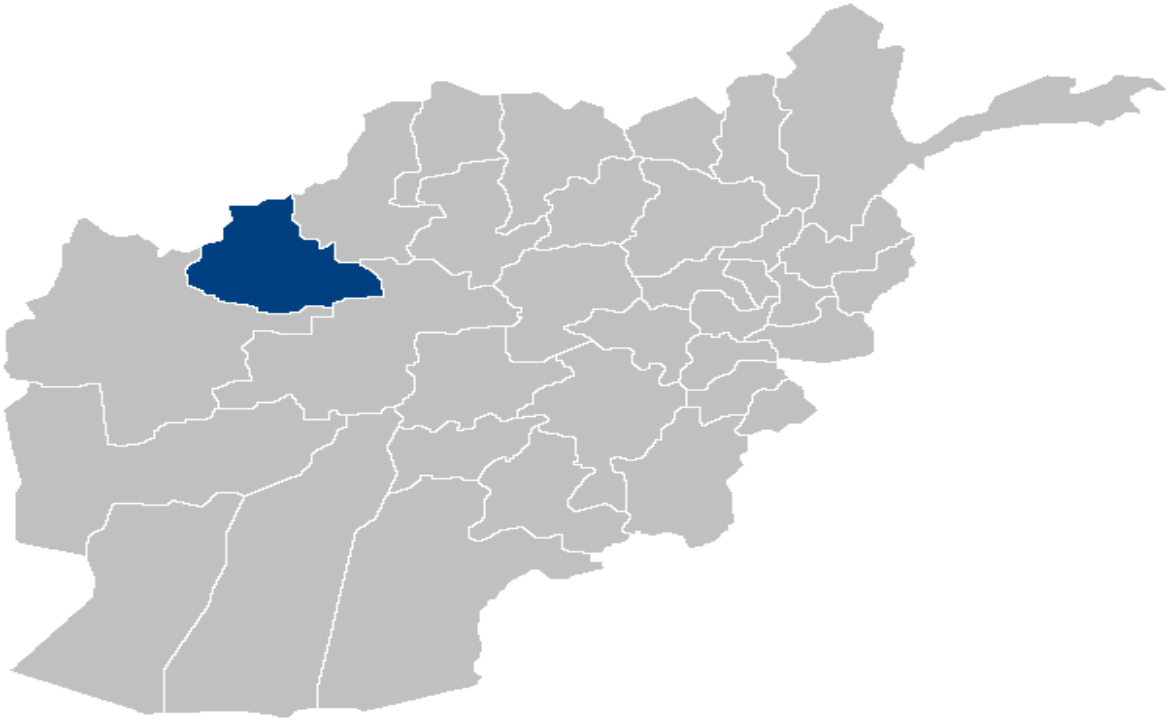
AFGHANISTAN

Rapid SMART Survey Final Report

Bala Murghab District of Badghis Province, Afghanistan

Date: 30th June to 7th July, 2018



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Funded by:

OCHA

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ACKNOWLEDGMENTS

The authors would like to pass their sincerely appreciation to the Action Against Hunger team in Kabul and Paris Headquarter. Finally yet importantly tremendous appreciation goes to the following stakeholders:

- Ministry of Public Health (MoPH) especially Public Nutrition Department (PND), AIM-Working Group and Nutrition Cluster for their support and validation of survey protocol.
- Badghis Provincial Public Health Directorate (PPHD) Especially Dr. Abdul Latif Rostayee Public Health Director.
- HEWAD Kabul and Badghis for their smooth implementation in the province.
- Office for the coordination of Humanitarian Affairs (OCHA) for their financial support in the survey.
- All the community members for welcoming and support the survey teams during the data process.
- Survey teams composed of Enumerators and supervisors for making the entire process smoothly.

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Abbreviations

AAH/ACF	Action Against Hunger/Action Contre la Faim
ARI	Acute Respiratory Infection
BHC	Basic Health Centre
CBA	Child Bearing Age
CT	Caretaker
CHF	Common Humanitarian Fund
CHS	Community Health Supervisor
CHW	Community Health worker
CBHC	Community Basic Health Care
CHC	Comprehensive Health Centre
DK	Do not know
DH	District Hospital
FHAG	Family Health Action Group
FHH	Family Health House
ENA	Emergency Nutrition Assessment
GAM	Global Acute Malnutrition
HH	Households
HF	Health Facility
HAZ	Height for Age Z-score
HP	Health Post
HSC	Health sub-centre
IFA	Iron Folic Acid
MUAC	Mid-Upper Arm Circumference
MHT	Mobile Health Team
PNO	Public Nutrition Officer
PPS	Probability Proportional to Size
RNA	Rapid Nutrition Assessment
SCA	Swedish Committee for Afghanistan (an NGO)
SFP	Supplementary Feeding Program
SMART	Standardized Monitoring of Assessment of Relief and Transition
UNOCHA	United Nations Office for Coordination and Humanitarian Affairs -
VWC	Verification with Cards
WHZ	Weight for Height Z-score
WASH	Water, Sanitation and Hygiene

Table of content

Acknowledgments **2**

1. Executive Summary **6**

2. Introduction **8**

3. Objective of the survey **9**

3.1 Main objective 9

3. 2 Specific objectives 9

3.3. Justification 9

4. Sample size, sampling design and procedures **9**

4.1 Sample size and sampling design 9

4.2. Final Sampling Strategy 10

4.3 Sampling procedures 11

4.4 Training and supervision 12

4.5 Data collection 12

4.6 Data analysis 13

4.7 Survey limitation 14

5. Results **14**

5.1 Data quality 14

5.2 Anthropometric results: 15

5.3 Child health and immunization 18

5.4 Maternal Nutritional status 18

8. Discussion **20**

8.1 undernutrition 20

8.2 Immunization status 21

8.3 Maternal nutrition status 21

9 Recommendations **22**

10 References **23**

10 Annexes **24**

List of Tables

Table 1: Details of proposed and actual sample size achieved 10

Table 2: Distribution of age and sex of sample 15

Table 3: Prevalence of acute malnutrition based on weight-for-height Z-scores (and/or oedema) and by sex 15

Table 4: Distribution of acute malnutrition and oedema based on weight-for-height Z-scores 16

Table 5: Prevalence of acute malnutrition based on MUAC cut offs (and/or oedema) and by sex 16

Table 6: Prevalence of Global Acute Malnutrition based on combined criteria (MUAC+WHZ+Oedema)* 16

Table 7: Prevalence of underweight based on weight-for-age Z-scores and by sex 17

Table 8: Prevalence of stunting based on height-for-age Z-scores and by sex 17

Table 9: Mean Z-scores, design effect and excluded subjects 17

Table 10: Under-five morbidity, two weeks recall, (N=322) 18

Table 11: Measles immunization status, children 9-59 mounts, (N=291) 18

Table 12: Physiological status of women of reproductive age (15-49 years), (N=275) 18

Table 13: Nutrition status of pregnant and lactating women based on MUAC 19

List of Annexes

Annex 1: List of selected clusters/ villages 24

Annex 2: Plausibility Check Report 25

Annex 3: RNA tally sheet/questionnaire for children and women 42

1. EXECUTIVE SUMMARY

Bala Murghab is one of the 7 districts of Badghis province. Bala Murghab, also simply called as Murghab of Badghis Province in north-western Afghanistan. Its population is entirely Pashtun and was estimated at 169,001[1].

According to Central Statistic Organization (CSO) Badghis has seven districts namely Ab Kamari, Jawand, Muqur , Qadis ,Ghormach, Murghab and the city of Qalai Naw with over thousand villages.

Badghis is one of the province recently affected by drought. Drought specially affected Kochi/Nomads population. Nutrition Cluster along with Assessment and Information Management Working Group, PND-MoPH through different meetings decided to conduct one Rapid SMART assessment in the area of Kochi/Nomads people. Through the data which was shared by FEWS-NET, Bala Murghab district was identified with high number of Kochi/Nomad people.

The Rapid Nutrition Assessment was conducted between 30th June to 7th July 2018 in Bala Murghab District, Badghis province. 250 households were assessed out 250 total estimated HHs as per the survey sampling. The Rapid SMART assessment report provides a description of the methodology used, an analysis and interpretation of the survey findings on anthropometric status, child morbidity, Immunization coverage (measles), nutritional status of pregnant and lactating women and recommendations proposed.

Summary of Key Survey Findings:

Child nutrition status (N=307)	
Indicators	Results
GAM rate among children aged 6-59 months based on Weight for Height Z-Score <-2SD and/or Oedema	**10.0%** (6.6 - 15.0; 95% CI)
SAM rate among children aged 6-59 months based on Weight for Height Z-Score <-3SD and/or Oedema	**2.7%** (1.2 - 6.0; 95% CI)
GAM rate among children aged 6-59 months based on MUAC <125mm and/or Oedema	**15.7%** (11.4 - 21.2; 95% CI)
SAM rate among children aged 6-59 months based on MUAC <115 mm and/or Oedema	**3.9%** (2.3 - 6.5; 95% CI)
GAM rate among children aged 6-59 months based on combined criteria (MUAC <125 mm and/or WH <-2 Z score and/or Oedema)*	**19.7%** (15.5 - 24.8; 95% CI)

[1] CSO updated population 1396 (2017-2018)

SAM rate among children aged 6-59 months based on combined criteria (MUAC <115 mm and WH <-3 Z Score and/or Oedema)*	**5.7%** (3.1 – 10.1; 95% CI)
Stunting among children aged 6-59 months based on Height for Age Z-Score <-2SD	**42.8%** (37.1 - 48.7; 95% CI)
Underweight among children aged 6-59 months based on Weight for Age Z-Score <-2SD	**21.3%** (16.6 - 26.9; 95% CI)

*The combined GAM and SAM estimation was performed manually by changing all the MUAC only GAM/SAM data into Oedema in the ENA software to provide an aggregated prevalence under the result category of WHZ and/or Oedema.

Child Health and Immunization (N=322)	
Indicators	**Results**
Children aged 0-59 months that reported of having Diarrhoea during the past 14 days of the survey	48.1%
Children aged 0-59 months that reported of having ARI during the past 14 days of the survey	31.1%
Measles vaccination status for the children aged 9-59 months based on recall and vaccination cards confirmed	75.9%

Nutrition status among Pregnant and Lactating Women (N=242)	
Indicators	**Results**
Undernutrition among pregnant women based on MUAC <230 mm	23.8%
Undernutrition among lactating women based on MUAC < 230 mm	25.9%
Undernutrition among pregnant and lactating women (PLWs) based on MUAC <230mm	24.8%

2. INTRODUCTION

Bādghīs (Pashto/Persian: بادغیس) is one of the thirty-four provinces of Afghanistan, located in the northwest of the country next to Turkmenistan. The name means "home of the winds" in Persian and Pashto languages, referring to the steppe winds that blow into the province from the north and northwest. Badghis is irrigated by the Murghab and Hari rivers. Its northern border extends to the edge of the desert of Sarakhs. Badghis includes the Chul formations through which the Turkmen-Afghan boundary runs. The province was carved out of portions of Herat Province and Meymaneh Province in 1964 and has a total area of 20,591 km^2. It is listed as one of the most underdeveloped province in the country. Qala-E-Naw, a small town halfway between Maimana and Herat, serve as the provincial center.

According to Central Statistic Organization (CSO) Badghis has seven districts namely Ab Kamari, Jawand, Muqur , Qadis ,Ghormach, Murghab and the city of Qalai Naw with over thousand villages. However, the Basic Package of Health Service (BPHS) emphasizes that Badghis has six districts. Ghormach district is covered in Farah province. Badghis Province is located in the isolated hills of northwestern Afghanistan and shares its borders with Herat, Ghor, and Faryab provinces as well as Turkmenistan. The province has two rivers namely; Murghab River in the north and the Hari-Rud River in the south.

The total population of Badghis (with Ghormach district) included is 447,2552. The population of Badghis with exception of Ghormach district is 394,689 consisting of mainly Tajik, Pashtun, Uzbek, Turkmen, and Baloch representing 62%, 28%, 5%, 3% and 2% respectively.

Badghis is one of the province recently affected by drough. Drought specially affected Kochi/Nomads population and other host population were also affected that cause internal migration. Nutrition Cluster along with Assessment and Information Management Working Group/PND/MoPH through different meetings decided to conduct one Rapid SMART assessment in the area of Kochi/Nomads people targeting the whole district of Bala Murghab. Because the IDPs (both Kochi and host community from other districts) were scattered across the districts due to the drought. Based on the data shared by FEWS-NET, Bala Murghab district was identified with high number of Kochi/Nomad people.

[2] Estimated Settled Population by Civil Division , Urban, Rural and Sex-2013

3. OBJECTIVE OF THE SURVEY

3.1 MAIN OBJECTIVE

- To quickly assess the health and nutrition situation of children U5 and PLWs in the emergency affected area of Bala Murghab district, Badghis province.

3. 2 SPECIFIC OBJECTIVES

- To assess Global Acute Malnutrition (GAM) rates among children from 6 - 59 months living in Bala Murghab district of Badghis province.
- To estimate morbidity among children from 0- 59 months living in Bala Murghab district of Badghis province using two weeks recall period.
- To estimate vaccination coverage among children from 0 - 59 months living in Bala Murghab district of Badghis province.
- To estimate prevalence of malnutrition among pregnant and lactating women (PLWs) using MUAC cut-off.

3.3. JUSTIFICATION OF SURVEY

- Badghis province categorized as “serious” based on OCHA analysis for recent drought.
- There is recently very high number of Kochi/Nomads population influx (20,690) in the district.
- Internal displacement of population (IDPs) due to drought (Both Kochi/Nomad and other people from the province).
- The area has been selected by nutrition cluster and AIM-Working Group to know the current nutrition situation of the district after the influx.

4. SAMPLE SIZE, SAMPLING DESIGN AND PROCEDURES

4.1 SAMPLE SIZE AND SAMPLING DESIGN

The population assessed are inhabitants and IDPs living in the group of affected villages, meaning several settlements and the households will assumed to be living in the area are more than 200. As there is more than ONE settlement and the population is dispersed: two stage cluster sampling has been applied. The number of clusters was also fixed to a minimum of 25 with 200 minimum

number of children (6-59 months) required. It has been selected using two-stage cluster sampling. The table below presents the precision, which is expected to be reached, according to the GAM result.

Expected GAM Prevalence	Minimum Sample size	Precision
20%	200 children	+/- 7.1%
15%	200 children	+/- 6.3%
10%	200 children	+/- 5.3%
5%	200 children	+/- 3.9%

To reach the required sample size, Rapid SMART assessment for Afghanistan proposes simplified rule to convert children into households:

A. When the percentage of children under age of 5 is below 15%, 25 clusters of 12 households have to be selected
B. When the percentage of children under age of 5 is above 15%, 25 clusters of 10 households have to be selected

The number of households per cluster has to be adapted following the reference percentage of under-5 population for Afghanistan, which is 17.2% (CSO updated population for Afghanistan 1396).

So, 25 clusters of 10 households were randomly selected using ENA for SMART software 2011 latest version (9th July, 2015) from the list of villages.

4.2. Final Sampling Strategy

In total, 25 clusters were visited and there was no rejection of HHs during the survey. Clusters were based mainly on villages (cluster selection is in Annex 2). Table 1 makes a summary of the achieved samples (household, children).

Table 1: Details of proposed and actual sample size achieved

Number of cluster planned	Number of Cluster surveyed	% of cluster surveyed	Number of HH planned	Number of HH surveyed	% HH surveyed	Number of children 6-59 months planned	Number of children 6-59 months surveyed	% children surveyed
25	25	100%	250	250	100%	200	307	154%

Data was analyzed with ENA for SMART (software 2011 version, updated 9th July 2015). Additional data (morbidity, measles vaccination and women nutritional status) was analyzed using Microsoft Excel.

4.3 SAMPLING PROCEDURES

Two-stage cluster sampling methodology was employed in this survey.

Stage 1:

Random selection of clusters/villages was done using probability proportionate to size (PPS) using ENA for SMART software version 2011 of (9th July, 2015). There were 486 number of cluster/villages with an estimated population of 246,246 in the original sampling frame and 123 number of clusters with an estimated population of 46,816 were systematically excluded because of insecurity and inaccessibility. So there were 25.3% villages and 19.0% population were excluded from the original sampling frame.

In case of large villages in a cluster, the village was divided into smaller segments and a segment was selected randomly to include the cluster. This division was done based on existing landmarks in the area. pathways, water points, mosques, health facilities, schools.

Stage 2: Households

It was difficult to obtain an updated and complete list of Households, hence **systematic random sampling** was used to identify the households surveyed. The teams were trained on both methods of sampling (simple and systematic random sampling) and they were offered with materials to assist in determining the households during the data collection exercise

For the sake of simplification and rapidity, polygamous families were accounted as ONE household.

In each selected village, one or more community member(s) was asked to help the survey teams to conduct their work by providing information about the village with regard to the geographical organization or the number of households.

Children:

All children from 0 to 59 months of age living in the selected household were included in the cluster (6-59 months for anthropometry measurements, 0-59 months for morbidity and from 9-59 months for measles vaccination).

Age being very difficult to investigate and to ascertain, the high prevalence of stunting in Afghanistan impairs the relevance of height benchmarks to identify simply an age category. Careful age identification by the use of locally developed event calendar, child dental chart, etc. was applied. Local event calendar was updated from previous studies. For the practice purpose - given the situation of no calendar, then a calendar including events of only close months was rapidly elaborated with the staffs during the training. **It is important to note that the official calendar in Afghanistan is the solar Hijri calendar (Iranian calendar).**

The use of the Gregorian calendar can introduce bias and confusion while interviewing caretakers and therefore can cause additional loss of time.

4.4 Training and supervision

Eight teams of two members in each team (one female and one male) conducted the field data collection. Each two teams had one supervisor. The previous experience from Afghanistan has shown that in some cases people are not eager to allow surveyors to measure female children. It is important to bear that in mind while conducting Rapid SMART assessment and to have as much as possible mixed teams of surveyors that have adapted communication approach. AAH SMART technical team, AAH - Badghis Nutrition and Health deputy manager and BPHS M&E officer were not able to supervise the teams because of critical security Situation.

This survey utilized 3 HEWAD BPHS supervisor, 16 enumerators some of them were participated in the previous SMART Survey. In this case, the teams received a 4-days training on data collection for Rapid SMART assessment, which included a 1-day standardization test. It was expected that based on the teams' experience with Health and Nutrition services they would be more aware and skilled to properly execute the data collection activities for the Rapid SMART assessment.

One field guideline document with instructions, household definition and selection information was provided to each team member. All documents, such as local event calendar, questionnaires or consent forms were translated form English to Pashto and Dari local language for better understanding and to avoid direct translation during the field data collection. The questionnaires were translated back using a different translator. Alterations were made as necessary.

4.5 Data collection

A simple tally sheets instead of a questionnaire was used (ANNEX 3) where surveyors would simply write down data for each child. The number of the child in the household and the number of the household in the cluster were recorded too.

Anthropometric data

- All 0-59 months children were included in the survey.
- The **sex** has recorded with codes: f=female and m=male.
- The **age** was written in months. The preparation and the use of tools to determine age was time consuming and required previous preparation (e.g. Event calendar). The teams were sensitized to the importance of the age record.

- **Weight (in kg):** Children were weighed to the nearest 0.1 kg by using an Electronic Uni scale (or SECA). The children who could easily stand were asked to stand on the weighing scale and their weight was recorded. In a situation when the children could not stand up, the double weighing method was applied[3].
- **Height/Length (in cm):** Measuring board used to measure bare headed and barefoot children. The precision of the measurement was 1 mm. Children of less than 2 years were measured lying down (length) and those equal to or above 2 years measured standing up (Height).
- All children were checked for **Bilateral Pitting Oedema**. It was essential that all staff well trained to check for Oedema on both feet.
- **MUAC** was taken on the **LEFT** arm using flexible MUAC tape. The MUAC measurement had recorded in mm.

All children detected as SAM whether by presence of bilateral pitting oedema WHZ <-3 Zscore and/ or MUAC < 115 cm, were referred to the nearest health facility or agency responsible for therapeutic care for immediate treatment, in this case BRAC BPHS implementer organization.

Measles immunization status

For all children selected in the sample, the mother/caretaker (CT) was asked if the child has been immunized against measles or not, and if there was a vaccination card The answers was recorded as 'Y' (Yes); 'VWC' (Vaccination without Card); 'N' (No); 'DK' (Does not Know), according to the situation.

Morbidity data

For all children selected in the sample, the mother/CT was asked:

- If the child had diarrhea within the last 14 days. Diarrhea is defined as every episode of more than 3 liquid stools per day. Record was made as follows: 'Y' (Yes); 'N' (No); 'DK' (Does not Know)
- If the child had Acute Respiratory Infection (ARI) within the last 14 days. Acute Respiratory Infection is any episode with severe, persistent cough or difficulty breathing. Record was made as follows: 'Y' (Yes); 'N' (No); 'DK' (Does not Know), according to the situation.

4.6 DATA ANALYSIS

The anthropometric data was analyzed using ENA for SMART software 2011 version, (updated July 9th, 2015). After data was being entered and the quality checked, ENA software generated results for acute

[3] The first measurement is the weight of the care taker and the second is the weight of the caretaker with the child. The scale can record the first measurement and automatically extract it from the second measurement, showing only the weight of the child on the screen.

malnutrition (WHZ), stunting (HAZ), and underweight (WAZ). Confidence intervals were automatically calculated by the software ENA. ENA generated a survey report automatically

Survey results are presented in reference to WHO standards for overall final analysis. Results are presented in (**%**) z-scores with 95% Confidence Interval.

ENA generates automatically table for MUAC results using cut-offs presented below:

Classification	Normal	Moderate Acute Malnutrition	Severe acute malnutrition
MUAC	**≥125mm**	**<125mm to ≥115**	**<115mm and/or oedema**

and for weight for Height z-scores as follows:

	Acute Malnutrition	Underweight	Stunting
Global	**WHZ <-2 SD and/or edema**	**WAZ <-2 SD**	**HAZ <-2 SD**
Moderate	**WHZ <-2 SD to ≥-3SD**	**WAZ <-2 SD to ≥-3 SD**	**HAZ <-2 SD to ≥-3SD**
Severe	**WHZ <-3 SD and/or edema**	**WAZ <-3 SD**	**HAZ <-3 SD**

4.7 SURVEY LIMITATION

- Security problems and lack of accessibility in some villages.
- Lack of updated list of Households in the villages.
- 123 villages with an estimated population of 46,816 had to exclude in the final sampling frame out of total 486 (with an estimated total population of 246,246).
- Inaccuracy of some villages level population data; some villages found smaller or larger than anticipated at the time of the visit during data collection.
- Sensitization of common people against health program especially with nutrition program.
- Illiteracy of local people.
- Luck of direct supervision from the teams during data collection due to insecurity and long distance from city to Murghab district.

5. RESULTS

5.1 DATA QUALITY

The overall standard deviation (SD) for acute malnutrition, weight for height z-scores, was calculated at 1.17, with SMART flags, a SD that is within the acceptable range of values for SD, between 0.80 and 1.20.

The plausibility check reported a percentage of values flagged with SMART flags - WHZ: 2.3%, HAZ: 2.6%, WAZ: 0.7%.

Among the surveyed children, boys and girls were equally represented with (p=0.189).

The age ratio of 6-29 months to 30-59 months was 1.06 (the value should be around 0.85): the age distribution was as expected with (p-value = 0.052).

5.2 ANTHROPOMETRIC RESULTS:

307 children aged 6-59 months were surveyed. Estimation of prevalence of GAM was done based on WHO 2006 child growth standards and the results are presented with exclusion of z-scores from Observed mean SMART flags: WHZ -3 to 3; HAZ -3 to 3; WAZ -3 to 3, for overall plausibility score refer to annex 2.

See table below for distribution of age and sex sample.

Table 2: Distribution of age and sex of sample

	Boys		Girls		Total		Ratio
AGE (mo)	**no.**	**%**	**no.**	**%**	**no.**	**%**	**Boy:girl**
6-17	40	51.9	37	48.1	77	25.1	1.1
18-29	50	61.7	31	38.3	81	26.4	1.6
30-41	36	50.0	36	50.0	72	23.5	1.0
42-53	30	54.5	25	45.5	55	17.9	1.2
54-59	9	40.9	13	59.1	22	7.2	0.7
Total	165	53.7	142	46.3	307	100.0	1.2

Table 3: Prevalence of acute malnutrition based on weight-for-height Z-scores (and/or oedema) and by sex

	All n = 300	Boys n = 159	Girls n = 141
Prevalence of global malnutrition (<-2 z-score and/or oedema)	(30) 10.0 % (6.6 - 15.0 95% C.I.)	(20) 12.6 % (7.7 - 19.9 95% C.I.)	(10) 7.1 % (3.5 - 13.8 95% C.I.)
Prevalence of moderate malnutrition (<-2 z-score and >=-3 z-score, no oedema)	(22) 7.3 % (4.7 - 11.2 95% C.I.)	(12) 7.5 % (4.5 - 12.5 95% C.I.)	(10) 7.1 % (3.5 - 13.8 95% C.I.)
Prevalence of severe malnutrition (<-3 z-score and/or oedema)	(8) 2.7 % (1.2 - 6.0 95% C.I.)	(8) 5.0 % (2.2 - 11.1 95% C.I.)	(0) 0.0 % (0.0 - 0.0 95% C.I.)

Table 4: Distribution of acute malnutrition and oedema based on weight-for-height Z-scores

	<-3 z-score	>=-3 z-score
Oedema present	Marasmic kwashiorkor No. 0 (0.0 %)	Kwashiorkor No. 0 (0.0 %)
Oedema absent	Marasmic No. 12 (3.9 %)	Not severely malnourished No. 295 (96.1 %)

Table 5: Prevalence of acute malnutrition based on MUAC cut offs (and/or oedema) and by sex

	All n = 306	Boys n = 164	Girls n = 142
Prevalence of global malnutrition (< 125 mm and/or oedema)	(48) 15.7 % (11.4 - 21.2 95% C.I.)	(25) 15.2 % (10.0 - 22.6 95% C.I.)	(23) 16.2 % (10.9 - 23.5 95% C.I.)
Prevalence of moderate malnutrition (< 125 mm and >= 115 mm, no oedema)	(36) 11.8 % (7.9 - 17.1 95% C.I.)	(19) 11.6 % (7.3 - 17.9 95% C.I.)	(17) 12.0 % (7.2 - 19.2 95% C.I.)
Prevalence of severe malnutrition (< 115 mm and/or oedema)	(12) 3.9 % (2.3 - 6.5 95% C.I.)	(6) 3.7 % (1.7 - 7.6 95% C.I.)	(6) 4.2 % (1.7 - 10.0 95% C.I.)

Table 6: Prevalence of Global Acute Malnutrition based on combined criteria (MUAC+WHZ+Oedema)*

Status	All (boys and girls) N=300
Prevalence of global acute malnutrition (WHZ <-2SD and MUAC <125mm and/or Oedema)	**19.7%** (15.5-24.8; 95% CI)
Prevalence of severe acute malnutrition (WHZ <-3SD and/or MUAC <115mm and/or Oedema)	**5.7%** (3.1 – 10.1; 95% CI)

*Combined GAM and SAM calculation was manually performed by changing the selected MUAC parameters (i.e. <125mm, <115mm) into Oedema in ENA software to provide an aggregated estimate with CI values.

Table 7: Prevalence of underweight based on weight-for-age Z-scores and by sex

	All n = 305	Boys n = 163	Girls n = 142
Prevalence of underweight (<-2 z-score)	(65) 21.3 % (16.6 - 26.9 95% C.I.)	(46) 28.2 % (21.7 - 35.9 95% C.I.)	(19) 13.4 % (7.8 - 22.1 95% C.I.)
Prevalence of moderate underweight (<-2 z-score and >=-3 z-score)	(46) 15.1 % (11.3 - 19.8 95% C.I.)	(31) 19.0 % (14.4 - 24.7 95% C.I.)	(15) 10.6 % (6.0 - 18.0 95% C.I.)
Prevalence of severe underweight (<-3 z-score)	(19) 6.2 % (3.8 - 10.0 95% C.I.)	(15) 9.2 % (5.1 - 16.2 95% C.I.)	(4) 2.8 % (1.1 - 6.8 95% C.I.)

Table 8: Prevalence of stunting based on height-for-age Z-scores and by sex

	All n = 305	Boys n = 163	Girls n = 142
Prevalence of underweight (<-2 z-score)	(128) 42.8 % (37.1 - 48.7 95% C.I.)	(85) 53.5 % (45.3 - 61.4 95% C.I.)	(43) 30.7 % (24.3 - 37.9 95% C.I.)
Prevalence of moderate underweight (<-2 z-score and >=-3 z-score)	(84) 28.1 % (23.0 - 33.8 95% C.I.)	(54) 34.0 % (26.7 - 42.1 95% C.I.)	(30) 21.4 % (16.4 - 27.5 95% C.I.)
Prevalence of severe underweight (<-3 z-score)	(44) 14.7 % (9.7 - 21.6 95% C.I.)	(31) 19.5 % (12.5 - 29.2 95% C.I.)	(13) 9.3 % (4.8 - 17.2 95% C.I.)

The summary of the Mean Z-scores with their Standard Deviations, the design effects and number of the out of range data per index is the table 9 below.

Table 9: Mean Z-scores, design effect and excluded subjects

Indicator	N	Mean z-scores ± SD	Design Effect (z-score < -2)	Z-scores not available*	Z-scores out of range
Weight-for-Height	300	-0.37±1.17	1.34	0	7
Weight-for-Age	305	-1.20±1.04	1.11	0	2
Height-for-Age	299	-1.72±1.15	1.00	0	8

* contains for WHZ and WAZ the children with oedema.

The observed mean of the z score was -0.37 (±1.17) The design effect of 1.34 is reflecting homogeneity of the surveyed population.

5.3 Child Health and Immunization

Retrospective morbidity data was collected among all children aged 0-59 months, with the 2 weeks recall period to assess the occurrence of main diseases. All children aged from 9 to 59 months were assessed whether they ever received measles vaccine or not. Analysis of data and findings illustrated in table 10 and 10.

Table 10: Under-five morbidity, two weeks recall, (N=322)

Parameters	Frequency	Results
Acute Respiratory Infection (ARI)	100	31.1%
Diarrhea	155	48.1%

Table 11: Measles immunization status, children 9-59 mounts, (N=291)

Parameters	Frequency	Results
Yes (Confirmed by card)	64	22.0%
Yes by recall	157	54.0%
No	57	19.6%
Don't Know	13	4.5%

Only 75.9% of children 9-59 months are vaccinated which is far below the expected National coverage (90%), meaning the population immunity against measles is low.

5.4 Maternal Nutritional Status

The information on maternal nutrition status was collected for women at childbearing age (CBA), from 15 to 49 years with focus on pregnant and lactating women. The results illustrated in the tables 12 and 13 below.

Table 12: Physiological status of women of reproductive age (15-49 years), (N=275)

Status	Frequency	Results
Pregnant	130	47.3%
Lactating	112	40.7%
Non-pregnant & non-lactating	33	12.0%

Table 13: Nutrition status of pregnant and lactating women based on MUAC

PLWs MUAC cut off (N=242)	Frequency	Results
Global acute malnutrition among pregnant women	31	23.8%
Global acute malnutrition among lactating women	**29**	**25.9%**
Global Acute Malnutrition among PLWs (MUAC <230mm)	60	24.8%
Severe acute malnutrition among PLWs (MUAC <185mm)	1	0.4%

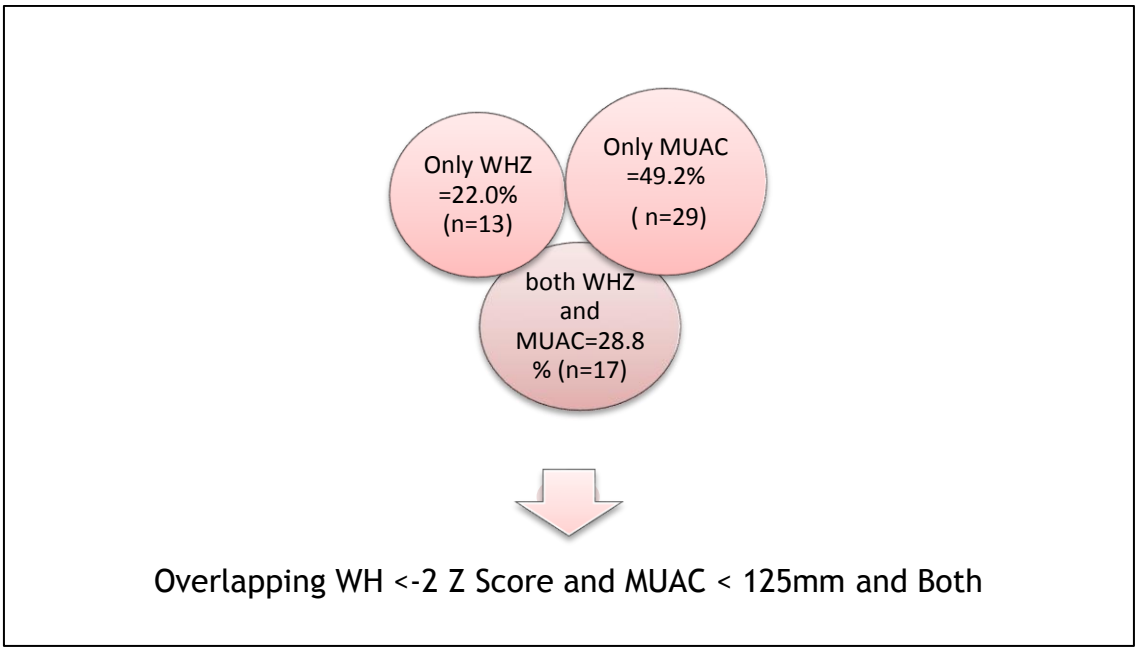
8. DISCUSSION

8.1 UNDERNUTRITION

The nutrition Rapid SMART Survey was done in the Bala Murghab district of Badghis province in the month of July 2018. The GAM prevalence based on WHZ unveiled by the survey **was 10.0% (6.6-15.0; 95% CI)**. According to WHO emergency threshold, it's classified as serious public health situation in the district. SAM rate based on WHZ was **2.7% (1.2- 6.0 95% CI)** which is just below 3% level trigger emergency for priority used in the context of Afghanistan.

The direct observation during the survey showed inappropriate personal Hygiene for internally displaced people due to ongoing conflict between AOGs and government in the Bala Murghab district, it also noted the province affected by drought which contributes to increase the number of malnourished cases.

The GAM prevalence based on MUAC was 15.7% (11.4-21.2; 95% CI) and SAM based on MUAC was 3.9% (2.3- 6.5; 95% CI), which is higher than the GAM based on WHZ . When both criteria are combined (WHZ <-2 SD and/or MUAC <125mm and/or Oedema), the GAM prevalence was 19.7% (15.5-24.8; 95% CI) while combined SAM rate was 5.7% (3.1–10.1; 95% CI). Combined rates are recommended to be used for caseloads estimation for SAM and MAM management in the district. The prevalence of acute malnourished children based on WHZ criteria is lower than the MUAC. Children screened only by MUAC who are detected through community screening is not enough to detect all acute malnourished children eligible for treatment according to the Afghanistan latest IMAM Guideline. This has to be however further investigated: the figure below shows the actual acute malnutrition prevalence comparing WHZ <-2 SD with MUAC <125 mm. There is significant difference.



Prevalence of Stunting rate was **42.8% (37.1-48.7 95% CI)** meaning that in every two children U5 one child is suffering from chronic malnutrition or stunting.

The prevalence of underweight was at **21.3% (16.6-26.9 95% CI). T**his form of under-nutrition represents the burden of acute and chronic under-nutrition among under-five.

8.2 IMMUNIZATION STATUS

The low coverage **(75.9%)** of measles vaccination illustrates the hindrance in accessing the basic health services in the area, with coverage below the WHO thresholds of >80%[4] and lower than national MoPH targets (90%).

8.3 MATERNAL NUTRITION STATUS

Nutritional status among PLWs were also seen quite high in the area. There were 23.8% pregnant women malnourished based on the MUAV cut-offs of <230mm while the rate among lactating women was 25.9%. An overall 24.8% PLWs were found to be acutely malnourished and the rate of severe malnutrition was actually quite low (0.4%) with a cut-off of <185mm.

[4] WHO from 2010 recommends increase routine coverage with the first dose of measles-containing vaccine (MCV1) by ≥90% nationally and ≥80% in every district or equivalent administrative unit for children aged 1 year (http://www.who.int/mediacentre/factsheets/fs286/en/).

9 RECOMMENDATIONS

- Efforts should be put towards scaling up health and nutrition services coverage at health facility and community levels including additional integrated outreach services through health mobile team.
- Total number of HFs in Bala Murghab district was 1 DH, 4 BHCs and 4 HSC - but still there is no IPD SAM and OPD MAM program. It is recommended to resume/expand the scope of OPD MAM program in the health facilities and IPD SAM program in the district hospital as well.
- Continuation and strengthening of the ongoing community management of OPD SAM and OPD MAM program in community outreach program in the district.
- Some additional mobile health and nutrition team can be deployed to serve the most vulnerable IDP population (i.e. Kochi/Nomad, other migrated people) with essential health and nutrition services.
- Provide health education and strengthen awareness of community about the benefits of immunization, micronutrient supplementation and children health care practices through CHWs (convincing of incentive) and health facilities staffs.
- Consider starting of TSFP program for long term to all health facilities (CHCs and BHCs if possible) for preventing and rehabilitating MAM children as well as Pregnant and lactating women.
- Capacity building and motivation for CHWs to strengthen active case findings through regular monthly planning in the community level.
- Strengthening sensitization for mass people regarding nutrition programs.
- Mobilize health shuras to strengthen nutrition mobilization in the community.
- To strengthen referral system of malnourished children from HPs to HFs.
- To consider starting of food demonstration program

10 REFERENCES

WHO 2010 recommended measles vaccine coverages

WHO emergency threshold

CSO updated population 2017

CAAC survey 2017

ENA software 2011 Updated 9 July 2015

FEWS-NET Weather Hazard Outlook, Afghanistan

OCHA drought response map

10 ANNEXES

Annex 1: List of selected clusters/ villages

District Name	Population	Villages Name	Cluster
Bala morghab	1050	مسجد جامع کلان	RC
Bala morghab	1260	زدران	1
Bala morghab	490	ارشین	2
Bala morghab	840	نورزائی جهان دوستی	3
Bala morghab	595	کپه بابا روشاخ	RC
Bala morghab	1050	کابلی کمیساری	4
Bala morghab	504	حاجی محمد ایوب خان	5
Bala morghab	560	ملاوزیرتولوچی	6
Bala morghab	630	قریه سرگند	7
Bala morghab	1925	محله پائین	8
Bala morghab	2450	سوخدی	9
Bala morghab	700	ظاهرخان	10
Bala morghab	5278	کمرچیلونک	11
Bala morghab	371	حاجی اهل الله	12
Bala morghab	980	اسحق زای	13
Bala morghab	595	امرخیل خم آب	14
Bala morghab	2100	محمدزائی	15
Bala morghab	140	جهرآب تروش	16
Bala morghab	595	قریه حاجی یعقوب	17
Bala morghab	245	ریگی دهن منگان	18
Bala morghab	1673 1330	چهارسنگی غولد	RC 19
Bala morghab	2114	ابلقی ها	20
Bala morghab	2233	فراریها	21
Bala morghab	1120	دوجهری	22
Bala morghab	1120	توروه چشمه	23
Bala morghab	154	باباخان	24
Bala morghab	2940	خواجه یخدان	25

Annex 2: Plausibility Check Report

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

(If it is not mentioned, flagged data is included in the evaluation. Some parts of this plausibility report are more for advanced users and can be skipped for a standard evaluation)

Overall data quality

Criteria	Flags*	Unit	Excel.	Good	Accept	Problematic	**Score**
Flagged data	Incl	%	0-2.5	>2.5-5.0	>5.0-7.5	>7.5	
(% of out of range subjects)			0	5	10	20	**0** (2.3 %)
Overall Sex ratio	Incl	p	>0.1	>0.05	>0.001	<=0.001	
(Significant chi square)			0	2	4	10	**0** (p=0.189)
Age ratio(6-29 vs 30-59)	Incl	p	>0.1	>0.05	>0.001	<=0.001	
(Significant chi square)			0	2	4	10	**2** (p=0.052)
Dig pref score - weight	Incl	#	0-7	8-12	13-20	> 20	
			0	2	4	10	**0** (7)
Dig pref score - height	Incl	#	0-7	8-12	13-20	> 20	
			0	2	4	10	**0** (6)
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	**10** (1.17)
Skewness WHZ	Excl	#	<±0.2	<±0.4	<±0.6	>=±0.6	
			0	1	3	5	**3** (-0.48)
Kurtosis WHZ	Excl	#	<±0.2	<±0.4	<±0.6	>=±0.6	
			0	1	3	5	**0** (-0.05)
Poisson dist WHZ-2	Excl	p	>0.05	>0.01	>0.001	<=0.001	
			0	1	3	5	**0** (p=0.246)
OVERALL SCORE WHZ =			0-9	10-14	15-24	>25	**15** %

The overall score of this survey is 15 %, this is acceptable.

There were no duplicate entries detected.

Percentage of children with no exact birthday: 75 %

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=15/ID=15: **WHZ (3.031)**, HAZ (-5.416), Height may be incorrect

Line=17/ID=17: **WHZ (-3.669)**, Height may be incorrect

Line=53/ID=53: **WHZ (6.176)**, WAZ (2.392), Weight may be incorrect

Line=65/ID=65: **WHZ (3.815)**, HAZ (-5.385), Height may be incorrect

Line=88/ID=88: **WHZ (-3.917)**, Weight may be incorrect

Line=104/ID=104: HAZ (-5.113), Age may be incorrect

Line=112/ID=112: **WHZ (-3.962)**, Weight may be incorrect

Line=194/ID=195: HAZ (3.745), Age may be incorrect

Line=196/ID=197: HAZ (1.330), Age may be incorrect

Line=242/ID=243: HAZ (-6.233), WAZ (-4.562), Age may be incorrect

Line=245/ID=246: HAZ (1.344), Height may be incorrect

Line=248/ID=249: **WHZ (-3.551)**, Height may be incorrect

Line=278/ID=279: HAZ (2.032), Height may be incorrect

Percentage of values flagged with SMART flags:WHZ: 2.3 %, HAZ: 2.6 %, WAZ: 0.7 %

Age distribution:

Month 6 : #######

Month 7 : ####

Month 8 : ####

Month 9 : #######

Month 10 : #####

Month 11 : #########

Month 12 : ######

Month 13 : #######

Month 14 : #####

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

Month 16 : #####

Month 17 : #######

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

Month 19 : #####

Month 20 : ####

Month 21 : ####

Month 22 : ####

Month 23 : ###

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

Month 25 : ########

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

Age ratio of 6-29 months to 30-59 months: 1.06 (The value should be around 0.85).:

p-value = 0.052 (as expected)

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

Age cat.	mo.	boys	girls	total	ratio boys/girls
6 to 17	12	40/38.3 (1.0)	37/32.9 (1.1)	77/71.2 (1.1)	1.08
18 to 29	12	50/37.3 (1.3)	31/32.1 (1.0)	81/69.4 (1.2)	1.61
30 to 41	12	36/36.2 (1.0)	36/31.1 (1.2)	72/67.3 (1.1)	1.00
42 to 53	12	30/35.6 (0.8)	25/30.6 (0.8)	55/66.2 (0.8)	1.20
54 to 59	6	9/17.6 (0.5)	13/15.2 (0.9)	22/32.8 (0.7)	0.69
6 to 59	54	165/153.5 (1.1)	142/153.5 (0.9)		1.16

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

Overall sex ratio: p-value = 0.189 (boys and girls equally represented)

Overall age distribution: p-value = 0.086 (as expected)

Overall age distribution for boys: p-value = 0.050 (as expected)

Overall age distribution for girls: p-value = 0.619 (as expected)

Overall sex/age distribution: p-value = 0.006 (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: **7** (0-7 excellent, 8-12 good, 13-20 acceptable and > 20 problematic)

p-value for chi2: 0.103

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: **6** (0-7 excellent, 8-12 good, 13-20 acceptable and > 20 problematic)

p-value for chi2: 0.456

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: 0.193

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:	1.32	1.26	1.17
(The SD should be between 0.8 and 1.2)			
Prevalence (< -2)			
observed:	11.1%	11.1%	10.0%
calculated with current SD:	10.8%	10.1%	8.2%
calculated with a SD of 1:	5.2%	5.4%	5.2%
HAZ			
Standard Deviation SD:	1.30	1.28	1.15
(The SD should be between 0.8 and 1.2)			
Prevalence (< -2)			

observed: 43.0% 42.8% 42.8%

calculated with current SD: 41.4% 40.8% 40.3%

calculated with a SD of 1: 38.9% 38.3% 38.9%

WAZ

Standard Deviation SD: 1.07 1.07 1.04

(The SD should be between 0.8 and 1.2)

Prevalence (< -2)

observed: 21.5% 21.5% 21.3%

calculated with current SD: 22.8% 22.8% 22.1%

calculated with a SD of 1: 21.2% 21.2% 21.2%

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

WHZ p= 0.000 p= 0.000 p= 0.000

HAZ p= 0.020 p= 0.022 p= 0.034

WAZ p= 0.002 p= 0.002 p= 0.001

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

Skewness

WHZ 0.01 -0.40 -0.48

HAZ 0.20 0.32 0.20

WAZ -0.38 -0.38 -0.45

If the value is:

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

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

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

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

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

Kurtosis

WHZ 1.95 0.41 -0.05

HAZ 1.06 0.85 -0.44

WAZ 0.38 0.38 0.03

Kurtosis characterizes the relative size of the body versus the tails of the distribution. Positive kurtosis indicates relatively large tails and small body. Negative kurtosis indicates relatively large body and small tails.

If the absolute value is:

-above 0.4 it indicates a problem. There might have been a problem with data collection or sampling.

-between 0.2 and 0.4, the data may be affected with a problem.

-less than an absolute value of 0.2 the distribution can be considered as normal.

Test if cases are randomly distributed or aggregated over the clusters by calculation of the Index of Dispersion (ID) and comparison with the Poisson distribution for:

WHZ < -2: ID=1.18 (p=0.246)

WHZ < -3: ID=1.23 (p=0.202)

GAM: ID=1.18 (p=0.246)

SAM: ID=1.23 (p=0.202)

HAZ < -2: ID=0.56 (p=0.959)

HAZ < -3: ID=1.43 (p=0.078)

WAZ < -2: ID=0.80 (p=0.740)

WAZ < -3: ID=1.02 (p=0.438)

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: 1.51 (n=25, f=1) ##############################

02: 1.43 (n=25, f=0) ########################

03: 1.36 (n=25, f=2) ####################

04: 1.18 (n=24, f=0) ################

05: 1.14 (n=23, f=0) ##############

06: 1.10 (n=24, f=0) ############

07: 1.21 (n=25, f=1) ################

08: 1.46 (n=25, f=2) ############################

09: 1.12 (n=20, f=0) ##############

10: 0.70 (n=22, f=0)

11: 1.54 (n=19, f=0) ##############################

12: 1.13 (n=17, f=0) ##############

13: 1.39 (n=10, f=0) OOOOOOOOOOOOOOOOOOOOOOOOO

14: 1.90 (n=05, f=0) ~~~~~~

15: 1.53 (n=04, f=0) ~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~

16: 4.20 (n=03, f=1) ~~~~~~

17: 0.61 (n=03, f=0)

18: 0.43 (n=02, f=0)

20: 0.06 (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**	**7**	**8**
n =	53	34	38	34	33	27	38	50
Percentage of values flagged with SMART flags:								
WHZ:	5.7	5.9	2.6	0.0	0.0	0.0	2.6	0.0
HAZ:	1.9	2.9	2.6	0.0	6.1	0.0	5.3	2.0
WAZ:	1.9	0.0	0.0	0.0	0.0	0.0	2.6	0.0
Age ratio of 6-29 months to 30-59 months:								
	0.66	1.83	0.90	1.27	1.06	1.45	0.90	1.17
Sex ratio (male/female):								
	0.89	1.43	1.00	1.00	1.20	1.70	1.38	1.17
Digit preference Weight (%):								
.0 :	4	6	3	3	6	11	0	6
.1 :	8	12	5	6	12	15	5	16
.2 :	4	9	5	18	15	19	16	8
.3 :	4	3	13	9	15	11	21	12
.4 :	9	9	8	18	12	11	11	8
.5 :	15	9	13	12	12	7	8	18
.6 :	13	6	21	3	3	7	8	6
.7 :	21	6	8	9	9	11	3	10
.8 :	8	26	21	18	6	7	8	12
.9 :	15	15	3	6	9	0	21	4
DPS:	18	21	22	19	13	16	23	14

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

Digit preference Height (%):

.0 :	9	9	5	6	6	7	8	18

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

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

Digit preference MUAC (%):

.0 :	9	3	8	6	3	4	3	6
.1 :	8	6	16	9	9	4	19	8
.2 :	15	6	11	3	15	11	8	10
.3 :	11	15	21	12	6	19	11	8
.4 :	8	9	11	21	3	22	16	6
.5 :	8	15	5	15	9	11	5	14
.6 :	15	18	8	9	18	15	11	10
.7 :	9	9	8	9	9	7	11	8
.8 :	9	9	3	6	15	4	5	12
.9 :	8	12	11	12	12	4	11	18
DPS:	9	15	17	16	16	21	16	12

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

Standard deviation of WHZ:

SD	1.48	1.20	1.36	1.16	1.19	1.41	1.32	1.18

Prevalence (< -2) observed:

%	9.4	2.9	15.8	8.8	9.1	18.5	23.7	4.0

Prevalence (< -2) calculated with current SD:

%	12.8	5.1	14.7	8.9	6.5	13.5	22.1	5.0

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

%	4.6	2.4	7.7	6.0	3.6	6.1	15.5	2.6

Standard deviation of HAZ:

SD	1.38	1.15	1.18	1.26	1.49	1.22	1.53	1.13

observed:

%	37.7	52.9	42.1	50.0	45.5	51.9	34.2	38.0

calculated with current SD:

%	35.1	50.8	47.7	44.9	40.4	49.2	38.0	35.3

calculated with a SD of 1:

%	29.9	50.9	47.3	43.6	35.9	49.0	32.1	33.4

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	3/5.8 (0.5)	9/6.5 (1.4)	12/12.3 (1.0)	0.33
18 to 29	12	5/5.7 (0.9)	4/6.3 (0.6)	9/12.0 (0.8)	1.25
30 to 41	12	6/5.5 (1.1)	7/6.1 (1.1)	13/11.6 (1.1)	0.86
42 to 53	12	10/5.4 (1.9)	4/6.0 (0.7)	14/11.4 (1.2)	2.50
54 to 59	6	1/2.7 (0.4)	4/3.0 (1.3)	5/5.7 (0.9)	0.25
6 to 59	54	25/26.5 (0.9)	28/26.5 (1.1)		0.89

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

Overall sex ratio: p-value = 0.680 (boys and girls equally represented)

Overall age distribution: p-value = 0.815 (as expected)

Overall age distribution for boys: p-value = 0.168 (as expected)

Overall age distribution for girls: p-value = 0.562 (as expected)

Overall sex/age distribution: p-value = 0.052 (as expected)

Team 2:

Age cat.	mo.	boys	girls	total	ratio boys/girls
6 to 17	12	6/4.6 (1.3)	3/3.2 (0.9)	9/7.9 (1.1)	2.00
18 to 29	12	7/4.5 (1.5)	6/3.2 (1.9)	13/7.7 (1.7)	1.17
30 to 41	12	3/4.4 (0.7)	2/3.1 (0.7)	5/7.5 (0.7)	1.50
42 to 53	12	2/4.3 (0.5)	2/3.0 (0.7)	4/7.3 (0.5)	1.00
54 to 59	6	2/2.1 (0.9)	1/1.5 (0.7)	3/3.6 (0.8)	2.00
6 to 59	54	20/17.0 (1.2)	14/17.0 (0.8)		1.43

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

Overall sex ratio: p-value = 0.303 (boys and girls equally represented)

Overall age distribution: p-value = 0.181 (as expected)

Overall age distribution for boys: p-value = 0.487 (as expected)

Overall age distribution for girls: p-value = 0.488 (as expected)

Overall sex/age distribution: p-value = 0.094 (as expected)

Team 3:

Age cat.	mo.	boys	girls	total	ratio boys/girls
6 to 17	12	7/4.4 (1.6)	4/4.4 (0.9)	11/8.8 (1.2)	1.75
18 to 29	12	5/4.3 (1.2)	2/4.3 (0.5)	7/8.6 (0.8)	2.50
30 to 41	12	3/4.2 (0.7)	6/4.2 (1.4)	9/8.3 (1.1)	0.50
42 to 53	12	4/4.1 (1.0)	4/4.1 (1.0)	8/8.2 (1.0)	1.00
54 to 59	6	0/2.0 (0.0)	3/2.0 (1.5)	3/4.1 (0.7)	0.00
6 to 59	54	19/19.0 (1.0)	19/19.0 (1.0)		1.00

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

Overall sex ratio: p-value = 1.000 (boys and girls equally represented)

Overall age distribution: p-value = 0.883 (as expected)

Overall age distribution for boys: p-value = 0.407 (as expected)

Overall age distribution for girls: p-value = 0.637 (as expected)

Overall sex/age distribution: p-value = 0.162 (as expected)

Team 4:

Age cat.	mo.	boys	girls	total	ratio boys/girls
6 to 17	12	3/3.9 (0.8)	4/3.9 (1.0)	7/7.9 (0.9)	0.75
18 to 29	12	7/3.8 (1.8)	5/3.8 (1.3)	12/7.7 (1.6)	1.40
30 to 41	12	4/3.7 (1.1)	5/3.7 (1.3)	9/7.5 (1.2)	0.80
42 to 53	12	2/3.7 (0.5)	2/3.7 (0.5)	4/7.3 (0.5)	1.00
54 to 59	6	1/1.8 (0.6)	1/1.8 (0.6)	2/3.6 (0.6)	1.00
6 to 59	54	17/17.0 (1.0)	17/17.0 (1.0)		1.00

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

Overall sex ratio: p-value = 1.000 (boys and girls equally represented)

Overall age distribution: p-value = 0.279 (as expected)

Overall age distribution for boys: p-value = 0.412 (as expected)

Overall age distribution for girls: p-value = 0.753 (as expected)

Overall sex/age distribution: p-value = 0.210 (as expected)

Team 5:

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

---

6 to 17	12	4/4.2 (1.0)	6/3.5 (1.7)	10/7.7 (1.3)	0.67
18 to 29	12	4/4.1 (1.0)	3/3.4 (0.9)	7/7.5 (0.9)	1.33
30 to 41	12	8/3.9 (2.0)	1/3.3 (0.3)	9/7.2 (1.2)	8.00
42 to 53	12	1/3.9 (0.3)	4/3.2 (1.2)	5/7.1 (0.7)	0.25
54 to 59	6	1/1.9 (0.5)	1/1.6 (0.6)	2/3.5 (0.6)	1.00

---

6 to 59	54	18/16.5 (1.1)	15/16.5 (0.9)	1.20

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

Overall sex ratio: p-value = 0.602 (boys and girls equally represented)

Overall age distribution: p-value = 0.651 (as expected)

Overall age distribution for boys: p-value = 0.149 (as expected)

Overall age distribution for girls: p-value = 0.424 (as expected)

Overall sex/age distribution: p-value = 0.025 (significant difference)

Team 6:

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

---

6 to 17	12	6/3.9 (1.5)	5/2.3 (2.2)	11/6.3 (1.8)	1.20
18 to 29	12	5/3.8 (1.3)	0/2.3 (0.0)	5/6.1 (0.8)	
30 to 41	12	4/3.7 (1.1)	4/2.2 (1.8)	8/5.9 (1.4)	1.00
42 to 53	12	2/3.7 (0.5)	0/2.2 (0.0)	2/5.8 (0.3)	
54 to 59	6	0/1.8 (0.0)	1/1.1 (0.9)	1/2.9 (0.3)	0.00

---

6 to 59	54	17/13.5 (1.3)	10/13.5 (0.7)	1.70

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

Overall sex ratio: p-value = 0.178 (boys and girls equally represented)

Overall age distribution: p-value = 0.083 (as expected)

Overall age distribution for boys: p-value = 0.405 (as expected)

Overall age distribution for girls: p-value = 0.061 (as expected)

Overall sex/age distribution: p-value = 0.009 (significant difference)

Team 7:

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

---

6 to 17	12	6/5.1 (1.2)	3/3.7 (0.8)	9/8.8 (1.0)	2.00
18 to 29	12	6/5.0 (1.2)	3/3.6 (0.8)	9/8.6 (1.0)	2.00
30 to 41	12	3/4.8 (0.6)	5/3.5 (1.4)	8/8.3 (1.0)	0.60

42 to 53 12 4/4.7 (0.8) 4/3.5 (1.2) 8/8.2 (1.0) 1.00

54 to 59 6 3/2.3 (1.3) 1/1.7 (0.6) 4/4.1 (1.0) 3.00

---

6 to 59 54 22/19.0 (1.2) 16/19.0 (0.8) 1.38

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

Oveall sex ratio: p-value = 0.330 (boys and girls equally represented)

Overall age distribution: p-value = 1.000 (as expected)

Overall age distribution for boys: p-value = 0.852 (as expected)

Overall age distribution for girls: p-value = 0.869 (as expected)

Overall sex/age distribution: p-value = 0.466 (as expected)

Team 8:

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

---

6 to 17 12 5/6.3 (0.8) 3/5.3 (0.6) 8/11.6 (0.7) 1.67

18 to 29 12 11/6.1 (1.8) 8/5.2 (1.5) 19/11.3 (1.7) 1.38

30 to 41 12 5/5.9 (0.8) 6/5.0 (1.2) 11/11.0 (1.0) 0.83

42 to 53 12 5/5.8 (0.9) 5/5.0 (1.0) 10/10.8 (0.9) 1.00

54 to 59 6 1/2.9 (0.3) 1/2.5 (0.4) 2/5.3 (0.4) 1.00

---

6 to 59 54 27/25.0 (1.1) 23/25.0 (0.9) 1.17

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

Overall sex ratio: p-value = 0.572 (boys and girls equally represented)

Overall age distribution: p-value = 0.075 (as expected)

Overall age distribution for boys: p-value = 0.226 (as expected)

Overall age distribution for girls: p-value = 0.467 (as expected)

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

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

Team: 1

Time SD for WHZ

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

01: 1.57 (n=03, f=1) ################################

02: 0.88 (n=03, f=0) ###

03: 2.06 (n=03, f=1) ##

04: 0.84 (n=03, f=0) ##

05: 1.72 (n=03, f=0) ##

06: 0.59 (n=03, f=0)

07: 0.91 (n=03, f=0) #####

08: 0.80 (n=03, f=0)

09: 1.22 (n=03, f=0) ##################

10: 0.95 (n=03, f=0) ######

11: 0.85 (n=03, f=0) ##

12: 1.29 (n=02, f=0) ####################

13: 0.81 (n=03, f=0)

14: 0.65 (n=02, f=0)

15: 0.54 (n=02, f=0)

16: 4.79 (n=02, f=1) ##

17: 0.55 (n=02, f=0)

20: 0.06 (n=02, f=0)

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

Team: 2

Time SD for WHZ

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

01: 0.31 (n=03, f=0)

02: 0.37 (n=03, f=0)

03: 0.51 (n=03, f=0)

04: 1.07 (n=03, f=0) ###########

05: 0.69 (n=02, f=0)

06: 1.32 (n=03, f=0) ######################

07: 0.85 (n=03, f=0) ##

08: 3.87 (n=03, f=2) ##

09: 0.27 (n=03, f=0)

10: 0.86 (n=03, f=0) ###

11: 0.75 (n=03, f=0)

12: 0.70 (n=02, f=0)

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

Team: 3

Time SD for WHZ

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

01: 1.80 (n=03, f=0) ##

02: 0.74 (n=03, f=0)

03: 0.62 (n=03, f=0)

04: 0.40 (n=03, f=0)

05: 0.74 (n=03, f=0)

06: 0.42 (n=03, f=0)

07: 2.07 (n=03, f=1) ##

08: 0.67 (n=03, f=0)

09: 2.10 (n=02, f=0)
OOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOO

10: 0.87 (n=03, f=0) ###

11: 1.03 (n=03, f=0) #########

12: 0.19 (n=03, f=0)

13: 1.28 (n=03, f=0) ####################

(when 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: 0.38 (n=03, f=0)

02: 1.86 (n=03, f=0) ##

03: 0.58 (n=03, f=0)

04: 0.24 (n=03, f=0)

05: 0.61 (n=02, f=0)

06: 0.79 (n=02, f=0)

07: 2.20 (n=03, f=0) ##

08: 0.22 (n=03, f=0)

09: 1.05 (n=03, f=0) ##########

10: 0.11 (n=02, f=0)

11: 0.19 (n=02, f=0)

12: 0.82 (n=02, f=0) #

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

Team: 5

Time SD for WHZ

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

01: 1.84 (n=03, f=0) ##

02: 1.10 (n=03, f=0) #############

03: 0.11 (n=03, f=0)

04: 1.35 (n=03, f=0) #######################

05: 1.76 (n=03, f=0) ##

06: 0.69 (n=03, f=0)

07: 1.27 (n=03, f=0) ####################

08: 1.07 (n=03, f=0) ###########

10: 0.11 (n=03, f=0)

11: 2.29 (n=02, f=0) OOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOO OOOOO

12: 1.43 (n=03, f=0) ##########################

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

Team: 6

Time SD for WHZ

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

01: 1.16 (n=03, f=0) ###############

02: 1.90 (n=03, f=0) ##

03: 1.23 (n=03, f=0) ##################

04: 1.09 (n=03, f=0) ############

05: 1.64 (n=03, f=0) ###################################

06: 1.89 (n=03, f=0) ##

07: 1.25 (n=03, f=0) ###################

08: 1.21 (n=03, f=0) #################

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

Team: 7

Time SD for WHZ

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

01: 1.36 (n=03, f=0) #######################

02: 1.69 (n=03, f=0) ######################################

03: 1.72 (n=03, f=0) #######################################

04: 2.00 (n=02, f=0) OOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOO

05: 0.52 (n=03, f=0)

06: 1.30 (n=03, f=0) #####################

07: 0.66 (n=03, f=0)

08: 0.20 (n=03, f=0)

09: 0.37 (n=03, f=0)

10: 1.13 (n=03, f=0) ##############

11: 1.97 (n=03, f=0) ###

12: 0.48 (n=03, f=0)

13: 2.51 (n=02, f=0) OOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOO
OOOOOO

(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: 8

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: 1.85 (n=04, f=0) ##

02: 0.69 (n=04, f=0)

03: 0.72 (n=04, f=0)

04: 1.10 (n=04, f=0) #############

05: 0.97 (n=04, f=0) #######

06: 0.88 (n=04, f=0) ###

07: 0.58 (n=04, f=0)

08: 1.71 (n=04, f=0) ######################################

09: 0.76 (n=04, f=0)

10: 0.38 (n=04, f=0)

11: 1.18 (n=02, f=0) OOOOOOOOOOOOOOOO

12: 1.37 (n=02, f=0) OOOOOOOOOOOOOOOOOOOOOOOO

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

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

Annex 3: RNA tally sheet/questionnaire for children and women

برای خانم های که سن شان از 15 الی 49 سال باشد 15 – 49 years women

Locationموقعت: Date: تاریخ (Cluster No نمبر کلستر :) Team No:نمبر تیم

Mother No شماره مسلسل	HH No نمبر خانواده	Physiological status: حالت فزیالوژیک 1 = Pregnant/حامله 2 = Lactating / شیر دهی 3 =None of both / هیچ کدام	Age عمر به سال /(years)	MUAC (mm) اندازه بازو به ملی متر	Oedema بلی 1=Y نخیر 2=N

تاریخ سروی Date of interview (mm/dd/yyyy)	نمبر کلستر Cluster Number	نمبر تیم Team Number	نام : Village Name قریه	نمبر خانه Households No

Child No نمبر طفل	Sex جنس F/M	Exact Date of Birth دقیق تاریخ تولد	Age month عمر به ماه	Weight (kg) وزن به کیلوگرام	Height (cm) قد به سانتی متر	Oedema پندیده گی Y/N	MUAC (mm) موک به ملی متر XXX	Has your child had diarrhea in the past two weeks? ایا طفل شما در دو هفته گذشته اسهال شده بود؟	Has your child had ARI in the past two weeks? ایا طفل شما در دوه هفته گذشته سرفه یا مشکلات تنفسی داشت؟	Have your child been vaccinated against measles? ایا طفل شما واکسین سرخکان گرفته است ؟ کارت Card: 1=Y بلی دارد 2=Y No card بلی کارت ندارد

								1=Y **بلی** 2=N**نخیر**	1=Y **بلی** 2=N**نخیر**	3=N : **نخیر** 4=DK: **نمی قهمم**
1										
2										
3										
4										