AFGHANISTAN

ANTHROPOMETRIC AND MORTALITY SMART SURVEY FINAL REPORT

Nuristan Province, Afghanistan

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ACRONYMS

ACF	Action Contre la Faim
ARI	Acute Respiratory Infection
BCG	Bacillus Calmette-Guérin
BHC	Basic Health Center
BPHS	Basic Package of Health Services
CDR	Crude Date Rate
CHF	Common Humanitarian Fund
CHW	Community Health Worker
CSO	Central Statistical Office
DEFF	Design Effect
ENA	Emergency Nutrition Assessment
EPI	Expended Program for Immunization
GAM	Global Acute Malnutrition
GAM	Global Acute Malnutrition
HAZ	Height for Age Z-score
HH	Household
IMC	International Medical Corps
IMAM	Integrated Management of Acute Malnutrition
IYCF	Infant and Young Child Feeding
MAM	Moderate Acute Malnutrition
MoPH	Ministry of Public Health
MUAC	Mid-Upper Arm Circumference
SAM	Severe Acute Malnutrition
SMART	Standardized Monitoring of Relief and Transition
TFU	Therapeutic Feeding Unit
UNOCHA	United Nations Office for the Coordination of Humanitarian Affairs
WAZ	Weight for Age Z-Score
WHO	World Health Organization

EXECUTIVE SUMMARY

Nuristan is one of the 34 provinces of Afghanistan, located in the eastern part of the country. It is divided in to eight districts and has a population of about 140,900[1]. The justification of conducting a SMART survey is to investigate and find up-to-date nutrition, mortality and IYCF data, specific to these districts and to inform better future programming with evidence-based specific information for the areas of intervention of International Medical Corp (IMC).

The overall objective of the survey was to evaluate current nutritional status and mortality of the population living in Nuristan Province and levels of possible contributing risk health, care practices and WASH factors. Maternal status was investigated too. The survey has covered the three most populated districts of the province, thus covering around 40% of the overall population. The remaining, mostly low populated mountainous districts were classified as inaccessible due to insecurity. The covered districts were namely Noorgram, Wama and Parun. The survey took place from 11th to 26th Aug 2015.

The survey design was a cross sectional study with two-stages clusters sampling using Standardized Monitoring of Relief and Transition (SMART) methodology. Thus, 614 households were randomly selected and all children under 5 five (847) living in those households were surveyed.

The GAM rate based on WHZ was of 14.6 % (11.4-18.4 95% C.I.) and GAM based on MUAC was of 29.4% (24.4-34.9 95% C.I.). Both rates suggest a situation between serious and critical, around and above WHO emergency threshold of 15%. The SAM rate based on WHZ was of 2.5% and MUAC below 115 mm was of 7.4 % (5.0 - 10.8 95% C.I.). Both indexes are suggesting quite high levels of moderate and severe wasting and the need of urgent measures. From the statistical analysis it was clear that younger age groups (6-29 months old) were more affected and their nutritional status have to be carefully followed-up and taken in change. The rates according to the CMAM program eligibility criteria were of GAM 33,3 % (30,0 - 36,7 95% C.I.) and SAM of 8,7% (6,7 - 10,7 95% C.I.), recommended to be used for caseload calculation as both criteria do not cover the same children.

The mortality rates were acceptable: 0, 29 (0.18-0.4995% C.I.) of CDR and 0.61 (0.28-1.31 95% C.I.) for U5MR.

The analysis of possible contributing factors has shown compromised women's nutritional status: 51.4 % (95%CI: 47,5-55,0) of the women in childbearing age found in the selected households were having a MUAC <230 mm. The two-week recall morbidity was also high, 44%, with diarrhea being the most prevalent symptom. The deworming levels were very low, and quite inacceptable in this context.

The recommendations are made to urgently scale up IMAM services for both children and PLW as well as to address the risk factors to under nutrition, especially all services of preventive health such as supplementation for children and pregnant women, basic primary and reproductive health. Special attention have to be given to access and utilization of community based health care, at basic health posts and home visits, to reinforce IYCF, with strong focus to exclusive breastfeeding and complementary feeding promotion and support. Coordinated multi-sectorial long-term programming at provincial level would be best to support more sustainable improvement of the situation.

[1] Settled Population of Nuristan province by Civil Division , Urban, Rural and Sex-2012-13

INTRODUCTION

Nuristan is one of the 34 provinces of Afghanistan, located in the eastern part of the country. It is divided in to eight districts and has a population of about 140,900[2]. Parun serves as the provincial capital and the others districts are Barg-i Matal, Du Ab, Kamdesh, Mandol, Noorgram, Wama and Waygal. Nuristan is bordered on the south by Laghman and Kunar provinces, on the north by Badakhshan province, on the west by Panjshir province, and on the east by Khyber Pakhtunkhwa, Pakistan.

Since Nuristan is a highly ethnically homogeneous province, there are few incidents of inter-ethnic violence. However, there are instances of disputes among inhabitants, some of which have continued for decades. Nuristan has faced challenges of inaccessibility and lack of infrastructure. The government presence is minimal and there is a lot of under-developed compared to neighboring provinces. Nuristan's formal educational sector is weak, with few professional teachers. Due to its proximity to Pakistan, many of the inhabitants are actively involved in trade and commerce across the border.

The primary occupations are agriculture, animal husbandry and day labor. Located on the southern slopes of the Hindu Kush Mountains in the northeastern part of the country, Nuristan spans the basins of the Alingar, Pech, Landai Sin and Kunar rivers.

Only 3 out of 8 districts in Nuristan province were surveyed due to security issues and inaccessibility of far areas (see table 1 below). The population of these 3 districts represent 40% of the entire population of Nuristan Province (**140,900**[3]). According to SMART methodology, the results cannot be extrapolated to the whole province but only representative of the surveyed areas. This is a limitation with regards to having a complete picture of the nutritional status of children under five year and pregnant/lactating women in the whole Nuristan province.

Table 1: Districts covered in the SMART survey, Nuristan Province, August 2015.

District	Total Population (inhabitants)
Parun	13,200
Noorgram	31,400
Wama	10,800
Total	**55,400**[4]

OBJECTIVES

The broad objective of the current study was to estimate the prevalence of undernutrition amongst children from 6 to 59 months in Nuristan Province. However, a set of more specific objectives was agreed with partners in order to have more in depth analysis about nutritional status of pregnant and lactating women, as well as possible contributing factors. So these specific objectives were:

- ✓ To estimate the Crude and under five death rates.
- ✓ To determine the prevalence of under nutrition among children 0-59 months.
- ✓ To determine the core IYCF practices of children 0-23 months.
- ✓ To determine the nutrition status of pregnant and lactating women (PLW) using MUAC.

[2] Settled Population of Nuristan province by Civil Division , Urban, Rural and Sex-2012-13

[3] Settled Population of Nuristan province by Civil Division , Urban, Rural and Sex-2012-13

[4] Population statistics provided by International medical corps (BPHS implementer in Nuristan)

- ✓ To understand the household WASH situation, such as households storages of water households use of water and hand washing practices.
- ✓ To estimate the coverage of Vitamin A supplementation and deworming in the last 6 months among children under five and the coverage of Iron/folate supplementation among pregnant women.
- ✓ To estimate the morbidity patterns among children 0-59 months.

JUSTIFICATION OF THE SURVEY

The justification of this SMART survey is to investigate and find up-to-date nutrition, mortality and IYCF data, specific to these districts and to inform better future programing with evidence-based specific information for the areas of intervention of International Medical Corp (IMC).

IMC is BPHS implementing partner of MoPH in Nuristan. As such IMC is charged to mainstream CMAM in health facilities under their responsibility. The present survey will help them to improve their programming and it is viewed as a great opportunity to build IMC staffs capacity on the ground.

Since there is no district specific information on nutritional status of local population, this survey will provide information relevant only for the 3 covered districts. This information will also complement the results from 2013 National Nutrition Survey providing an update for those 3 districts.

METHODOLOGY

Sample size for the anthropometry and the mortality survey

The sample size of households to survey is determined by using the ENA for SMART 2011 software (April 2015). The Table 2 and 3 below summarizes all parameters used for sample size calculation.

Table 2: Parameters for sample size calculation for anthropometry, SMART- Nuristan 2015

Parameters for Anthropometry	Value	Assumptions based on context
Estimated Prevalence of GAM (%)	10.5 %	According to the MoPH National Nutrition Survey-2013[5], the Global Acute Malnutrition prevalence is estimated at 19.4 % (95% CI 14.93 - 24.87). The standard deviation of these results was considered to be very high (SD 3.0) and above the recommended limit of 1.2. Data from the neighboring province of Kunar indicated a prevalence of 11% and 12% (95% 10.1 - 14.3) in 2011 and 2012 respectively. Data from another neighboring province (Laghman) 2011 SMART survey indicated a prevalence of 8.5 %(95 %CI: 5.6 – 12.7). Based on the above prevalence and considering that there is no other data available specific to Nuristan province, an estimated prevalence of 10.5% was assumed based on the average of the 3 prevalence above. (11+12+8.5)/3 =10.5.
Desired precision	± 3%	Since the expected GAM prevalence is low, a precision of ± 3% was chosen.

[5] National Nutrition Survey of Afghanistan, UNICEF, 2013

Design Effect	1.5	The population living in the 3 targeted districts is considered as having similar living conditions and the same access to food and social conditions. The access to health facilities cannot be estimated as similar within the targeted population as some remote areas are not well served by health facilities.
Children 6-59 months	**655**	This number is automatically calculated by ENA. This is the minimum sample to be achieved in order to get reliable estimates of GAM rates.
Average HH Size	7.5	According to the National Nutrition Survey 2013, the average household size is 7.7. According to the national vulnerability assessment of Afghanistan 2014, the average HH size is 7.3[6]. Therefore, based on these sources, an average household size of 7.5 is used based on 2 more recent results.
% Children under-5	15.6%	The estimated U5 population according to the Afghanistan Mortality survey 2010 is at 15.6% providing a more conservative and accurate percentage[7]. Therefore, 15.6% is used and considered the more conservative and accurate estimate.
% Non-response Households	6%	The percentage of non-respondent households was estimated at 6%. Using the same percentage as that of 2011 and similar to the non-response rate of the national nutrition survey for Afghanistan (2013)[8] of 6%.
Households included	**662**	Households

Table 3: Parameters for sample size calculation for anthropometry, SMART-Nuristan 2015

Parameters for mortality	Value	Assumptions based on context
Estimated death rate	0.5/10000/day	No updated death rate at population level; Recommended in cases where there is no specific mortality data for the area to be surveyed
± Desired precision	0.3%	In order to meet set mortality objectives and inline to estimated death rate
Design effect	1.5	Cater for heterogeneity in the province population being sampled.
Recall period	120	Start point of recall period was considered to be 120 days or 4 months
Average HH size	7,5	National vulnerability assessment of Afghanistan -2014 and National Nutrition Survey 2013
Per cent of non-respondent	6%	Refer to Table 2 above
Population to be included	2904	Population
Households to be Included	412	Households

[6] National vulnerability assessment of Afghanistan, 2014
[7] Afghanistan Mortality survey, 2010
[8] National Nutrition Survey of Afghanistan, UNICEF, 2013

As there was no recent data on IYCF indicators for Nuristan, Core IYCF indicators have been assumed to be 50 % (Table 4). It was assumed in that case that precision of 10% would be enough.

Table 4: Parameters for sample size calculation for additional IYCF indicators, SMART-Nuristan 2015

Parameters for Anthropometry	Value	Assumptions based on context
Estimated Prevalence of additional indicators (%)	50%	No recent data
± Desired precision	10%	
Design Effect	1,5	Cluster effect
Survey subjects to be included	**157**	
Average HH Size	7,5	As above
% of target population	6.25%	Children 0-23 months
% Non-response Households	6%	
Households to be included	**395**	

Based on the parameters indicated above, Anthropometric sample were used as the overall sample size since it is the highest and therefore qualifies to represent the other indicators. Therefore with the selection of the highest sample size (662 HH) the other indicators had representation within the larger sample size selected.

Sampling Procedure

Selecting clusters

A two stage sampling methodology was employed. In the first stage is the cluster selection. Clusters were sampled using probability proportional to population size (PPS).

It is estimated that one team could cover 16 households per day. By targeting 16 households per cluster per day, a total number of 40 clusters are expected to be reached over the duration of this survey (662 HHs/16HHs/day=41 clusters). This will allow the survey to reach the minimum sample required of 655 children for the anthropometric sample – Children 6-59 months.

A total of 41 villages corresponding to 41 clusters/villages were included in the survey; Reserve Clusters (RCs) were selected by ENA software version 2011 updated 21st April 2015. Reserve clusters will only been used if 10% or more clusters were impossible to reach during the survey.

Selecting households and children

Simple random sampling method was used where an up-to-date list of the households in each village were created to select the households at random, with enough information to allow them to be located. All households were enumerated and given numbers by the survey team. The 16 households were chosen randomly from these enumerated households, by randomly drawing from a hat or using a random number table. 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 it is difficult to obtain an updated list of Households systematic random sampling were used to identify the households to be surveyed. The teams were trained on both methods of sampling (simple and systematic random sampling) and they will also be offered with materials to

assist in determining the households during the data collection exercise.

In cases where there are large villages in a cluster, the village was divided into smaller segments and a segment was selected randomly to represent the cluster. This division was done based on existing administrative units e.g. neighborhoods, or streets or natural landmarks like river, road, or public places like market, schools, and mosques.

All the children living in the selected house in the correct age range (children from 0 to 59 months old were included for anthropometric measurement and 0-23 months for IYCF were included, without regard to height). If more than one eligible child is found in a household, both were included, even if there are twins. Eligible orphans living in the selected Households will also be surveyed.

All of the selected HH were included in the mortality survey as well as will respond to questions concerning the HH as a whole (ex. water storage).

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 will not be subsequently found will not be included in the survey. A cluster control form was used to record all these missed and absent households.

Case definitions and inclusion criteria

The household were the basic sampling unit. Here, a household were defined as all people eating from the same pot and living together (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 were ensured with the village leaders/community elders and then identifying compound together with the use of the list of households within the community, asking if there are multiple cooking areas to determine what members of the household/compound should be included in the study.

Different parameters are used to assess the nutritional status of an individual. Weight, height, Mid Upper Arm Circumference and bilateral oedema are the most commonly used. These are often linked to sex and age.

For each selected child, the following information was collected:

- ✓ **Age (in months):** Only children between 0 and 59 months old of age were included. Height will not be considered as a valid criterion in absence of age due to the high stunting rates in Nuristan province. Age was confirmed by showing a vaccination card or a birth certificate, if available. If these documents are not available, the use of a local event calendar built for Nuristan province was used to determine the age. The age was recorded into the questionnaire in months.
- ✓ **Sex:** Male or female
- ✓ **Weight (in kg):** Children were weighed to the nearest 0.1 kg by using an Electronic Uni-scale. The children who can easily stand were asked to stand on the weighing scale and their weight recorded. In a situation when the children could not stand up, the double weighing method were applied.
- ✓ **Height (in cm):** Measuring board was used to measure bare headed and barefoot children. The precision of the measurement is 1 mm. Children of less than 2 years of age were measured lying down and those equal to or above 2 years of age measured standing up.

- ✓ **Mid-Upper Arm Circumference (in mm):** MUAC were used as an indicator of mortality risk for malnutrition and were measured to the nearest 1mm for all children with an indicated age of greater than 6 months, using the UNICEF MUAC strips. An adult MUAC tape were used to measure women of reproductive age (15-49 years)
- ✓ **Oedema:** Only children with bilateral pitting nutrition oedema were recorded as having nutritional oedema this were checked by applying normal thumb pressure for at least 3 seconds to both feet.

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

Acute malnutrition

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

Weight-for-height index (W/H)

A child's nutritional status is estimated by comparing it to the weight-for-height curves of a reference population (WHO standards data[9]). These curves have a normal shape and are characterized by the median weight (value separating the population into two groups of the same size) and its standard deviation (SD).

The expression of the weight-for-height index as a Z-score (WHZ) compares the observed weight (OW) of the surveyed child to the mean weight (MW) of the reference population, for a child of the same height. The Z-score represents the number of standard deviations (SD) separating the observed weight from the mean weight of the reference population: WHZ = (OW - MW) / SD.

During the field data collection, the weight-for-height index in Z-score was calculated on the field for each child in order to refer malnourished cases to appropriate centre if needed. Moreover, the results were presented in Z-score using WHO reference in the final report.

Mid Upper Arm Circumference (MUAC)

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

Table 5: Cut offs points of MUAC, children 6-59 months, WHO Recommendations

Target group	MUAC (mm)	Nutritional status
Children 6-59 months	> or = 125 and < 135	No malnutrition
	< 125 and > or = 115	Moderate acute malnutrition
	< 115	Severe acute malnutrition

[9] WHO: World Health Organization, WHO growth curves for children, 2006

Nutritional bilateral pitting oedema

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

Table 6: Definition of acute malnutrition according to weight-for-height index (W/H), expressed as a Z-score according to WHO standards

Severe Acute Malnutrition (SAM)
W/H <-3 z-score and /or bilateral oedema
and/or MUAC < 115 mm
Moderate Acute Malnutrition
W/H <-2 z-score and >= -3 z-score and absence of bilateral oedema
and/or MUAC >= 115mm and <125mm
Global Acute Malnutrition (GAM)
W/H <-2 z-score and /or bilateral oedema
and MUAC < 125 mm

Chronic malnutrition

The height-for-age index (H/A) measure indicates if a child of a given age is stunted and so if he is chronically malnourished. This index reflects the nutritional history of a child rather than his/her current nutritional status. This is mainly used to identify chronic malnutrition. The same principle is used as for weight-for-height; except that a child's chronic nutritional status is estimated by comparing its height with WHO standards height-for-age curves, as opposed to weight-for-height curves. The height-for-age index of a child from the studied population is expressed in Z-score (HAZ). The HAZ cut-off points are presented in table 8.

Table 7: 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

The weight-for-age index or Underweight indicates the weight of the child compared to his age. It is expressed by the Weight-for-Age index and in Z-scores of WHO Standards (2006). The table below show underweight classes with their cut-off points.

Table 8: Cut-off point of the Height for Age index (HAZ) expressed in Z-score, WHO standards

Normal	≥ -2 z-score
Moderate underweight	-3 z-score ≤ W/A < -2 z-score
Severe underweight	< -3 z-score

Mortality Indicator Calculation

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

Crude death rate (CDR): Number of persons in the total population that dies over a defined period of time.

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

Under-5 death rate (U5DR): The probability for those children aged 0-5 years to die during a specific time interval. Calculated as:

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

Additional Indicators – Health & WASH

Beside anthropometric data, additional information was collected as follows:

- ✓ Immunization status, deworming and vitamin A supplementation: Mothers/caretakers of all children were asked if children received all the necessary vaccinations, which was subsequently be verified by reviewing the vaccination card, if available. If the vaccination card was not available, then recall of the caregiver option was considered. The deworming and the Vitamin A supplementation of children were also recorded using samples.
- ✓ Morbidity: Mothers/caretakers of children were asked if children had experienced an illness in the past 2 weeks. Acute respiratory infection, fever and diarrhoea were recorded when symptoms according to the case definition are described by the caretaker.
- ✓ Mother's nutritional status and Iron/Folate supplementation for pregnant: Women in childbearing age were assessed for their nutritional status based on MUAC using the cut-off of 230 mm.
- ✓ Water storage and Usage: House hold heads were asked what type of container they use for storing drinking water and also how much water they used in the HH in the last 24 hours to assess the water use per person per day.
- ✓ Hand washing practices: The mothers were asked on what occasions they wash their hands and also what they use to wash their hands to determine the hand washing practices in the surveyed area.

Infant and Young Child Feeding Practices Indicators (IYCF)

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

- ✓ Child ever breastfed: Proportion of children who have ever received breast milk.
- ✓ Timely initiation of breastfeeding: Proportion of children born in the last 23 months who were put to the breast within one hour of birth.
- ✓ Provision of colostrum in the first 3 days of life: Proportion of children who received colostrum (yellowish liquid) within the first 3 days after birth.
- ✓ Exclusive breastfeeding under 6 months: Proportion of infants 0-5 months of age who are fed exclusively with breast milk.
- ✓ Continued breastfeeding at 1 year: Proportion of children 12 – 15 months of age who are fed with breast milk.
- ✓ Introduction of solid, semi-solid or soft foods: Proportion of infants 6-8 months of age who receive solid, semi-solid or soft foods.
- ✓ Continued breastfeeding at 2 years: Proportion of children 20–23 months of age who are fed breast milk.

Training and supervision

Four teams of three members conducted the field data collection. Each team was composed of one IMC team leader and two IMC data collectors. Each team had at least two female data collectors to ensure acceptance of the team amongst the surveyed households; particularly for IYCF questionnaires. Each female member of the survey team was accompanied with a mahram[10] to facilitate the work of the female data collectors at the community level. The teams were supervised by ACF SMART Program Manager and IMC nutrition focal point.

The entire teams received a 7-days training on the survey methodology and all its practical aspects; conducted by ACF SMART Program Manager. A standardization test was conducted over the course of 1 day, measuring 8 children, in order to evaluate the accuracy and the precision of the team members in taking the anthropometrics measurements. A one-day field test was conducted by the teams in order to evaluate their work in real field conditions. Feedback was provided to the team in regard to the results of the field test; particularly in relation to digit preferences and data collection. Refresher training on the anthropometric measurement and on the filling of the questionnaires and the household's selection were organized on the last day of the training by ACF to ensure overall comprehension before going to the field.

One Field Guidelines document with instructions, household definition and selection document were provided to each team member. All documents, such as local event calendar, questionnaires or consent forms were translated in Pashtu, local language, for better understanding and to avoiding direct translation during the data field collection. The questionnaires were back translated using a different translator and were pre-tested during the field test. Alterations were made as necessary.

Daily data entry and analysis were done using ENA for anthropometric data, plausibility check, and feedback were provided to the field teams. Anthropometric data was directly entered into ENA

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

while IYCF and other data were completed through an excel spreadsheet.

Data analysis

The anthropometric and mortality data were analyzed using ENA software 2011 version, 21st April 2015 updated. Survey results were presented in reference to WHO standards for overall final analysis.

Other indicators were analyzed using Excel version 2010 and were expressed in percentage out of the sample surveyed.

SURVEY FINDINGS

Characteristics of the Sample (households and children)

The total number of 614 households has been surveyed while initially 662 have been planned. The non-response rate was 7.2% with 3 clusters not reached due to un-expected emergence of insecurity in these villages/clusters. However since the non-response rate is still less than the limit of 10% of clusters missed, then the data can still be considered valid and representative.

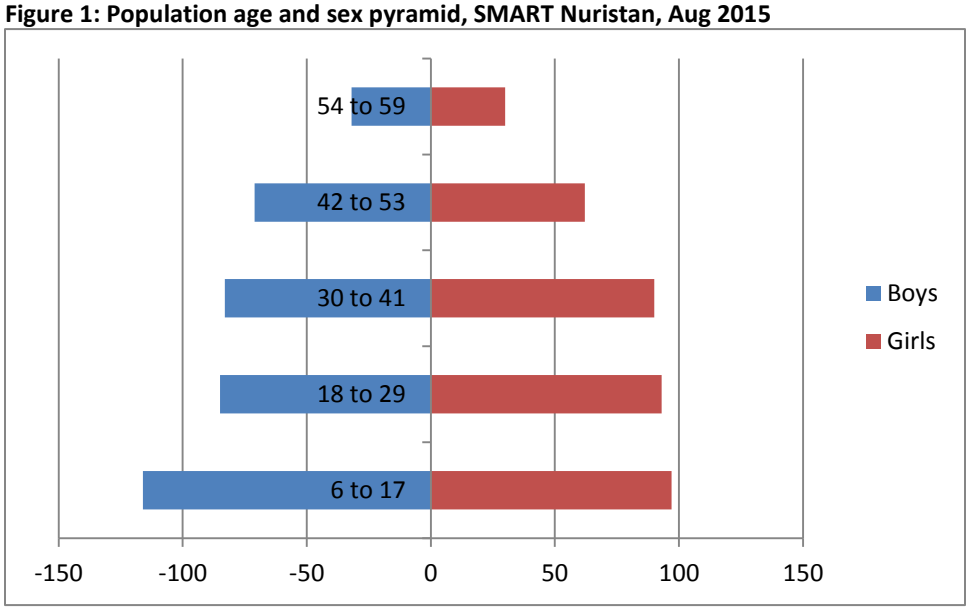
Anthropometric data was collected from 847 children from 0-59 months. 759 out of them were children between 6-59 months, Table 9 below, which is above the minimum 6-59 sample required for the anthropometric survey.

The overall boy to girl ratio was 1.0 indicating that sampling was unbiased and within expected range of values (0.8 – 1.2). Age ratio of 6-29 months to 30-59 months was 1.06, meaning that younger age group have been slightly overrepresented. This could probably be due to approximation of ages amongst 81% of the sampled children. The sex and age pyramid (Figure 1) follows a normal shape.

Table 9: Distribution of age and sex of sample, SMART Nuristan, Aug 2015

	Boys		Girls		Total		Ratio
AGE (mo)	**no.**	**%**	**no.**	**%**	**no.**	**%**	**Boy: girl**
6-17	116	54.5	97	45.5	213	28.1	1.2
18-29	85	47.8	93	52.2	178	23.5	0.9
30-41	83	48.0	90	52.0	173	22.8	0.9
42-53	71	53.4	62	46.6	133	17.5	1.1
54-59	32	51.6	30	48.4	62	8.2	1.1
Total	**387**	**51.0**	**372**	**49.0**	**759**	**100.0**	**1.0**

Figure 1: Population age and sex pyramid, SMART Nuristan, Aug 2015



Anthropometric results

Data quality

The anthropometric data were analyzed using ENA for SMART Software (version 2011, 21st April 2015 updated). The plausibility check report is available in Annex 2.

A summary of the statistical parameters by index is in the table below. The SD of all indicators are within WHO recommended ranges[11].

Table 10: Mean z-scores, Design Effects 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	756	-0.78±1.07	1.80	0	3
Weight-for-Age	756	-1.87±1.03	2.39	0	3
Height-for-Age	746	-2.39±1.22	1.33	0	13

* contains for WHZ and WAZ the children with edema.

Prevalence of acute malnutrition

Weight-for-height Z-scores (WHO 2006) and/or oedema

The sex and age disaggregated results are presented in Table 11 and 12 respectively. The Prevalence of wasting is insignificantly higher among boys as compared to girls.

[11] Recommendations from WHO expert panel in 1995 requires ranges of SD for weight-for-height Z-score of 0.85 to 1.10 (http://www.who.int/nutgrowthdb/about/introduction/en/index5.html)

Table 11: Prevalence of acute malnutrition based on weight-for-height z-scores (and/or oedema) and by sex, SMART- Nuristan, Aug 2015

	All n = 756	Boys n = 385	Girls n = 371
Prevalence of global malnutrition (<-2 z-score and/or oedema)	(110) 14.6 % (11.4 - 18.4 95% C.I.)	(65) 16.9 % (12.9 - 21.8 95% C.I.)	(45) 12.1 % (8.8 - 16.5 95% C.I.)
Prevalence of moderate malnutrition (<-2 z-score and >=-3 z-score, no oedema)	(91) 12.0 % (9.4 - 15.3 95% C.I.)	(52) 13.5 % (10.1 - 17.9 95% C.I.)	(39) 10.5 % (7.5 - 14.5 95% C.I.)
Prevalence of severe malnutrition (<-3 z-score and/or oedema)	(19) 2.5 % (1.4 - 4.4 95% C.I.)	(13) 3.4 % (1.9 - 6.1 95% C.I.)	(6) 1.6 % (0.6 - 4.0 95% C.I.)

The prevalence of oedema is 0.0%.

The younger children (6-29 months) seem to be more affected than older (30-59 months). The chi-square statistic is 5.5347. The p-value is 0.018643. This result is significant at $p < .05$.

There were no edematous cases (Table 13).

Table 12: Prevalence of acute malnutrition by age, based on weight-for-height z-scores and/or oedema, SMART-Nuristan, Aug 2015

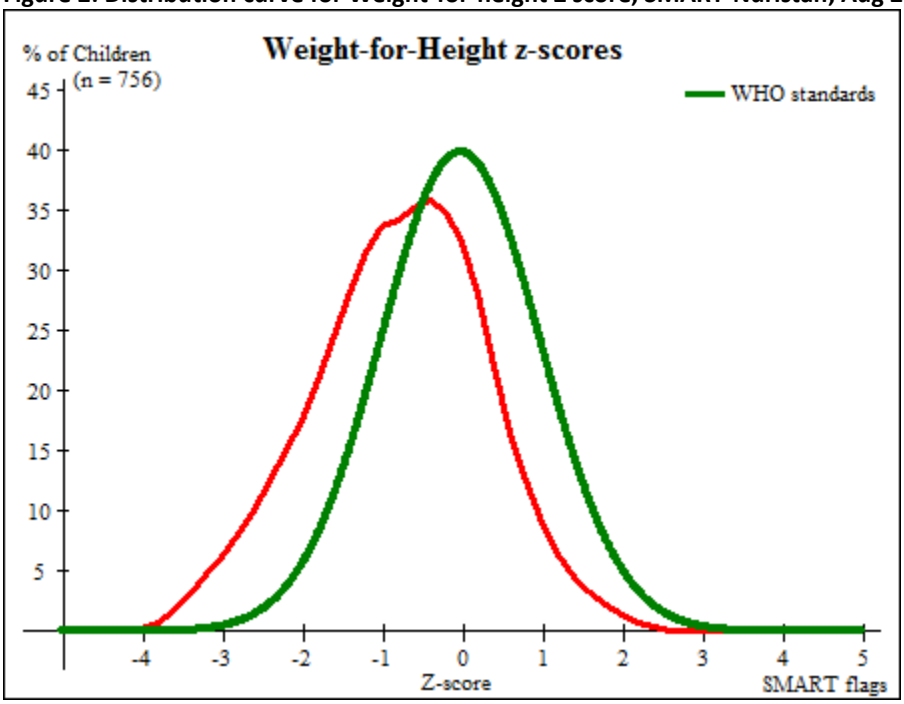
		Severe wasting (<-3 z-score)		Moderate wasting (>= -3 and <-2 z-score)		Normal (> = -2 z score)		Oedema	
Age (mo)	**Total no.**	**No.**	**%**	**No.**	**%**	**No.**	**%**	**No.**	**%**
6-17	211	6	2.8	42	19.9	163	77.3	0	0.0
18-29	178	6	3.4	14	7.9	158	88.8	0	0.0
30-41	173	3	1.7	20	11.6	150	86.7	0	0.0
42-53	133	1	0.8	13	9.8	119	89.5	0	0.0
54-59	61	3	4.9	2	3.3	56	91.8	0	0.0
Total	**756**	**19**	**2.5**	**91**	**12.0**	**646**	**85.4**	**0**	**0.0**

Table 13: Distribution of acute malnutrition and oedema based on weight-for-height z-scores, SMART-Nuristan, Aug 2015

	<-3 z-score	>=-3 z-score
Oedema present	Marasmic kwashiorkor No. 0 (0.0 %)	Kwashiorkor No. 0 (0.0 %)
Oedema absent	Marasmic No. 21 (2.8 %)	Not severely malnourished No. 738 (97.2 %)

The Weight-for Height in Z-scores distribution curve is shifted to the left, indicating that the observed population is more wasted than the WHO reference. The curve was marked with negative kurtosis value, indicating that the body is larger than the tales, no extreme WHZ values.

Figure 2: Distribution curve for Weight-for-height Z score, SMART-Nuristan, Aug 2015



MUAC cut-off classification and/or oedema:

The prevalence of acute malnutrition based on MUAC cut-off is presented in **Table 14**.
As for WHZ, the younger children (6-29 months) seem to be more affected than older (30-59 months). The chi-square statistic is 83.1205 with $p < .05$.

In this survey, MUAC<125 was associated with HAZ <-2 as compared to WHZ <-2. In other words, children diagnosed wasted by MUAC were stunted also. Children diagnosed wasted by WHZ, were not necessarily having low MUAC.

Table 14: Prevalence of acute malnutrition based on MUAC cut off's (and/or oedema) and by sex, SMART-Nuristan, Aug 2015

	All n = 756	Boys n = 386	Girls n = 370
Prevalence of global malnutrition (< 125 mm and/or oedema)	(222) 29.4 % (24.4 - 34.9 95% C.I.)	(106) 27.5 % (21.9 - 33.9 95% C.I.)	(116) 31.4 % (25.5 - 37.9 95% C.I.)
Prevalence of moderate malnutrition (< 125 mm and >= 115 mm, no oedema)	(166) 22.0 % (18.5 - 25.8 95% C.I.)	(82) 21.2 % (16.8 - 26.5 95% C.I.)	(84) 22.7 % (18.4 - 27.6 95% C.I.)
Prevalence of severe malnutrition (< 115 mm and/or oedema)	(56) 7.4 % (5.0 - 10.8 95% C.I.)	(24) 6.2 % (3.7 - 10.2 95% C.I.)	(32) 8.6 % (5.5 - 13.3 95% C.I.)

Table 15: Prevalence of acute malnutrition by age, based on MUAC cut off's and/or oedema, SMART-Nuristan, Aug 2015.

		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	210	33	15.7	73	34.8	104	49.5	0	0.0
18-29	178	14	7.9	51	28.7	113	63.5	0	0.0
30-41	173	6	3.5	29	16.8	138	79.8	0	0.0
42-53	133	2	1.5	10	7.5	121	91.0	0	0.0
54-59	62	1	1.6	3	4.8	58	93.5	0	0.0
Total	**756**	**56**	**7.4**	**166**	**22.0**	**534**	**70.6**	**0**	**0.0**

Prevalence of Underweight (WHO 2006)

The underweight is defined by weight-for-age z-scores (WAZ). The sex and age disaggregated results are represented in Table 16 and 15.

Table 16: Prevalence of underweight based on weight-for-age z-scores by sex, SMART-Nuristan, Aug 2015.

	All n = 756	Boys n = 385	Girls n = 371
Prevalence of underweight (<-2 z-score)	(351) 46.4 % (40.8 - 52.1 95% C.I.)	(191) 49.6 % (42.9 - 56.4 95% C.I.)	(160) 43.1 % (37.0 - 49.5 95% C.I.)
Prevalence of moderate underweight (<-2 z-score and >=-3 z-score)	(253) 33.5 % (28.7 - 38.6 95% C.I.)	(139) 36.1 % (30.7 - 41.9 95% C.I.)	(114) 30.7 % (25.5 - 36.6 95% C.I.)
Prevalence of severe underweight (<-3 z-score)	(98) 13.0 % (10.3 - 16.2 95% C.I.)	(52) 13.5 % (10.3 - 17.5 95% C.I.)	(46) 12.4 % (9.1 - 16.8 95% C.I.)

Table 17: Prevalence of underweight by age, based on weight-for-age z-scores, SMART-Nuristan, Aug 2015.

		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	211	27	12.8	67	31.8	117	55.5	0	0.0
18-29	177	26	14.7	63	35.6	88	49.7	0	0.0
30-41	173	24	13.9	55	31.8	94	54.3	0	0.0
42-53	133	15	11.3	46	34.6	72	54.1	0	0.0
54-59	62	6	9.7	22	35.5	34	54.8	0	0.0
Total	**756**	**98**	**13.0**	**253**	**33.5**	**405**	**53.6**	**0**	**0.0**

Prevalence of Stunting (WHO 2016)

The chronic malnutrition or stunting is defined by Height-for-age Z-scores (HAZ) <-2. The sex and age disaggregated results are represented in Table 18 and 19.

Table 18: Prevalence of stunting based on height-for-age z-scores and by sex, SMART-Nuristan, Aug 2015.

	All n = 746	Boys n = 377	Girls n = 369
Prevalence of stunting (<-2 z-score)	(459) 61.5 % (57.3 - 65.6 95% C.I.)	(236) 62.6 % (57.0 - 67.9 95% C.I.)	(223) 60.4 % (54.6 - 66.0 95% C.I.)
Prevalence of moderate stunting (<-2 z-score and >=-3 z-score)	(222) 29.8 % (26.4 - 33.3 95% C.I.)	(105) 27.9 % (23.1 - 33.1 95% C.I.)	(117) 31.7 % (26.8 - 37.0 95% C.I.)
Prevalence of severe stunting (<-3 z-score)	(237) 31.8 % (28.2 - 35.6 95% C.I.)	(131) 34.7 % (29.6 - 40.2 95% C.I.)	(106) 28.7 % (24.1 - 33.9 95% C.I.)

Table 19: Prevalence of stunting by age based on height-for-age z-scores, SMART-Nuristan, Aug 2015.

		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	203	41	20.2	64	31.5	98	48.3
18-29	176	75	42.6	53	30.1	48	27.3
30-41	173	61	35.3	49	28.3	63	36.4
42-53	132	43	32.6	39	29.5	50	37.9
54-59	62	17	27.4	17	27.4	28	45.2
Total	**746**	**237**	**31.8**	**222**	**29.8**	**287**	**38.5**

Figure 3 shows HAZ distribution curve of the observed population, compared to WHO Reference curve. In Nuristan, it was shifted to the left, suggesting restricted linear growth of the observed population. Further analysis (**Figure 4**) suggests that linear growth retardation is at its highest in the lower age group of children (18 -29 months) and overall trend decreases with the increase of age.

Figure 3: Gaussian (normal) distribution curve, HAZ, SMART –Nuristan, Aug 2015

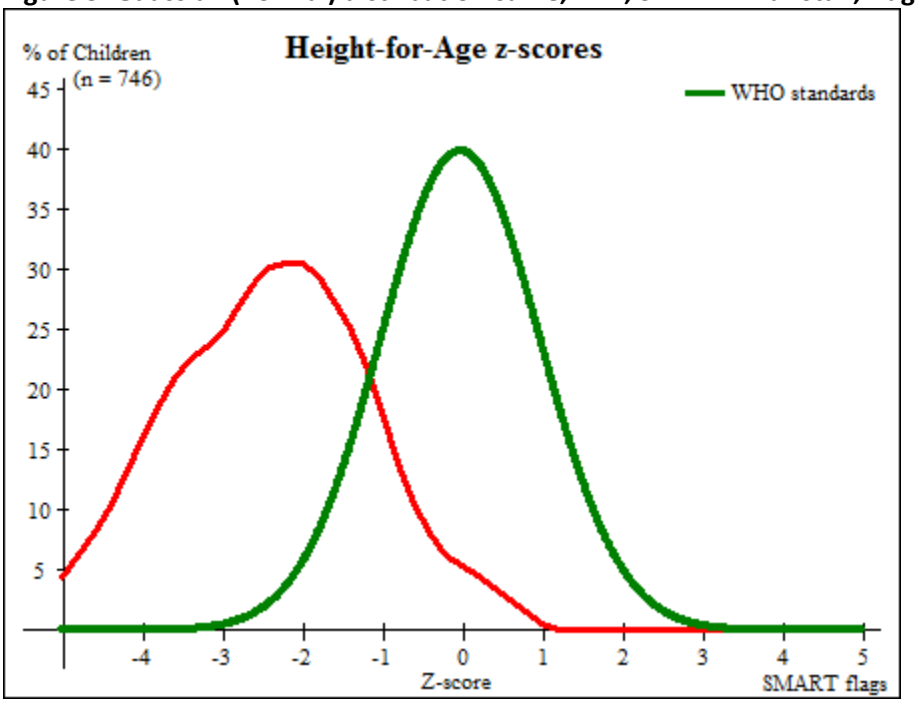
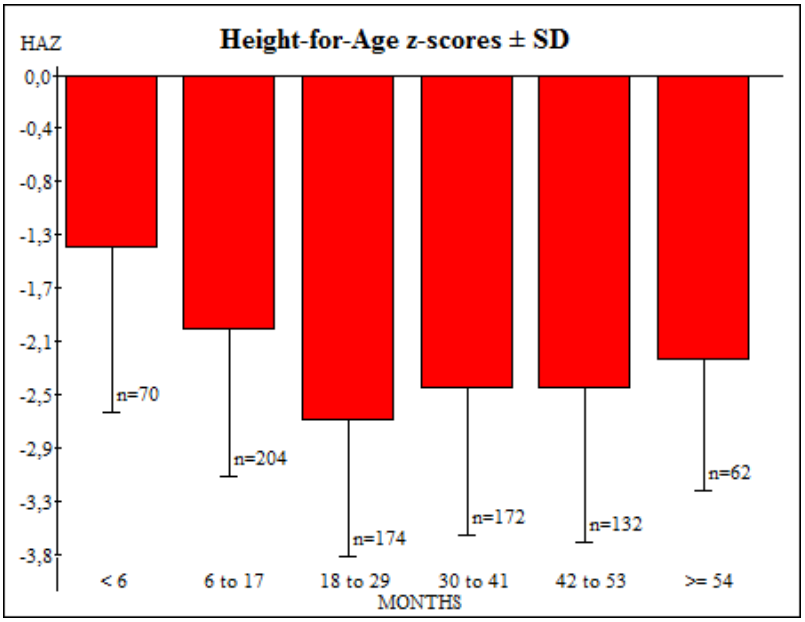


Figure 4: Trends of stunting over the age distribution, SMART-Nuristan, Aug 2015



Prevalence of overweight (WHO 2006):

The prevalence of overweight is based on weight-for-height in z-score >2 and found to remain low.

Table 20: Prevalence of overweight based on weight for height cut offs and by sex (no oedema), SMART-Nuristan, Aug 2015.

	All n = 756	Boys n = 385	Girls n = 371
Prevalence of overweight (WHZ > 2)	(2) 0.3 % (0.1 - 1.1 95% C.I.)	(1) 0.3 % (0.0 - 1.9 95% C.I.)	(1) 0.3 % (0.0 - 2.0 95% C.I.)
Prevalence of severe overweight (WHZ > 3)	(0) 0.0 % (0.0 - 0.0 95% C.I.)	(0) 0.0 % (0.0 - 0.0 95% C.I.)	(0) 0.0 % (0.0 - 0.0 95% C.I.)

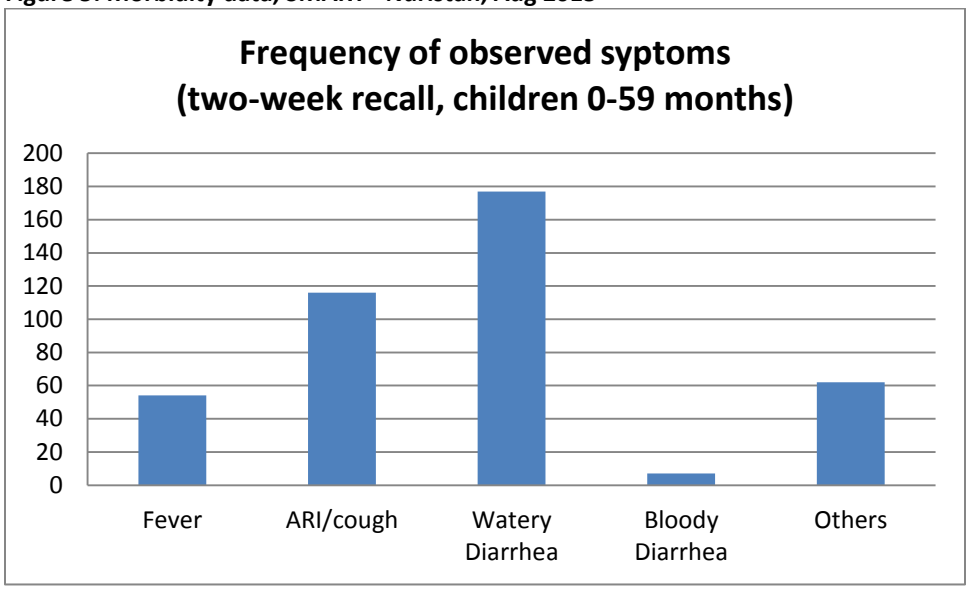
* contains for WHZ and WAZ the children with edema

Child health indicators

Two weeks recall morbidity (children 0-59 months)

A total of 838 respondents answered about whether they experienced health issue in the last 2 weeks prior to the day of visit of the survey team, **44,4 %** responded with "yes". The frequencies of the symptoms are presented in the figure 5 below.

Figure 5: Morbidity data, SMART –Nuristan, Aug 2015



Immunization

Immunization, supplementation and deworming are proxy indicators informing community health outreach and health seeking behaviours. The immunization coverage is important public health indicator as immunization prevents illness, disability and death from vaccine-preventable diseases. In the surveyed areas of Nuristan, different key immunization coverage is concisely presented below (Table 21).

Table 21: Immunization, SMART–Nuristan, Aug 2015

Types of Vaccine	Class	Frequency	%
Measles immunization Children 9-59 months (n= 844)	Yes, Card	102	14,9%
	Yes, Recall	252	36,8%
	No	220	32,2%
	Don't Know	110	16,1%
	Yes card and recall	**354**	**51,7%**
BCG immunization coverage (n = 1012)	**Scar**	**538**	**64.9%**
	No Scar	291	35.1%
Polio immunization coverage (n = 1012)	Yes, card	174	21,0%
	Yes, Recall	511	61,6%
	No	60	7,2%
	Don't know	84	10,1%
	Yes card and recall	**685**	**82,6%**

Supplementation and Deworming

Supplementation and deworming rates were far below the optimum level, especially concerning the deworming (WHO recommends >80%). Both Vitamin A supplementation and deworming reduce the incidence of diarrhea (of bacterial, viral or parasitic origin) and therefore has beneficial effect on the nutritional status of children of pre-school age. A summary of the results are presented in the below table 22.

Table 22: Vitamin A and Deworming coverage, SMART –Nuristan, Aug 2015

	Class	Frequency	%
Vitamin A supplementation aged 6-59 months (6 months recall) , n=755	**Yes**	580	76,8%
	No	175	23,2%
Deworming aged 12-59 months (6 months recall), n=651	**Yes**	198	30,4%
	No	453	69,6%

IYCF Indicators

Indicators for infant and young child feeding (IYCF) practices included all children 0 – 23 months. A total of 380 children are included in the sample. The results are presented as percentage of the total answers available (See Table 23).

Table 23: Infant and Young Child Feeding Practice, SMART -Nuristan, Aug 2015

Core Indicators	Definition	N	%
Child ever breastfed (n=380)	Proportion of children who have ever received breast milk	**374**	**98,4**
Timely initiation of breastfeeding (n=373)	Proportion of children born in the last 23 months who were put to the breast within one hour of birth	**273**	**73,2**
Provision of colostrum within first 3 days	Proportion of children who received colostrum (yellowish liquid) within the first	**360**	**94,7**

(n=380)	3 days after birth		
Still breast feeding at 1 year (n=198)	Proportion of children 12–15 months of age Who are fed breast milk.	**188**	**94,9**
Exclusive breast feeding (n=93)	Proportion of infants 0–5 months of age who are fed exclusively with breast milk.	**53**	**57,0**
Introduction of solid, semisolid or soft foods (n=38)	Proportion of infants 6–8 months of age who Receive solid, semi-solid or soft foods.	**19**	**50,0**

Maternal Nutrition status and hand washing

All women aged between 15 and 49 years, found in the selected households (n=700), were included in the analysis of the following key indicators:

- ✓ Physiological status
- ✓ Nutritional status based on MUAC cut-off
- ✓ Iron/folate for pregnant women (at least once during the visit of the survey team)
- ✓ Handwashing practices of caretakers

The results are presented in the tables below.

Around quarter of the women have stated of being pregnant and 45,6% declared of lactating, which is consistent with the results on "continued breastfeeding" from the previous section.

Table 24: Physiological status of women of reproductive age (15 – 49 years), n=691, SMART –Nuristan, Aug 2015

Status	Frequency	%
Pregnant	154	22,3%
Lactating	315	45,6%
Pregnant & Lactating	20	2,9%
Non-pregnant & non-lactating	202	29,2%

More than the half of the women in childbearing age who allowed of having their MUAC measured had MUAC below the cutoff point of 230 mm.

Table 25: Nutritional status of women of reproductive age based on Mid-Upper Arm Circumference, n=692, SMART- Nuristan, Aug 2015

MUAC Cutoff	Frequency	%
MUAC <230 mm	356	51,4%
MUAC ≥ 230 mm	336	48,6%

Iron Folate supplementation is analyzed only for women who declared of being pregnant. However, the majority of the answers were negative. Results are below.

Table 26: Iron-folate supplementation for pregnant women based on available answers, (n=170), SMART - Nuristan, Aug 2015

Iron-folate for PW	Frequency	%
Yes	51	30,0%
No	97	57,1%
Do not know	22	12,9%

Caretakers hand washing practices results (tables below) are based on information collected on a recall based; there was no practical verification process to know whether caretakers actually practice them. Practices of hand washing are indicated in Tables below.

Table 27: Hand washing, use of soap (n=587), SMART -Nuristan, Aug 2015,

Hand Washing care takers (n=587)	Frequency	%
Only water	321	54,7%
Soap water	226	38,5%
Soap when I can afford it	40	6,8%
Traditional herb	0	0,0%
Other	0	0,0%

Mortality and Demographics

Mortality

Data from all 614 household heads have been collected in order to calculate under-5 and crude mortality rates. The recall period was of 120 days. Both Crude Mortality Rates and Under Five Mortality rates are presented in Table 28.

Table 28: Crude mortality rates (CMR) and under-5 mortality rates (U5MR).

Retrospective Mortality in 120 days prior to survey	Rate	(95% CI)
CMR (total deaths/10,000 people / day)	0.29	0.18-0.49
U5MR (deaths in children under five/10,000 children under -5/day)	0.61	0.28-1.31

Demography

The mortality questionnaire in SMART is designed in a way that some additional useful Demographic data can be withdrawn. Summary is available in **Table 29**. A total of 4838 Individuals were surveyed and 971 out of them were declared to be children under age of 5. A "household" is defined using WFP definition.

Table 29: Short summary of demographics, SMART- Nuristan, Aug 2015

Indicator	Value
Average HH size	7.9
Children under 5	17,5%
Most frequent HH size	8
Min HH Size	2
Max HH Size	20

Household information

Several questions concerning the surveyed households were collected which included structure and type of households, livelihoods, water access and storage.

Structure and type of household

This information is concisely presented in the below tables.

Table 30: structure and type of households, (n=588) SMART – Nuristan, Aug 2015

Head of HH	Frequency	%
Male	555	94,4%
Female	3	0,5%
Both	22	3,7%
Others	8	1,4%

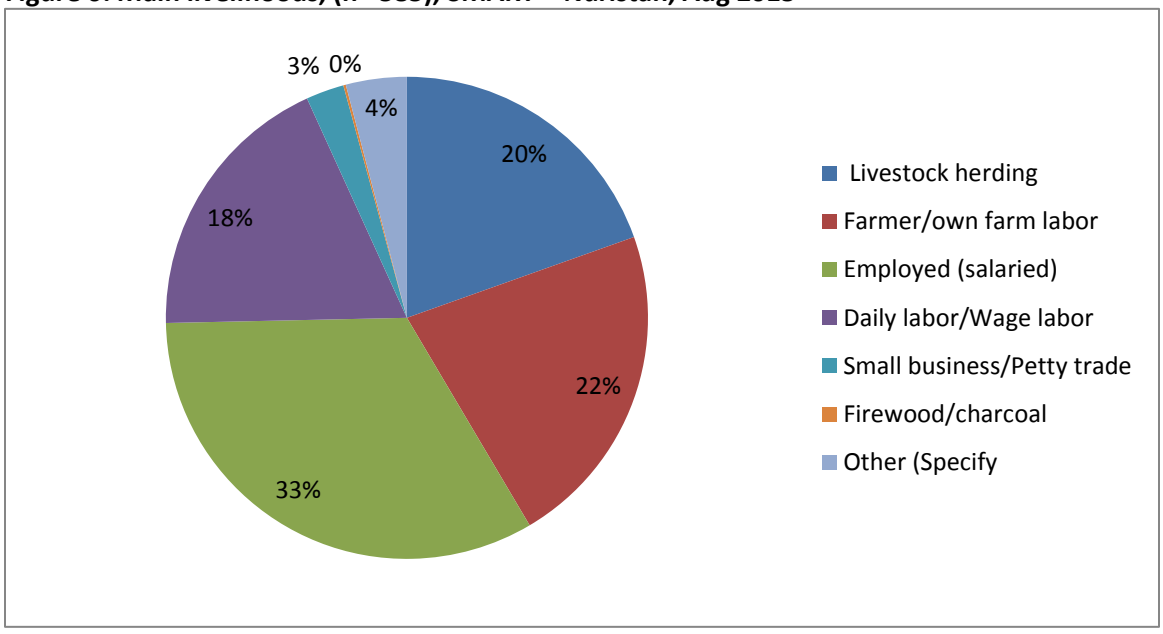
Table 31: Type of family, n=589, SMART-Nuristan, Aug 2015

Family type	Frequency	%
Monogamous	529	89,8%
Polygamous	53	9,0%
Single parent	7	1,2%

Main livelihoods

The main livelihoods were defined as those of the family heads. One third of the responders declared of being employed. See **figure 6** below.

Figure 6: Main livelihoods, (n= 585), SMART – Nuristan, Aug 2015



WASH

Water storage and consumption

A total from 614 households were asked for their main water storage. Most of households stored water in closed container/Jerricans (60.9 %) and 39.1 % in open containers. The average water (excluding animals) used per household was of 144,5 litters in the last 24 hours. 33, 2% of the households members were consuming water below Sphere standards of 15 litters/person/day.

DISCUSSION

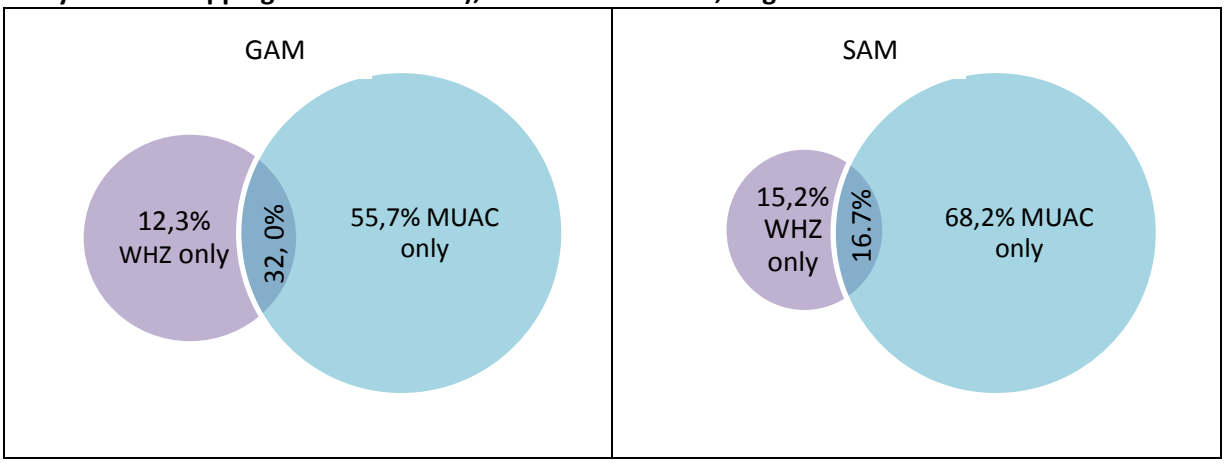
Nutritional Status

Global Acute Malnutrition

This SMART Nutrition Survey was conducted in 3 districts of Nuristan province between 11th and 26th of August 2015. The GAM rate based on WHZ was of 14.6 % [CI: 11.4-18.4] and GAM based on MUAC was 29.4% [CI: 24.4-34.9]. Both rates suggest a situation between serious and critical, around and above WHO emergency threshold of 15%. The SAM rate based on WHZ was of 2.5% and MUAC below 115 mm was of 7.4 % (5.0 - 10.8 95% C.I.). Both values are suggesting quite high levels of moderate and severe wasting and the need of urgent measures. From the statistical analysis it was clear that younger age groups (6-29 months old) were more affected and their nutritional status have to be carefully followed-up and taken in change.

For the sake of proper programming and caseload calculation, it would be important to take into account that the WHZ and MUAC prevalence calculated during this survey were not based on the same children. In other words, children being diagnosed as wasted based on their Weight-for-height index were not necessarily presenting low MUAC and vice versa. The figure 7 below depicts the % of children 6-59 months old in the sample being wasted and severely wasted according to: WHZ only, MUAC only and combining both criteria. Only 32% of the wasted children were having both MUAC <125 mm and WHZ< -2. The overlapping for SAM was even lower: only 16,7%.

Figure 7. Proportion of children in the sample by signs of wasting (with % of WHZ only, MUAC only and overlapping of both criteria), SMART – Nuristan, August 2015



As eligibility criteria for selective feeding services (CMAM/IMAM) in Afghanistan follow up WHO definition and considers both WHZ and MUAC, the data of this survey was further analyzed to get rates that are fitted for programming and caseload estimation purposes, as there is a risk of

underestimation if only MUAC or only WHZ rates are taken into account. The rates according to the CMAM eligibility criteria are displayed in the table below.

Table 32. Overall GAM and SAM estimates based on WHO case definition and recommended for programming, SMART – Nuristan, August 2015

	Definition	Rate	95% CI
Global Acute Malnutrition (GAM)	W/H <-2 z-score and /or bilateral oedema and MUAC < 125 mm	**33,3 %**	**30,0 - 36,7**
Severe Acute Malnutrition (SAM)	W/H <-3 z-score and /or bilateral oedema and/or MUAC < 115 mm	**8,7 %**	**6,7 - 10,7**

Infants under the age of 6 months were also measured where possible. Their nutritional status appear to be better than expected with Weight-for-Height z-scores ± SD of **-0, 40** ± 1,05 (n=75) as compared to the mean WHZ for children from 6-59 months ±SD: **-0,78**±1,07 (n=756). The relatively good rates of exclusive breastfeeding (as compared to other provinces in Afghanistan) might play a protective role in that regard.

Chronic malnutrition

Based on WHO classification of severity levels of stunting, chronic malnutrition trends in Nuristan province are quite worrying, 61.5% [CI: 57.3-65.6]. More than one in every 2 children included in the survey were found to be stunted. From the survey data it is seen that stunting increases in the period from birth up to 29 months (figure 4 from Findings section above), while this is exactly the period when eventual catch-up growth can happen (in the first 24 months). The very high stunting rates can probably be due to high prevalence of diseases (44% reported of being ill 2 weeks prior to survey), with special predominance of the diarrheal diseases, but ultimately might be quite in line with very low maternal nutrition status suggested by the very high prevalence of low MUAC within women in childbearing age. Low deworming coverage (30,4%) found in this survey suggest probability of high parasite infestations that contribute to impaired children growth.

High stunting requires long term nutrition interventions combined with improved access to primary health care together with encouraging timely health seeking behavior during illness, scaling up deworming practice and infant and young children nutrition as well to be put in place to reverse this trend. Maternal nutrition and reproductive health also needs to be improved significantly in order to have better impact on high stunting.

Maternal nutritional 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 51.4 % (95%CI: 47,5-55,0) of the mothers were found to have a MUAC<230 mm, meaning that every second woman of childbearing age has low MUAC and is eligible for eventual supplementary feeding. If only PLWs are selected, the results it similar: 52,7% has MUAC below 230 mm.

The main concern was iron supplementation among pregnant women which the survey found to be very low (30,0%). 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 life. Overall, Iron/Folate supplementation is also a proxy indicator on ante-natal control as in Afghanistan this supplementation is given only at ANC visit in a health center. Although not of emergency matter, the Iron/Folate supplementation for pregnant women needs to be increased significantly by reinforcing the usual channels for that in BPHS/CBHC. The BPHS Implementing partner needs to make immediately significant progress by reinforcing ANC and CHW home visits to PLW and keep continuously in Nuristan province.

Mortality Rates

The survey showed that the Crude Mortality Rate (CMR) and under five mortality rate (U5MR) were 0.29 (95% CI: 0.18-0.49) and 0.61 (95% CI; 0.28-1.31) respectively. Both CMR and U5MR rates were below the WHO's emergency thresholds of 2/10,000/day and 4/10,000/day respectively.

Contributing factors and risks

Morbidity, immunization, supplementation and deworming

The UNICEF conceptual framework of malnutrition can be used to explain the probable causes of under-nutrition in this area. Diseases weaken the individual immune system, increase nutritional needs with around 10% and in the same time might be a reason of reduced food intake and absorption (diarrhea), engaging the body in a vicious circle with malnutrition. In the 3 districts of Nuristan province, almost the half of the sampled children had suffered from one or another form of illness symptoms (44,4 %) such as diarrhea, fever or acute respiratory signs in the last 2 weeks prior the survey, suggesting quite increased incidence of basic curable diseases.

While the coverage of Vitamin A supplementation was good (76.8% while recommended WHO target is of 80%), the proportion of children aged 12-59 months who had received deworming in the last 6 months was declared of being 30.4%, which remain quite low for this context. Schistosome and soil-transmitted helminthes infections are among the most common infections in developing countries such as Afghanistan and can impair nutritional status by causing 1) internal bleeding which can lead to loss of iron and anemia; 2) malabsorption of nutrients; 3) diarrhea; and 4) loss of appetite which can lead to a reduction in energy intake.

Low levels of measles (51,7% both by cards and verbal verification) and BCG based on scar verification (64.9%) puts children under five under increased risk to morbidity and mortality related to childhood illnesses, again linked with under-nutrition. SPHERE thresholds for measles are of 95%.

Infant and young child feeding practices

Optimal infant and young child nutrition, especially exclusive breastfeeding is estimated to prevent potentially 1.4 million deaths every year among children under five years old. Infant and young child feeding nutrition in this area still needs to be improved.

Findings so far have indicated that timely initiation of breastfeeding, colostrum feeding and continuous breastfeeding up to the first year of life were well practiced by the mothers. However, the exclusive breastfeeding rate (57%) have to be further improved as well as complementary

feeding (50%). The complementary food is often mixed with tea (inhibits iron absorption). These two practices need to be significantly improved in a targeted manner.

Water Hygiene and Sanitation (WASH)

The WASH indicators collected in this survey were mostly limited to the most pragmatic and easy to collect using a SMART methodology. Although hand washing practices and water storage were difficult to be defined with enough certainty during the survey, from the results 33,2% of the households declared of having consuming water below Sphere standards of 15 litters/person/day in the 24 hours prior the survey.

RECOMMENDATIONS

Some recommendations have been drawn after the context analysis as a bellow.

Survey finding	Recommendations	Responsible
High GAM rates	✓ It is strongly recommended to continue the scale-up of IMAM program. ✓ Promote and strength regular growth monitoring at all health facilities and community level in the province might have better chances to early detect potentially wasted infants and older children that cannot be detected with MUAC. ✓ The household food security should also be promoted in order to contribute to the nutrition status of the population overall. ✓ Critical public health issues (Iron/folate and Vitamin A supplementation, measles vaccination and deworming) are addressed.	MOPH, Nutrition Cluster BPHS and EPHS implementers
Immunization and supplementation	✓ To strength routine immunization programs and promotes awareness on immunization. ✓ To increase outreach programs to increased EPI coverages ✓ Immediately measles campaign need to increase measles, BCG , Polio and vitamin A coverages ✓ To strength and promote community awareness on micronutrients and immunization.	MOPH , WHO, BPHS and EPHS implementers
Childhood illnesses	✓ Improve and strength health education in community and health facilities level to reduced child morbidity and proper care and hygiene practice. ✓ Improve awareness and investigate more on barriers for improved health care seeking by families for management of children's infections. ✓ Reinforce the work with CHV, CHS, Health Shuras in order to improve referral for health care	MOPH, Community , BPHS and EPHS implementer
Maternal Nutrition status	✓ To increase reproductive health activities for pregnant and lactating women and linked with this Iron/folate supplementation. ✓ Strengthening of community component in line with MoPH CBHC strategy of FHAG (Family Health Action Groups) to improve the maternal counselling and overall Behaviour Change Communication. ✓ To continue the scale-up of TSFP programs for pregnant and lactating women (PLWs)	MOPH, WFP, BPHS and EPHS implementers
IYCF	✓ To strengthen IYCF sensitization at community level, through reinforcing community actors work, including sessions of food demonstration. ✓ At health facility level: to improve optimal breastfeeding and complementary feeding through counseling and the use of improved local recipes (again cooking demo's at HF	MOPH, BPHS and EPHS implementers

	level).	
WASH	✓ To routinely integrate awareness on water, hygiene and sanitation community based sensitizations, together with care and feeding practices ✓ Simple methods of improving the quality of the drinking water have to be part of the basic community awareness	

Other key programmatic recommendations are:

- ✓ To strength active and passive case finding and timely reporting on IMAM
- ✓ To implement regular monitoring of the nutritional situation (RNAs & SMARTs) in order to capture changes.

REFERENCES

National Risk and Vulnerability Assessment (NRVA), Afghanistan, 2013
Extended Program for Immunization (EPI) village data, 2013
National Risk and Vulnerability Assessment (NRVA), Afghanistan, 2007/08
Laghman SMART survey 2011.
Kunar Mortality and Nutrition SMART survey 2012
National nutrition survey, 2013
Afghanistan Mortality survey, 2010
National vulnerability assessment of Afghanistan -2014

ANNEXES

Annex 1: Cluster sampling

No	Province	District	Community/village Name	Population	Cluster
1	Nuristan	Wama	islam abad	430	RC
2		Wama	wama qadem1	820	1
3		Wama	wama qadem2	1060	2
4		Wama	actaband	730	3
5		Wama	boni	423	4
6		Wama, korder	saprigal	150	5
7		Wama, korder	archani qadem	918	6
8		Wama, korder	paula	918	7
9		Wama, korder	payen korder	730	RC
10		Noorgram	Ningaraje	1815	8,9
11		Noorgram	Dosaraka/koetak	1430	10
12		Noorgram	wakilabad	398	11
13		Noorgram	shakot	1290	12
14		Noorgram	ziarat	2520	RC,13
15		Noorgram	mamo/bala bagh	3149	14,15
16		Noorgram	shalangy	480	16
17		Noorgram	mashpa	4410	17,18,19,20
18		Noorgram	malil	3150	21,22,23
19		Noorgram	baazarak khail	2268	24,25
20		Noorgram	bagi,sharok trot	1134	26
21		Noorgram	daba,daramlamga	852	RC
22		Noorgram	blic	650	27
23		Noorgram kulatan	kulatan	3000	RC,28,29
24		Paroon	Maandi	1215	30
25		Paroon	Pashki	1210	31
26		Paroon	estivi	1430	32,33
27		Paroon	pronz	1150	34
28		Paroon	dewa	1222	35
29		Paroon	koshtaki	1160	36
30		Paroon, kantiva	islampet, wazir abad	1040	37
31		Paroon, kantiva	naw, pasgram, ghonday	460	38
32		Paroon, kantiva	payok	1102	39
33		Paroon, kantiva	adky, atati	1460	40

Annex 2: Plausibility check

Plausibility check for: ENA Modified file Nuristan Aug-2015.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** (0.4 %)

Overall Sex ratio Incl p >0.1 >0.05 >0.001 <=0.001
(Significant chi square) 0 2 4 10 **0** (p=0.586)

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=0.002)

Dig pref score - weight Incl # 0-7 8-12 13-20 > 20
0 2 4 10 **0** (5)

Dig pref score - height Incl # 0-7 8-12 13-20 > 20
0 2 4 10 **0** (5)

Dig pref score - MUAC Incl # 0-7 8-12 13-20 > 20
0 2 4 10 **0** (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 **0** (1.07)

Skewness WHZ Excl # <±0.2 <±0.4 <±0.6 >=±0.6
0 1 3 5 **0** (-0.15)

Kurtosis WHZ Excl # <±0.2 <±0.4 <±0.6 >=±0.6
0 1 3 5 **1** (-0.22)

Poisson dist WHZ-2 Excl p >0.05 >0.01 >0.001 <=0.001
0 1 3 5 **1** (p=0.013)

OVERALL SCORE WHZ = 0-9 10-14 15-24 >25 **6** %

The overall score of this survey is 6 %, this is excellent.

There were no duplicate entries detected.

Percentage of children with no exact birthday: 81 %

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 wereflagged 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=29/ID=29: HAZ (4.145), WAZ (2.215), Age may be incorrect
Line=97/ID=97: HAZ (2.878), Age may be incorrect
Line=128/ID=128: HAZ (0.918), WAZ (1.167), Age may be incorrect

Line=139/ID=139: HAZ (2.900), Height may be incorrect
Line=164/ID=163: HAZ (1.900), Age may be incorrect
Line=195/ID=194: HAZ (-5.900), Age may be incorrect
Line=278/ID=277: HAZ (2.340), Age may be incorrect
Line=289/ID=288: **WHZ (-5.487)**, Weight may be incorrect
Line=296/ID=295: **WHZ (-4.357)**, Weight may be incorrect
Line=305/ID=304: **WHZ (2.599)**, Weight may be incorrect
Line=525/ID=523: HAZ (1.261), Height may be incorrect
Line=586/ID=584: HAZ (1.926), Age may be incorrect
Line=602/ID=600: HAZ (1.054), Height may be incorrect
Line=766/ID=765: HAZ (12.550), WAZ (5.008), Age may be incorrect
Line=773/ID=772: HAZ (1.162), Height may be incorrect
Line=815/ID=814: HAZ (0.803), Age may be incorrect

Percentage of values flagged with SMART flags:WHZ: 0.4 %, HAZ: 1.7 %, WAZ: 0.4 %

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 = 0.002 (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	116/89.8 (1.3)	97/86.3 (1.1)	213/176.1 (1.2)	1.20
18 to 29	12	85/87.5 (1.0)	93/84.2 (1.1)	178/171.7 (1.0)	0.91
30 to 41	12	83/84.9 (1.0)	90/81.6 (1.1)	173/166.4 (1.0)	0.92
42 to 53	12	71/83.5 (0.9)	62/80.3 (0.8)	133/163.8 (0.8)	1.15
54 to 59	6	32/41.3 (0.8)	30/39.7 (0.8)	62/81.0 (0.8)	1.07
6 to 59	54	387/379.5 (1.0)	372/379.5 (1.0)		1.04

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

Overall sex ratio: p-value = 0.586 (boys and girls equally represented)
Overall age distribution: p-value = 0.001 (significant difference)
Overall age distribution for boys: p-value = 0.019 (significant difference)
Overall age distribution for girls: p-value = 0.047 (significant difference)

Overall sex/age distribution: p-value = 0.000 (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: **5** (0-7 excellent, 8-12 good, 13-20 acceptable and > 20 problematic)
p-value for chi2: 0.050

Digit preference Height:

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

Digit preference score: **5** (0-7 excellent, 8-12 good, 13-20 acceptable and > 20 problematic)
p-value for chi2: 0.081

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: 0.000 (significant difference)

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

.	no exclusion	exclusion from reference mean (WHO flags)	exclusion from observed mean (SMART flags)
WHZ			
Standard Deviation SD:	1.10	1.09	1.07
(The SD should be between 0.8 and 1.2)			
Prevalence (< -2)			
observed:	14.8%	14.6%	14.6%
calculated with current SD:	13.5%	13.1%	12.8%
calculated with a SD of 1:	11.2%	11.1%	11.1%
HAZ			
Standard Deviation SD:	1.43	1.33	1.22
(The SD should be between 0.8 and 1.2)			
Prevalence (< -2)			
observed:	60.6%	60.7%	61.5%
calculated with current SD:	58.6%	59.9%	62.5%
calculated with a SD of 1:	62.2%	63.0%	65.1%
WAZ			
Standard Deviation SD:	1.08	1.05	1.03
(The SD should be between 0.8 and 1.2)			
Prevalence (< -2)			
observed:	46.2%	46.3%	46.4%
calculated with current SD:	44.5%	44.7%	45.0%
calculated with a SD of 1:	44.1%	44.5%	44.9%

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

WHZ	p= 0.024	p= 0.131	p= 0.026
HAZ	p= 0.000	p= 0.000	p= 0.004
WAZ	p= 0.000	p= 0.721	p= 0.661

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

Skewness

WHZ	-0.23	-0.15	-0.15
HAZ	1.81	0.46	0.03
WAZ	0.40	0.08	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	0.22	-0.08	-0.22
HAZ	15.44	1.03	-0.44
WAZ	1.96	0.09	-0.13

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=1.58 (p=0.013)
WHZ < -3: ID=1.38 (p=0.063)
GAM: ID=1.58 (p=0.013)
SAM: ID=1.38 (p=0.063)
HAZ < -2: ID=0.97 (p=0.524)
HAZ < -3: ID=1.16 (p=0.237)
WAZ < -2: ID=1.27 (p=0.124)
WAZ < -3: ID=1.06 (p=0.369)

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 wererelated 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: 1.19 (n=38, f=1)  ##################
02: 0.99 (n=36, f=0)  ########
03: 1.04 (n=30, f=0)  ##########
04: 0.86 (n=34, f=0)  ##
05: 1.08 (n=34, f=0)  ############
06: 0.99 (n=34, f=0)  ########
07: 1.18 (n=33, f=0)  ################
08: 0.88 (n=33, f=0)  ###
09: 1.24 (n=34, f=0)  ##################
10: 1.32 (n=33, f=1)  ######################
11: 1.17 (n=35, f=0)  ################
12: 1.07 (n=36, f=0)  ###########
13: 1.29 (n=33, f=0)  ####################
14: 1.09 (n=31, f=0)  ############
15: 0.98 (n=29, f=0)  #######
16: 1.07 (n=28, f=0)  ###########
17: 1.47 (n=29, f=1)  ##############################
18: 1.03 (n=28, f=0)  ##########
19: 1.10 (n=26, f=0)  ############
20: 0.87 (n=22, f=0)  ###
21: 1.11 (n=19, f=0)  #############
```

22: 0.96 (n=20, f=0) #######
23: 1.11 (n=16, f=0) OOOOOOOOOOOOO
24: 0.96 (n=15, f=0) OOOOOOO
25: 1.07 (n=13, f=0) OOOOOOOOOOO
26: 1.06 (n=11, f=0) OOOOOOOOOOO
27: 0.99 (n=09, f=0) ~~~~~~~~
28: 1.09 (n=07, f=0) ~~~~~~~~~~~~
29: 0.93 (n=06, f=0) ~~~~~
30: 0.97 (n=03, f=0) ~~~~~~~~
31: 0.49 (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**
n =	183	216	191	169
Percentage of values flagged with SMART flags:				
WHZ:	0.5	0.9	0.0	0.0
HAZ:	1.6	1.4	1.6	2.4
WAZ:	0.5	0.0	0.5	0.6
Age ratio of 6-29 months to 30-59 months:				
1.29	0.93	0.95	1.17	
Sex ratio (male/female):				
1.08	1.04	1.08	0.97	
Digit preference Weight (%):				
.0 :	6	6	9	9
.1 :	12	13	9	11
.2 :	16	12	9	11
.3 :	8	8	7	12
.4 :	11	12	11	5
.5 :	5	8	12	9
.6 :	10	7	12	8
.7 :	10	13	10	9
.8 :	7	8	10	15
.9 :	14	13	9	12
DPS:	11	9	4	8

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

Digit preference Height (%):				
.0 :	3	5	19	12
.1 :	13	10	10	9
.2 :	12	8	16	13
.3 :	11	13	10	12
.4 :	9	11	6	10
.5 :	5	7	13	9
.6 :	10	12	8	9
.7 :	13	11	10	15

.8 :	12	9	6	5
.9 :	13	13	3	5
DPS:	11	8	15	10

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

Digit preference MUAC (%):

.0 :	2	11	25	11
.1 :	11	8	7	6
.2 :	10	10	12	8
.3 :	10	16	5	15
.4 :	12	11	8	11
.5 :	10	10	24	15
.6 :	11	10	5	11
.7 :	9	6	5	5
.8 :	11	9	5	9
.9 :	12	10	4	9
DPS:	10	8	26	10

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

Standard deviation of WHZ:

SD	1.21	1.16	0.98	1.00

Prevalence (< -2) observed:

%	19.7	17.1		

Prevalence (< -2) calculated with current SD:

%	19.9	14.9		

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

%	15.4	11.3		

Standard deviation of HAZ:

SD	1.36	1.33	1.66	1.35

observed:

%	66.7	58.8	58.1	59.2

calculated with current SD:

%	62.6	57.5	55.1	60.7

calculated with a SD of 1:

%	66.9	59.9	58.3	64.3

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	30/22.0 (1.4)	25/20.4 (1.2)	55/42.5 (1.3)	1.20
18 to 29	12	25/21.5 (1.2)	23/19.9 (1.2)	48/41.4 (1.2)	1.09
30 to 41	12	20/20.8 (1.0)	23/19.3 (1.2)	43/40.1 (1.1)	0.87
42 to 53	12	12/20.5 (0.6)	9/19.0 (0.5)	21/39.5 (0.5)	1.33
54 to 59	6	8/10.1 (0.8)	8/9.4 (0.9)	16/19.5 (0.8)	1.00
6 to 59	54	95/91.5 (1.0)	88/91.5 (1.0)		1.08

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

Overall sex ratio: p-value = 0.605 (boys and girls equally represented)
Overall age distribution: p-value = 0.007 (significant difference)
Overall age distribution for boys: p-value = 0.114 (as expected)
Overall age distribution for girls: p-value = 0.104 (as expected)
Overall sex/age distribution: p-value = 0.004 (significant difference)

Team 2:

Age cat.	mo.	boys	girls	total	ratio boys/girls
6 to 17	12	33/25.5 (1.3)	25/24.6 (1.0)	58/50.1 (1.2)	1.32
18 to 29	12	23/24.9 (0.9)	23/24.0 (1.0)	46/48.9 (0.9)	1.00
30 to 41	12	28/24.1 (1.2)	33/23.2 (1.4)	61/47.4 (1.3)	0.85
42 to 53	12	17/23.7 (0.7)	16/22.9 (0.7)	33/46.6 (0.7)	1.06
54 to 59	6	9/11.7 (0.8)	9/11.3 (0.8)	18/23.1 (0.8)	1.00
6 to 59	54	110/108.0 (1.0)	106/108.0 (1.0)		1.04

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

Overall sex ratio: p-value = 0.785 (boys and girls equally represented)
Overall age distribution: p-value = 0.034 (significant difference)
Overall age distribution for boys: p-value = 0.239 (as expected)
Overall age distribution for girls: p-value = 0.154 (as expected)
Overall sex/age distribution: p-value = 0.016 (significant difference)

Team 3:

Age cat.	mo.	boys	girls	total	ratio boys/girls
6 to 17	12	35/23.0 (1.5)	25/21.3 (1.2)	60/44.3 (1.4)	1.40
18 to 29	12	15/22.4 (0.7)	18/20.8 (0.9)	33/43.2 (0.8)	0.83
30 to 41	12	17/21.7 (0.8)	24/20.2 (1.2)	41/41.9 (1.0)	0.71
42 to 53	12	23/21.4 (1.1)	16/19.9 (0.8)	39/41.2 (0.9)	1.44
54 to 59	6	9/10.6 (0.9)	9/9.8 (0.9)	18/20.4 (0.9)	1.00
6 to 59	54	99/95.5 (1.0)	92/95.5 (1.0)		1.08

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

Overall sex ratio: p-value = 0.613 (boys and girls equally represented)
Overall age distribution: p-value = 0.079 (as expected)
Overall age distribution for boys: p-value = 0.038 (significant difference)
Overall age distribution for girls: p-value = 0.636 (as expected)
Overall sex/age distribution: p-value = 0.010 (significant difference)

Team 4:

Age cat.	mo.	boys	girls	total	ratio boys/girls
6 to 17	12	18/19.3 (0.9)	22/20.0 (1.1)	40/39.2 (1.0)	0.82

18 to 29	12	22/18.8 (1.2)	29/19.5 (1.5)	51/38.2 (1.3)	0.76
30 to 41	12	18/18.2 (1.0)	10/18.9 (0.5)	28/37.1 (0.8)	1.80
42 to 53	12	19/17.9 (1.1)	21/18.6 (1.1)	40/36.5 (1.1)	0.90
54 to 59	6	6/8.9 (0.7)	4/9.2 (0.4)	10/18.0 (0.6)	1.50
6 to 59	54	83/84.5 (1.0)	86/84.5 (1.0)		0.97

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

Overall sex ratio: p-value = 0.817 (boys and girls equally represented)
Overall age distribution: p-value = 0.034 (significant difference)
Overall age distribution for boys: p-value = 0.804 (as expected)
Overall age distribution for girls: p-value = 0.015 (significant difference)
Overall sex/age distribution: p-value = 0.007 (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 wasbe related to the time of the day the measurement is made).

Team: 1

```
Time                          SD for WHZ
point          0.8 0.9 1.0 1.1 1.2 1.3 1.4 1.5 1.6 1.7 1.8 1.9 2.0 2.1 2.2 2.3
01: 0.80 (n=10, f=0)
02: 1.33 (n=10, f=0)  ######################
03: 1.29 (n=08, f=0)  ######################
04: 1.03 (n=09, f=0)  #########
05: 1.41 (n=10, f=0)  ##########################
06: 0.80 (n=09, f=0)
07: 1.52 (n=09, f=0)  ###############################
08: 0.77 (n=09, f=0)
09: 1.39 (n=10, f=0)  ########################
10: 1.23 (n=09, f=0)  ##################
11: 1.16 (n=08, f=0)  ################
12: 1.16 (n=10, f=0)  ################
13: 1.46 (n=10, f=0)  ##############################
14: 1.17 (n=08, f=0)  ################
15: 1.13 (n=10, f=0)  ###############
16: 1.31 (n=08, f=0)  ######################
17: 2.05 (n=08, f=1)  ####################################################
18: 1.00 (n=08, f=0)  #########
19: 1.14 (n=06, f=0)  ###############
20: 0.55 (n=03, f=0)
21: 1.93 (n=03, f=0)  OOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOO
22: 1.39 (n=03, f=0)  OOOOOOOOOOOOOOOOOOOOOOOO
23: 0.18 (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: 1.73 (n=09, f=1)  ########################################
02: 0.88 (n=09, f=0)  ###
03: 0.56 (n=07, f=0)
04: 0.59 (n=08, f=0)
05: 0.62 (n=07, f=0)
```

06: 0.99 (n=08, f=0) ########
07: 1.05 (n=07, f=0) ###########
08: 1.09 (n=08, f=0) ############
09: 1.50 (n=07, f=0) ##############################
10: 1.88 (n=09, f=1) ##
11: 1.07 (n=09, f=0) ###########
12: 1.08 (n=09, f=0) ############
13: 1.46 (n=07, f=0) ##############################
14: 1.04 (n=08, f=0) ##########
15: 0.87 (n=08, f=0) ###
16: 1.02 (n=09, f=0) #########
17: 1.28 (n=08, f=0) ####################
18: 1.11 (n=09, f=0) #############
19: 1.15 (n=09, f=0) ################
20: 1.18 (n=07, f=0) #################
21: 1.37 (n=07, f=0) ########################
22: 1.00 (n=07, f=0) ########
23: 1.26 (n=07, f=0) ###################
24: 1.02 (n=06, f=0) #########
25: 1.28 (n=06, f=0) ####################
26: 1.43 (n=05, f=0) OOOOOOOOOOOOOOOOOOOOOOOOO
27: 1.29 (n=05, f=0) OOOOOOOOOOOOOOOOOOO
28: 1.08 (n=04, f=0) OOOOOOOOOOO
29: 1.09 (n=04, f=0) OOOOOOOOOOO
30: 1.16 (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: 1.08 (n=10, f=0) ############
02: 0.97 (n=09, f=0) #######
03: 0.90 (n=09, f=0) ####
04: 0.86 (n=09, f=0) ###
05: 0.65 (n=09, f=0)
06: 1.09 (n=08, f=0) ############
07: 1.01 (n=09, f=0) #########
08: 0.96 (n=10, f=0) #######
09: 0.83 (n=09, f=0) #
10: 0.68 (n=07, f=0)
11: 1.04 (n=10, f=0) ##########
12: 1.06 (n=09, f=0) ###########
13: 1.35 (n=10, f=0) ########################
14: 1.16 (n=07, f=0) ###############
15: 0.95 (n=07, f=0) ######
16: 1.04 (n=04, f=0) OOOOOOOOOO
17: 0.98 (n=06, f=0) #######
18: 0.63 (n=06, f=0)
19: 0.89 (n=06, f=0) ####
20: 0.84 (n=06, f=0) ##
21: 0.42 (n=04, f=0)
22: 0.54 (n=06, f=0)
23: 0.84 (n=04, f=0) OO
24: 0.88 (n=05, f=0) OOO
25: 1.13 (n=03, f=0) OOOOOOOOOOOOOO
26: 0.71 (n=04, f=0)
27: 0.07 (n=02, f=0)
28: 0.55 (n=02, f=0)

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

Team: 4

Time SD for WHZ
point 0.8 0.9 1.0 1.1 1.2 1.3 1.4 1.5 1.6 1.7 1.8 1.9 2.0 2.1 2.2 2.3
01: 1.11 (n=09, f=0) #############
02: 0.66 (n=08, f=0)
03: 1.33 (n=06, f=0) ######################
04: 0.97 (n=08, f=0) #######
05: 1.37 (n=08, f=0) ########################
06: 1.14 (n=09, f=0) ##############
07: 1.19 (n=08, f=0) ################
08: 0.71 (n=06, f=0)
09: 1.07 (n=08, f=0) ###########
10: 0.96 (n=08, f=0) #######
11: 1.18 (n=08, f=0) ################
12: 0.70 (n=08, f=0)
13: 0.61 (n=06, f=0)
14: 0.65 (n=08, f=0)
15: 0.45 (n=04, f=0)
16: 0.89 (n=07, f=0) ####
17: 1.13 (n=07, f=0) ##############
18: 1.38 (n=05, f=0) ########################
19: 1.04 (n=05, f=0) ##########
20: 0.76 (n=06, f=0)
21: 0.47 (n=05, f=0)
22: 0.50 (n=04, f=0)
23: 1.27 (n=03, f=0) OOOOOOOOOOOOOOOOOOO
24: 1.25 (n=03, f=0) OOOOOOOOOOOOOOOOOO
25: 0.79 (n=03, f=0)
27: 0.80 (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)

Annex3: Questionnaires

1.IDENTIFICATION (هویت)

1.1 Data Collector(ارقام جمع کونکی) _____ **1.2 Team Leader**(ټیم لیډر)_____ **1.3 Survey date (dd/mm/yy)** (سروی تاریخ) **/___/___/___/**

1.4 Province(ولایت)	1.5 District, ولسوالی	1.6 Division ناحیه	1.7 Location محل	1.8 Sub-Location محل فرعی	1.9 Village قریه	1.10 Cluster No کلستر نمبر	1.11 HH No دکورنی نمبر	1.12 Team No. دټیم نمبر

2. HOUSEHOLD STRUCTURE (دکورنی جوړښت)

2.1	**How many people live together in this household & share meals** |____| **پدی کورنی کی څومره کسان یوځای ژوند کوی او په شریکه غذا خوری ؟**	
2.2	**Who is the Head of the Household?** |____| [1=Husband, 2=Mother, 3=My parents, 4=others , specify] **د دی کورنی مشر څوک دی ؟** **[مشخص یی کړی ، نور =۴ ، مور اوپلار =۳ ، مور =۲ ، خاوند =۱]**	
2.3	**What is the structure of your family**? |____| [1=monogamy, 2=polygamy,3=single parent] **ستاسی کورنی جوړښت څه دول دی ؟** **[بوائی مور یا پلار =۳ ، څو ښځو خاوند =۲ ، یوی ښځی خاوند =۱** *If 2 go to 2.4 else, skip to 2.5* **ک چیرته ۱ او یا ۳ انتخاب شو نو ۲,۴ سوال نه تیر شی**	
2.4	**If polygamous, how many wives does your husband have?** |____| **که چیرته څو ښځیو خاوند وی ، تعداد د ښځو یی وپوښتی ؟**	
2.5	**What is the main occupation of the household head** **ستاسی د کور د مشر عمده وظیفه څه شی ده ؟** 1. Livestock herding شپون 2. Farmer/own farm labor دهقان یا خپل فارم لری 3. Employed (salaried) (وظیفه (معاش 4. Daily labor/Wage labor روزمره مزدوری کوی 5. Small business/Petty trade وړوکی تجارت لری 6. Firewood/charcoal لرگی ټولوی او خرڅوی 7. Other (Specify نور مشخص یی کړی _____	|____|

3. CHILD HEALTH AND NUTRITION (ONLY FOR CHILDREN 0-59 MONTHS OF AGE; IF N/A SKIP TO SECTION 3.3) د **N/A**وی نو ۳،۶ برخی ته مراجعه وکړی
ماشوم صحت او تغذیه (یوائی ۰- ۵۹ میاشتو ماشومانو لپاره) که جواب
دماشوم مور یا پایواز عام وتام مسولیت لری پدی برخه کی*The caregiver of the child should be the main respondent for this section* :دستور العمل **Instructions**

***3.1 CHILD ANTHROPOMETRY* دماشوم اندازه گیری**

مهربانی وکړی ټول ضروری معلومات چی لاندی ذکر شوی دی ډک کړی(.*(**Please** fill in **ALL REQUIRED** details below*

A	B	C	D	E	F	G	H	I	J
Child No. دماشوم نمبر	SEX جنس F/M	Exact Birth Date د تولد تاریخ دقیق شکل سره	Age in months عمر په میاشت	Weight (KG) XX.X وزن په کیلوګرام	Height (CM) XXX.X قد په سانتی متر	Oedema پرسوب Y= Yes N= No N = نخیر Y= بلی	MUAC (mm) XXX موک په ملی متر	Has your child (NAME) been ill in the past two weeks? If No, please skip part J and K proceed to 3.4 ایاستاسی ماشوم (نوم یی) په تیرو دوه هفتو کی ناروغ شوی که جواب نه وی د J نه تیر شی او 3.3 ته مراجعه وکړی 1=Yes (بلی) 2=No (نه)	If YES, what type of illness (multiple responses possible) که جواب بلی وی کومه نوعه ناروغی لری (امکان لری چی زیات جوابات ولری) 1 = Fever malaria تبه د لرزی سره 2 = ARI /Cough توخی / تنفسی مشکلات 3 = Watery diarrhoea اوبلن اسهال 4 = Bloody diarrhoea وینه لرونکی اسهال 5 = Other (specify) نور مشخص یی کړی *See case definitions below* لاندی تعریف ته وګوری
01									
02									
03									
04									

Bloody diarrhoea (وینه لرونکی اسهال): Any episode of three or more stools with blood per day که چیری په ورځ کی دری یا د دری ځلو نه زیات وینه لرونکی غایطه مواد ولری	**Watery diarrhoea(اوبلن اسهال) :** Any episode of three or more watery stools per day که اوبلن غایطه مواد په ورځ کی دری یا د دری ځلو نه زیات ولری	**Cough/ARI(توخی / تنفسی مشکلات) :** Any episode with severe, persistent cough or difficulty breathing دوامداره توخی یا په ساه اخیستنه کی مشکلات	**Fever تبه دملاریا سره :** High temperature لوړه درجه تبه د لرزی سره

3.3 Kindly maintain the same child number as part 2 and 3.1 above **د ۲ او ۳,۱ برخی دماشوم سره مشابه وی**					
	A	**B**	**C**	**D**	**E**
Child No. دماشوم نمبر	Has the child received Vitamin A in the past 6 months? (show sample) ایا ستاسی ماشوم دتیرو شپرو میاشتو راهیسی ویتامین ای کپسول اخیستی دی (نمونه ورته وښایی) 1= Yes 2= No	Has the child received drugs for worms in the past 6 months? **(12-59 Months)** *(show Sample)* ایا ستاسی ماشوم د تیرو شپرو میاشتو راهیسی د چنجو دوا اخیستی ده (**۱۲ – ۵۹ میاشتنی عمرلرونکی ماشومان)** (نمونه ورته وښایی) *1= Yes* *2= No*	Has the child received BCG vaccination? ایا ستاسی ماشوم د بی سی جی واکسین اخیستی دی **1 = scar (ندبه لری** **2=No scar (ندبه نلری)**	Has the child received Polio vaccination (please for all polio vaccinations) ایا ستاسی ماشوم د پولیوواکسین اخیستی دی (دتولو پولیو واکسینونو لپاره) **1=Yes, Card بلی کارد** **2=Yes, Recall بلی مګر کارد نلری** **3 = No نه** **4 = Do not know نه پوهیږم**	Has the child received measles vaccination *(On the upper right shoulder)?* (**9 months and above)** ایا ستاسی ماشوم د شری واکسین اخیستی (ښی لاس پورتنی برخه)(**۹ میاشتی یا زیات عمر** **1=Yes, Card** بلی ، کارد لری **2=Yes, Recall** بلی کارد نلری **3 = No** نه **4 = Do not know** نه پوهیږم
01					
02					
03					
04					

MATERNAL NUTRITION FOR MOTHERS OF REPRODUCTIVE AGE (15-49 YEARS)*(Please insert appropriate number in the box)* **هغه ښځی چې د تولد اوتناسل عمر ولری (۱۵ – ۴۹ کلنی عمر لرونکی ښځی)** (لطفآ مناسب عدد په بکس کی ولیکی)			
3.4	**3.5**	**3.6**	**3.7**
Woman ID. نمبر دزنانه **(all ladies in the HH aged 15-49 years** **تولی هغه ښځی چې په کورنی کی د ۱۵ تر ۴۹ کالو عمر ولری)**	What is the mother's / caretaker's physiological status د مور یا پایواز فزیالوژیک حالت څه شی دی **1.Pregnant** (حامله) **2.Lactating**(شیدی ورکونکی) **3.Pregnant and Lactating** حامله او شیدی ورکونکی) **4.None of the above** یو هم نه	Mother/ caretaker's MUAC reading: **XXX mm** مور یا پایواز د موک اندازه په ملی متر	Have you been taking iron-folate tablets? (Only for pregnant women) ایا تاسی اوسپنی یا د کم خونی گولی اخیستی (یواځی د حامله ښځو لپاره) (نمونه وښایی) **1.Yes** بلی **2.No** نه **3.Don't know** نه پوهیږم
1			
2			
3			
4			

3.8	3.9
Yesterday (within last 24 hours) at what instances did you wash your hands? (MULTIPLE RESPONSE- (Use 1 if "Yes" and 2 if "No") **پرون (تیرو ۲۴ ساعتو کی) کی مو لاسونه وینځلی دی (امکان لری چی زیات جوابونه ولری) که بلی نو ۱ او که نه خیر وی نو ۲ انتخاب کړی ؟** 1.After toilet **(وروسته د کناراب نه** |____| 2.Before cooking **مخکی د اشپزی نه** |____| 3.Before eating **مخکی د خوړو نه** |____| 4.After taking children to the toilet **وروسته له دی نه چی ماشوم کناراب ته بوزم** |____| 5.Others **نور** |____|	**If the caregiver washes her hands, then probe further; what did you use to wash your hands?** **که چیرته پایواز یا مور خپل لاسونه وینځي ، بیا پوښتنه وکړی چی لاسونه په څه شی وینځی ؟** 1.Only water **یواځی په اوبو باندی** 2.Soap and water **صابون او اوبو باندی** 3.Soap when I can afford it **صابون باندی که چیرته په لاس راشی یا موجود وی** 4.traditional herb **محلی یا سنتی گیاه گانو باندی** 5.Any other specify **نور مشخص یی کړی** |____|

Kindly maintain the same child number as part 2 and 3.1 above د ۲ او ۳،۱ برخی دماشوم سره مشابه وی	**To be conducted in Households with children aged 0 - 23 months** په هغه کورنی که یک کری چی د ۰ – ۲۳ میاشتو ماشوم ولری

Date (D/M/Y)تاریخ: ...... /...../..... Division ناحیه: _____ Sub locationفرعی موقعیت: _____ Village Name قریه: _____ Cluster No کلستر نمبر_____Team No تیم نمبر:_____

3.10	A	B	C	D	E	F	G	H	I	J
Child No. دماشوم نمبر	**Number of people in the household** په کورنی کی دافرادو تعداد	**HH Ref-No** د کور نی نمبر	**Age (in months)** عمر په میاشت	**Has this child ever been breastfed?** ایا دی ماشوم کله دمور شیدی رودلی **1 = Yes** بلی **2 = No** نه ***If no go to question I*** که چیرته جواب نه وی سوال ته *I* نو مراجعه وکړی	**How long after birth did you first put the child to the breast** وروسته دولادت نه څومره وخت بعد دی ماشوم خپلی سینی ته واچوو **1 = Within one hour** په یو ساعت کی **2 = In first day (within 24 hours)** په لومړی ورځ کی **3 = After first day** وروسته دیوی ورځی نه **(>24 hours)**	**Did you feed your child with fluid or liquid that came from breasts in the first 3 days after birth COLOSTRUM ایا کوم مایعات چی ستاسی د سینی راوڅی یعنی اورگه بعد له ولادت نه په لومړیو دری ورځو کی مو خپل ماشوم ته ورکړی** **1 = Yes** **2= No**	**Is this child still breastfeeding now?** یا تراوسه هم خپل ماشوم ته خپلی شیدی ورکوی **1 = Yes** بلی **2= No** نه	**Exclusive breast feeding: Other than breast milk, what other foods did you give the child before the age of 6 months** خالص دمور شیدو باندی تغذیه : مخکی د ۶ میاشتو نه مو بغیر دمور دشیدو نه کومه غذا ماشوم ته ورکړی ؟ **1 =None other than breast milk** بغیر دمور دشیدو نه می هیڅ نه دی ورکړی **2 = Powder/animal milk/yogurt** پودری ، حیوانی شیدی یا ماستی **3 = Cereals based diet** سیریلاک **4 = Plain water** ساده اوبه **5 = Fruit Juice** د میوی جوس **6 = Sugar water** دبوری اوبه **7 = Vegetables** ترکاری	**What foods were given to the child yesterday during the day and night?** کومه نوعه خواړه مو پرون د شپی او ورځی له خوا نه ورکړی **1 =Grains, roots and tubers** حبوبات ، دانی او هغه غذای مواد چی زمکی لاندی کیږی لکه کچالو ،الو پشمک او نو ر **2 = Flesh foods (Meat/Fish/Poultry/Organ meats)** د غوښی غذا (ماهی ، غوښه ، مرغی و چرگان ، جگر او توری پښتورگی او نور **3 = Legumes and Nuts** سبزی او مغذی مواد **4 = Dairy products (milk, yoghurt, chees e)** لبنیات (شیدی ، مستی ، کوچ) **5 = Eggs** هگی **6= Vitamin A rich fruits & Vegetables** د ویتامین ای نه غنی میوه او ترکاری **7 = Other Fruits and vegetables** ن**(specify___)** نوره میوه او ترکاری واضح یی کړی **8. Nothing** هیڅ شی **9. Others (specify)** نور مشخص یی کړی **(*Multiple responses are possible)*** شاید دیر ځوابونه انتخا ب شی	**Yesterday (During the day and at night). How many times did you feed [Name] solid and semi-solid foods? No. of times child was given food to make it full.** پرون په شپه او ورځ کی څو ځلی ماشوم مو په جامدو او نیمه جامدو موادو تغذیه کړی؟ چی ماشوم یی مور کړی وی
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2										
3										
4										

Team Leader Name_____Signature _____

Questionnaire for mortality rate calculation (one sheet/cluster) دمرګ او میر د معلومولو لپاره پوښتنی (یو ورق /کلستر)

تیم نمبر:Team number _____ کلستر نمبر:Cluster number _____ تاریخ:Date_____ قریه/ Village _____ ولسوالیDistrict _____

HH No د کور نمبر.	Total people in HH تول هغه افراد چی په کورنی کی ژوند کوی	Total under 5 in HH د ۵ کالو نه ښکته ماشومان په کورنی کی	Joined HH Total تعداد دافرادو چی کورنی سره یوځای شوی	Joined HH under 5 د ۵ کلونه ښکته چی کورنی سره یوځای شوی	Left HH Total تعداد دافرادو چی کورنی یی پریښی وی	Left HH under 5 دپنځو کالو نه ښکته ماشومان چی کوریی پریښی وی	No. of births in recall period د ولادتونو تعداد په یاده شوی دوره کی	Total deaths in recall period دمړو تعداد په یاده شوی دوره کی	No. < 5 deaths in recall period د ۵ کالو نه ښکته مړو شوو ماشومانو تعداد	Where do you store water for drinking? تاسی چیرته اوبه ذخیره کوی ؟ 1= Closed jerricans/containers. سربند ذخیره 2=Open jerricans /container سر خلاص ذخیره	How much water did your household use YESTERDAY (excluding for animals)? پرون مو څومره اوبه مصرف کړی دی (په استثنی د حیواناتو نه) *Note :* پوښتنه وکړی چی څومره ۲۰ لیتره بوشکی بیا یی مجموعی کړی او ویی لیکی ()
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Team Leader Name_____Signature _____

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