AFGHANISTAN

ANTHROPOMETRIC AND MORTALITY SMART SURVEY FINAL REPORT

Paktika 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

Paktika is one of the 34 provinces of Afghanistan. Located in the South East part of the Afghanistan Paktika it is surrounded by Paktya, Khost, Ghazni and Zabul provinces and has an international border with Pakistan. Paktika sits next to the poorly marked Durand Line border between Pakistan and Afghanistan.

International Medical Corps, with support from Action Contre la Faim (ACF) conducted a Nutrition, Mortality and IYCF SMART survey covering 5 out of 19 districts of Paktia province. These included about 41.52% (260658[1]) of the total population. The remaining area was classified inaccessible due to insecurity[2]. The main objective of this assessment was to assess the current nutrition status, mortality rates, and possible contributing health and WASH factors. The survey was conducted from 30th April to 8th May 2015. The survey design was a cross sectional study with two stage cluster sampling using Standardised Monitoring of Relief and Transition (SMART) methodology. A total of 1012 children aged 0-59 months from 529 households in 38 clusters/villages were examined.

The GAM rate, based on both WHZ and MUAC, respectively of 6.1 % (95% CI: 4.5 - 8.1) and 7.8% (95% CI: 5.5-10.9), are lower than the WHO emergency threshold of 15%. They can be classified as poor. The SAM rates based on both WHZ and MUAC, respectively of 0.8% (95% CI: 0.3- 1.8) and 1.4% (95% CI: 0.8- 2.6), were also lower than the 4% threshold used in the context of Afghanistan to trigger emergency. The rates of stunting and underweight were worryingly high, 46.2 % (95% CI: 41.1 - 51.4) and 26.4 % (95% CI: 22.4 - 30.9). The mortality rates were acceptable: 0.25 death/10,000.Day (95% CI: 0.13-0.47) of Crude Dead Rate and 0.33 death/10,000/Day for Under-five Mortality Rate.

The analysis of possible contributing factors has shown that 28.3% of the children had symptoms of illness 2-weeks prior the survey with prevailing respiratory complains. The mother's nutritional status was compromised with 24.5% having MUAC < 230 mm. Only 20.1% of the pregnant by the moment of the survey women reported to have had Iron/Folate supplementation. Vitamin A supplementation (55.1%) and de-worming for children (10.4%) was as extremely poor. Exclusive breastfeeding (1.9%) and timely complementary feeding practices (39.6%) were of concern and potentially a great contributing to undernutriton factor.

[1] EPI program data 2013 - 2014
[2] See Annex for districts not covered.

The findings of this survey suggest greater implication of public health policy-makers, planners and organizations seeking to meet national and international developmental targets.

The key recommendations made are:

- Recalibrate the targets for acute malnutrition in line with the findings.
- Raise awareness of mothers on micronutrient supplementation and vaccination campaigns.
- Improve awareness and investigate more on barriers for improved health care seeking by families for management of children's infections.
- To strengthen awareness on micronutrients supplementation during pregnancy and lactation in health facilities and community levels and train and encourage CHWs to promote positive breastfeeding practices using techniques of counselling on recommended Breastfeeding practices. Regular follow up visits to assess the progress made and confirm the outcome.

INTRODUCTION

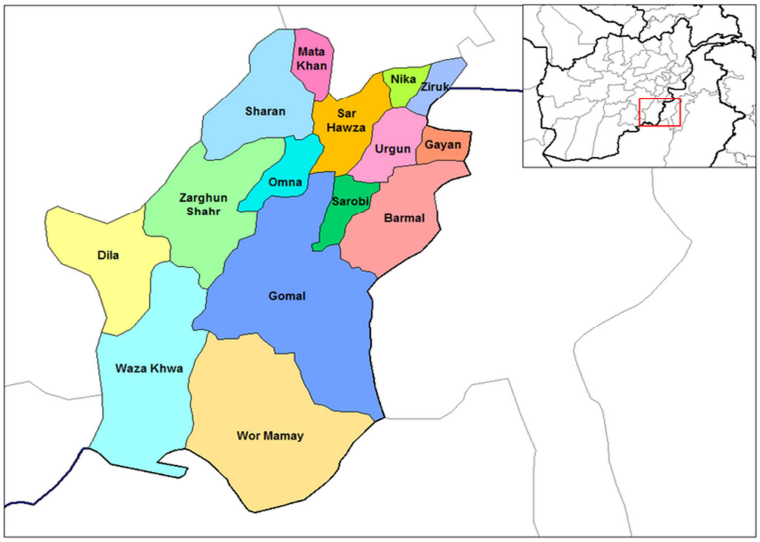
Paktika is one of the 34 provinces of Afghanistan. Located in the South East part of the Afghanistan Paktika it is surrounded by Pakitya, Khost, Ghazni and Zabul provinces and has an international border with Pakistan. Paktika sits next to the poorly marked Durand Line border between Pakistan and Afghanistan.

The province covers an area of 19336 km2, half of the province is mountainous or semi mountainous terrain (50%) while two fifth of the area is made up flat land (41%). Around 99% of the population of Paktika lives in rural districts while 1% lives in urban areas. Around 51% of the population is male and 49% is female. Pashto is spoken by more than 96% of the population. Other languages spoken in the zone are Uzbek and Tajik. Paktika province also has a nomad Kuchi population whose numbers vary in deferent seasons.

Paktika province has 19 districts: Barmal, Dila, Gaven, Gomal, Janikhil, Mata khan, Nika, Omna, Sar Hawza, Surobi, Sharana, Terwa, Urgoon, Waza khawa, Wor Mamay, Yahakhail, Zarghon Shair (Khair kot) and Ziruk. The city of Paktika is situated in Sharana distrist (District map below).

Paktika, like many other areas of Afghanistan, has been severely affected by deforestation. This has been a cause of devastating floods in recent years. The province is mainly hilly and interspersed with seasonal river Valleys (refer to Annex 1: Physical map of Paktika). In the north the terrain gains elevation and becomes more rugged. The sparsely populated southern districts are also hilly, with descending elevation towards the south and west. The main crops in the province are wheat, corn, rice, vetch beans, peas, spinach, cauliflower and potatoes, particular in the Gomal, Urgoon, Dilawa, Omna and Sharana Districts.

Figure 1: Map of Paktika districts (*https://fr.wikipedia.org/wiki/Paktîkâ*)



Only 5 districts out of 19 districts in Paktika province will be surveyed due to security issues and inaccessibility of far areas (see Table 1 below). The population of these 5 district represent 41.62% of the entire population of Paktika Province. 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 Paktika province.

Table 1: List of covered districts (Source: EPI program village data 2013-2014)

District	Total Number of Villages	Total Population (inhabitants)
Mata Khan	33	34,044
Sharana	134	80,970
Yahakhail	45	54,247
Sar Hawza	31	27,521
Khair kot (Zarghon Shair)	44	63,876
Total	287	260,658

OBJECTIVES

The broad objective of the current study was to estimate the prevalence of undernutrition amongst children from 6 to 59 months in Paktika Province. However, a set of more specific objectifs 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.
- 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 Corps (IMC).

IMC is BPHS implementing partner of MoPH in Paktika. 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 5 covered districts. This information will also complement the results from 2013 National Nutrition Survey providing an update for those 5 districts: areas of intervention for IMC.

METHODOLOGY

Sample size

The following assumptions (based on the given context) were used to calculate the sample size in number of children, which were then converted into number of households to survey. All calculations were made using ENA Software for SMART 2011 (November 2014 update). The Tables 2, 3 and 4 below summarize all parameters.

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

Parameters for Anthropometry	Value	Assumptions based on context
Estimated Prevalence of GAM (%)	8.7%	According to the MoPH National Nutrition Survey-2013[3], the Global Acute Malnutrition prevalence is estimated at 8.7% (95% CI: 5.88 - 12.7). A review of the available secondary data gave no indication of a possible more reliable GAM estimates. Therefore the prevalence of 8.7% was assumed due to a lack of any other data but with caution.
Desired precision	± 3%	Since the expected GAM prevalence is low, a precision of ± 3% was chosen.
Design Effect	1.5	The population living in the 5 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	554	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[4]. 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[5]. 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)[6] of 6%.
Households included	559	Households

[3] National Nutrition Survey of Afghanistan, UNICEF, 2013
[4] National vulnerability assessment of Afghanistan, 2014
[5] Afghanistan Mortality survey, 2010
[6] National Nutrition Survey of Afghanistan, UNICEF, 2013

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

As there was no recent data on IYCF indicators for Paktika so core IYCF indicators have been assumed to be 50 % (Table 4). It was assumed as well that precision of 10% would be enough.

Table 4: Parameters for sample size calculation for additional IYCF indicators, SMART-Paktika 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, the anthropometric sample was 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 (559 HH) the other indicators would have 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 15 households per day. By targeting 15 households per cluster per day, a total number of 38 clusters are expected to be reaching over the duration of this survey (559 HHs/15HHs/day=37.26 clusters), which were round up to 38 clusters in order to reach the required 559 households. This could theoretically allow reaching the minimum sample of 554 children required for the anthropometric sample.

Out of 287 villages, 38 villages, corresponding to 38 clusters were included in the survey. Reserve Clusters (RCs) were selected by ENA software. Reserve clusters were supposed to only been used if 10% or more clusters were impossible to reach during the field data collection. Cluster selection might be seen in Annex 2.

Selecting households and children

Simple random sampling method was used where an up-to-date list of the households in each village was created to select the households at random, with enough information to allow them to be located. All households was enumerated and given numbers by the survey team. The 15 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) was asked to help the survey teams to conduct their work by providing information about the village with regard to the geographical organization or the number of households.

In cases where it was difficult to obtain an updated list of Households systematic random sampling was used to identify the households to be surveyed. The teams were trained on both methods of sampling (simple and systematic random sampling) and they were also 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 was 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 were also be surveyed.

All of the selected HH was included in the mortality survey as well as were responding 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 were not be subsequently found was not 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 was the basic sampling unit. Here, a household was 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 was ensured with the village leaders/community elders supporting in identification of compounds 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.

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

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 was not considered as a valid criterion in absence of age due to the high stunting rates in Paktika province. Age was confirmed by showing a vaccination card or a birth certificate, if available. If these documents were not available, the use of a local event calendar built for Paktika province was used to determine the age (Annex 4). The age was recorded into the questionnaire in months.

Sex: Male or female

Weight (in kg): Children were weighed to the nearest 0.1kg by using an Electronic Uni-scale. The children who can easily stand was 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 was 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 was measured lying down and those equal to or above 2 years of age measured standing up.

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

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

Acute malnutrition

Acute malnutrition in children 0-59 months could be expressed by using 2 indicators: Weight-for-Height (WHZ) or Mid Upper Arm Circumference (MUAC). The presence of bilateral pitting oedema classifies the clinical form of kwashiorkor as severe acute malnutrition. The acute malnutrition in Afghanistan is defined as described below.

Table 5: Definition of acute malnutrition in Afghanistan (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

Weight-for-Height Z-score (WHZ): A child's nutritional status is estimated by comparing it to the weight-for-height curves of a reference population (WHO standards data[7]). 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 =

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

(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 6: 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

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.

Chronic malnutrition

The height-for-age index: The height-for-age measure indicates if a child of a given age is stunted and so if he is considered as chronically malnourished. This index reflects the nutritional history of a child. The same principle is used as for WHZ index 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 7.

Table 7: Cut-off 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: 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 household members. 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.

Individual Dietary Diversity Score: Proportion of 6-23 months children consumed minimum 4 food groups the last 24 hours.

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

Five teams of three members were conducting the field data collection. Each team was composed of one IMC team leader and two IMC data collector. Each team was having 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[8] to facilitate the work of the female data collectors at the community level. The teams were supervised by ACF and IMC nutrition program manager/nutrition focal points.

The entire teams received a 7-days training on the survey methodology and all its practical aspects, conducted by ACF Nutrition SMART Program Manager. A standardization test was conducted over the course of 1 day, measuring 10 children, in order to evaluate the accuracy and the precision of the team members in taking the 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 and household definition and selection document were provided to each team member. All documents, such as local event calendar, questionnaires (Annex 5) or consent forms were translated in Pashtu (local language) for better understanding and to avoid 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 data collection teams. Anthropometric data was directly entered into ENA 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, November 2014 update. 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.

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

SURVEY RESULTS

Characteristics of the Sample (households and children)

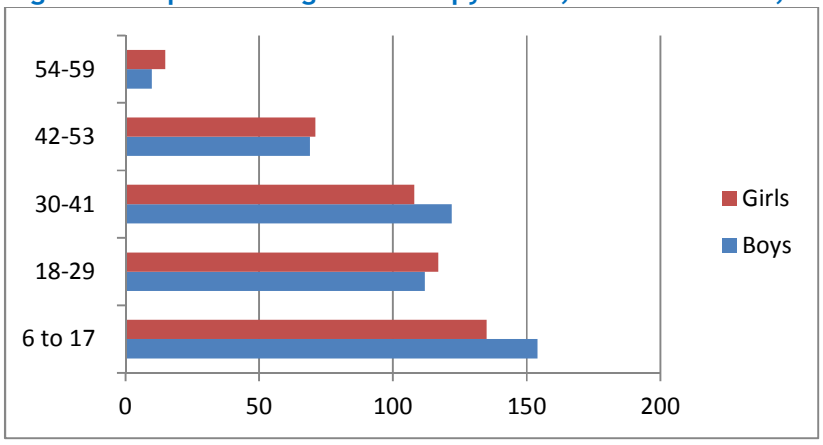
A total number of 529 households have been surveyed. These represent 94% from the initially required 559 households (non-response rate was of 5.4%). However, this still remain in the limits of 10% missing data. Overall, this does not affect the GAM estimates as the sample for the Anthropometry was reached. 1012 children from 0 to 59 months were surveyed. Out of them 913 children were from 6 to 59 months.

The overall boy to girl ratio was 1.0 indicating that sampling was within the expected range values of 0.8 – 1.2. Age ratio of 6-29 months to 30-59 months was 1.31, meaning that younger age group have been overrepresented. This could probably be due to approximation of ages amongst 84% of the sampled children. The population age and sex pyramid was following the normal shape (Figure 2 below).

Table 9: Distribution of age and sex of sample, SMART Paktika, May 2015

	Boys		Girls		Total		Ratio
AGE (mo)	**no.**	**%**	**no.**	**%**	**no.**	**%**	**Boy : girl**
6 to 17	154	53.3	135	46.7	289	31.7	1.1
18-29	112	48.9	117	51.1	229	25.1	1.0
30-41	122	53.0	108	47.0	230	25.2	1.1
42-53	69	49.3	71	50.7	140	15.3	1.0
54-59	10	40.0	15	60.0	25	2.7	0.7
Total	**467**	**51.2**	**446**	**48.8**	**913**	**100.0**	**1.0**

Figure 2: Population age and sex pyramid, SMART Paktika, May 2015



Anthropometric results

Data quality

The anthropometric data were analyzed using ENA for SMART Software (version 2011, November 2014 update). The automatically generated plausibility report is available in Annex 3.

Exclusion of z-scores is computed from the Observed mean (SMART flags): WHZ -3 to 3; HAZ -3 to 3; WAZ -3 to 3. A summary of the statistical parameters by index is in the table below. The overall quality of the survey as evaluated by the ENA software is reported as good, with plausibility score of 12%.

Table 10: Mean z-scores, Design Effects and excluded subjects, SMART Paktika, May 2015

Indicator	n	Mean z-scores ± SD	Design Effect (z-score < -2)	z-scores not available*	z-scores out of range
Weight-for-Height	888	-0.29±1.06	1.15	3	22
Weight-for-Age	890	-1.26±1.17	2.00	2	21
Height-for-Age	848	-1.85±1.34	2.20	0	65

* contains for WHZ and WAZ the children with edema

Prevalence of acute malnutrition

Weight-for-Height Z scores (WHZ) and/or Oedema (WHO 2006)

The prevalence of Global Acute Malnutrition (GAM) defined as Weight-for-Height Z-scores (WHZ<-2 and/or oedema) rate for five districts of Paktika was 6.1 % (95% CI: 4.5 - 8.1). The Severe Acute Malnutrition (SAM) defined as (WHZ<-3 and/or oedema) rate was 0.8% (95% CI: 0.3 - 1.8), including two (0.2%) oedema cases (Table 11[9]).

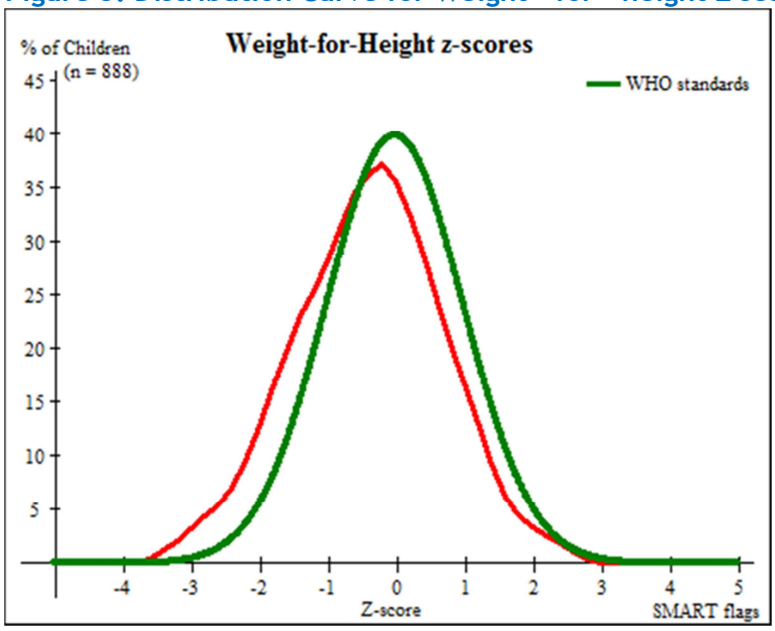
Table 11: Prevalence of acute malnutrition based on weight-for-height z-scores (and/or oedema) and by sex SMART Paktika May 2015

	All n = 890	Boys n = 452	Girls n = 438
Prevalence of global malnutrition (<-2 z-score and/or oedema)	(54) 6.1 % (4.5 - 8.1 95% C.I.)	(30) 6.6 % (4.8 - 9.1 95% C.I.)	(24) 5.5 % (3.6 - 8.2 95% C.I.)
Prevalence of moderate malnutrition (<-2 z-score and >=-3 z-score, no oedema)	(47) 5.3 % (4.0 - 7.0 95% C.I.)	(26) 5.8 % (4.1 - 8.0 95% C.I.)	(21) 4.8 % (3.3 - 7.0 95% C.I.)
Prevalence of severe malnutrition (<-3 z-score and/or oedema)	(7) 0.8 % (0.3 - 1.8 95% C.I.)	(4) 0.9 % (0.3 - 2.3 95% C.I.)	(3) 0.7 % (0.2 - 2.1 95% C.I.)

The prevalence of oedema is 0.2 %.

[9] The presence of oedema has been crosschecked by the supervisor. Pictures depicting bi-lateral pitting oedema have been sent to the survey manager for confirmation.

Figure 3: Distribution Curve for Weight – for – height Z score, SMART Paktika May 2015



The distribution curve for WHZ for the sample compared to WHO 2006 standard is presented above (**Figure 3**). The curve is shifted to the left compared to the reference which indicates that the surveyed population's nutritional status is poorer as compared to the WHO reference population. The standard deviation is of 1.06, within acceptable range of 0.8 to 1.2. The design effect (DEFF) determined was 1.15 which shows little intra-cluster variations.

The prevalence of acute malnutrition (WHZ<-2 and/or oedema) by age is presented in **Table 12** and shows a higher proportion of wasted children among 6-17 and 54-59 age groups. While for younger age group this might be indication of higher prevalence of wasting within younger children, this is not the case for older children as the sample size for this age group is too small. **Table 13** shows the distribution of acute malnutrition based on WHZ and oedema.

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

		Severe wasting (<-3 z-score)		Moderate wasting (>= -3 and <-2 z-score)		Normal (> = -2 z score)		Oedema	
Age (mo)	**Total no.**	**N o.**	**%**	**No.**	**%**	**No.**	**%**	**No.**	**%**
6-17	281	3	1.1	19	6.8	257	91.5	2	0.7
18-29	224	0	0.0	16	7.1	208	92.9	0	0.0
30-41	225	1	0.4	8	3.6	216	96.0	0	0.0
42-53	135	1	0.7	1	0.7	133	98.5	0	0.0
54-59	25	0	0.0	3	12.0	22	88.0	0	0.0
Total	**890**	**5**	**0.6**	**47**	**5.3**	**836**	**93.9**	**2**	**0.2**

Table 13: Distribution of acute malnutrition and oedema based on weight-for-height z-scores SMART Paktika May 2015

	<-3 z-score	>=-3 z-score
Oedema present	Marasmic kwashiorkor No. 0 (0.0 %)	Kwashiorkor No. 2 (0.2 %)
Oedema absent	Marasmic No. 19 (2.1 %)	Not severely malnourished No. 891 (97.7 %)

Mid Upper Arm Circumference (MUAC) cut-off classification and/or oedema:

As shown in **Table 14**, the prevalence of global acute malnutrition based on MUAC (<125mm) and/or oedema was 7.8% (95% CI: 5.5 - 10.9) and of severe acute malnutrition (MUAC<115mm and/or oedema) was 1.4% (95% CI: 0.8 - 2.6). **Table 15** shows the distribution of acute malnutrition based on MUAC by age. It is also observed that severe malnutrition is at its highest among children 6-17 months.

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

	All n = 909	Boys n = 464	Girls n = 445
Prevalence of global malnutrition (< 125 mm and/or oedema)	(71) 7.8 % (5.5-10.9 95% C.I.)	(32) 6.9 % (4.8 - 9.8 95% C.I.)	(39) 8.8 % (5.5-13.6 95% C.I.)
Prevalence of moderate malnutrition (< 125 mm and >= 115 mm, no oedema)	(58) 6.4 % (4.4 - 9.1 95% C.I.)	(28) 6.0 % (4.1 - 8.9 95% C.I.)	(30) 6.7 % (4.1-10.9 95% C.I.)
Prevalence of severe malnutrition (< 115 mm and/or oedema)	(13) 1.4 % (0.8 - 2.6 95% C.I.)	(4) 0.9 % (0.3 - 2.8 95% C.I.)	(9) 2.0 % (1.0 - 4.1 95% C.I.)

Table 15: Prevalence of acute malnutrition by age, based on MUAC cut off's and/or oedema SMART Paktika May 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	286	10	3.5	44	15.4	232	81.1	2	0.7
18-29	228	1	0.4	8	3.5	219	96.1	0	0.0
30-41	230	0	0.0	4	1.7	226	98.3	0	0.0
42-53	140	0	0.0	2	1.4	138	98.6	0	0.0
54-59	25	0	0.0	1	4.0	24	96.0	0	0.0
Total	**909**	**11**	**1.2**	**59**	**6.5**	**839**	**92.3**	**2**	**0.2**

Prevalence of Underweight (WHO 2006)

The prevalence of children underweight based on Weight-for-Age Z scores (WAZ) was 26.4% (95% CI: 22.4 - 30.9) with 8.3% (95% CI: 6.1 - 11.2) severely underweight (**Table 16**). Higher proportion of boys (28.9%) than girls (23.9%) were underweight found to be underweight but this difference is not significant.

It was observed that there is no significant difference between age group when underweight is analyzed, **Table 16** below.

Table 16: Prevalence of underweight based on weight-for-age z-scores by sex, SMART Paktika, May 2015

	All n = 890	Boys n = 454	Girls n = 436
Prevalence of underweight (<-2 z-score)	(235) 26.4 % (22.4-30.9 95% C.I.)	(131) 28.9 % (23.3-35.1 95% C.I.)	(104) 23.9 % (19.8-28.5 95% C.I.)
Prevalence of moderate underweight (<-2 z-score and >=-3 z-score)	(161) 18.1 % (15.3-21.2 95% C.I.)	(85) 18.7 % (14.8-23.4 95% C.I.)	(76) 17.4 % (14.1-21.4 95% C.I.)
Prevalence of severe underweight (<-3 z-score)	(74) 8.3 % (6.1 - 11.2 95% C.I.)	(46) 10.1 % (6.9 - 14.7 95% C.I.)	(28) 6.4 % (4. -9.4 95% C.I.)

Table 17: Prevalence of underweight by age, based on weight-for-age z-scores, SMART - Paktika, May 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	277	21	7.6	54	19.5	202	72.9	2	0.7
18-29	220	19	8.6	39	17.7	162	73.6	0	0.0
30-41	228	23	10.1	45	19.7	160	70.2	0	0.0
42-53	140	11	7.9	18	12.9	111	79.3	0	0.0
54-59	25	0	0.0	5	20.0	20	80.0	0	0.0
Total	**890**	**74**	**8.3**	**161**	**18.1**	**655**	**73.6**	**2**	**0.2**

Prevalence of Stunting (WHO 2006)

The prevalence of stunting (HAZ<-2) was 46.2% (95% CI: 41.1 - 51.4) with 19.6% (95% CI: 16.3 - 23.3) severe stunted (HAZ<-3). There are no differences in stunting prevalence between boys and girls; they appear to be equally affected (**Table 18**).

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

	All n = 848	Boys n = 429	Girls n = 419
Prevalence of stunting (<-2 z-score)	(392) 46.2 % (41.1 - 51.4 95% C.I.)	(208) 48.5 % (41.4 - 55.7 95% C.I.)	(184) 43.9 % (38.8 - 49.2 95% C.I.)
Prevalence of moderate stunting (<-2 z-score and >=-3 z-score)	(226) 26.7 % (23.5 - 30.0 95% C.I.)	(115) 26.8 % (22.1 - 32.1 95% C.I.)	(111) 26.5 % (22.9 - 30.4 95% C.I.)
Prevalence of severe stunting (<-3 z-score)	(166) 19.6 % (16.3 - 23.3 95% C.I.)	(93) 21.7 % (17.3 - 26.8 95% C.I.)	(73) 17.4 % (13.8 - 21.7 95% C.I.)

The prevalence of stunting by age groups is detailed in **Table 18**. HAZ distribution curve of the observed population (SMART flags excluded) compared to WHO reference is shifted to the left, (**Figure 4 below)** suggesting restricted linear growth of the observed population. Further analysis (**Figure 5**) suggests that linear growth retardation is at its highest at age of 18-29 months and overall trend increases with the increase of age.

Table 19: Prevalence of stunting by age based on height-for-age z-scores, SMART - Paktika, May 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	261	31	11.9	67	25.7	163	62.5
18-29	205	54	26.3	55	26.8	96	46.8
30-41	222	55	24.8	61	27.5	106	47.7
42-53	135	24	17.8	36	26.7	75	55.6
54-59	25	2	8.0	7	28.0	16	64.0
Total	**848**	**166**	**19.6**	**226**	**26.7**	**456**	**53.8**

Figure 4: Gaussian (normal) distribution curve, HAZ, SMART - Paktika, May 2015

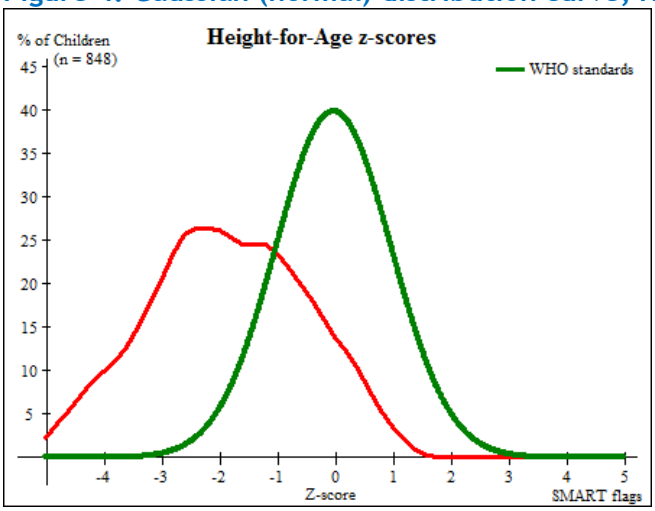
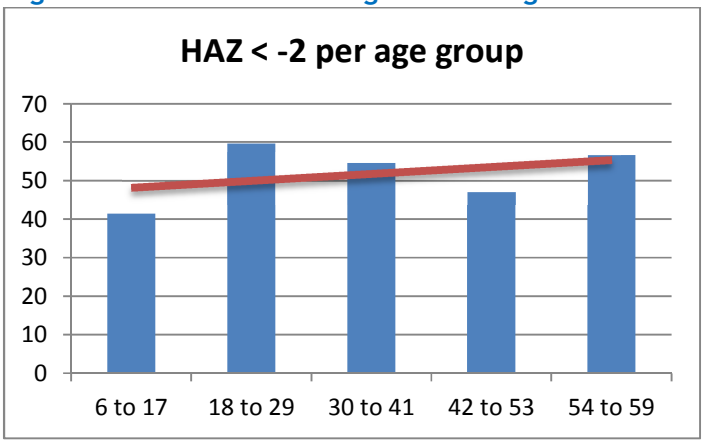


Figure 5: Trends of stunting over the age distribution, SMART - Paktika, May 2015



Prevalence of overweight (WHO 2006)

The prevalence of overweight based on Weight-for-Height > 2 Z scores (no oedema) was of 1.9% (95% CI: 0.8 - 4.5). There was no difference between boys and girls in the sample **(see Table 20).**

Table 20: Prevalence of overweight based on weight for height cut off's and by sex (no oedema), SMART - Paktika, May 2015

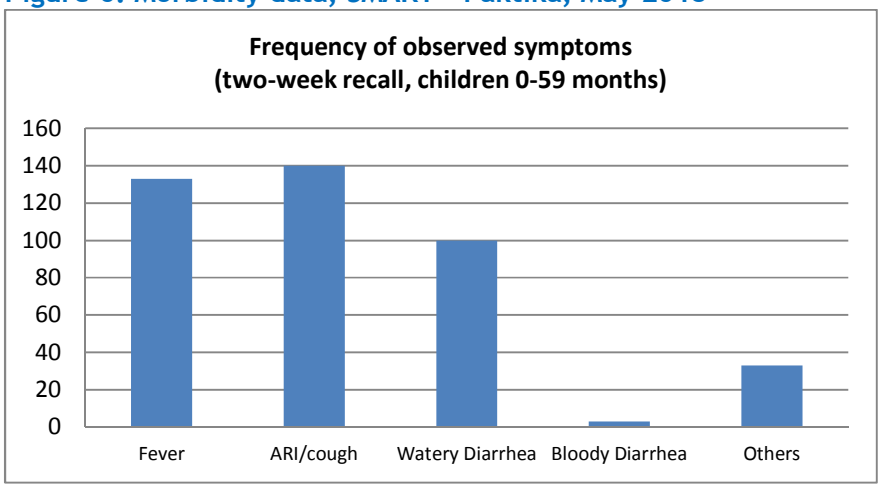
	All n = 890	Boys n = 452	Girls n = 438
Prevalence of overweight (WHZ > 2)	(17) 1.9 % (0.8 - 4.5 95% C.I.)	(7) 1.5 % (0.7 - 3.5 95% C.I.)	(10) 2.3 % (0.8 - 6.4 95% C.I.)
Prevalence of severe overweight (WHZ > 3)	(0) 0.0 % (0.0 - 0.0 95% C.I.)	(0) 0.0 % (0.0 - 0.0 95% C.I.)	(0) 0.0 % (0.0 - 0.0 95% C.I.)

Child Health Indicators

Two weeks recall morbidity (children 0-59 months)

A total of 1012 respondents answered about whether they experienced health issue in the last 2 weeks prior to the day of visit of the survey team, **28.3 %** responded with "yes". The frequencies of the symptoms are presented in the **Figure 6** below.

Figure 6: Morbidity data, SMART - Paktika, May 2015



Immunization, supplementation and deworming

Immunization, supplementation and deworming are proxy indicators informing community health outreach and health seeking behaviours. A total of 844 of children aged 9-59 months are in the sample population. Out of these children, 54.9 % received measles vaccination; 7.3% confirmed by card and 47.6% were confirmed by recall. From the surveyed 1012 children from 0 to 59 months, 48.9% had scar for BCG vaccination. Both measles and BCG are far below the standard of 95% vaccination rate (see **Table 21 and 22 below**).

Table 21: Immunization, SMART - Paktika, May 2015

Types of Vaccine	Class	Frequency	%
Measles immunization Children 9-59 months (n= 844)	Yes, Card	62	7.3
	Yes, Recall	402	47.6
	No	360	42.7
	Don't Know	20	2.4
BCG immunization coverage (n = 1012)	Scar	495	48.9
	No Scar	517	51.1
Polio immunization coverage (n = 1012)	Yes, card	125	12.4
	Yes, Recall	759	75.0
	No	122	12
	Don't know	6	1

Table 22: Vitamin A and Deworming, SMART - Paktika, May 2015

	Class	Frequency	%
Vitamin A supplementation (6-59 months, 6 months recall) n=914	Yes	504	55.1
	No	410	44.9
Deworming (12-59 months, 6 months recall) n=757	Yes	79	10.4
	No	678	89.6

IYCF Indicators

The sample for Infant and Young Child Feeding (IYCF) practices included all children 0 – 23 months, representing a total of 485 children. The results are presented as percentage of the total answers available, and as such will not be presented with confidence interval (**See Table 23**).

Table 23: Infant and Young Child Feeding Practice, SMART -Paktika, May 2015

Core Indicator	Definition	Frequency	%
Child ever breastfed (n=485)	Proportion of children who have ever received breast milk	481	99.2
Timely initiation of breastfeeding (n=480)	Proportion of children born in the last 23 months who were put to the breast within one hour of birth	270	56.3
Provision of colostrum within first 3 days (n=480)	Proportion of children who received colostrum (yellowish liquid) within the first 3 days after birth	379	99.8
Still breastfed at 1 year (n=93)	Proportion of children 12–15 months of age who are fed breast milk.	65	69.89
Exclusive breast feeding (n=106)	Proportion of infants 0–5 months of age who are fed exclusively with breast milk.	2	1.9
Introduction of solid, semi-solid or soft foods (n=48)	Proportion of infants 6–8 months of age who receive solid, semi-solid or soft foods.	19	39.6

Maternal Nutrition status and hand washing

All women aged between 15 and 49 years (n=1221), found in the selected households, were included in the analysis of the following 3 key indicators:

- Physiological status (n=1220)
- Nutritional status based on MUAC cut-off
- Iron/folate supplementation for pregnant women (at least once during the visit of the survey team)

Table 24: Physiological status of women of reproductive age (15 - 49 years) (n=1120), SMART -Paktika, May 2015

Status	Frequency	%
Pregnant	170	15.2
Lactating	345	30.8
Pregnant & Lactating	15	1.3
Non-pregnant & non-lactating	590	52.7

Table 25: Nutritional status of women of reproductive age based on Mid-Upper Arm Circumference (n=1220), SMART - Paktika, May 2015

MUAC Cut-off	Frequency	%
MUAC <230 mm	274	24.5
MUAC ≥ 230 mm	843	75.5

Table 26: Iron Folate supplementation for pregnant women based on available answers, (n=174), SMART -Paktika, May 2015

Iron Folate for pregnant women	Frequency	%
Yes	35	20.1
No	103	59.2
Do not know	36	20.7

Appropriate hands washing is a general measure that contributes to the prevention and control of communicable disease, during the survey a total of 541 mothers or caretakers were surveyed. 84.4% washed their hand in all 4 critical moments. Frequencies per practice can be seen in **Table 28** below.

Table 27: Hand-washing practice by caretakers, (n=541), SMART - Paktika, May 2015

Response	Frequency	%
After Toilet/latrines	521	96.3
Before cooking	514	95.0
Before eating	530	97.9
After taking children to the toilet	471	87.0

* This was a multiple response question; percentages don't add up to 100.

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

The use of soap depends mainly on access to soap. 24.6% of the caretakers had no access to, or had no knowledge on the use of soap.

Table 28: Use of soap by caretakers, (n=540) SMART - Paktika, May 2015

Hand Washing care takers (n=540)	Frequency	%
Only water	133	24.6
Soap	274	50.7
Soap when I can afford it	131	23.3
Traditional herb	2	0.4
Other	0	0.0

Mortality and Demographics

Mortality Results

The crude mortality rate (CMR) was **0.25** (95% CI: 0.13-0.47) and the under-five mortality rate (U5MR) was **0.33** (95% CI: 0.12-0.87). Both CMR and U5MR rates are above the WHO's alert thresholds of 1/10,000/day and 2/10,000/day respectively. The design effects for CMR and U5MR were between 1 and 1.89 indicating little inter-cluster variations (clustering of deaths) in the population, see bellow table. The main causes of death were not collected; hence this information is not included in this report.

Table 29: Mortality Rates, SMART - Paktika, May 2015

Retrospective Mortality in 120 days prior to survey	Rate	(95% CI)
CMR (total deaths/10,000 people / day):	0.25	0.13-0.47
U5MR (deaths in children under five/10,000 children under five / day):	0.34	0.13-0.90

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 30**. A total of 6394 individuals were surveyed and 1012 were reported to have children under age of 5 years.

Table 30: Short summary of demographics, SMART- Paktika, May 2015

Indicator	Value
Average HH size	11.6 members
Children under 5	15.8 %
Most frequent HH size	7 members
Min HH Size	2 members
Max HH Size	48 members

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 **Table 31**.

Table 31: structure and type of households, n=517, SMART - Paktika May 2015

Head of HH	Frequency	%
Male	421	81.4
Female	8	1.5
Both	80	15.5
Others	8	1.5

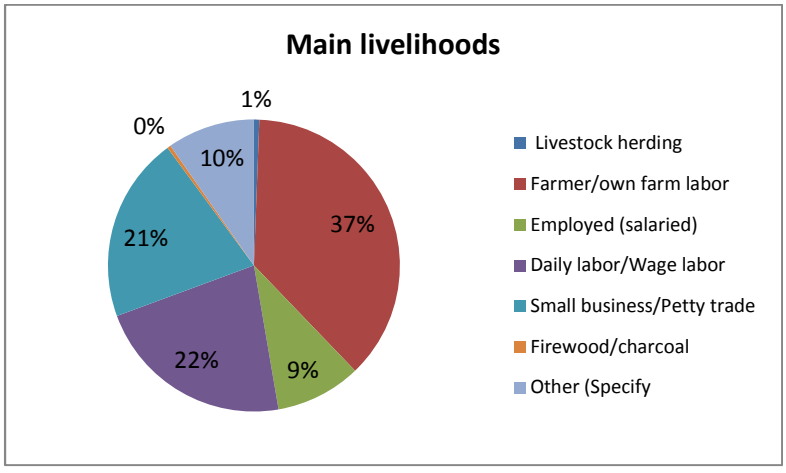
Table 32: structure and type of households, n= 515, SMART - Paktika May 2015

Family type	Frequency	%
Monogamy	467	90.7
Polygamy	40	7.8
Single Parent	8	1.6

Main livelihoods

The main livelihoods were defined as those of the family heads. The farming was main livelihood for 37.2% of the surveyed families. See Figure 7 below.

Figure 7: Main livelihoods, (n= 516), SMART - Paktika, May 2015



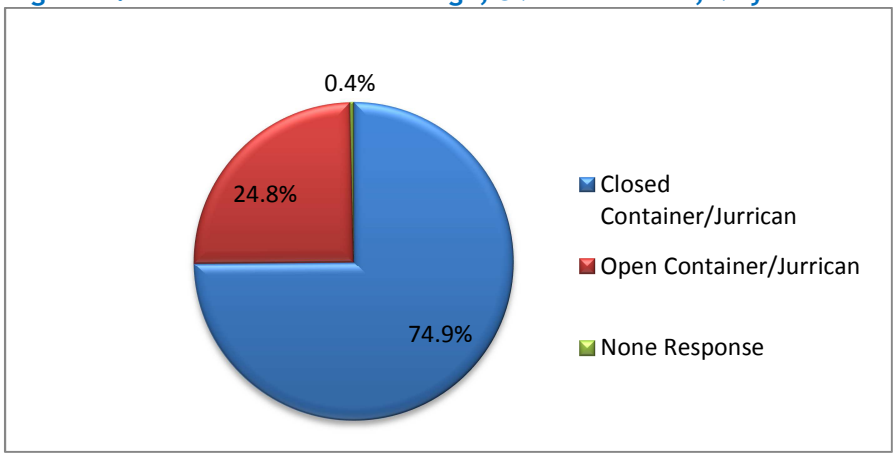
Water consumption and storage at Household level

Two proxy indicators were collected in order to gather overall information about access to water and its quality at surveyed households:

- Household water storage
- Liters of water/person/day used in households, with 24 hours of recall

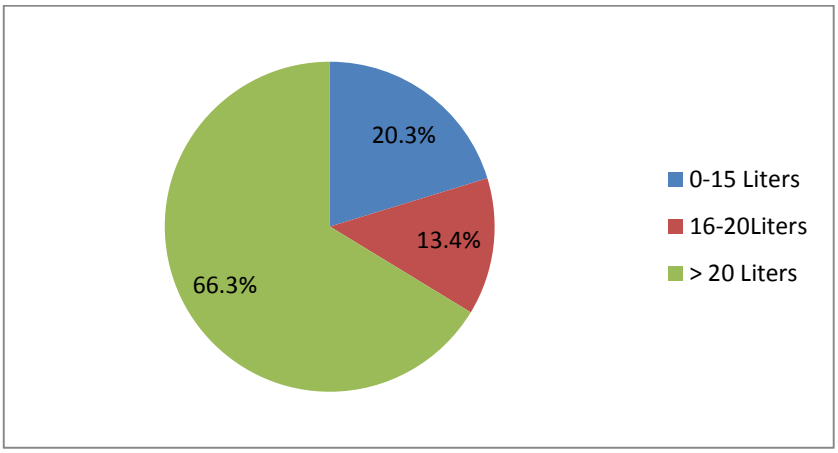
From the total 529 households visited during the survey, 74.9% were storing water closed container or jerricans **(Figure 8**).

Figure 8: Households water storage, SMART Paktika, May 2015



Data collection in order to assess access to water per person per day was going through two stages: first was asked for the total amount of water in liters (using pictorial representation for water storages available in Afghanistan) used in a household and second, exclusion of the water used for animals was done, approximately indicated by the interviewers. The available for human use water (in liters) have been calculated for each household member as average, with the data from the mortality questionnaire. Thus average consumption per person per day each surveyed household was available. The household were subsequently divided into 3 classes: 0-15, 16 to 20 and >20 liters per person per day. Results are graphically presented in **Figure 9.**

Figure 9: Households access to water (liters/person/day), n=529, SMART - Paktika, May 2015



According to the 24 hours recall of water availability in the studied households, the individuals in 20.3 % of the households had less than 15 Litres/person/day of water.

DISCUSSION

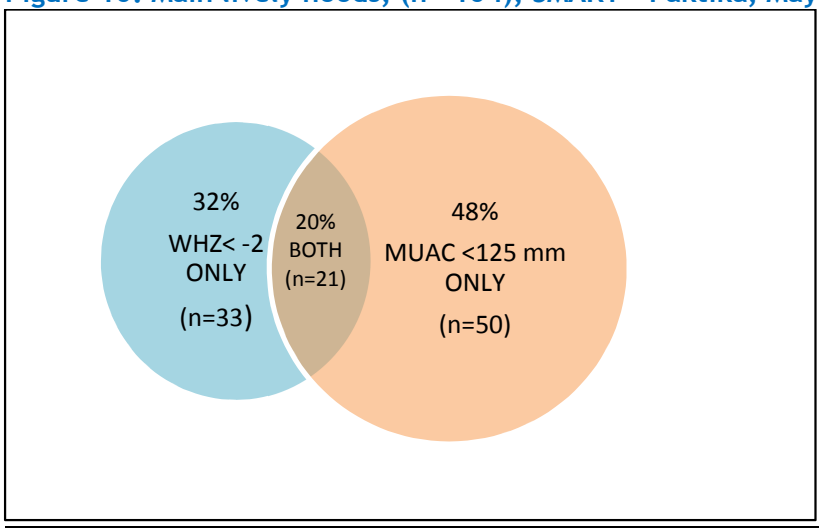
Nutritional Status

Global Acute Malnutrition

The GAM rate, based on both WHZ and MUAC, respectively of 6.1 % (95% CI: 4.5 - 8.1) and 7.8% (95% CI: 5.5-10.9), are lower than the WHO emergency threshold of 15%. They can be classified as poor. The SAM rates based on both WHZ and MUAC, respectively of 0.8% (95% CI: 0.3 - 1.8) and 1.4% (95% CI: 0.8 - 2.6), were also lower than the 4% threshold used in the context of Afghanistan to trigger emergency. However this prevalence might be considered cautiously for programming as in Afghanistan both weight-for-height and MUAC are used as criteria to attend undernutrition management services. In Paktika, for example, out of the total 104 children 6-59 months found to be malnourished according to approved classification of acute malnutrition, only 21 were complying with both criteria (see **Figure 10** below). This data support the hypothesis that in Paktika about 30% of the acutely malnourished children are WHZ <-2, and **MUAC based community screenings are not enough to detect all acutely malnourished children eligible for treatment according** criteria stipulated in Afghanistan IMAM Guidelines[10]. This has to be however further investigated.

Both GAM WHZ and MUAC have been more prevalent in children from 6-29 months compared to children from 30-59 age groups. This suggests higher vulnerability of younger children to wasting. Gender disaggregated analysis does not point out any significant differences of GAM between genders.

Figure 10: Main lively hoods, (n= 104), SMART - Paktika, May 2015



[10] Integrated Guidelines for the Management of Acute Malnutrition, MoPH General Directorate of Preventive Medicine, Public Nutrition Department, Islamic Republic of Afghanistan, 2014

Chronic malnutrition

Chronic malnutrition trends in Paktika province remain worrying. The results show a level of chronic malnutrition considered "high", exceeding the 40% threshold of WHO for public health significance [HAZ<-2 was of 46.2 % (95% CI: 41.1 - 51.4)]. The rate of stunting was higher than the national stunting figures reported in the NNS-2013 (34.0%). In Paktika the lower age group, 6-29 months, was found to be the most affected by stunting, this could be linked with eventual premature or low birth weight babies and/or low maternal nutrition status. Slight linear trends of increasing stunting with the age were also observed.

This highlights the need to prioritize stunting prevention interventions in Paktika. Programming for stunting will require a more comprehensive and long-term approach (outside the emergency context). As stipulated in Lancet Series 2008, globally the prevalence of chronic malnutrition can be reduced by about a third if effective large scale interventions touching the maternal and birth outcomes, newborn babies, infants and children are implemented[11] (deworming, encouraging timely health seeking behavior, improved supplementation, improved breastfeeding and complementary feeding practice, etc.) Maternal nutrition and reproductive health also needs to be improved significantly in order to have better impact on high stunting rates.

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 24.5 % of the mothers were found to have a MUAC<230mm, which suggest that a considerable number of PLWs in Paktika are with compromised nutritional status. The main concern was iron supplementation among pregnant women which the survey found to be very low (20.1%). Iron supplementation prevents 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. 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 significant progress by reinforcing ANC and CHW home visits to PLW.

[11] 2008 Lancet series on Maternal and Child Undernutrition

Mortality Rates

The crude mortality rate (CMR) was **0.25** (95% CI: 0.13-0.47) and the under-five mortality rate (U5MR) was **0.33** (95% CI: 0.12-0.87) [Table 5.13]. Both CMR and U5MR rates are above the WHO's *alert* thresholds of 1/10,000/day and 2/10,000/day respectively.

Risk factors

Morbidity, immunization, supplementation and deworming

Immunization is an important public health intervention that protects children from illness and disability. As part of the Expanded Program on Immunization (EPI), measles vaccination is given to infants on the 9th month. In the survey, measles immunization was asked among parents or caregivers of children 9-59 months old.

The results showed that based on vaccination card records, 7.3% of children were vaccinated, either through the routine services or during the special massive measles vaccination. On the other hand, 47.6% were reported vaccinated but without cards. About 43% were not yet vaccinated and this group will be at risk to measles infection and its consequences like under-nutrition and deficiencies in vitamin A and zinc. It is very important to note immunization coverage such as measles coverage (54.9%) and BCG coverage (48.9%) was very low compared to the national target (95%).

Provision of vitamin A supplementation every 6 months can help protect a child from death and disease associated with vitamin A deficiency and is recognized as one of the most cost-effective approaches to improve child survival. Improving the vitamin A status of deficient children through supplementation enhances their resistance to disease and can significantly reduce mortality. The coverage of Vitamin A supplementation, 6 months prior to the survey, was low. About 55.1% children from the sample received vitamin A supplementation. About 44.9 % of the children did not receive vitamin A supplement in Paktika province, these children are at the highest risk of having poor immune systems which may make them vulnerable to getting illnesses like diarrhea that may then lead to under-nutrition. Building awareness on Vitamin A is of importance as the current rates are very low compared to the recommended WHO target of 80%.

Helminths or intestinal worms represent a serious public health problem. Helminths cause significant malabsorption of vitamin A and aggravate malnutrition and anemia, which eventually contributes to retarded growth and poor performance in school. Children under five years old are extremely vulnerable to the deficiencies induced by worm infestations. This

puts deworming as critical for the reduction of child morbidity and mortality. For these reasons, deworming is recommended for children 12-59 months old as children in this age group are considered to be susceptible to disease. Deworming also helps enhance the iron status of children which eventually helps children to exercise their intellectual ability to the fullest. Deworming is only a short-term measure of reducing worm infestation and re-infestation is frequent. Control measures through improved sanitation, hygiene and deworming are needed to prevent infestation and re-infestation. The survey found alarming rates of children not dewormed (89.6%) in the past 6 months prior to the survey. Strengthening deworming through BPHS/CBHC services has to be top priority for the following months.

Infant and young child feeding practices

The World Health Assembly and the Executive Board of the United Nations Children's Fund (UNICEF) endorsed The Global Strategy for Infant and Young Child Feeding in 2002. The global IYCF strategy provides governments and other stakeholders with strategies and key components to improve IYCF practices. These need to be adapted and contextualized to the situation, conditions and cultural norms at the country level.

IYCF recommendations in Afghanistan are aligned with the Global Strategy for Infant and Young Child Feeding and include initiation of breastfeeding within the first hour of life, exclusive breastfeeding for six months, and provision of appropriate, adequate and safe complementary food at six months while continuing breastfeeding until two years and beyond.

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. In this survey the care takers of 104 children 0 to 5 months have been asked whether they feed or fed other than breastmilk to their child and only 1.9% of the answers were negative. As general rule mothers very often give additional "reinforcement" to their babies under the form of sugar water, butter (ghee) or honey. The very early introduction of complementary food is another practice affecting exclusive breastfeeding rates. However, exclusive breastfeeding rate is of real concern as it potentially contributes to increased morbidity and stunting in the first two years of life.

The complementary feeding practice is of concern too. Although, the sample of children from 6-9 months was limited, for more than third of the children, complementary feeding was

not yet introduced. More worrying is the fact that for those already fed with complementary solid or liquid food, in none of the answers, the use of fruits or vegetables was reported. Diet was mentioned to be mainly cereals, roots and dairy products, which limits the access to greatly needed for the child growth vitamins and minerals.

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. WASH findings from the 5 districts of Paktika province are found 66.3% of HH were accessing the recommended amount of water per person per day, 84.4% of the caretakers were with good hand washing practices, in 74.9% of the HH water storage was with closed container/Jerricans. It is however important to note that due to the limited scope of WASH questions and indicators included, a more general conclusion of the WASH situation is not possible. Also the survey did not include observation of the practice of hand washing and the responses are suspected to be more of knowledge-based than practice-based which means that these results need to be interpreted with caution. In order to understand better the WASH situation in these 5 districts it is important to conduct a more in depth WASH assessment.

In conclusion, this survey provided evidence that the children in Paktika province were under chronic nutritional stress in form of stunting indicating the requirement of immediate appropriate public health intervention. The findings of this survey have important implications for public health policy-makers, planners and organizations seeking to meet national and international developmental targets.

RECOMMENDATIONS

Survey finding	Recommendations	Responsible
Poor GAM rates by WHZ and MUAC	There is a need to recalibrate the targets for acute malnutrition in line with the findings	MOPH, Nutrition Cluster BPHS implementers
High level of Stunting	Support community-based programs to provide information and counseling on optimal and appropriate IYCF practices	MoPH, GCMU, Nutrition cluster and BPHS partner
	Educate pregnant women about the importance of prenatal and postnatal care, optimum maternal nutrition, especially during pregnancy, and health care for them to prevent low birth weight babies	
	Promote regular growth monitoring and promotion at all health facilities and health posts in the province	
Very low Vitamin A, measles and BCG vaccination coverage	Raise awareness of mothers on micronutrient supplementation and vaccination campaigns	MOPH, WHO, EMT, BPHS/EPHS implementers
	Strengthen distribution channels of vitamin A, vaccination supplies as well as monitoring and evaluation of campaigns	
	Advocate and support measles vaccination campaign, particularly in zones that are less accessible due to security issues	
	Community sensitization on importance of micronutrient supplementation and immunization for children and pregnant women.	
Childhoods illness	Reduce child morbidity by educating households on proper care and hygiene practices.	MOPH, Community units, BPHS and EPHS implementer
	Improve awareness and investigate more on barriers for improved health care seeking by families for management of childhood illnesses	
	Strength health education at community and health facilities level	
Poor Maternal Nutrition status and very poor Iron folate supplementation for pregnant women	To strength awareness on micronutrients supplementation during pregnancy and lactation in health facilities and community levels.	MOPH, WFP, BPHS and EPHS implementers
	To strength reproductive health services at both facilities and community level.	
	To continues and provide Targeted SFP programs to support pregnant and lactating women (PLWs)	
	Promotion of community sensitization on micronutrients and adequate food intake during pregnancy and lactation	
WASH	Intervention programs for improving hygiene practices including health education to inform the community on domestic treatment of drinking water and proper disposal of human fecal waste to avoid contamination of water sources.	MOPH,MRRD Community units, BPHS and EPHS implementer
Low Exclusive breast feeding rates and poor complementary feeding	Strengthen the IYCF component of the nutrition intervention in Paktika through larger support and establishment of FHAGs.	BPHS implementer, Nutrition cluster, and PND
	Increase awareness of IYCF practices and knowledge through regular IYCF messages both at facility and community level.	
	Support integrated nutrition interventions with a focus on Infant feeding practices in the province as a strategy to combat malnutrition.	

Other key programmatic recommendations are:

- Strength regular supervisions, Monitoring and Surveillance systems on health facilities and community level
- To strength active and passive case finding and timely reporting systems
- Advocate at the national level for acceptance of a standardized SMART methodology as a regular monitoring tool of nutrition situation in the country
- To survey districts which were not included in this survey.

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

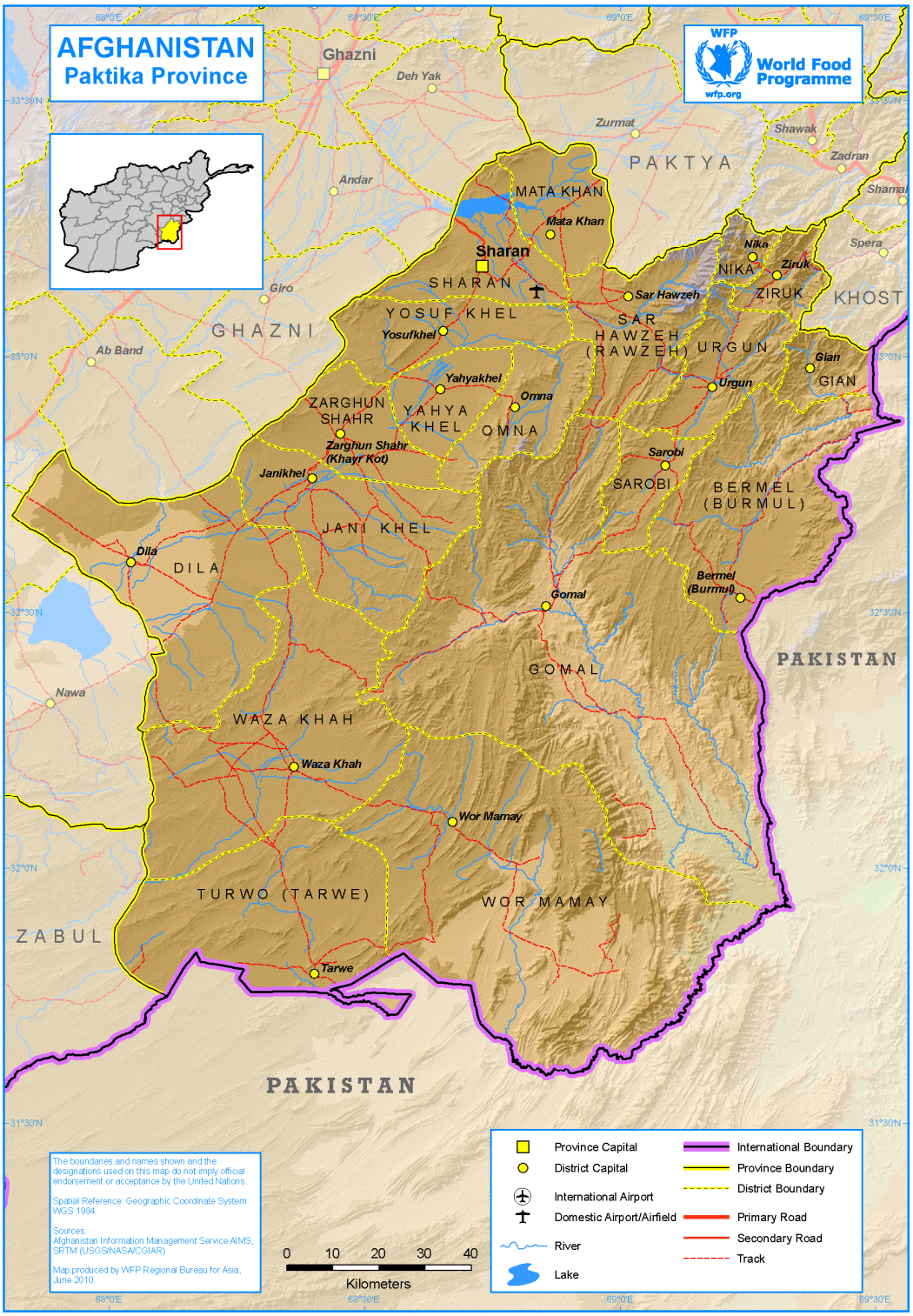
National nutrition survey 2013 GAM calculated with SD of 1

Afghanistan Mortality survey, 2010

National vulnerability assessment of Afghanistan -2014

ANNEXES

Annex 1: Physical map of Paktika



Annex 2: Cluster sampling

No	Province	District	Geographical unit	Population size	Cluster
1	Paktika	Matakhan	Mank /baran kala	1216	1
2	Paktika	Matakhan	Moshtarak	256	2
3	Paktika	Matakhan	Adil kala / landi wal	1123	3
4	Paktika	Matakhan	Sowee khana	801	4
5	Paktika	Sharana	Safari	717	5
6	Paktika	Sharana	Garo kala	328	6
7	Paktika	Sharana	Chakan kala	2232	7
8	Paktika	Sharana	Karmo khial	399	8
9	Paktika	Sharana	Khaliq kala	102	9
10	Paktika	Sharana	Zar wali kala	3123	10
11	Paktika	Sharana	Chardeh	2611	11
12	Paktika	Sharana	Zara sharana	1178	12
13	Paktika	Sharana	Mohamad jan kala	430	RC
14	Paktika	Sharana	Sara kala	3369	13
15	Paktika	Sharana	Daftan I molayan	256	14
16	Paktika	Sharana	jabar kahil	743	15
17	Paktika	Sharana	Haji alam jomat	256	16
18	Paktika	Sharana	Shair jomat	220	RC
19	Paktika	Sharana	Shiefa kala	154	17
20	Paktika	Sharana	Dalo kala	820	18
21	Paktika	Sharana	Maswas	646	19
22	Paktika	Sharana	Maswas bar	820	20
23	Paktika	Yousefkhil	Porta Masha kahil	1950	21
24	Paktika	Yousefkhil	khil gul jomat	1851	22
25	Paktika	Yousefkhil	Bokhan khial	1190	23
26	Paktika	Yousefkhil	Zee	1990	24
27	Paktika	Yousefkhil	Arynan	1837	25
28	Paktika	Yousefkhil	Gholam khial	1772	26
29	Paktika	Yousefkhil	Goda kahil	2000	RC
30	Paktika	Yousefkhil	Koz madi khail	1820	27
31	Paktika	Yousefkhil	Mast chapoli	2625	28
32	Paktika	Yousefkhil	Sahib khail	1500	29
33	Paktika	Sarhuza	Mobarak qala	328	30
34	Paktika	Sarhuza	Mola sahib jomat	1326	31
35	Paktika	Sarhuza	Mondi jomat	922	RC
36	Paktika	Sarhuza	Mado khail jomat	614	32
37	Paktika	Khirkot	Gdali	2150	33
38	Paktika	Khirkot	Khar landi	2868	34
39	Paktika	Khirkot	Moh hasan	2253	35
40	Paktika	Khirkot	Moh dost	2560	36
41	Paktika	Khirkot	Se Ganah	5632	37,38

Annex 3: Plausibility check

Plausibility check for: AFG_201505_ACF_PAKTIKA_SMART.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 (% of out of range subjects)	Incl	%	0-2.5 0	>2.5-5.0 5	>5.0-7.5 10	>7.5 20	**0** (2,4 %)
Overall Sex ratio (Significant chi square)	Incl	p	>0.1 0	>0.05 2	>0.001 4	<=0.001 10	**0** (p=0,487)
Age ratio(6-29 vs 30-59) (Significant chi square) (p=0,000)	Incl	p	>0.1 0	>0.05 2	>0.001 4	<=0.001 10	**10**
Dig pref score - weight	Incl	#	0-7 0	8-12 2	13-20 4	> 20 10	**0** (4)
Dig pref score - height	Incl	#	0-7 0	8-12 2	13-20 4	> 20 10	**2** (8)
Dig pref score - MUAC	Incl	#	0-7 0	8-12 2	13-20 4	> 20 10	**0** (6)
Standard Dev WHZ .	Excl	SD	<1.1 and	<1.15 and	<1.20 and	>=1.20 or	
.	Excl	SD	>0.9 0	>0.85 5	>0.80 10	<=0.80 20	**0** (1,06)
Skewness WHZ	Excl	#	<±0.2 0	<±0.4 1	<±0.6 3	>=±0.6 5	**0** (-0,07)
Kurtosis WHZ	Excl	#	<±0.2 0	<±0.4 1	<±0.6 3	>=±0.6 5	**0** (-0,15)
Poisson dist WHZ-2	Excl	p	>0.05 0	>0.01 1	>0.001 3	<=0.001 5	**0** (p=0,335)
OVERALL SCORE WHZ =			0-9	10-14	15-24	>25	**12** %

The overall score of this survey is 12 %, this is good.

There were no duplicate entries detected.

Percentage of children with no exact birthday: 84 %

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

Line=10/ID=1: **WHZ (2,910)**, Weight may be incorrect
Line=15/ID=1: **WHZ (3,172)**, Weight may be incorrect
Line=17/ID=2: HAZ (1,670), WAZ (2,400), Age may be incorrect
Line=55/ID=3: HAZ (1,942), Height may be incorrect
Line=64/ID=1: HAZ (1,916), Height may be incorrect
Line=87/ID=1: HAZ (2,416), Age may be incorrect
Line=106/ID=4: HAZ (1,294), Age may be incorrect
Line=127/ID=2: HAZ (2,634), WAZ (2,983), Age may be incorrect
Line=141/ID=2: WAZ (1,852), Weight may be incorrect

Line=142/ID=3: **WHZ (3,972)**, WAZ (2,839), Weight may be incorrect
Line=150/ID=3: HAZ (2,269), Height may be incorrect
Line=160/ID=1: HAZ (1,211), Height may be incorrect
Line=185/ID=1: **WHZ (3,070)**, Weight may be incorrect
Line=203/ID=3: HAZ (-5,359), WAZ (-4,783), Age may be incorrect
Line=208/ID=5: WAZ (-4,660), Age may be incorrect
Line=232/ID=2: **WHZ (-3,365)**, Weight may be incorrect
Line=247/ID=1: HAZ (3,926), WAZ (2,243), Age may be incorrect
Line=248/ID=2: HAZ (-4,859), Age may be incorrect
Line=267/ID=2: HAZ (1,416), Height may be incorrect
Line=272/ID=3: WAZ (-4,314), Age may be incorrect
Line=294/ID=1: HAZ (-5,514), Age may be incorrect
Line=297/ID=1: HAZ (-5,055), Age may be incorrect
Line=298/ID=2: HAZ (-4,912), Age may be incorrect
Line=302/ID=1: HAZ (-4,835), Age may be incorrect
Line=310/ID=4: HAZ (-5,559), WAZ (-4,654), Age may be incorrect
Line=311/ID=5: HAZ (-4,832), Age may be incorrect
Line=372/ID=1: HAZ (2,870), Height may be incorrect
Line=374/ID=1: **WHZ (-4,712)**, WAZ (-4,903), Weight may be incorrect
Line=378/ID=1: HAZ (1,635), Age may be incorrect
Line=379/ID=2: HAZ (-6,753), Age may be incorrect
Line=381/ID=2: HAZ (-5,753), Age may be incorrect
Line=395/ID=1: HAZ (-5,130), Age may be incorrect
Line=405/ID=2: HAZ (-5,096), WAZ (-4,412), Age may be incorrect
Line=413/ID=1: HAZ (-4,935), Age may be incorrect
Line=435/ID=3: HAZ (-5,961), WAZ (-5,018), Age may be incorrect
Line=437/ID=1: HAZ (1,810), Age may be incorrect
Line=476/ID=2: HAZ (1,699), WAZ (2,258), Age may be incorrect
Line=484/ID=5: HAZ (-5,813), Age may be incorrect
Line=486/ID=2: HAZ (-5,318), Age may be incorrect
Line=490/ID=1: HAZ (-6,395), WAZ (-4,651), Age may be incorrect
Line=508/ID=1: HAZ (2,159), Age may be incorrect
Line=512/ID=5: HAZ (3,864), WAZ (1,909), Age may be incorrect
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Line=530/ID=2: HAZ (4,571), WAZ (2,789), Age may be incorrect
Line=561/ID=1: HAZ (3,853), Age may be incorrect
Line=570/ID=1: **WHZ (2,903)**, WAZ (2,658), Weight may be incorrect
Line=587/ID=1: **WHZ (2,947)**, HAZ (1,341), WAZ (2,738)
Line=589/ID=3: HAZ (-5,062), Age may be incorrect
Line=613/ID=2: **WHZ (-3,483)**, Weight may be incorrect
Line=622/ID=1: HAZ (2,019), Age may be incorrect
Line=628/ID=1: HAZ (1,895), Height may be incorrect
Line=667/ID=1: HAZ (-5,163), Age may be incorrect
Line=698/ID=1: HAZ (1,414), Age may be incorrect
Line=699/ID=1: HAZ (1,697), Age may be incorrect
Line=700/ID=2: HAZ (2,335), WAZ (2,449), Age may be incorrect
Line=717/ID=1: HAZ (-5,130), Age may be incorrect
Line=720/ID=1: HAZ (-7,105), Age may be incorrect
Line=723/ID=1: HAZ (1,754), Age may be incorrect
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Line=783/ID=3: HAZ (-4,997), Age may be incorrect
Line=792/ID=7: HAZ (-9,695), Height may be incorrect
Line=836/ID=5: **WHZ (4,423)**, HAZ (-5,065), Height may be incorrect
Line=857/ID=1: **WHZ (-4,158)**, Weight may be incorrect
Line=865/ID=2: **WHZ (-3,724)**, Weight may be incorrect
Line=902/ID=3: **WHZ (-5,479)**, HAZ (8,839), Height may be incorrect
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Line=928/ID=1: **WHZ (3,353)**, Height may be incorrect
Line=933/ID=2: HAZ (2,160), Age may be incorrect
Line=935/ID=2: **WHZ (-3,658)**, Weight may be incorrect
Line=937/ID=1: **WHZ (-3,338)**, Height may be incorrect
Line=940/ID=2: HAZ (-4,965), Age may be incorrect
Line=941/ID=3: **WHZ (-3,645)**, Weight may be incorrect
Line=951/ID=2: HAZ (-5,637), WAZ (-4,433), Age may be incorrect
Line=973/ID=1: **WHZ (-3,334)**, Weight may be incorrect
Line=976/ID=2: **WHZ (-6,016)**, HAZ (1,416), Height may be incorrect
Line=987/ID=2: **WHZ (-3,745)**, Weight may be incorrect

Percentage of values flagged with SMART flags:WHZ: 2,4 %, HAZ: 7,1 %, WAZ: 2,3 %

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: 1,31 (The value should be around 0.85).:
p-value = 0,000 (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	154/108,4 (1,4)	135/103,5 (1,3)	289/211,8 (1,4)	1,14
18 to 29	12	112/105,6 (1,1)	117/100,9 (1,2)	229/206,5 (1,1)	0,96
30 to 41	12	122/102,4 (1,2)	108/97,8 (1,1)	230/200,2 (1,1)	1,13
42 to 53	12	69/100,8 (0,7)	71/96,2 (0,7)	140/197,0 (0,7)	0,97
54 to 59	6	10/49,8 (0,2)	15/47,6 (0,3)	25/97,4 (0,3)	0,67
6 to 59	54	467/456,5 (1,0)	446/456,5 (1,0)		1,05

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

Overall sex ratio: p-value = 0,487 (boys and girls equally represented)
Overall age distribution: p-value = 0,000 (significant difference)
Overall age distribution for boys: p-value = 0,000 (significant difference)
Overall age distribution for girls: p-value = 0,000 (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: **4** (0-7 excellent, 8-12 good, 13-20 acceptable and > 20 problematic)
p-value for chi2: 0,271

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: **8** (0-7 excellent, 8-12 good, 13-20 acceptable and > 20 problematic)
p-value for chi2: 0,000 (significant difference)

Digit preference MUAC:

Digit .0 : ######################
Digit .1 : ##

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

Digit preference score: **6** (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:	1,21	1,17	1,06
(The SD should be between 0.8 and 1.2)			
Prevalence (< -2)			
observed:	7,3%	6,9%	5,9%
calculated with current SD:	8,2%	7,4%	5,4%
calculated with a SD of 1:	4,7%	4,5%	4,4%
HAZ			
Standard Deviation SD:	1,70	1,62	1,34
(The SD should be between 0.8 and 1.2)			
Prevalence (< -2)			
observed:	46,5%	46,4%	46,2%
calculated with current SD:	46,0%	45,5%	45,4%
calculated with a SD of 1:	43,3%	42,7%	43,9%
WAZ			
Standard Deviation SD:	1,28	1,28	1,17
(The SD should be between 0.8 and 1.2)			
Prevalence (< -2)			
observed:	26,9%	26,9%	26,4%
calculated with current SD:	27,9%	27,9%	26,3%
calculated with a SD of 1:	22,6%	22,6%	22,9%

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

WHZ	p= 0,000	p= 0,001	p= 0,151
HAZ	p= 0,000	p= 0,001	p= 0,000
WAZ	p= 0,003	p= 0,003	p= 0,000

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

Skewness

WHZ	-0,30	-0,05	-0,07
HAZ	0,30	0,23	-0,05
WAZ	-0,07	-0,07	-0,21

If the value is:
-below minus 0.4 there is a relative excess of wasted/stunted/underweight subjects in the sample
-between minus 0.4 and minus 0.2, there may be a relative excess of wasted/stunted/underweight subjects in the sample.
-between minus 0.2 and plus 0.2, the distribution can be considered as symmetrical.
-between 0.2 and 0.4, there may be an excess of obese/tall/overweight subjects in the sample.
-above 0.4, there is an excess of obese/tall/overweight subjects in the sample

Kurtosis

WHZ	1,64	0,79	-0,15
HAZ	2,28	0,42	-0,65
WAZ	0,24	0,24	-0,42

```
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=1,08 (p=0,335)
WHZ < -3: ID=1,30 (p=0,103)
Oedema:   ID=0,97 (p=0,516)
GAM:      ID=1,09 (p=0,327)
SAM:      ID=1,13 (p=0,268)
HAZ < -2: ID=2,15 (p=0,000)
HAZ < -3: ID=1,68 (p=0,006)
WAZ < -2: ID=2,00 (p=0,000)
WAZ < -3: ID=1,86 (p=0,001)
```

Subjects with SMART flags are excluded from this analysis.

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

Are the data of the same quality at the beginning and the end of the clusters?
Evaluation of the SD for WHZ depending upon the order the cases are measured within each cluster (if one cluster per day is measured then this will be related to the time of the day the measurement is made).

```
Time                                          SD for WHZ
point                 0.8 0.9 1.0 1.1 1.2 1.3 1.4 1.5 1.6 1.7 1.8 1.9 2.0 2.1 2.2 2.3
01: 1,17 (n=38, f=2)  ################
02: 1,16 (n=37, f=2)  ###############
03: 1,35 (n=34, f=1)  ########################
04: 1,14 (n=36, f=1)  ##############
05: 0,87 (n=35, f=0)  ###
06: 1,29 (n=34, f=1)  ####################
07: 1,01 (n=36, f=0)  #########
08: 1,06 (n=32, f=1)  ###########
09: 1,22 (n=32, f=1)  ##################
10: 1,40 (n=32, f=1)  ########################
11: 1,49 (n=33, f=2)  ##############################
12: 1,00 (n=33, f=0)  ########
13: 1,16 (n=36, f=1)  ###############
14: 1,36 (n=35, f=1)  ########################
15: 1,13 (n=32, f=0)  ##############
16: 0,97 (n=34, f=0)  #######
17: 1,31 (n=33, f=2)  ####################
18: 1,48 (n=27, f=2)  ##############################
19: 1,25 (n=29, f=0)  ##################
20: 1,22 (n=29, f=0)  ##################
21: 1,02 (n=29, f=0)  #########
22: 1,52 (n=24, f=1)  ##############################
23: 1,15 (n=27, f=0)  ###############
24: 1,40 (n=25, f=2)  ########################
25: 0,85 (n=18, f=0)  ##
26: 1,17 (n=17, f=0)  000000000000000
27: 1,30 (n=19, f=0)  ####################
```

```
28: 1,23 (n=14, f=0)  000000000000000000
29: 1,30 (n=10, f=0)  00000000000000000000
30: 0,75 (n=11, f=0)
31: 0,75 (n=10, f=0)
32: 0,76 (n=07, f=0)
33: 0,71 (n=04, f=0)
34: 1,02 (n=05, f=0)  ~~~~~~~~~
35: 1,63 (n=03, f=0)  ~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~
36: 0,30 (n=05, f=0)
37: 2,13 (n=05, f=1)  ~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~
38: 2,04 (n=03, f=0)  ~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~
39: 0,65 (n=03, f=0)
40: 0,49 (n=03, f=0)

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

Analysis by Team

Team	**1**	**2**	**3**	**4**	**5**
n =	149	208	182	196	178
Percentage of values flagged with SMART flags:					
WHZ:	0,0	0,0	3,3	5,6	0,6
HAZ:	3,4	2,9	8,2	9,7	1,1
WAZ:	0,7	0,5	4,4	3,6	0,0
Age ratio of 6-29 months to 30-59 months:					
	1,19	1,06	2,37	0,88	1,62
Sex ratio (male/female):					
	1,22	1,08	0,84	0,96	1,23
Digit preference Weight (%):					
.0 :	9	9	8	3	11
.1 :	11	10	10	18	10
.2 :	9	13	17	3	10
.3 :	14	7	10	12	9
.4 :	9	9	9	8	11
.5 :	9	10	4	12	10
.6 :	9	12	13	10	10
.7 :	9	11	8	10	10
.8 :	5	9	13	12	10
.9 :	14	12	8	13	10
DPS:	8	6	11	14	2
Digit preference score (0-7 excellent, 8-12 good, 13-20 acceptable and > 20 problematic)					
Digit preference Height (%):					
.0 :	17	5	8	1	4
.1 :	9	8	15	20	10
.2 :	9	8	10	15	13
.3 :	8	12	15	11	8
.4 :	9	13	13	15	17
.5 :	13	13	10	13	10
.6 :	9	13	7	10	14
.7 :	13	12	8	9	7
.8 :	7	11	5	5	11
.9 :	6	7	9	1	6
DPS:	10	9	11	20	12
Digit preference score (0-7 excellent, 8-12 good, 13-20 acceptable and > 20 problematic)					
Digit preference MUAC (%):					
.0 :	12	5	4	1	6
.1 :	8	6	12	10	10
.2 :	9	14	11	9	7
.3 :	8	13	12	9	7
.4 :	12	9	13	9	9
.5 :	14	11	13	10	7
.6 :	12	8	9	20	15
.7 :	8	12	7	13	10

.8 :	6	12	8	16	12
.9 :	11	11	12	3	17
DPS:	8	9	9	18	12

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

Standard deviation of WHZ:

SD	1,14	1,06	1,30	1,38	1,12

Prevalence (< -2) observed:

%	6,7	5,3	7,8	9,2	7,3

Prevalence (< -2) calculated with current SD:

%	7,1	5,6	9,1	10,3	8,5

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

%	4,7	4,6	4,1	4,0	6,2

Standard deviation of HAZ:

SD	1,61	1,60	1,89	1,78	1,52

observed:

%	46,3	50,5	39,6	36,7	60,1

calculated with current SD:

%	43,2	48,7	42,3	41,7	55,6

calculated with a SD of 1:

%	39,1	47,9	35,7	35,3	58,4

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

Team 1:

Age cat.	mo.	boys	girls	total	ratio boys/girls
6 to 17	12	30/19,0 (1,6)	17/15,5 (1,1)	47/34,6 (1,4)	1,76
18 to 29	12	10/18,5 (0,5)	24/15,2 (1,6)	34/33,7 (1,0)	0,42
30 to 41	12	31/18,0 (1,7)	13/14,7 (0,9)	44/32,7 (1,3)	2,38
42 to 53	12	10/17,7 (0,6)	12/14,5 (0,8)	22/32,2 (0,7)	0,83
54 to 59	6	1/8,8 (0,1)	1/7,2 (0,1)	2/15,9 (0,1)	1,00
6 to 59	54	82/74,5 (1,1)	67/74,5 (0,9)		1,22

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

Overall sex ratio: p-value = 0,219 (boys and girls equally represented)
Overall age distribution: p-value = 0,000 (significant difference)
Overall age distribution for boys: p-value = 0,000 (significant difference)
Overall age distribution for girls: p-value = 0,024 (significant difference)
Overall sex/age distribution: p-value = 0,000 (significant difference)

Team 2:

Age cat.	mo.	boys	girls	total	ratio boys/girls
6 to 17	12	41/25,1 (1,6)	25/23,2 (1,1)	66/48,3 (1,4)	1,64
18 to 29	12	20/24,4 (0,8)	21/22,6 (0,9)	41/47,1 (0,9)	0,95
30 to 41	12	22/23,7 (0,9)	25/21,9 (1,1)	47/45,6 (1,0)	0,88
42 to 53	12	20/23,3 (0,9)	18/21,6 (0,8)	38/44,9 (0,8)	1,11
54 to 59	6	5/11,5 (0,4)	11/10,7 (1,0)	16/22,2 (0,7)	0,45
6 to 59	54	108/104,0 (1,0)	100/104,0 (1,0)		1,08

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

Overall sex ratio: p-value = 0,579 (boys and girls equally represented)
Overall age distribution: p-value = 0,038 (significant difference)
Overall age distribution for boys: p-value = 0,004 (significant difference)
Overall age distribution for girls: p-value = 0,863 (as expected)
Overall sex/age distribution: p-value = 0,002 (significant difference)

Team 3:

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

6 to 17	12	25/19,3 (1,3)	36/23,0 (1,6)	61/42,2 (1,4)	0,69
18 to 29	12	32/18,8 (1,7)	35/22,4 (1,6)	67/41,2 (1,6)	0,91
30 to 41	12	15/18,2 (0,8)	19/21,7 (0,9)	34/39,9 (0,9)	0,79
42 to 53	12	10/17,9 (0,6)	9/21,4 (0,4)	19/39,3 (0,5)	1,11
54 to 59	6	1/8,9 (0,1)	0/10,6 (0,0)	1/19,4 (0,1)	
6 to 59	54	83/91,0 (0,9)	99/91,0 (1,1)		0,84

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

Overall sex ratio: p-value = 0,236 (boys and girls equally represented)
Overall age distribution: p-value = 0,000 (significant difference)
Overall age distribution for boys: p-value = 0,000 (significant difference)
Overall age distribution for girls: p-value = 0,000 (significant difference)
Overall sex/age distribution: p-value = 0,000 (significant difference)

Team 4:

Age cat.	mo.	boys	girls	total	ratio boys/girls
6 to 17	12	29/22,3 (1,3)	23/23,2 (1,0)	52/45,5 (1,1)	1,26
18 to 29	12	19/21,7 (0,9)	21/22,6 (0,9)	40/44,3 (0,9)	0,90
30 to 41	12	29/21,0 (1,4)	27/21,9 (1,2)	56/43,0 (1,3)	1,07
42 to 53	12	17/20,7 (0,8)	28/21,6 (1,3)	45/42,3 (1,1)	0,61
54 to 59	6	2/10,2 (0,2)	1/10,7 (0,1)	3/20,9 (0,1)	2,00
6 to 59	54	96/98,0 (1,0)	100/98,0 (1,0)		0,96

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

Overall sex ratio: p-value = 0,775 (boys and girls equally represented)
Overall age distribution: p-value = 0,000 (significant difference)
Overall age distribution for boys: p-value = 0,013 (significant difference)
Overall age distribution for girls: p-value = 0,018 (significant difference)
Overall sex/age distribution: p-value = 0,000 (significant difference)

Team 5:

Age cat.	mo.	boys	girls	total	ratio boys/girls
6 to 17	12	29/22,7 (1,3)	34/18,6 (1,8)	63/41,3 (1,5)	0,85
18 to 29	12	31/22,2 (1,4)	16/18,1 (0,9)	47/40,3 (1,2)	1,94
30 to 41	12	25/21,5 (1,2)	24/17,5 (1,4)	49/39,0 (1,3)	1,04
42 to 53	12	12/21,1 (0,6)	4/17,3 (0,2)	16/38,4 (0,4)	3,00
54 to 59	6	1/10,5 (0,1)	2/8,5 (0,2)	3/19,0 (0,2)	0,50
6 to 59	54	98/89,0 (1,1)	80/89,0 (0,9)		1,23

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

Overall sex ratio: p-value = 0,177 (boys and girls equally represented)
Overall age distribution: p-value = 0,000 (significant difference)
Overall age distribution for boys: p-value = 0,001 (significant difference)
Overall age distribution for girls: p-value = 0,000 (significant difference)
Overall sex/age distribution: p-value = 0,000 (significant difference)

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

Team: 1

```
Time                                        SD for WHZ
point              0.8 0.9 1.0 1.1 1.2 1.3 1.4 1.5 1.6 1.7 1.8 1.9 2.0 2.1 2.2 2.3
01: 0,78 (n=08, f=0)
02: 0,91 (n=08, f=0)  #####
```

```
03: 0,89 (n=07, f=0)  ####
04: 0,97 (n=07, f=0)  #######
05: 0,60 (n=08, f=0)
06: 1,15 (n=08, f=0)  ###############
07: 0,67 (n=08, f=0)
08: 1,15 (n=08, f=0)  ###############
09: 1,01 (n=06, f=0)  #########
10: 1,79 (n=07, f=0)  ########################################
11: 1,76 (n=06, f=1)  ########################################
12: 0,89 (n=07, f=0)  ####
13: 1,03 (n=08, f=0)  ##########
14: 2,16 (n=07, f=1)  ############################################################
15: 0,85 (n=05, f=0)  ##
16: 0,77 (n=06, f=0)
17: 1,00 (n=05, f=0)  ########
18: 2,15 (n=03, f=0)  OOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOO
19: 1,64 (n=03, f=0)  OOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOO
20: 0,80 (n=02, f=0)
21: 0,99 (n=04, f=0)  OOOOOOOO
22: 0,99 (n=04, f=0)  OOOOOOOO
23: 1,13 (n=04, f=0)  OOOOOOOOOOOOOO
24: 0,32 (n=03, f=0)
25: 0,23 (n=02, f=0)
26: 0,56 (n=03, f=0)
27: 1,41 (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: 1,30 (n=08, f=1)  ######################
02: 0,92 (n=08, f=0)  #####
03: 0,84 (n=08, f=0)  ##
04: 1,07 (n=08, f=0)  ############
05: 0,53 (n=08, f=0)
06: 1,05 (n=06, f=0)  ############
07: 1,18 (n=07, f=0)  ################
08: 0,68 (n=04, f=0)
09: 0,86 (n=07, f=0)  ##
10: 1,23 (n=06, f=0)  ##################
11: 1,15 (n=07, f=0)  ################
12: 1,20 (n=07, f=0)  ##################
13: 0,78 (n=08, f=0)
14: 0,99 (n=07, f=0)  ########
15: 0,87 (n=07, f=0)  ###
16: 0,63 (n=08, f=0)
17: 1,63 (n=08, f=1)  ####################################
18: 1,95 (n=06, f=1)  ##################################################
19: 0,92 (n=07, f=0)  #####
20: 1,27 (n=07, f=0)  ####################
21: 1,12 (n=07, f=0)  #############
22: 1,23 (n=07, f=0)  ##################
23: 1,22 (n=07, f=0)  ##################
24: 0,59 (n=06, f=0)
25: 0,74 (n=06, f=0)
26: 1,00 (n=03, f=0)  OOOOOOOO
27: 1,09 (n=05, f=0)  ############
28: 1,35 (n=03, f=0)  OOOOOOOOOOOOOOOOOOOO
29: 1,61 (n=03, f=0)  OOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOO
30: 0,80 (n=04, f=0)
31: 0,51 (n=03, f=0)
32: 0,79 (n=03, f=0)
```

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

Team: 3

```
Time                                                SD for WHZ
point                  0.8 0.9 1.0 1.1 1.2 1.3 1.4 1.5 1.6 1.7 1.8 1.9 2.0 2.1 2.2 2.3
01: 0,82 (n=08, f=0)   #
02: 0,24 (n=07, f=0)
03: 0,84 (n=06, f=0)   ##
04: 1,28 (n=08, f=0)   ####################
05: 0,89 (n=07, f=0)   ####
06: 1,08 (n=07, f=0)   ############
07: 0,26 (n=07, f=0)
08: 0,94 (n=08, f=0)   ######
09: 1,84 (n=08, f=1)   ############################################
10: 1,30 (n=07, f=0)   #####################
11: 1,62 (n=07, f=1)   ###################################
12: 0,89 (n=07, f=0)   ####
13: 1,60 (n=08, f=0)   ###################################
14: 1,19 (n=08, f=0)   ################
15: 1,30 (n=06, f=0)   #####################
16: 0,63 (n=07, f=0)
17: 1,10 (n=08, f=0)   #############
18: 1,37 (n=07, f=0)   ########################
19: 1,51 (n=07, f=0)   ##############################
20: 1,28 (n=07, f=0)   ####################
21: 1,09 (n=06, f=0)   ############
22: 3,24 (n=03, f=1)   OOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOO
23: 0,69 (n=05, f=0)
24: 2,08 (n=05, f=1)   ########################################################
25: 0,93 (n=04, f=0)   OOOOOO
26: 1,87 (n=03, f=0)   OOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOO
27: 1,10 (n=04, f=0)   OOOOOOOOOOOO
28: 0,60 (n=03, f=0)
```

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

Team: 4

```
Time                                                SD for WHZ
point                  0.8 0.9 1.0 1.1 1.2 1.3 1.4 1.5 1.6 1.7 1.8 1.9 2.0 2.1 2.2 2.3
01: 0,72 (n=07, f=0)
02: 2,12 (n=07, f=2)   ##########################################################
03: 2,51 (n=06, f=1)   ##################################################################
04: 1,18 (n=07, f=1)   ################
05: 1,35 (n=06, f=0)   #######################
06: 2,08 (n=07, f=1)   ########################################################
07: 1,20 (n=07, f=0)   #################
08: 1,22 (n=07, f=1)   ##################
09: 1,21 (n=05, f=0)   #################
10: 1,66 (n=06, f=1)   #####################################
11: 1,63 (n=06, f=0)   ####################################
12: 0,96 (n=07, f=0)   #######
13: 1,56 (n=06, f=1)   ################################
14: 1,03 (n=07, f=0)   ##########
15: 1,13 (n=07, f=0)   ##############
16: 1,50 (n=07, f=0)   ##############################
17: 1,08 (n=06, f=0)   ############
18: 1,56 (n=06, f=1)   ################################
19: 1,15 (n=06, f=0)   ###############
20: 1,52 (n=06, f=0)   ##############################
21: 1,21 (n=05, f=0)   #################
22: 0,90 (n=04, f=0)   ####
```

```
23: 1,19 (n=05, f=0)  ################
24: 1,78 (n=05, f=1)  ##########################################
25: 1,04 (n=02, f=0)  0000000000
26: 0,93 (n=04, f=0)  #####
27: 1,83 (n=04, f=0)  ############################################
28: 0,91 (n=04, f=0)  #####
29: 1,66 (n=04, f=0)  ####################################
30: 0,92 (n=03, f=0)  OOOOO
31: 0,15 (n=03, f=0)
32: 0,99 (n=03, f=0)  OOOOOOOO
33: 0,73 (n=03, f=0)
34: 0,81 (n=03, f=0)
35: 2,29 (n=02, f=0)  OOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOO
36: 0,13 (n=03, f=0)
37: 1,40 (n=03, f=0)  OOOOOOOOOOOOOOOOOOOOOOO
38: 0,93 (n=02, f=0)  OOOOO
39: 0,85 (n=02, f=0)  OO
40: 0,52 (n=02, f=0)
(when n is much less than the average number of subjects per cluster different symbols
are used: 0 for n < 80% and ~ for n < 40%; The numbers marked "f" are the numbers of
SMART flags found in the different time points)
```

Team: 5

```
Time                                          SD for WHZ
point                 0.8 0.9 1.0 1.1 1.2 1.3 1.4 1.5 1.6 1.7 1.8 1.9 2.0 2.1 2.2 2.3
01: 1,42 (n=07, f=1)  ############################
02: 1,13 (n=07, f=0)  ##############
03: 0,75 (n=07, f=0)
04: 0,76 (n=06, f=0)
05: 1,10 (n=06, f=0)  ############
06: 1,05 (n=06, f=0)  ##########
07: 1,00 (n=07, f=0)  ########
08: 0,86 (n=05, f=0)  ###
09: 0,64 (n=06, f=0)
10: 0,55 (n=06, f=0)
11: 1,20 (n=07, f=0)  ##################
12: 1,22 (n=05, f=0)  ##################
13: 0,86 (n=06, f=0)  ##
14: 0,72 (n=06, f=0)
15: 1,25 (n=07, f=0)  ####################
16: 1,12 (n=06, f=0)  ##############
17: 1,61 (n=06, f=0)  ####################################
18: 0,70 (n=05, f=0)
19: 0,93 (n=06, f=0)  ######
20: 1,03 (n=07, f=0)  ##########
21: 0,57 (n=07, f=0)
22: 1,28 (n=06, f=0)  ####################
23: 1,24 (n=06, f=0)  ##################
24: 0,97 (n=06, f=0)  #######
25: 0,80 (n=04, f=0)
26: 0,86 (n=04, f=0)  OOO
27: 1,05 (n=04, f=0)  OOOOOOOOOO
28: 0,80 (n=04, f=0)
29: 0,52 (n=03, f=0)
30: 0,84 (n=03, f=0)  OO
31: 1,31 (n=03, f=0)  OOOOOOOOOOOOOOOOOO
(when n is much less than the average number of subjects per cluster different symbols
are used: 0 for n < 80% and ~ for n < 40%; The numbers marked "f" are the numbers of
SMART flags found in the different time points)
```

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

Annex 4: The calendar of events

(دتغذیوی SMART سروی پوښتنی)

د میاشتو نومونه	میاشتی	۱۳۸۹	میاشتی	۱۳۹۰	میاشتی	۱۳۹۱	میاشتی	۱۳۹۲	میاشتی	۱۳۹۳	میاشتی	۱۳۹۴
حمل		د نوروز ورځ د مکتبونو د شروع ورځ د جړی با جړی وخت (دبارانونو وخت) د اوروو د وتلو وخت دونو د ګلانو د غوړیدو وخت	۵۰	د نوروز ورځ د مکتبونو د شروع ورځ د جړی با جړی وخت (دبارانونو وخت) د اوروو د وتلو وخت دونو د ګلانو د غوړیدو وخت	۳۸	د نوروز ورځ د مکتبونو د شروع ورځ د جړی با جړی وخت (دبارانونو وخت) د اوروو د وتلو وخت دونو د ګلانو د غوړیدو وخت	۲۶	د نوروز ورځ د مکتبونو د شروع ورځ د جړی با جړی وخت (دبارانونو وخت) د اوروو د وتلو وخت دونو د ګلانو د غوړیدو وخت	۱۴	د نوروز ورځ د مکتبونو د شروع ورځ د جړی با جړی وخت (دبارانونو وخت) د اوروو د وتلو وخت دونو د ګلانو د غوړیدو وخت	۲	د نوروز ورځ د مکتبونو د شروع ورځ د جړی با جړی وخت (دبارانونو وخت) د اوروو د وتلو وخت دونو د ګلانو د غوړیدو وخت
ثور		د مجاهدینو د کامیابی ورځ د کوچیانو د راختلو وخت د بادونو وخت د شفتلو وخت د ختو وخت	۴۹	د مجاهدینو د کامیابی ورځ د کوچیانو د راختلو وخت د بادونو وخت د شفتلو وخت د ختو وخت	۳۷	د مجاهدینو د کامیابی ورځ د کوچیانو د راختلو وخت د بادونو وخت د شفتلو وخت د ختو وخت	۲۵	د مجاهدینو د کامیابی ورځ د کوچیانو د راختلو وخت د بادونو وخت د شفتلو وخت د ختو وخت	۱۳	د مجاهدینو د کامیابی ورځ د کوچیانو د راختلو وخت د بادونو وخت د شفتلو وخت د ختو وخت	۱	د مجاهدینو د کامیابی ورځ د کوچیانو د راختلو وخت د بادونو وخت د شفتلو وخت د ختو وخت
جوزا	۵۹	د غلو د پخیدو وخت د زردالو د غوره کیدو وخت برات میاشت د پاتو میاشت	۴۸	د غلو د پخیدو وخت د زردالو د غوره کیدو وخت برات میاشت د پاتو میاشت	۳۶	د غلو د پخیدو وخت د زردالو د غوره کیدو وخت برات میاشت د پاتو میاشت	۲۴	د غلو د پخیدو وخت د زردالو د غوره کیدو وخت برات میاشت د پاتو میاشت	۱۲	د غلو د پخیدو وخت د زردالو د غوره کیدو وخت برات میاشت د پاتو میاشت		د غلو د پخیدو وخت د زردالو د غوره کیدو وخت برات میاشت د پاتو میاشت
سرطان	۵۸	د روژي میاشت د غنمو د لو کولو وخت	۴۷	د روژي میاشت د غنمو د لو کولو وخت	۳۵	د روژي میاشت د غنمو د لو کولو وخت	۲۳	د روژي میاشت د غنمو د لو کولو وخت	۱۱	د روژي میاشت د غنمو د لو کولو وخت		د روژي میاشت د غنمو د لو کولو وخت

د زردالود پخیدو وخت شدیده ګرمی او د هندانو د پخیدو		د زردالود پخیدو وخت شدیده ګرمی او د هندانو د پخیدو		د زردالود پخیدو وخت شدیده ګرمی او د هندانو د پخیدو		د زردالود پخیدو وخت شدیده ګرمی او د هندانو د پخیدو		د زردالود پخیدو وخت شدیده ګرمی او د هندانو د پخیدو		د زردالود پخیدو وخت شدیده ګرمی او د هندانو د پخیدو					
کوچنی اختر د نیمی کال امتحانونه او رخصتیدو وخت		کوچنی اختر د نیمی کال امتحانونه او رخصتیدو وخت	۱۰	کوچنی اختر د نیمی کال امتحانونه او رخصتیدو وخت	۲۲	کوچنی اختر د نیمی کال امتحانونه او رخصتیدو وخت	۳۴	کوچنی اختر د نیمی کال امتحانونه او رخصتیدو وخت	۴۶	کوچنی اختر د نیمی کال امتحانونه او رخصتیدو وخت	۵۷	اسد
د حاجیانو د تګ وخت د مکتب د شروع کیدو وخت		د حاجیانو د تګ وخت د مکتب د شروع کیدو وخت	۹	د حاجیانو د تګ وخت د مکتب د شروع کیدو وخت	۲۱	د حاجیانو د تګ وخت د مکتب د شروع کیدو وخت	۳۳	د حاجیانو د تګ وخت د مکتب د شروع کیدو وخت	۴۵	د حاجیانو د تګ وخت د مکتب د شروع کیدو وخت	۵۶	سنبله
د بادونو د شورع کیدو وخت د ونو د پانو زیریدلو وخت د جنغوزو د شکولو وخت		د بادونو د شورع کیدو وخت د ونو د پانو زیریدلو وخت د جنغوزو د شکولو وخت	۸	د بادونو د شورع کیدو وخت د ونو د پانو زیریدلو وخت د جنغوزو د شکولو وخت	۲۰	د بادونو د شورع کیدو وخت د ونو د پانو زیریدلو وخت د جنغوزو د شکولو وخت	۳۱	د بادونو د شورع کیدو وخت د ونو د پانو زیریدلو وخت د جنغوزو د شکولو وخت	۴۴	د بادونو د شورع کیدو وخت د ونو د پانو زیریدلو وخت د جنغوزو د شکولو وخت	۵۵	میزان
د ونو دپآنو د تویدو وخت د شفتلی د زیریدو وخت		د ونو دپآنو د تویدو وخت د شفتلی د زیریدو وخت	۷	د ونو دپآنو د تویدو وخت د شفتلی د زیریدو وخت	۱۹	د ونو دپآنو د تویدو وخت د شفتلی د زیریدو وخت	۳۰	د ونو دپآنو د تویدو وخت د شفتلی د زیریدو وخت	۴۳	د ونو دپآنو د تویدو وخت د شفتلی د زیریدو وخت	۵۴	عقرب
د اوبو د یخ وهلو وخت د مکتب د رخصتیدو وخت د کونو ګرمولو وخت ، د لاندو کولو وخت د غنمو د ژرنده کولو وخت		د اوبو د یخ وهلو وخت د مکتب د رخصتیدو وخت د کونو ګرمولو وخت ، د لاندو کولو وخت د غنمو د ژرنده کولو وخت	۶	د اوبو د یخ وهلو وخت د مکتب د رخصتیدو وخت د کونو ګرمولو وخت ، د لاندو کولو وخت د غنمو د ژرنده کولو وخت	۱۸	د اوبو د یخ وهلو وخت د مکتب د رخصتیدو وخت د کونو ګرمولو وخت ، د لاندو کولو وخت د غنمو د ژرنده کولو وخت	۳۰	د اوبو د یخ وهلو وخت د مکتب د رخصتیدو وخت د کونو ګرمولو وخت ، د لاندو کولو وخت د غنمو د ژرنده کولو وخت	۴۲	د اوبو د یخ وهلو وخت د مکتب د رخصتیدو وخت د کونو ګرمولو وخت ، د لاندو کولو وخت د غنمو د ژرنده کولو وخت	۵۳	قوس
د ژمی د شروع وخت میلادو نبی میاشت ، د واورو میاشت		د ژمی د شروع وخت میلادو نبی میاشت ، د واورو میاشت	۵	د ژمی د شروع وخت میلادو نبی میاشت ، د واورو میاشت	۱۷	د ژمی د شروع وخت میلادو نبی میاشت ، د واورو میاشت	۲۹	د ژمی د شروع وخت میلادو نبی میاشت ، د واورو میاشت	۴۱	د ژمی د شروع وخت میلادو نبی میاشت ، د واورو میاشت	۵۲	جدی
د څیلی میاشت ،		د څیلی میاشت ،	۴	د څیلی میاشت ،	۱۶	د څیلی میاشت ،	۲۸	د څیلی میاشت ،	۴۰	د څیلی میاشت ،	۵۱	دلوه
د یخونو د ختمیدو وخت		د یخونو د ختمیدو وخت	۳	د یخونو د ختمیدو وخت	۱۵	د یخونو د ختمیدو وخت	۲۷	د یخونو د ختمیدو وخت	۳۹	د یخونو د ختمیدو وخت	۵۰	حوت

تربپ میاشت میراثی میاشت		تربپ میاشت میراثی میاشت		تربپ میاشت میراثی میاشت		تربپ میاشت میراثی میاشت		تربپ میاشت میراثی میاشت		تربپ میاشت میراثی میاشت		تربپ میاشت میراثی میاشت		تربپ میاشت میراثی میاشت		تربپ میاشت میراثی میاشت	

Annex 5: 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. ډټیم 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 **لرګی 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

Instructions دستور العمل**:** *The caregiver of the child should be the main respondent for this section*کی دماشوم مور یا پایواز عام وتام مسولیت لری پدی برخه

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

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

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 لنه 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									

Fever تبه دملاریا سره : High temperature لوړه درجه تبه د لرزی سره	**Cough/ARI**(توخی / تنفسی مشکلات) **:** Any episode with severe, persistent cough or difficulty breathing	**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 خلو نه زیات ولری	**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		دوامداره ټوخی یا په ساه اخستنه کی مشکلات	

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 شپږو 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 شپږو 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 (بنی 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 چی 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** **ټولی هغه ښځی چی 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 ګولی اخیستی (یوائی 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**

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 پک کړی چې د ۰ – ۲۳ میاشتو ماشوم ولري

Date (D/M/Y)تاریخ: ...... /...../..... Division ناحیه: _____ Sub locationفرعی موقعیت: _____ قریه Village Name: _____ 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 د ستاسی د سینی راوځی یعنی اورگه بعد له ولادت نه په لومړیو درې 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 ترگاری **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 خوابونه 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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Questionnaire for mortality rate calculation (one sheet/cluster) دمرګ او میر د معلومولو لپاره پوښتنې (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 ټول هغه افراد چې په کورنۍ کې ژوند کوي	Total under 5 in HH د ۵ کالو نه ښکته ماشومان په کورنۍ کې	Joined HH Total تعداد دافرادو چې کورنۍ سره یوځای شوی	Joined HH under 5 د ۵ کلونه ښکته چې کورنۍ سره یوځای شوی	Left HH Total تعداد دافرادو چې کورنۍ یې پریښې وی	Left HH under 5 دپنځو کالو نه ښکته ماشومان چې کورۍ پریښې وی	No. of births in recall period د ولادتونو تعداد په یاده شوی دوره کې	Total deaths in recall period دمړو تعداد په یاده شوی دوره کې	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 چې څومره

											۲۰ لیتره بوشکی بیا یی مجموعی کړی او ویی لیکی ()
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