0.85	>0.80	<=0.80	
			0	5	10	20	**5** (1.15)
Skewness WHZ	Excl	#	<±0.2	<±0.4	<±0.6	>=±0.6	
			0	1	3	5	**1** (-0.26)
Kurtosis WHZ	Excl	#	<±0.2	<±0.4	<±0.6	>=±0.6	
			0	1	3	5	**0** (-0.09)
Poisson dist WHZ-2	Excl	p	>0.05	>0.01	>0.001	<=0.001	
			0	1	3	5	**5** (p=0.000)

OVERALL SCORE WHZ = 0-9 10-14 15-24 >25 **17** %

The overall score of this survey is 17 %, this is acceptable.

There were no duplicate entries detected.

Percentage of children with no exact birthday: 43 %

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=16/ID=1: **WHZ (-3.574)**, Weight may be incorrect

Line=87/ID=1: HAZ (-4.816), Age may be incorrect

Line=98/ID=1: HAZ (1.981), Height may be incorrect

Line=201/ID=1: **WHZ (-3.580)**, Weight may be incorrect

Line=202/ID=2: HAZ (3.272), Age may be incorrect

Line=214/ID=1: **WHZ (-3.469)**, WAZ (-4.467), Weight may be incorrect

Line=260/ID=1: HAZ (1.797), Age may be incorrect

Line=267/ID=1: HAZ (1.958), Height may be incorrect

Line=291/ID=1: **WHZ (2.593)**, Weight may be incorrect

Line=298/ID=2: HAZ (-4.665), Age may be incorrect

Line=406/ID=2: HAZ (3.480), Age may be incorrect

Line=407/ID=3: HAZ (3.026), Age may be incorrect

Line=409/ID=1: HAZ (1.968), Height may be incorrect

Line=457/ID=1: HAZ (2.490), Age may be incorrect

Percentage of values flagged with SMART flags:WHZ: 0.7 %, HAZ: 1.9 %, WAZ: 0.2 %

Age distribution:

Month 6 : ###############

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

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

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

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

Month 11 : ######

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

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

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

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

Month 16 : ##########

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

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

Month 19 : ##########

Month 20 : ########

Month 21 : #####

Month 22 : ######

Month 23 : ######

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

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

Month 26 : ########

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

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

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

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

Month 31 : #########

Month 32 : ##########

Month 33 : ######

Month 34 : #####

Month 35 : #####

Month 36 : ##########

Month 37 : ##########

Month 38 : ##########

Month 39 : ##########

Month 40 : ####

Month 41 : ########

Month 42 : #########

Month 43 : ########

Month 44 : ####

Month 45 : ######

Month 46 : #######

Month 47 : ######

Month 48 : ########################

Month 49 : ########

Month 50 : ######

Month 51 : ##########

Month 52 : ####

Month 53 : ####

Month 54 : #########

Month 55 : #########

Month 56 : ##

Month 57 : ##

Month 58 : ###############

Month 59 : #########

Month 60 : ##

Age ratio of 6-29 months to 30-59 months: 1.05 (The value should be around 0.85).:

p-value = 0.013 (significant difference)

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

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

---

6 to 17	12	75/64.7 (1.2)	62/59.2 (1.0)	137/123.9 (1.1)	1.21
18 to 29	12	74/63.1 (1.2)	63/57.7 (1.1)	137/120.8 (1.1)	1.17
30 to 41	12	61/61.2 (1.0)	56/55.9 (1.0)	117/117.1 (1.0)	1.09
42 to 53	12	43/60.2 (0.7)	53/55.0 (1.0)	96/115.2 (0.8)	0.81
54 to 59	6	26/29.8 (0.9)	21/27.2 (0.8)	47/57.0 (0.8)	1.24
6 to 59	54	279/267.0 (1.0)	255/267.0 (1.0)		1.09

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

Overall sex ratio: p-value = 0.299 (boys and girls equally represented)

Overall age distribution: p-value = 0.074 (as expected)

Overall age distribution for boys: p-value = 0.064 (as expected)

Overall age distribution for girls: p-value = 0.714 (as expected)

Overall sex/age distribution: p-value = 0.015 (significant difference)

Digit preference Weight:

Digit .0 : ##

Digit .1 : ##

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

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

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

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

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

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

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

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

Digit preference score: **9** (0-7 excellent, 8-12 good, 13-20 acceptable and > 20 problematic)

p-value for chi2: 0.000 (significant difference)

Digit preference Height:

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

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

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

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

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

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

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

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

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

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

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

p-value for chi2: 0.009 (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: **7** (0-7 excellent, 8-12 good, 13-20 acceptable and > 20 problematic)

p-value for chi2: 0.002 (significant difference)

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

procedures

.	**no exclusion**	**exclusion from**	**exclusion from**
.	**reference mean**	**observed mean**	
.	**(WHO flags)**	**(SMART flags)**	
WHZ			
Standard Deviation SD:	1.17	1.17	1.15
(The SD should be between 0.8 and 1.2)			
Prevalence (< -2)			
observed:	9.9%	9.9%	9.4%
calculated with current SD:	8.8%	8.8%	8.1%
calculated with a SD of 1:	5.6%	5.6%	5.4%
HAZ			
Standard Deviation SD:	1.31	1.31	1.22
(The SD should be between 0.8 and 1.2)			
Prevalence (< -2)			
Observed:	32.0%	32.0%	32.3%
Calculated with current SD:	30.5%	30.5%	30.3%
Calculated with a SD of 1:	25.1%	25.1%	26.6%
WAZ			
Standard Deviation SD:	1.11	1.11	1.10
(The SD should be between 0.8 and 1.2)			
Prevalence (< -2)			
Observed:	19.1%	19.1%	18.9%
Calculated with current SD:	19.1%	19.1%	18.7%
Calculated with a SD of 1:	16.5%	16.5%	16.4%

Results for Shapiro-Wilk test for normally (Gaussian) distributed data:

WHZ	p= 0.000	p= 0.000	p= 0.001
HAZ	p= 0.008	p= 0.008	p= 0.015
WAZ	p= 0.587	p= 0.587	p= 0.380

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

Skewness

WHZ	-0.29	-0.29	-0.26
HAZ	0.34	0.34	0.11
WAZ	-0.04	-0.04	0.00

If the value is:

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

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

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

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

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

Kurtosis

WHZ	-0.01	-0.01	-0.09
HAZ	0.28	0.28	-0.46
WAZ	-0.07	-0.07	-0.14

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=2.00 (p=0.000)

WHZ < -3: ID=1.52 (p=0.014)

GAM: ID=2.00 (p=0.000)

SAM: ID=1.52 (p=0.014)

HAZ < -2: ID=1.56 (p=0.009)

HAZ < -3: ID=1.56 (p=0.009)

WAZ < -2: ID=2.16 (p=0.000)

WAZ < -3: ID=1.28 (p=0.101)

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: 1.23 (n=46, f=1) ##################

02: 1.29 (n=44, f=0) ####################

03: 1.07 (n=41, f=0) ##########

04: 1.20 (n=41, f=2) ################

05: 1.12 (n=40, f=0) ############

06: 1.34 (n=40, f=1) ######################

07: 1.23 (n=35, f=0) ################

08: 1.10 (n=41, f=0) ############

09: 1.12 (n=36, f=0) ############

10: 1.27 (n=35, f=0) ####################

11: 0.82 (n=31, f=0) #

12: 1.24 (n=24, f=0) ################

13: 1.30 (n=21, f=0) ####################

14: 1.24 (n=17, f=0) OOOOOOOOOOOOOOOOO

15: 1.50 (n=14, f=0) OOOOOOOOOOOOOOOOOOOOOOOOOOO

16: 1.10 (n=10, f=0) ~~~~~~~~~~~~

17: 0.69 (n=07, f=0)

18: 0.84 (n=07, f=0) ~~

19: 0.29 (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 =	74	82	72	114	103	89
Percentage of values flagged with SMART flags:						
WHZ:	0.0	1.2	1.4	0.9	0.0	0.0
HAZ:	4.1	3.7	1.4	0.9	1.0	1.1
WAZ:	0.0	0.0	1.4	0.0	0.0	0.0
Age ratio of 6-29 months to 30-59 months:						
	1.24	1.22	1.25	0.70	1.29	0.93
Sex ratio (male/female):						
	1.31	1.28	0.64	1.19	1.06	1.17
Digit preference Weight (%):						
.0 :	9	22	3	34	7	7
.1 :	23	22	19	9	10	15
.2 :	9	4	10	10	17	16
.3 :	5	6	11	9	13	8
.4 :	5	11	10	4	9	7
.5 :	8	5	11	8	16	11
.6 :	5	7	15	5	5	9
.7 :	4	12	3	11	4	6
.8 :	20	2	8	4	13	11
.9 :	9	9	10	8	9	11
DPS:	20	22	16	28	14	11

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

Digit preference Height (%):

.0 :	1	24	3	25	7	2
.1 :	8	20	10	11	12	11
.2 :	18	11	21	11	16	11
.3 :	11	10	21	10	9	9
.4 :	11	6	8	10	9	9
.5 :	11	7	7	4	11	9
.6 :	8	5	13	10	17	8
.7 :	18	6	6	4	6	8
.8 :	7	4	13	6	8	16
.9 :	8	7	0	10	7	17
DPS:	15	21	22	19	12	13

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

Digit preference MUAC (%):

.0 :	0	18	0	11	5	2
.1 :	4	2	23	17	8	8
.2 :	7	4	18	10	15	10
.3 :	15	11	7	12	16	20
.4 :	11	12	7	5	8	7
.5 :	11	16	27	13	10	11
.6 :	11	10	4	13	7	11
.7 :	19	7	6	7	13	9
.8 :	16	9	6	4	9	9
.9 :	7	11	3	8	12	12
DPS:	18	16	29	12	11	15

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

Standard deviation of WHZ:

SD	1.24	1.31	1.04	1.27	0.99	1.10
Prevalence (< -2) observed:						
%	12.2	17.1	4.2	13.2		6.7
Prevalence (< -2) calculated with current SD:						
%	10.9	17.0	3.4	11.3		6.1
Prevalence (< -2) calculated with a SD of 1:						
%	6.4	10.5	2.8	6.3		4.5

Standard deviation of HAZ:

SD	1.39	1.35	1.24	1.24	1.32	1.27
observed:						
%	20.3	40.2	20.8	28.1	38.8	40.4
calculated with current SD:						
%	23.1	33.8	22.8	26.6	36.5	37.9
calculated with a SD of 1:						
%	15.3	28.7	17.9	21.9	32.5	34.8

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 15/9.7 (1.5) 9/7.4 (1.2) 24/17.2 (1.4) 1.67

18 to 29 12 9/9.5 (0.9) 8/7.2 (1.1) 17/16.7 (1.0) 1.13

30 to 41 12 6/9.2 (0.7) 2/7.0 (0.3) 8/16.2 (0.5) 3.00

42 to 53 12 10/9.1 (1.1) 10/6.9 (1.4) 20/16.0 (1.3) 1.00

54 to 59 6 2/4.5 (0.4) 3/3.4 (0.9) 5/7.9 (0.6) 0.67

---

6 to 59 54 42/37.0 (1.1) 32/37.0 (0.9) 1.31

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

Overall sex ratio: p-value = 0.245 (boys and girls equally represented)

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

Overall age distribution for boys: p-value = 0.244 (as expected)

Overall age distribution for girls: p-value = 0.245 (as expected)

Overall sex/age distribution: p-value = 0.016 (significant difference)

Team 2:

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

---

6 to 17 12 16/10.7 (1.5) 6/8.4 (0.7) 22/19.0 (1.2) 2.67

18 to 29 12 12/10.4 (1.2) 11/8.1 (1.4) 23/18.5 (1.2) 1.09

30 to 41 12 7/10.1 (0.7) 7/7.9 (0.9) 14/18.0 (0.8) 1.00

42 to 53 12 5/9.9 (0.5) 6/7.8 (0.8) 11/17.7 (0.6) 0.83

54 to 59 6 6/4.9 (1.2) 6/3.8 (1.6) 12/8.8 (1.4) 1.00

---

6 to 59 54 46/41.0 (1.1) 36/41.0 (0.9) 1.28

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

Overall sex ratio: p-value = 0.269 (boys and girls equally represented)

Overall age distribution: p-value = 0.188 (as expected)

Overall age distribution for boys: p-value = 0.163 (as expected)

Overall age distribution for girls: p-value = 0.496 (as expected)

Overall sex/age distribution: p-value = 0.021 (significant difference)

Team 3:

Age cat.	mo.	boys	girls	total	ratio boys/girls
6 to 17	12	8/6.5 (1.2)	13/10.2 (1.3)	21/16.7 (1.3)	0.62
18 to 29	12	7/6.3 (1.1)	12/10.0 (1.2)	19/16.3 (1.2)	0.58
30 to 41	12	6/6.1 (1.0)	7/9.6 (0.7)	13/15.8 (0.8)	0.86
42 to 53	12	5/6.0 (0.8)	11/9.5 (1.2)	16/15.5 (1.0)	0.45
54 to 59	6	2/3.0 (0.7)	1/4.7 (0.2)	3/7.7 (0.4)	2.00
6 to 59	54	28/36.0 (0.8)	44/36.0 (1.2)		0.64

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

Overall sex ratio: p-value = 0.059 (boys and girls equally represented)

Overall age distribution: p-value = 0.296 (as expected)

Overall age distribution for boys: p-value = 0.921 (as expected)

Overall age distribution for girls: p-value = 0.281 (as expected)

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

Team 4:

Age cat.	mo.	Boys	girls	total	ratio boys/girls
6 to 17	12	10/14.4 (0.7)	15/12.1 (1.2)	25/26.5 (0.9)	0.67
18 to 29	12	17/14.0 (1.2)	5/11.8 (0.4)	22/25.8 (0.9)	3.40
30 to 41	12	15/13.6 (1.1)	17/11.4 (1.5)	32/25.0 (1.3)	0.88
42 to 53	12	8/13.4 (0.6)	10/11.2 (0.9)	18/24.6 (0.7)	0.80

54 to 59 6 12/6.6 (1.8) 5/5.5 (0.9) 17/12.2 (1.4) 2.40

---

6 to 59 54 62/57.0 (1.1) 52/57.0 (0.9) 1.19

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

Overall sex ratio: p-value = 0.349 (boys and girls equally represented)

Overall age distribution: p-value = 0.179 (as expected)

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

Overall age distribution for girls: p-value = 0.110 (as expected)

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

Team 5:

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

---

6 to 17 12 14/12.3 (1.1) 14/11.6 (1.2) 28/23.9 (1.2) 1.00

18 to 29 12 16/12.0 (1.3) 14/11.3 (1.2) 30/23.3 (1.3) 1.14

30 to 41 12 11/11.6 (0.9) 10/11.0 (0.9) 21/22.6 (0.9) 1.10

42 to 53 12 10/11.4 (0.9) 7/10.8 (0.6) 17/22.2 (0.8) 1.43

54 to 59 6 2/5.7 (0.4) 5/5.3 (0.9) 7/11.0 (0.6) 0.40

---

6 to 59 54 53/51.5 (1.0) 50/51.5 (1.0) 1.06

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

Overall sex ratio: p-value = 0.768 (boys and girls equally represented)

Overall age distribution: p-value = 0.247 (as expected)

Overall age distribution for boys: p-value = 0.385 (as expected)

Overall age distribution for girls: p-value = 0.632 (as expected)

Overall sex/age distribution: p-value = 0.143 (as expected)

Team 6:

Age cat.	mo.	Boys	girls	total	ratio boys/girls
6 to 17	12	12/11.1 (1.1)	5/9.5 (0.5)	17/20.6 (0.8)	2.40
18 to 29	12	13/10.9 (1.2)	13/9.3 (1.4)	26/20.1 (1.3)	1.00
30 to 41	12	16/10.5 (1.5)	13/9.0 (1.4)	29/19.5 (1.5)	1.23
42 to 53	12	5/10.4 (0.5)	9/8.8 (1.0)	14/19.2 (0.7)	0.56
54 to 59	6	2/5.1 (0.4)	1/4.4 (0.2)	3/9.5 (0.3)	2.00
6 to 59	54	48/44.5 (1.1)	41/44.5 (0.9)		1.17

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

Overall sex ratio: p-value = 0.458 (boys and girls equally represented)

Overall age distribution: p-value = 0.012 (significant difference)

Overall age distribution for boys: p-value = 0.091 (as expected)

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

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

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

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

Team: 1

Time SD for WHZ

point 0.8 0.9 1.0 1.1 1.2 1.3 1.4 1.5 1.6 1.7 1.8 1.9 2.0 2.1 2.2 2.3

01: 1.57 (n=07, f=0) ################################

02: 2.12 (n=07, f=0) ###

03: 0.63 (n=07, f=0)

04: 0.98 (n=07, f=0) ########

05: 0.69 (n=05, f=0)

06: 2.00 (n=04, f=0) ##

07: 1.57 (n=04, f=0) ################################

08: 1.30 (n=07, f=0) #####################

09: 0.55 (n=05, f=0)

10: 0.86 (n=05, f=0) ###

11: 0.48 (n=05, f=0)

12: 1.08 (n=04, f=0) ############

14: 0.88 (n=02, f=0) OOO

15: 2.03 (n=02, f=0)
OOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOO

16: 0.20 (n=02, f=0)

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

time points)

Team: 2

Time SD for WHZ

point 0.8 0.9 1.0 1.1 1.2 1.3 1.4 1.5 1.6 1.7 1.8 1.9 2.0 2.1 2.2 2.3

01: 1.72 (n=06, f=1) ##

02: 1.25 (n=05, f=0) ##################

03: 1.73 (n=05, f=0) ##

04: 0.52 (n=05, f=0)

05: 1.67 (n=04, f=0) ######################################

06: 1.41 (n=06, f=0) ##########################

07: 1.62 (n=05, f=0) ###################################

08: 0.92 (n=05, f=0) #####

09: 1.12 (n=06, f=0) #############

10: 1.51 (n=06, f=0) ##############################

11: 0.59 (n=05, f=0)

12: 1.21 (n=05, f=0) ################

13: 1.84 (n=04, f=0) ##

14: 1.76 (n=04, f=0) ##

15: 1.42 (n=03, f=0) OOOOOOOOOOOOOOOOOOOOOOOOO

16: 0.61 (n=03, f=0)

17: 0.11 (n=02, f=0)

18: 0.97 (n=02, f=0) OOOOOOO

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

time points)

Team: 3

Time SD for WHZ

point 0.8 0.9 1.0 1.1 1.2 1.3 1.4 1.5 1.6 1.7 1.8 1.9 2.0 2.1 2.2 2.3

01: 1.34 (n=07, f=1) ########################

02: 1.16 (n=07, f=0) ###############

03: 1.33 (n=07, f=0) ######################

04: 1.04 (n=05, f=0) ##########

05: 1.00 (n=06, f=0) ########

06: 0.91 (n=06, f=0) #####

07: 1.00 (n=06, f=0) ########

08: 0.49 (n=06, f=0)

09: 1.19 (n=04, f=0) OOOOOOOOOOOOOOO

10: 0.96 (n=06, f=0) #######

11: 1.20 (n=04, f=0) OOOOOOOOOOOOOOOO

12: 0.65 (n=04, f=0)

13: 0.01 (n=02, f=0)

14: 0.11 (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: 0.82 (n=10, f=0) #

02: 1.41 (n=09, f=0) ##########################

03: 0.97 (n=08, f=0) #######

04: 1.72 (n=10, f=2) #######################################

05: 1.11 (n=09, f=0) #############

06: 1.02 (n=08, f=0) #########

07: 0.91 (n=08, f=0) #####

08: 1.05 (n=09, f=0) ##########

09: 0.84 (n=08, f=0) ##

10: 1.37 (n=06, f=0) ########################

11: 0.50 (n=05, f=0)

12: 2.43 (n=04, f=0)
OOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOO
OOOOOO

13: 1.69 (n=06, f=0) #####################################

14: 1.17 (n=04, f=0) OOOOOOOOOOOOOOOO

15: 2.00 (n=04, f=0)

17: 0.35 (n=02, f=0)

18: 1.02 (n=02, f=0)

(When n is much less than the average number of subjects per cluster different symbols are used 0 for n <

80% and ~ for n < 40%; the numbers marked "f" are the numbers of SMART flags found in the different time points)

Team: 5

Time SD for WHZ

Point 0.8 0.9 1.0 1.1 1.2 1.3 1.4 1.5 1.6 1.7 1.8 1.9 2.0 2.1 2.2 2.3

01: 0.99 (n=07, f=0) ########

02: 0.80 (n=07, f=0)

03: 0.98 (n=05, f=0) ########

04: 0.89 (n=06, f=0) ####

05: 1.48 (n=07, f=0) ############################

06: 1.21 (n=07, f=0) ##################

07: 1.29 (n=06, f=0) ####################

08: 0.63 (n=06, f=0)

09: 0.62 (n=06, f=0)

10: 0.98 (n=06, f=0) #######

11: 0.58 (n=06, f=0)

12: 0.77 (n=06, f=0)

13: 0.91 (n=06, f=0) #####

14: 1.00 (n=05, f=0) #########

15: 0.89 (n=05, f=0) ####

16: 1.11 (n=03, f=0) OOOOOOOOOOOOO

17: 0.16 (n=03, f=0)

18: 0.92 (n=03, f=0) OOOOO

(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: 0.76 (n=09, f=0)

02: 1.03 (n=09, f=0) ##########

03: 0.86 (n=09, f=0) ###

04: 1.11 (n=08, f=0) ##########

05: 0.88 (n=09, f=0) ##########

07: 1.05 (n=06, f=0) ##########

08: 0.84 (n=08, f=0) ##

09: 1.22 (n=07, f=0) ##########

10: 1.64 (n=06, f=0) ##########

11: 1.38 (n=06, f=0) ##########

13: 0.93 (n=02, f=0)

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

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

10. REFERENCES

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

[i]