AFGHANISTAN

ANTHROPOMETRIC AND MORTALITY SMART SURVEY FINAL REPORT

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CONTENTS

EXECUTIVE SUMMARY 1
1. INTRODUCTION 2
2.1 Background 2
3 OBJECTIVES 3
3.1 Broad objective 3
3.2 Specific objective 3
3.3 Justification of the survey 3
4 METHODOLOGY 4
4.1 Sample size for the anthropometry and the mortality survey 4
5 IYCF SAMPLING 5
5.1 Sampling procedure: selecting clusters 6
5.2 Sampling procedure: selecting households and children 7
5.3 Case definitions and inclusion criteria 7
6 ANTHROPOMETRIC INDICATORS 8
6.1 Acute malnutrition 8
6.2 Mid Upper Arm Circumference (MUAC) 9
6.3 Nutritional bilateral pitting oedema 9
6.4 Chronic malnutrition 9
6.5 Mortality Indicator Calculation 10
6.6 Additional Indicators – Health & WASH 10
6.7 Infant and Young Child Feeding Practices Indicators (IYCF) 10
7 SURVEY FINDINGS 12
7.1 Child health and Nutrition 12
7.2 Anthropometric results 13
7.2.1 Prevalence of acute malnutrition 13
7.2.2 Prevalence of underweight (WHO 2006) 16
7.2.3 Prevalence of Chronic malnutrition (WHO 2006) 17
7.2.4 Prevalence of overweight (WHO 2006) 19
8 CHILD HEALTH INDICATORS 19
8.1 Two-weeks recall morbidity (Children 0-59 months) 19
8.2 Immunization, supplementation and deworming 20
9 IYCF INDICATORS 21
10 MATERNAL NUTRITION AND HAND WASHING 21
11 MORTALITY AND DEMOGRAPHICS 23
11.1 Demographics 23
12 MORTALITY RATES 23
13 HOUSEHOLD'S INFORMATION 24
13.1 Structure and type of households 24
13.2 Main livelihoods 24
13.3 Water consumption and storages at Household level 25

14 DISCUSSION 26
14.1 Nutritional Status 26
14.1.1 Global Acute Malnutrition 26
14.1.2 Chronic malnutrition 27
14.1.3 Maternal nutritional status 27
14.1.4 Mortality rates 28
15 RISK FACTORS 28
15.1 Morbidity, immunization, supplementation and deworming 28
15.2 Infant and young child feeding practices 28
15.3 Water Hygiene and Sanitation (WASH) 29
16 RECOMMENDATIONS AND PRIORITIES 30
17 REFERENCES 32
18 ANNEXES 33

TABLE OF FIGURES

Figure 1: Map of Covered Districts – white zone, Nangarhar, December 2014 - January 2015 .. 2
Figure 2: Population age and sex pyramid, SMART – Nangarhar, December 2014 – January 2015 12
Figure 3: Gaussian curve on weight-for-height Z-score, SMART – Nangarhar, December 2014 – January 2015 15
Figure 4: Gaussian (normal) distribution curve, HAZ, SMART – Nangarhar, December 2014 – January 2015 18
Figure 5: Trends of stunting over the age distribution, SMART – Nangarhar, December 2014 – January 2015 19
Figure 6: Morbidity data, SMART – Nangarhar, December 2014 – January 2015 20
Figure 7: Main livelihoods, n=551, SMART – Nangarhar, December 2014 – January 2015 25
Figure 8: Overlapping WHZ<-2 and MUAC<125, SMART – Nangarhar, December 2014 – January 2015 26
Figure 9: Trends of malnutrition in Nangarhar province, 2011 -2015. 27

ACRONYMS

AADA	Agency for assistance and development of Afghanistan
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
CHC	Comprehensive Health Centre
CHF	Common Humanitarian Fund
CHW	Community Health Worker
CRS	Catholic Relief Service
CSO	Central Statistical Office
DEFF	Design Effect
ENA	Emergency Nutrition Assessment
EPI	Expended Program for Immunization
FS	Food Security
GAM	Global Acute Malnutrition
HAZ	Height for Age Z-score
HH	Household
HHS	House Hunger Score
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	Saver Acute Malnutrition
SCI	Save the children international
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

Nangarhar is one of the 34 provinces of Afghanistan, located in the eastern part of the country. It is divided into 22 districts and has a population of about 1,436,000. Jalalabad is the capital of Nangarhar province.

The overall objectives of the survey were to evaluate the current nutritional status of vulnerable population living in Nangarhar Province, and identify possible health and WASH factors contributing to their nutritional status. The survey was a cross sectional study with two-stages clusters samplings using Standardized Monitoring of Relief and Transition (SMART) methodology.

The survey was conducted from December 17th, 2014 to January 4th, 2015 and covered 5 districts, namely Jalalabad, Surkhrod, Kama, Behsud, and Kuzkunar (Khewa). These included about 75% (1,077,814[1]) of the total population. The remaining areas are mostly low populated mountainous districts which were classified as inaccessible due to insecurity.

Data from the survey indicated that the Global Acute Malnutrition (GAM) rates, identified by weight-for-height <-2 z-scores (WHO 2006) and MUAC <125mm, were **5.6%** (CI: 3.9–7.9) were found to be poor while GAM was acceptable if MUAC <-125 rates are considered (and **4.1%** respectively**. The GAM rate indicated by Weight-for-height was classified as poor while GAM rate indicated by MUAC <-125 was classified as acceptable** It is important to note that these two rates do not cover the same individuals in the sample The rates of stunting and underweight were **51.5%** (CI: 45.9 – 57.0) and **24.2**% respectively (CI: 19.7 -29.5). In addition, Crude Death Rate (CDR) and Under 5 Mortality Rate (U5MR) were 0.44/10,000/day (CI: 0.24 – 0.78) and **0.86/10,000/day** (CI: 0.25 – 2.96) respectively.

Poor nutritional status of mothers (6.5%), inadequate supplementation of Iron during pregnancy (39.8%), high child morbidity (62.6%), extremely low coverage on Vitamin A supplementation and de-worming among children 35.8% and 15.3% respectively as well as poor IYCF practices, both breastfeeding and complementary feedings (5.5% and 8.6% respectively), are some of the main factors contributing to the nutritional status of children.

This survey provided evidence on the nutritional status of Under 5 children in Nangarhar province. The findings of this survey are important for public health professionals, policy-makers and planners for relevant interventions. In order to address the problems, attention needs to be given to access and utilization of community based health services including preventive health services such as supplementation programs for children and pregnant women, basic reproductive health services etc. IYCF practices also need to be reinforced both at facility and community levels with strong focus on exclusive breastfeeding and proper complementary feeding practices. In addition, long term multi-sectoral program might be necessary to address stunting among children.

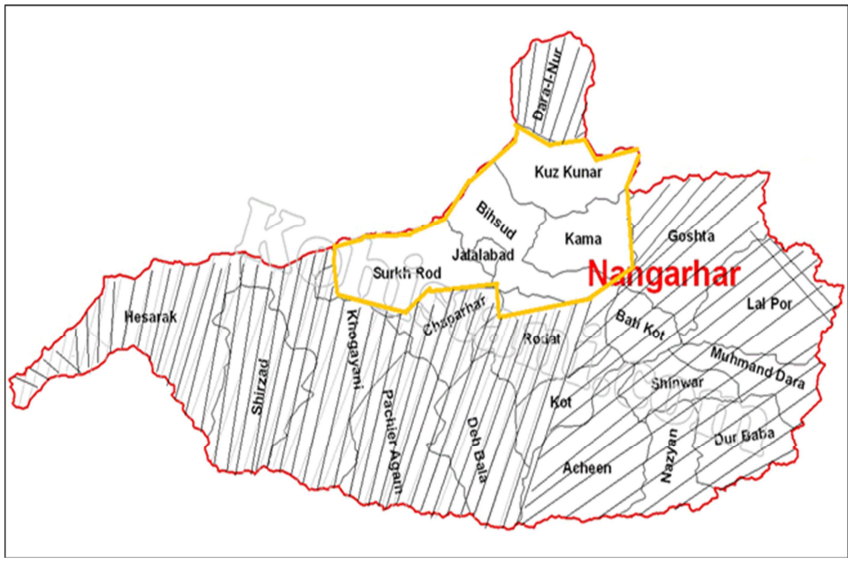
[1] CSO population data, Afghanistan.

1. INTRODUCTION

1.1. Background

Nangarhar is one of the 34 provinces of Afghanistan, located in the eastern part of the country. It is divided into twenty-two districts and has a population of about 1,436,000. Jalalabad is the capital of Nangarhar province. Nangarhar borders with Laghman , Kunar, Nuristan ,Paktiya and along to Peshawar (Pokhton khwa), and has 22 districts : Darah-e-Noor, Kot, Goshta, Achin, Shinwari, Mohmond, Darah, Lalpora, Sherzad, Nazyan, Hesarak, Durbaba, Jalalabad city, Behsud, Surkhrod, Chaperhar, Kuzkonar (Khewa), Rodat, Khugyani, Batikote, Deh Bala and Pachir-w-Agam.

Figure 1: Map of Covered Districts – white zone, Nangarhar, December 2014 - January 2015



Nangarhar is considered the food basket of Afghanistan as most of the crops produced are consumed in different parts of the country. Main summer crops grown in the province are rice, maize, cotton, sunflower, beans, and potato; and the winter crops are wheat, barley, sugarcane, potato and mustard. Although Opium is still considered as the predominant crop in 12 southern districts of the province, there is a growing trend of vegetable productions in the province due to its demand and better price. The vegetables normally grown in summer are okra, tomato, eggplant, pepper, pumpkins, cucumbers, spinach, lettuce etc. The winter vegetables are onion, cauliflower, turnip, spinach, radish, carrot, cabbage etc. Rodat district is well known for potato and onion production. Most of the vegetables and crops produced are supplied to Kabul and other parts of Afghanistan. Some of the crops and vegetables are also sold locally.

Only 5 out of 22 districts in Nangarhar province are surveyed due to security issues and inaccessibility of far areas (see table 1 below). The population of these 6 districts represent about 75% of the entire population of Nangarhar 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 in the Nangarhar province.

Table 1: List of covered districts (Source: EPI program village data 2013-2014), Nangarhar, December 2014 - January 2015

District	Total Number of Villages (EPI)	Total Pop (EPI)
Jalalabad	11	51,750
Kama	52	120,814
Behsud	146	240,122
Surkhrod	107	234,766
Kuzkunar	65	92,037
Total	**381**	**739,489**

2 OBJECTIVES

2.1 Broad objective

- To estimate the prevalence of acute malnutrition among children 0-59 months in Nangarhar province

2.2 Specific objective

- To estimate Crude Death Rate (CDR) and Under Five Mortality Rate (U5MR) in 6 districts of Nangarhar province.
- To determine prevalence of acute and chronic malnutrition among children 0-59 months
- To determine IYCF practice among children 0-23 months in 6 districts of Nangarhar province
- To determine the nutrition status of Pregnant and Lactating Women (PLW) in 6 districts of Nangarhar Province

2.3 Justification of the survey

The justification of this SMART survey is to investigate the current nutrition, mortality and IYCF data, specific to these districts and to inform better future program with evidence based specific information for the areas of intervention of Save the Children.

Save the children was selected to participate in this survey because they are supporting the BPHS implementer in the proper implementation of nutrition program within the BPHS program. This, therefore, was viewed as a great opportunity to build capacity of Save the Children's staffs on the ground who are then in a position to offer support to the BPHS partner in Nangarhar with regard to nutrition.

Since there was no district specific information on nutrition, this survey was important to provide information relevant to nutrition in the 5 selected districts, the survey was conducted. This information would also complement the 2013 National Nutrition Survey, which gave provincial estimates of malnutrition and IYCF by providing much more detailed and specific information to the areas of intervention for Save the children.

3 METHODOLOGY

3.1 Sample size for the anthropometry and the mortality survey

The sample size of households to survey is determined by using the ENA software April 2011, Updated version November 2014. The table below summarizes all parameters used for sample size calculation.

Table 2: Parameters for sample size calculation for anthropometry, SMART - Nangarhar, December 2014 - January 2015

Parameters for Anthropometry	Value	Assumptions based on context
Estimated Prevalence of GAM (%)	8.2%	According to the MoPH National Nutrition Survey (NNS)-2013 [2], the Global Acute Malnutrition prevalence was estimated at **21.2%** with a standard deviation of 3.9, which was very high thus making the results unreliable. Therefore an estimate of the prevalence of GAM was calculated from the mean assuming that there is a standard deviation of 1 Z-score unit, and the assumption that the data was normally distributed. This calculation gave a more representative GAM estimate of 8.2% given the parameters derived from the NNS 2013. A review of the available secondary data gave no indication of a higher GAM estimate, therefore based on these findings the prevalence of 8.2% was selected to be used as the estimate.
± Desired precision	3%	Since the expected GAM prevalence was low, a precision of ± 3% was chosen. At the same time since this survey's objective was to act as a baseline study therefore a precision of ± 3% was considered appropriate for this study.
Design Effect	1.5	The population living in the 6 targeted districts were considered as having similar living conditions and the same access to food and social conditions. Nevertheless, access to health facilities cannot be estimated as similar within the targeted population as some remote areas were not well deserved by health facilities. Hence the design effect was estimated at 1.5.
Children to be included	525	Minimum children 6-59 months old. However to avoid possible bias of selection for younger age group, all children from 0 to 59 months old found in the selected households were surveyed.
Average HH Size	7	According to CSO population data 2010-2011, the average household size was 5.5[3]. According to the NNS 2013, the average household size was 7.7 – most recent result. According to the National Mortality Survey of 2010, the average household size was 5.5. According to the national vulnerability assessment of Afghanistan 2014, the average HH size was 7.3[4]. Therefore, based on these 4 sources, an average household size of 7 is used in this survey based on

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

[4] National vulnerability assessment of Afghanistan, 2014

		2 more recent results of 2014.
% Children under-5	15.6%	The proportion of children under five was estimated at 20% according to the national nutrition policy and CSO estimates [5] . However, the estimated U5 population according to the Afghanistan Mortality survey 2010 was at 15.6% providing a more conservative and accurate percentage[6]. Therefore, 15.6% is used and considered the more conservative and accurate estimate.
% Non-response Households	6%	The percentage of non-respondent households is 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)[7] of 6%.
Households included	568	Households

Parameter	Mortality survey	Rationale
Estimated death rate	0.5/10,000/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 in line with estimated death rate
Design effect	1.5	Cater for heterogeneity in the County
Recall period	90	Start point of recall period (during the start of the of Miizan solar month 1393 i.e, 3 months ago and end of recall is end of the Qaws solar month which will coincide with 22nd December 2014)
Average HH size	7	National vulnerability assessment of Afghanistan -2014 and NNS 2013
Per cent of non-respondent	6%	Past experience from assessments in Afghanistan due to cultural challenges. Anticipated community mobilization is expected to create further awareness
Households to be included	588	Households

4 IYCF SAMPLING

The sample size for collection of data on IYCF indicators was calculated by developing a stratified proportionate sampling methodology (using the Care International Sampling Spread Document) so as to cater for the sample sizes required for the various indicators of IYCF practices, which were disaggregated by age. Four main IYCF indicators (WHO, 2010)[8] were used to calculate the sample size. The prospected prevalence rates of the four indicators: Exclusive Breastfeeding Rate; Timely Initiation of Breastfeeding; Minimum Dietary Diversity and Minimum Meal Frequency (Table 1) were used to determine the sample size. The same

[5] CSO: Central Statistics Office of Afghanistan, 2010-2011

[6] Afghanistan Mortality survey, 2010

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

[8] WHO 2010, Indicators for Assessing Infant and Young Child Feeding Practices

desired precision levels were used for the each of the four IYCF indicators and a design effect of 1.5 was used for the cluster methodology (Table 1). Information on the proportion of the under-fives and the average household size was solicited from the Afghanistan mortality survey 2010.

A non-response rate estimated at 6% (based on rationale provided above) was used in the calculation of the sample. The resulting sample sizes for the four IYCF indicators are shown in Table 3.

In order to estimate the actual population for children 0-23 months, the IYCF calculator was factored the percentage of children in this group by assuming that 40% of children under the age of 5 years are between 0-23 months.

In this case the calculation is:

$$Total\ \#\ of\ HH = (\left(\frac{sample\ size\ of\ children}{\frac{average\ HH\ size\ x\ \%\ under5years}{100}}\right) x\ 0.4 + \left(\frac{sample\ size\ of\ children}{\frac{average\ HH\ size\ x\ \%\ under5years}{100}}\right) x\ 0.4\ )) \ x\ \%\ non\ response\ rate$$

Table 3: IYCF sample size calculation (SMART- Nangarhar, December 2014 - January 2015)

Indicator	Estimated prevalence (%)	± desired precision	Design effect	Sample size	Households to be included
Exclusive breastfeeding	50	8	1.5	245	
Timely initiation of breastfeeding	50	8	1.5	245	595
Minimum dietary diversity	50	8	1.5	245	595
Minimum meal frequency	50	8	1.5	245	595

For the exclusive breast feeding indicator, the survey conducted the questionnaire to all illegible children found in the survey.

Based on the parameters indicated above, IYCF sample was used as the overall sample size since it was the highest and therefore qualifies to represent the other indicators. Therefore with the selection of the highest sample size (595 HH) the other indicators would have representation within the larger sample size selected.

4.1 Sampling procedure: selecting clusters

A sample size of 595 HH, 34 clusters by 18 households was used based on various parameters as indicated in Tables 1 and 2. A two stage sampling methodology was employed. In the first stage 34 clusters were sampled using probability proportional to population size (PPS).

The second stage involved obtaining an updated and complete list of households from village elder at the cluster/village level. A total of 18 households were selected using simple random sampling or in cases where it was difficult to obtain an updated list of household systematic random sampling was applied. A sampling interval was determined based on the total number of households available, divided by the total number of households required for the survey. The survey teams were properly trained on both sampling methodologies and were offered guiding material to carry to the field during data collection for reference. All the households

sampled were interviewed using the mortality and IYCF questionnaire; and anthropometric measurements were taken to all children aged 0-59 months.

Out of 434 villages, 34 villages, corresponding to 34 clusters, were included in the survey. Reserve Clusters (RCs) were selected by ENA software version 2011 updated Nov 2014. Reserve clusters would only be used if 10% or more clusters were impossible to reach during the survey.

It is estimated that one team could cover 18 households per day.

By targeting 18 households per cluster per day, a total number of 34 clusters were expected to be reached over the duration of this survey (595HH/18HH/day = 33.05 clusters), which was rounded up to 34 clusters in order to reach the required 595 households. This would allow the survey to reach the maximum sample required of 525 children 0-59 months, for the anthropometric sample. The sampling methodology at the cluster level was simple random sampling, where teams prepared a list of households with the assistance of a village elder and randomly selecting 20HH. When lists were difficult to be obtained, the teams would proceed through systematic random sampling.

4.2 Sampling procedure: 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 houses were enumerated and given numbers by the survey team. The 20 households were then chosen at random from these enumerated houses, by randomly drawing from a hat.

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 were offered with materials to assist in determining the households during the data collection.

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

All children, living in the selected house in the correct age range (0 - 59 months for anthropometric measurement and 0-23 months for IYCF) were included irrespective of their heights. If more than one eligible child were found in a household, both were included, even if they were twins.

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

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

4.3 Case definitions and inclusion criteria

The household was the basic sampling unit. A household was defined as all people eating from the same pot (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 such case, a two-step process was ensured with the village

leaders/community elders and then identifying compound together with the use of the list of households within the community, asking if there were multiple cooking areas to determine what members of the household/compound should be included in the study.

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

For each selected child, the following information was collected:

Age (in months): Only children between 0 - 59 months old or if the age cannot be determined. Height would not be considered as a valid criterion in absence of age due to the high stunting rates in Nangrahar 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 Nangrahar province, was used to determine the age and 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 could easily stand were asked to stand on the weighing scale and their weight recorded. In a situation when the children could not stand up, the double weighing method was applied.

Height (in cm): Measuring board was used to measure bare headed and barefoot children. The precision of the measurement was 1 mm. Children of less than 2 years of age were measured lying down and those equal to or above 2 years of age were measured standing up.

Mid-Upper Arm Circumference (MUAC; in mm): MUAC is used as an indicator of mortality risk by malnutrition. In this survey MUAC 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 also used to measure women of reproductive age (15-49 years)

Oedema: Only children with bilateral pitting nutrition oedema were recorded as having nutritional oedema.

5 ANTHROPOMETRIC INDICATORS

5.1 Acute malnutrition

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

Weight-for-height index (W/H)

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

The weight-for-height index of a child from the studied population can be expressed either as a percentage of the median or as a Z-score according to NCHS reference and only as a Z-score according to WHO standards. WHO recommends the use of Z-scores as it is considered to be more reliable in terms of statistical theory.

[9] NCHS: National Centre for Health Statistics (1977) NCHS growth curves for children birth-18 years. United States. Vital Health Statistics. 165, 11-74.

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

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

5.2 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 4: 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

5.3 Nutritional bilateral pitting oedema

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

The table below defines the acute malnutrition according to W/H index, MUAC criterion and oedema.

Table 5: Definition of acute malnutrition according to weight-for-height index (W/H), expressed as a Z-score according to WHO standards

Severe Acute Malnutrition (SAM)
W/H <-3 z-score and /or bilateral oedema and/or MUAC < 115 mm
Moderate Acute Malnutrition (MAM)
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

5.4 Chronic malnutrition

The height-for-age index (H/A)

The height-for-age measure indicates if a child of a given age is stunted and so if he is chronically malnourished. This index reflects the nutritional history of a child rather than his/her current nutritional status. This is mainly used to identify chronic malnutrition. The same principle is used as for weight-for-height, except that a child's chronic nutritional status

is estimated by comparing its height with NCHS reference or 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 6.

Table 1: Cut offs points of the Height for Age index (HAZ) expressed in Z-score, WHO standards

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

5.5 Mortality Indicator Calculation

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

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

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

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

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

5.6 Additional Indicators – Health & WASH

Beside anthropometric data, additional information was collected as follows:

Immunization status and vitamin A supplementation: mothers/caretakers of all children were asked if children received all the necessary vaccinations, which were subsequently verified by reviewing the vaccination card, if available. If the vaccination card was not available, then recall of the caregiver option was considered.

Morbidity: mothers/caretakers of children were asked if children had experienced an illness in the past 2 weeks.

Water storage and Usage: House hold members 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 hrs, in order to assess the water consumption per person per day.

Hand washing practices: The mothers were asked on what occasions they washed their hands and also what they used to wash their hands to determine the hand washing practices in the surveyed area.

5.7 Infant and Young Child Feeding Practices Indicators (IYCF)

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

Child ever breastfed: Proportion of children who have ever received breast milk.

Timely initiation of breastfeeding: Proportion of children born in the last 23 months who were put to the breast within one hour of birth.

Provision of colostrum in the first 3 days of life: Proportion of children who received colostrum (yellowish liquid) within the first 3 days after birth.

Exclusive breastfeeding under 6 months: Proportion of infants 0-5 months of age who are fed exclusively with breast milk.

Continued breastfeeding at 1 year: Proportion of children 12 – 15 months of age who are fed with breast milk.

Introduction of solid, semi-solid or soft foods: Proportion of infants 6-8 months of age who received solid, semi-solid or soft foods.

Continued breastfeeding at 2 years: Proportion of children 20–23 months of age who are breastfed.

Training and supervision

Four teams of three members conducted the field data collection. Each team was composed of one save the children team leader and two save the children data collector. Each team had at least two female data collectors to ensure acceptance of the team amongst the surveyed households; particularly for IYCF questionnaires (All questionnaires available in Annex 3). Each female member of the survey team was accompanied with a mahram[10] to facilitate the work of the female data collectors at the community level. The teams were supervised by ACF and Save the Children Nutrition Program Manager/Nutrition Focal Points.

The entire teams received a 5-days training on the survey methodology and all its' practical aspects; conducted by ACF Health and Nutrition Surveillance 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 team 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 by ACF to ensure overall comprehension before going to the field.

One field guidelines document with instructions and household definition and selection document is provided to each team member. All documents, such as local event calendar, questionnaires or consent forms were translated in Pashtu, one of the local languages, for better understanding and to avoid direct translation during the data collection at field. 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 plausibility check, and feedback was provided to the data collection teams. Anthropometric data was directly entered into ENA while IYCF and other data were compiled through an excel spreadsheet.

Data analysis

The anthropometric and mortality data was analyzed using ENA Delta software 2011 version, updated in November 2014. Survey results are presented in reference to WHO standards for overall final analysis.

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

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

6 SURVEY FINDINGS

6.1 Child health and Nutrition

Description of the sample

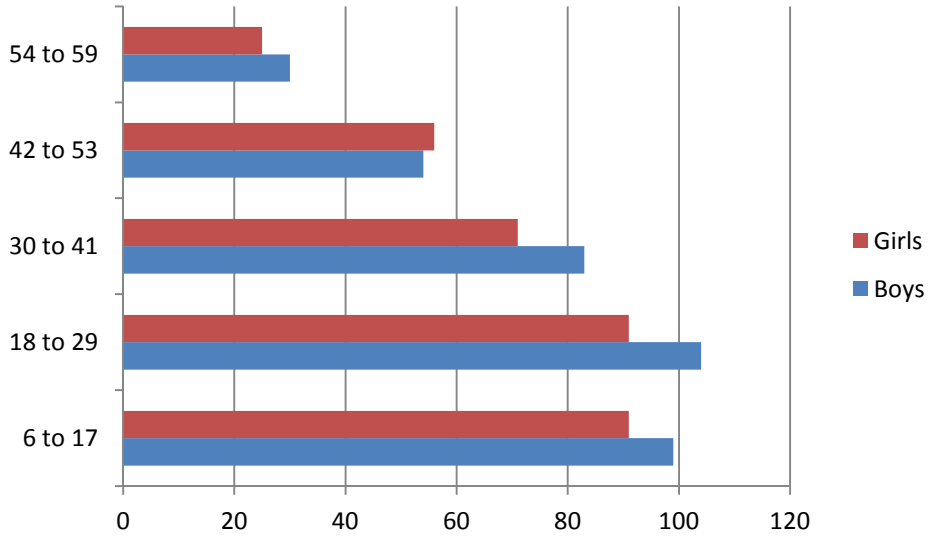
Anthropometric data was collected from 697 children between 6-59 months. Non-response rate was 5%. The overall boy to girl ratio was 1.1 indicating that sampling was unbiased and within expected range of values (0.8 – 1.2; Table 7).

The age distribution showed under representation in some age groups such as 54-59 months. This could probably be due to approximation of ages amongst 28% of the sampled children. The sex and age pyramid (Figure 2) follow a normal shape.

Table 7: Distribution of age and sex of sample, SMART – Nangarhar, December 2014 – January 2015

	Boys		Girls		Total		Ratio
AGE (mo)	no.	%	no.	%	no.	%	Boy : girl
6-17	99	52.1	91	47.9	190	27.0	1.1
18-29	104	53.3	91	46.7	195	27.7	1.1
30-41	83	53.9	71	46.1	154	21.9	1.2
42-53	54	49.1	56	50.9	110	15.6	1.0
54-59	30	54.5	25	45.5	55	7.8	1.2
Total	370	52.6	334	47.4	704	100.0	1.1

Figure 2: Population age and sex pyramid, SMART – Nangarhar, December 2014 – January 2015



6.2 Anthropometric results

Data quality

The anthropometric data were analysed using ENA for SMART Software (version 2011, November 2014 update). SMART flags[11] were excluded from the analysis. The plausibility check report is available in Annex 2.

A summary of the statistical parameters by index is in the table below.

Table 8: Mean z-scores, Design Effects and excluded subjects, SMART – Nangarhar, December 2014 – January 2015

Indicator	n	Mean z-scores ± SD	Design Effect (z-score < -2)	z-scores not available*	z-scores out of range (SMART)
Weight-for-Height	697	-0,21±1,06	1,21	6	1
Weight-for-Age	693	-1,24±1,09	2,22	0	11
Height-for-Age	645	-1,98±1,25	1,94	1	58

* contains for WHZ and WAZ the children with oedema.

6.2.1 Prevalence of acute malnutrition

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

The sex and age disaggregated results are presented in Table 9 and 10 respectively. The prevalence of wasting is insignificantly higher among boys as compared to girls. The younger children (6-29 months) seem to be more affected than older (30-59 months). There were no edematous cases (Table 11).

Table 9: Prevalence of acute malnutrition based on weight-for-height z-scores (and/or oedema) and by sex, SMART – Nangarhar, December 2014 – January 2015

	All n = 697 (CI: 95%)	Boys n = 366 (CI: 95%)	Girls n = 331 (CI: 95%)
Prevalence of global malnutrition (<-2 z-score and/or oedema)	5.6% (39) (3.9 - 7.9)	X 6.3% (4) (4.2 - 9.2)	4.8% (16) (2.8 - 8.3)
Prevalence of moderate malnutrition (<-2 z-score and >=-3 z-score, no oedema)	5.0% (35) (3.5 - 7.1)	5.2% (19) (3.4 - 7.8)	4.8% (16) (2.8 - 8.3)
Prevalence of severe malnutrition (<-3 z-score and/or oedema)	0.6% (4) (0.2 - 1.5)	1.1% (4) (0.4 - 2.9)	0.0% (0) (0.0 - 0.0)

[11] SMART flags are the data outside the range of -3 to +3 WHZ, HAZ and WAZ.

Table 10: Prevalence of acute malnutrition by age based on weight for height z-score, SMART - Nangarhar, December 2014 - January 2015

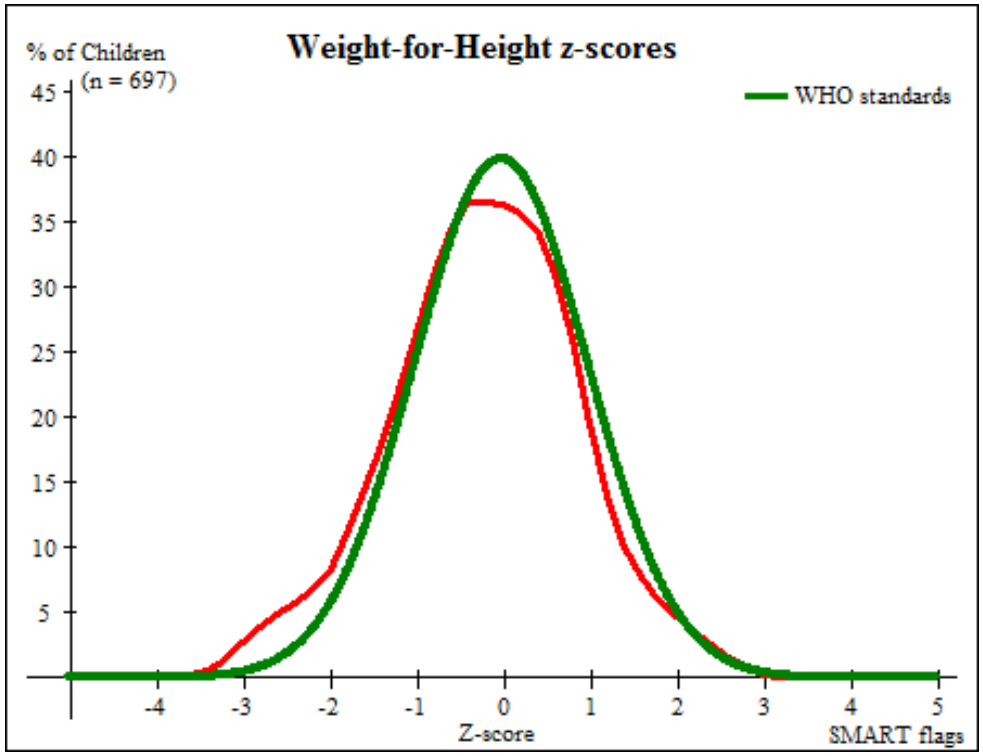
		Severe wasting (<-3 z-score)		Moderate wasting (>= -3 and <-2 z-score)		Normal (> = -2 z score)		Oedema	
Age (mo)	Total no.	No.	%	No.	%	No.	%	No.	%
6-17	187	4	2.1	13	7.0	170	90.9	0	0.0
18-29	193	0	0.0	10	5.2	183	94.8	0	0.0
30-41	153	0	0.0	8	5.2	145	94.8	0	0.0
42-53	109	0	0.0	2	1.8	107	98.2	0	0.0
54-59	55	0	0.0	2	3.6	53	96.4	0	0.0
Total	697	4	0.6	35	5.0	658	94.4	0	0.0

Table 11: Distribution of acute malnutrition and oedema based on weight for height z score, SMART - Nangarhar, December 2014 - January 2015

	<-3 z-score	>=-3 z-score
Oedema present	Marasmic kwashiorkor No. 0 (0.0 %)	Kwashiorkor No. 0 (0.0 %)
Oedema absent	Marasmic No. 4 (0.6 %)	Not severely malnourished No. 694 (99.4 %)

There is a slight shift of the sample population to the left of the reference curve (Figure 3).

Figure 3: Gaussian curve on weight-for-height Z-score, SMART - Nangarhar, December 2014 - January 2015



MUAC cut-off classification and/or oedema:

The prevalence of acute malnutrition based on MUAC cut-off is presented in Table 12. The younger children (6-29 months) seem to be more affected than older (30-59 months; Table 13).

Out of 29 children identified with MUAC<125 mm, only 6 were with WHZ<-2, representing only 9.6% of the acutely malnourished children in the sample.

Table 12: Prevalence of acute malnutrition base on MUAC cut off and /or edema, SMART - Nangarhar, December 2014 - January 2015

	All n = 704 (CI: 95%)	Boys n = 370 (CI: 95%)	Girls n = 334 (CI: 95%)
Prevalence of global malnutrition (< 125 mm and/or oedema)	4.1% (29) (2.7 - 6.2)	(11) 3.0% (1.4 - 6.2)	(18) 5.4% (3.4 - 8.5)
Prevalence of moderate malnutrition (< 125 mm and >= 115 mm, no oedema)	3.7% (26) (2.5 - 5.5)	2.7% (10) (1.3 - 5.6)	4.8% (16) (2.8 - 8.0)
Prevalence of severe malnutrition (< 115 mm and/or oedema)	0.4% (3) (0.1 - 1.9)	0.3% (1) (0.0 - 2.0)	0.6% (2) (0.1 - 2.4)

Table 13: Prevalence of acute malnutrition by age base on MUAC cut offs and or oedema, SMART - Nangarhar, December 2014 - January 2015

		Severe wasting (<-3 z-score)		Moderate wasting (>= -3 and <-2 z-score)		Normal (> = -2 z score)		Oedema	
Age (mo)	Total no.	No.	%	No.	%	No.	%	No.	%
6-17	187	4	2.1	13	7.0	170	90.9	0	0.0
18-29	193	0	0.0	10	5.2	183	94.8	0	0.0
30-41	153	0	0.0	8	5.2	145	94.8	0	0.0
42-53	109	0	0.0	2	1.8	107	98.2	0	0.0
54-59	55	0	0.0	2	3.6	53	96.4	0	0.0
Total	697	4	0.6	35	5.0	658	94.4	0	0.0

6.2.2 Prevalence of underweight (WHO 2006)

The underweight is defined by weight-for-age z-scores (WAZ). The sex and age disaggregated results are represented in Table 14 and 15.

Table 2: Prevalence of underweight based on weight-for-age z-scores by sex, SMART - Nangarhar, December 2014 - January 2015

	All n = 693 (CI:95%)	Boys n = 363 (CI:95%)	Girls n = 330 (CI:95%)
Prevalence of underweight (<-2 z-score)	24.2% (168) (19.7 - 29.5)	27.0% (98) (21.5 - 33.3)	21.2% (70) (15.8 - 27.8)
Prevalence of moderate underweight (<-2 z-score and >=-3 z-score)	18.2 % (126) (14.7 - 22.3)	19.3 % (70) (15.2 - 24.2)	17.0 % (56) (12.3 - 23.0)
Prevalence of severe underweight (<-3 z-score)	6.1 % (42) (4.4 - 8.3)	7.7 % (28) (5.2 - 11.4)	4.2 % (14) (2.4 - 7.4)

Table 15: Prevalence of underweight by age, based on weight-for-age z-scores, SMART - Nangarhar, December 2014 - January 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	187	8	4,3	24	12,8	155	82,9	0	0,0
18-29	192	13	6,8	41	21,4	138	71,9	0	0,0
30-41	152	15	9,9	29	19,1	108	71,1	0	0,0
42-53	107	2	1,9	17	15,9	88	82,2	0	0,0
54-59	55	4	7,3	15	27,3	36	65,5	0	0,0
Total	693	42	6,1	126	18,2	525	75,8	0	0,0

6.2.3 Prevalence of Chronic malnutrition (WHO 2006)

The chronic malnutrition or stunting is defined by Height-for-age Z-scores (HAZ) <-2. The sex and age disaggregated results are represented in Table 16 and 17.

Table 16: Prevalence of stunting based on height-for-age z-scores and by sex, SMART - Nangarhar, December 2014 - January 2015

	All n = 645 (CI: 95%)	Boys n = 337 (CI: 95%)	Girls n = 308 (CI: 95%)
Prevalence of stunting (<-2 z-score)	51.5 % (332) (45.9 - 57.0)	55.2 % (186) (48.2 - 61.9)	47.4 % (146) (40.1 - 54.8)
Prevalence of moderate stunting (<-2 z-score and >=-3 z-score)	29.8 % (192) (25.7 - 34.2)	30.9 % (104) (25.1 - 37.2)	28.6 % (88) (23.0 - 34.9)
Prevalence of severe stunting (<-3 z-score)	21.7 % (140) (17.6 - 26.5)	24.3 % (82) (19.4 - 30.0)	18.8 % (58) (13.7 - 25.3)

Table 17: Prevalence of stunting by age based on height-for-age z-scores, SMART - Nangarhar, December 2014 - January 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	169	23	13,6	47	27,8	99	58,6
18-29	178	48	27,0	58	32,6	72	40,4
30-41	141	35	24,8	42	29,8	64	45,4
42-53	104	20	19,2	29	27,9	55	52,9
54-59	53	14	26,4	16	30,2	23	43,4
Total	645	140	21,7	192	29,8	313	48,5

Figure 4 shows the distribution of HAZ of the observed population (SMART flags excluded) compared to WHO Reference curve. In Nangarhar it was strongly shifted to the left, suggesting restricted linear growth of the observed population. Further analysis (Figure 5) suggests that linear growth retardation is at its highest in the lower age group of children (18-29 months) and overall trend increases with the increase of age.

Figure 4: Gaussian (normal) distribution curve, HAZ, SMART - Nangarhar, December 2014 - January 2015

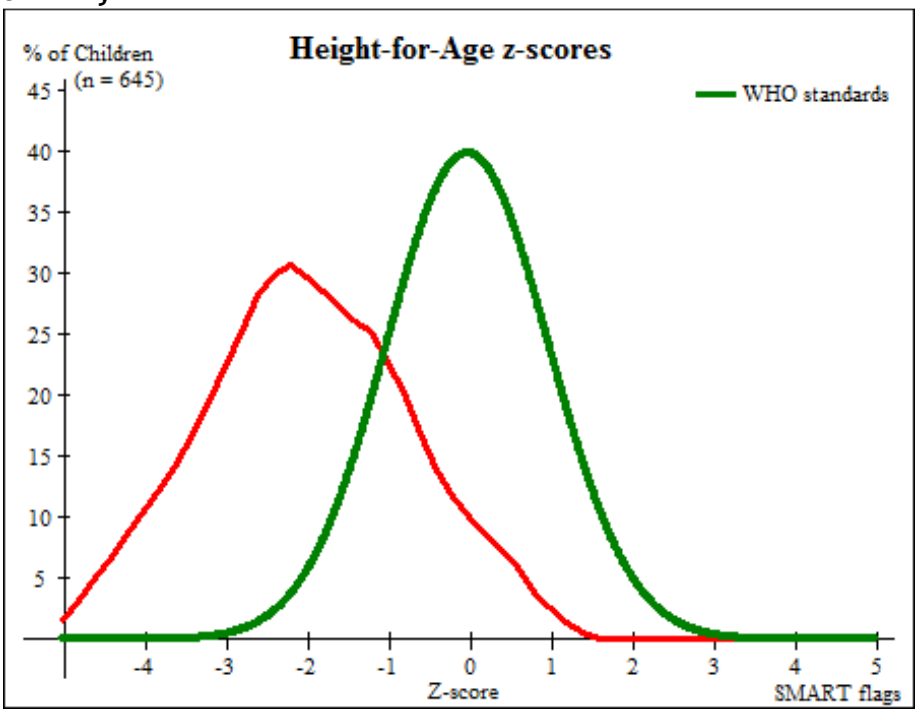
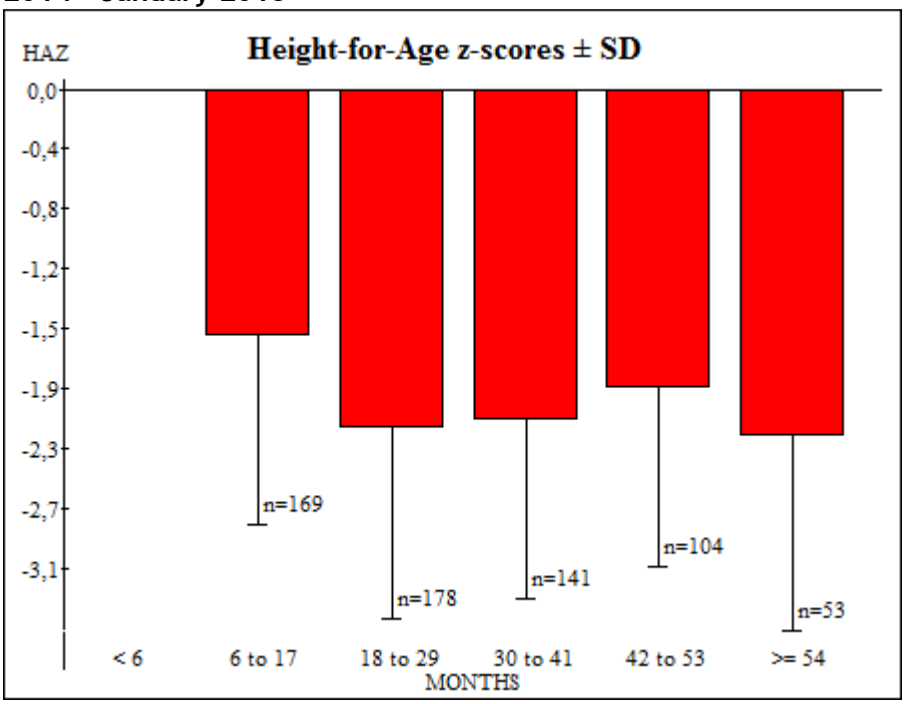


Figure 5: Trends of stunting over the age distribution, SMART - Nangarhar, December 2014 - January 2015



6.2.4 Prevalence of overweight (WHO 2006)

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

Table 18: Prevalence of overweight based on weight for height cut offs and by sex ratio with no oedema, SMART - Nangarhar, December 2014 - January 2015

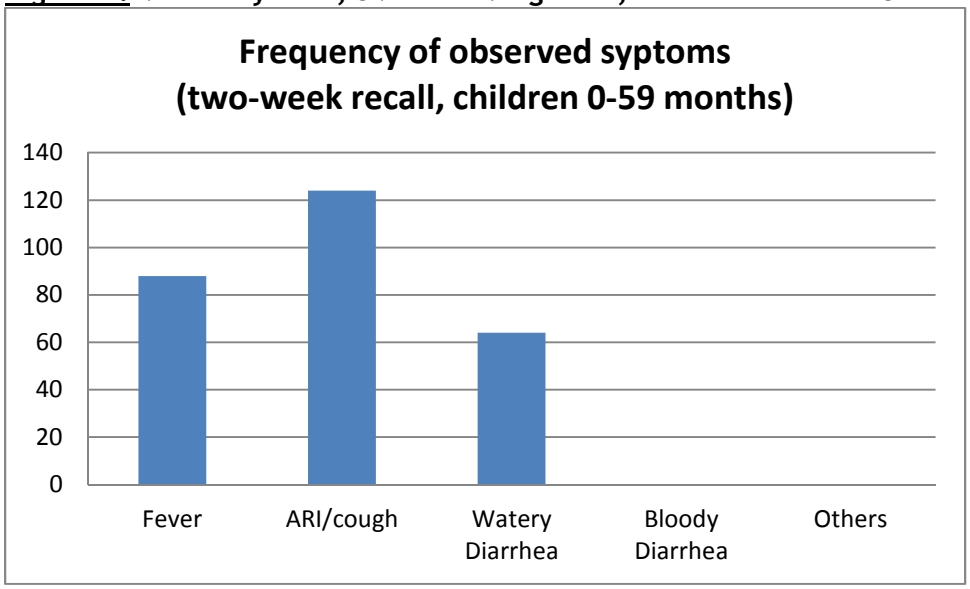
	All n = 697 (CI: 95%)	Boys n = 366 (CI: 95%)	Girls n = 331 (CI: 95%)
Prevalence of overweight (WHZ > 2)	1.9 % (13) (1.0 - 3.6)	1.6 % (6) (0.7 - 3.9)	2.1 % (7) (0.9 - 4.7)
Prevalence of severe overweight (WHZ > 3)	0.0 % (0) (0.0 - 0.0)	0.0 % (0) (0.0 - 0.0)	0.0 % (0) (0.0 - 0.0)

7 CHILD HEALTH INDICATORS

7.1 Two-weeks recall morbidity (Children 0-59 months)

A total of 792 respondents answered about whether they experienced health issue in the last 2 weeks prior to the day of visit of the survey team, **62.6 %** responded with "yes". The frequencies of the symptoms are presented in the figure below. Out of 5.3% children who reported of having watery diarrhoea, 23% children received Zinc.

Figure 6: Morbidity data, SMART - Nangarhar, December 2014 - January 2015



7.2 Immunization, supplementation and deworming

Immunisation, supplementation and deworming are proxy indicators informing community health outreach and health seeking behaviours. A summary of the results are presented in the tables below.

Table 19: Immunisation, SMART - Nangarhar, December 2014 - January 2015

	Class	Frequency	%
Measles Vaccination, children 9-59 months (n=596)	Yes, card	418	70,1%
	Yes, recall	120	20,1%
	No	57	9,6%
	No not know	1	0,2%
Polio (n=756)	Yes, card	578	76,5%
	Yes, recall	161	21,3%
	No	17	2,2%
	No not know	0	0,0%
BCG (n=758)	Scar	719	94,9%
	No Scar	39	5,1%

Table 20: Vitamin A supplementation and deworming, SMART - Nangarhar, December 2014 - January 2015

	Class	Frequency	%
Vitamin A supplementation (6 months recall) (n=740)	Yes	280	37,8%
	No	460	62,2%
Deworming (6 months recall; 12-59) (n=517)	Yes	79	15,3%
	No	438	84,7%

8 IYCF INDICATORS

Indicators for infant and young child feeding (IYCF) practices included all children 0 – 23 months. A total of 323 children included in the sample. The results are presented as a percentage of the total answers available, and as such will not be presented with a confidence interval (see Table 21).

Table 21: IYCF Core Indicators for children 0-23 months (n=317), SMART - Nangarhar, December 2014 - January 2015

Core Indicators	Definition	N	%
Child ever breastfed (n=323)	Proportion of children who have ever received breast milk	320	99.07%
Timely initiation of breastfeeding (n=321)	Proportion of children born in the last 23 months who were put to the breast within one hour of birth	319	99.37%
Provision of colostrum within first 3 days (n=322)	Proportion of children who received colostrum (yellowish liquid) within the first 3 days after birth	319	99.06%
Still breast feeding at 1 year (n=59)	Proportion of children 12-15 months of age who are fed breast milk.	67	88.05%
Exclusive breast feeding (n=91)	Proportion of infants 0-5 months of age who are fed exclusively with breast milk.	5	5.49%
Introduction of solid, semi-solid or soft foods (n=35)	Proportion of infants 6-8 months of age who receive solid, semi-solid or soft foods.	3	8.57%

9 MATERNAL NUTRITION AND HAND WASHING

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

- Physiological status
- Nutritional status based on MUAC cut-off

- Iron/folate for pregnant women (at least once during the visit of the survey team)

The results are presented in the tables below.

Table 22: Physiological status of women of reproductive age (15 - 49 years), (n=809), SMART - Nangarhar, December 2014 - January 2015

Status	Frequency	%
Pregnant	116	14,3%
Lactating	303	37,5%
Pregnant & Lactating	15	1,9%
Non-pregnant & non-lactating	375	46,4%

Table 23: Nutritional status of women of reproductive age based on Mid-upper arm circumference, (n=812), SMART - Nangarhar, December 2014 - January 2015

MUAC cut offs	Frequency	%
MUAC <230 mm	53	6,5%
MUAC ≥230 mm	759	93,5%

Table 24: Iron folate for pregnant women based on available answers, (n=98), SMART - Nangarhar, December 2014 - January 2015

Iron-folate for PLW	Frequency	%
Yes	39	39,8%
No	59	60,2%
Don't know	0	0,0%

Practices of hand washing are indicated in Table 25.

Table 25: Hand washing, SMART - Nangarhar, December 2014 - January 2015

Hand Washing care takers (n=544)	Frequency	%
Only water	16	2.9%
Soap	409	75.2%
Soap when I can afford it	118	21.7%
Traditional herb	1	0.2%
Other	0	0.0%

Although the percentage of people using water only for hand washing is low, a chi- square test was done in order to assess the relationship between hand washing and episode of diarrhoea. The result indicated that children from households not using soap were more likely to have diarrhoea compared to children from households using soap ($p < 0.05$).

Table 26: Hand washing at 4 critical moments, SMART - Nangarhar, December 2014 - January 2015

Response	Frequency	%*
Wash hands at all 4 critical moments	516	94.3%
After Toilet/latrines	541	99.2%
Before cooking	542	99.4%
Before eating	542	99.4%
After taking children to the toilet	517	94.9%

* 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 4 critical points or if they were largely recalling times to which they were previously informed.

10 MORTALITY AND DEMOGRAPHICS

10.1 Demographics

The mortality questionnaire in SMART is designed in a way that some additional useful demographic data can be withdrawn. Summary is available in Table 27. A total of 4596 individuals were surveyed and 786 were reported to have children under age of 5 years.

Table 27: Short summary of demographics, SMART - Nangarhar, December 2014 - January 2015

Indicator	Value
Average HH size	7.86 members
Children under 5	17.1%
Most frequent HH size	10 members
Min HH Size	1 members
Max HH size	30 members

11 MORTALITY RATES

Mortality was included in the survey, with basic data collected at the household level using the retrospective mortality methodology with a 90 days recall period. Heads of household were the main responders, from all households included in the survey, a total of 595 households, regardless of households with children or not. Crude Mortality Rates and Under Five Mortality rates are presented in Table 28).

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

Indicator	Definition	Rate (CI 95%)
CMR	total deaths/10,000 people / day	0.44 (0.24-0.78)
U5MR	deaths in children under five/10,000 children under five/day	0.86 (0.25-2.94)

The main causes of death were not collected; hence this information is not included in this report.

12 HOUSEHOLD'S INFORMATION

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

12.1 Structure and type of households

This information is concisely presented in the tables below.

Table 29: Head of household, SMART - Nangarhar, December 2014 - January 2015

Head of HH (n=553)	Frequency	%
Male	490	88,6%
Female	12	2,2%
Both	47	8,5%
Others	4	0,7%

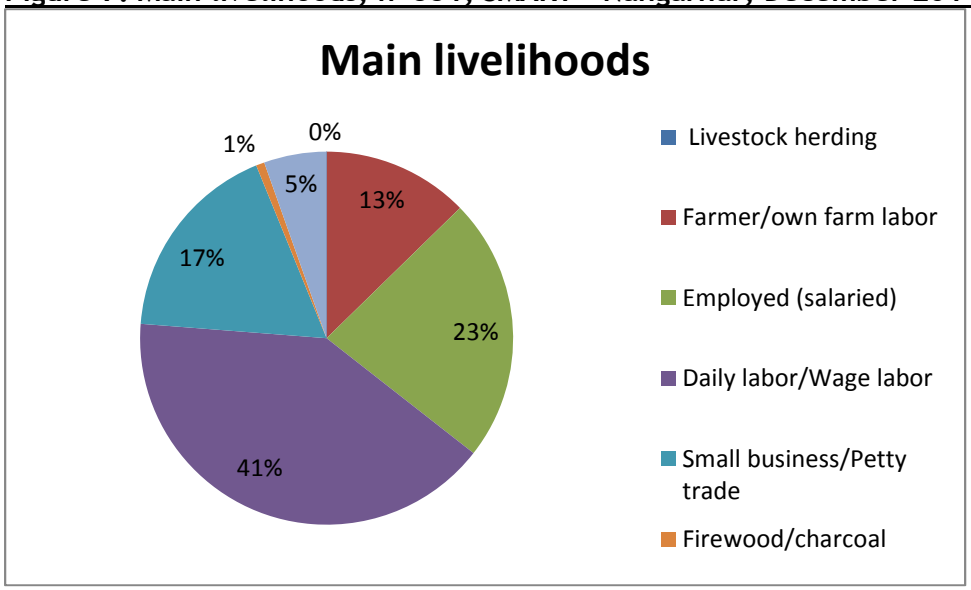
Table 30: Type of family, SMART - Nangarhar, December 2014 - January 2015

Family type (n=553)	Frequency	%
Monogamous	528	95.5%
Polygamous	14	2.5%
Single Parent	11	2.0%

12.2 Main livelihoods

The main livelihoods were defined as those of the family heads. The livestock herding was of 0%.

Figure 7: Main livelihoods, n=551, SMART - Nangarhar, December 2014 - January 2015



12.3 Water consumption and storages at Household level

From the 558 households studied for these indicators, about 86% of the respondents were storing their drinking water in closed containers (jerri cans) and about 8% in open containers. The daily access to water for the majority (96.5%) of the households was above 15 L/person/day (Sphere 2011).

13 DISCUSSION

13.1 Nutritional Status

13.1.1 Global Acute Malnutrition

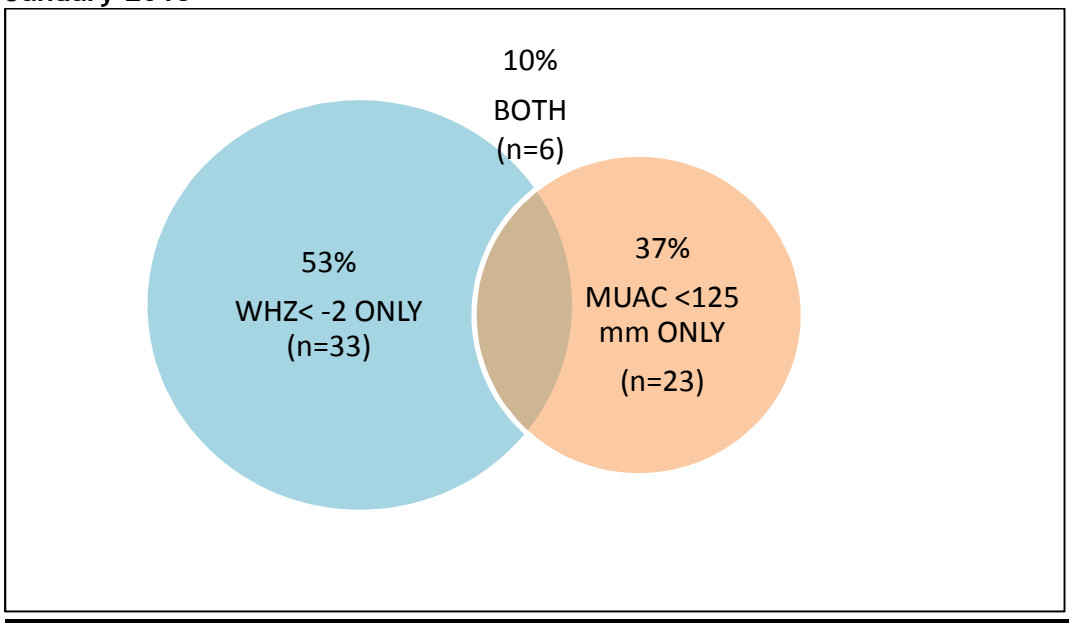
This SMART Nutrition Survey was conducted in 5 districts of Nangarhar province between December 2014 and January 2015. The GAM rate, based on WHZ was of 5.6 % [CI: 3.9 - 7.9]. It is lower than the WHO emergency threshold of 15%, but might be classified as poor. The SAM rates, based on WHZ, was 0.6% [CI: 0.2 – 1.5], also lower than the 4% level, used in the context of Afghanistan to trigger emergency.

The GAM rate based on MUAC was 4.1 % [CI: 2.7 - 6.2], slightly lower than the GAM rate based on WHZ but insignificant. It can be classified as acceptable if WHO standards are considered. In-depth analysis indicated that the WHZ and MUAC prevalence are not based on the same children.

Figure 8 schematically demonstrate this difference. Only 9.6% children in the sample were detected as acutely malnourished according both criteria. The survey have shown that children having MUAC <125 mm were more stunted (HAZ<-2) than wasted (WHZ<-2). This data support the hypothesis that in Nangarhar about 50 % of the acutely malnourished children are by WHZ. Therefore, MUAC based community screenings are not enough to detect all acutely malnourished children eligible for treatment according to the criteria stipulated in the Afghanistan National IMAM Guidelines. This has to be however further investigated.

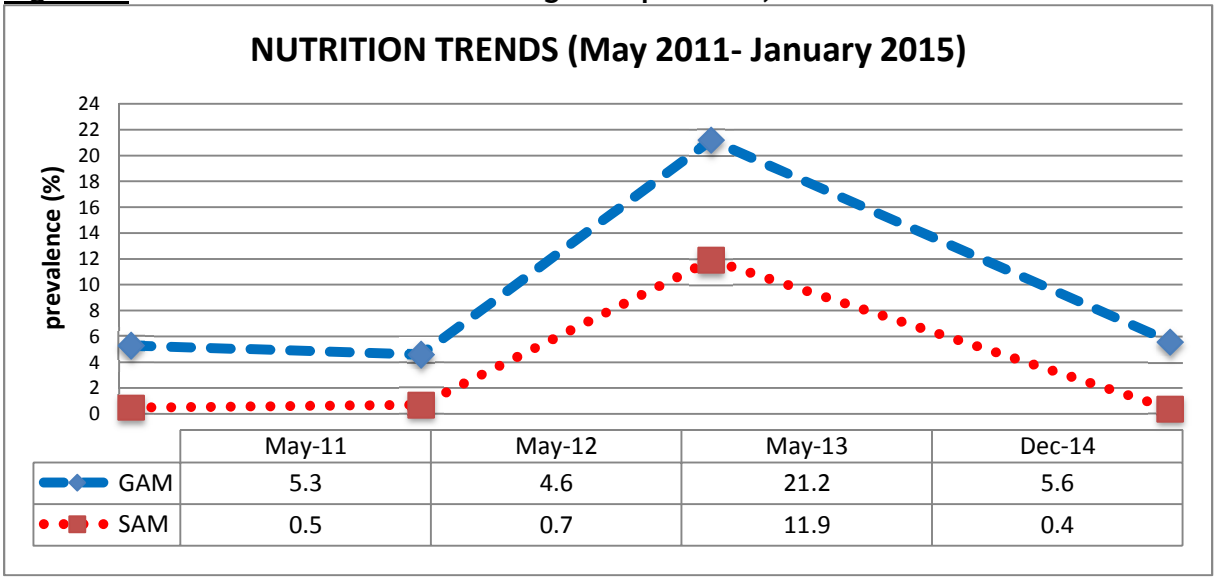
Both GAM WHZ and MUAC have been more prevalent among children 6-29 months compared to children 30-59 months old. This suggests higher vulnerability of younger children to wasting.

Figure 8: Overlapping WHZ<-2 and MUAC<125, SMART - Nangarhar, December 2014 - January 2015



Looking at the most recent trends in Nangarhar province from 2011, apart from the 2013 results from the national nutrition survey, the general trend of malnutrition in Nangarhar province has remained low over the years as indicated in the figure below.

Figure 9: Trends of malnutrition in Nangarhar province, 2011 -2015.



	May-11	May-12	May-13	Dec-14
GAM	5.3	4.6	21.2	5.6
SAM	0.5	0.7	11.9	0.4

13.1.2 Chronic malnutrition

Chronic malnutrition trends in Nangarhar province remain worrying. The results of the present survey clearly showed that, based on WHO classification of severity of malnutrition, the overall prevalence of stunting was very high (51%). one in every 2 children included in the survey were found to be stunted, while 1 in every 4 children was underweight.

The very high stunting rates can probably be due to high prevalence of diseases (62.5% reported of being ill 2 weeks prior to survey), lack of vitamins and/or minerals in the diet (coverage of vitamin A supplementation was 35.8%), and poor infant feeding practices (exclusive breastfeeding was found to be 5.5 % and timely complementary feeding was of 8.6%). The rate of stunting was higher than the national stunting figures reported in the NNS 2013 (40.9%). Interestingly, the very young age group, 6-17 months, was found to be suffered by lower linear growth which could be linked with eventual premature or low birth weight babies and/or low maternal nutrition status. Increasing trends of stunting with the age were also observed.

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

13.1.3 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 6.5% of the mothers were found to have a MUAC<230mm, which suggest that a considerable number of PLWs in Nangarhar are malnourished.

The main concern was iron supplementation among pregnant women which the survey found to be very low (39.8%). The Iron supplementation prevent anemia during pregnancy and

eventual life-threatening complications during delivery. Therefore it decreases maternal mortality, prenatal and perinatal infant loss and prematurity which can be directly related to child stunting in the first 2 years of 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 PW.

13.1.4 Mortality rates

The Crude Mortality rate of 0.44 (0.24-0.78) and the Under-five Mortality Rate of 0.86 (0.25-2.94) remain lower than the emergency and alert levels of 1/10,000 persons/day and 2/10,000 persons/day; and 2/10,000 persons/day and 4/10,000 persons/day respectively.

14 RISK FACTORS

14.1 Morbidity, immunization, supplementation and deworming

The UNICEF conceptual framework of malnutrition can be used to explain the probable causes of under-nutrition in this area. Diseases weaken an individual immune system causing them to have other side effects such as reduced food intake and diarrhea. In the 5 districts of Nangarhar province, more than half of the sampled children had suffered from one form of illness or another (62.6%) such as diarrhea, fever and cough. Informal discussions with health workers indicated that diarrheal cases amongst these age groups were mainly reported to be managed through oral rehydration solution with the use of micronutrient supplementation such as zinc being at merely 23.1%.

The coverage of Vitamin A supplementation, 6 months prior to the survey, was low. About 37.8% children received vitamin A supplementation. One of the core functions of Vitamin A is to boost an individuals' immunity hence important of supplement. Building awareness on Vitamin A is of importance as the current rates are very low compared to the recommended WHO target of 80%. The same applies for de-worming amongst children aged 12 –59 months where the coverage of 15.3% considered extremely low.

It is, however, commendable to note that immunization coverage has indicated admirable trends from measles (90.2%) to BCG (94.6%) and further to Polio (96.8%).

14.2 Infant and young child feeding practices

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

Findings so far have indicated that timely initiation of breastfeeding, colostrum feeding and continuous breastfeeding up to the first year of life were well practiced by the mothers. However, exclusive breastfeeding and timely complementary feeding rates of 5.5% and 8.6% respectively are of real concern as these potentially contributes to stunting in the first two years of life. The complementary feeding, beside from its timeliness, is quite poor and often mixed with tea (inhibits iron absorption). These two practices need to be significantly improved in a targeted manner.

14.3 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 Nangarhar province are found to be acceptable: 96.5% of HH were accessing the recommended amount of water per person per day, 94.3% of the caretakers with good hand washing practices, in 85.64% of the HH water storage was acceptable. 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 Nangarhar province were under acute and chronic nutritional stress in form of stunting indicating the requirement of immediate appropriate public health nutritional 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.

15 RECOMMENDATIONS AND PRIORITIES

Survey finding	Recommendation	Who
High level of Stunting	Support women and their families to practice optimal breastfeeding and ensure timely and adequate complementary feeding through provision of IYCF programs at facility and community levels.	Save the children, MoPH, BPHS Partner
	Support nutrition relevant aspects of availability, access, as well as the utilization of nutritious and diverse foods through integrated programming.	Nutrition cluster, PND and GCMU
	Prioritize activities addressing chronic malnutrition, high stunting rates, at the community level, through food security/agricultural, nutrition cooking demonstrations, IYCF, appropriate supplementation, growth monitoring, and improving maternal health and nutrition.	Nutrition cluster, PND and GCMU
	Advocate for an integrated approach within the health system to ensure monitoring of chronic malnutrition, growth monitoring and promotion, at the health facility and community level	Nutrition cluster, PND
Low Vitamin A supplementation	Ensure that there are effective micronutrient strategies for pregnant women to promote iron folate supplementation at community and facility levels.	MoPH, SCI, and AADA
Therapeutic Zinc	Increase Zinc supplementation through facilities; build awareness through campaigns, and CHW's to combat diarrhoea cases in community levels.	Save the children and AADA
Iron/folic acid supplementation for PW	Community sensitization on importance of micronutrient supplementation and immunization for children and pregnant women.	AADA, Save the children and MoPH
High disease burden	Promote proper hygiene practices at facility and community levels to reduce child morbidity.	WASH cluster, AADA, SCI
	Advocate for increased Health Facilities, outreaches and enhanced coverage, in line with existing gaps, in order to support health and nutrition activities, including supporting links with appropriate facilities such as madrasas to reach children under 5 years of age.	SCI, AADA and MoPH
Low EBF rates and Poor complementary feeding	Strengthen the IYCF component of the nutrition intervention in Nangarhar through formation of mother to mother support groups.	Save the children, AADA and PND
	Increase awareness of IYCF practices and knowledge through regular IYCF messages, both at facility and community levels.	Save the children, AADA, and PND
	Support integrated nutrition interventions with a focus on Infant feeding practices in the province as a strategy to combat malnutrition.	Nutrition cluster, Save the children and PND

Other key programmatic recommendations are:

- Increase monitoring and surveillance of nutrition activities through improved and more timely reporting structure and conducting nutrition survey using the SMART methodology on an annual basis.
- Advocate at the national level for acceptance of a standardized SMART methodology as regular monitoring tool for under nutrition levels.
- To survey districts which were not included in this survey. Twelve districts were excluded due to security issues, and should be assessed at a later date depending on security access.

16 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

17 ANNEXES

Annex 1 Cluster selection

Geographical unit	Population size	Cluster
Malak khwani kalee	3500	1
Zareen abad	4168	2
Qali Tahseel dar Qali Mohammadi	1487	3
Haji Abdul hakeem Kalee	1200	4
Turab Kalee	1000	5
Joee Dag , Miagan	2851	RC
Qali chimar , Qali rishteen	3000	6
Zar alam Camp	2795	7
Mastali Khoshal malim	1997	8
Sada	1575	9
Zarmandi	1542	10
Khakhi	3758	11
Koti taran	1090	12
Sarjal	1250	13
Malak said jan kalee	1000	14
Lewa sarhadi	2100	15
Qali noor khan qali now	2100	16
Ghondi , kuz miagan	1260	17
Haji sahiban qala	3000	18
Swati qali sadiq khan	2000	19
Zerani masjad noor	2100	20
Kacha gari	16000	21
Qali dasht	3000	RC
Shanzda famili	3000	22
Ghochak	17000	23
Bagrami	15887	24
Alikhil	8000	25
Narangh bagh	1000	26
Chalmetra	2500	27
Mashko kosa	3800	28
Kolalano kosa	9077	29
Kabul hada	2315	30
Khowaja saidiq agha	16000	RC
Maiobeen	3000	RC
Qabailo Reasat	2000	31
Chaparhar hada	1600	32
Laghaman Hada	3800	33
Afghan mina	2000	34

Annex 2 Plausibility check

Plausibility check for: Anthro_mortality _SMART_Nangarhar_ Dec 2014_final.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 in-range subjects)	Incl	%	0-2.5 0	>2.5-5.0 5	>5.0-7.5 10	>7.5 20	**0** (0,1 %)
Overall Sex ratio (Significant chi square)	Incl	p	>0.1 0	>0.05 2	>0.001 4	<=0.001 10	**0** (p=0,175)
Overall Age distrib (Significant chi square)	Incl	p	>0.1 0	>0.05 2	>0.001 4	<=0.001 10	**10** (p=0,000)
Dig pref score - weight	Incl	#	0-7 0	8-12 2	13-20 4	> 20 10	**0** (5)
Dig pref score - height	Incl	#	0-7 0	8-12 2	13-20 4	> 20 10	**2** (12)
Dig pref score - MUAC	Incl	#	0-7 0	8-12 2	13-20 4	> 20 10	**2** (11)
Standard Dev WHZ	Excl	SD	<1.1 and	<1.15 and	<1.20 and	>=1.20 or	
.	Excl	SD	>0.9 0	>0.85 2	>0.80 6	<=0.80 20	**0** (1,06)
Skewness WHZ	Excl	#	<±0.2 0	<±0.4 1	<±0.6 3	>=±0.6 5	**0** (-0,15)
Kurtosis WHZ	Excl	#	<±0.2 0	<±0.4 1	<±0.6 3	>=±0.6 5	**0** (0,05)
Poisson dist WHZ-2	Excl	p	>0.05 0	>0.01 1	>0.001 3	<=0.001 5	**0** (p=0,232)
OVERALL SCORE WHZ =			0-9	10-14	15-24	>25	**14** %

The overall score of this survey is 14 %, this is good.

There were no duplicate entries detected.
Percentage of children with no exact birthday: 28 %
Age/Height out of range for WHZ:

HEIGHT:
Line=147/ID=1: 37,40 cm
Line=389/ID=1: 162,00 cm
Line=645/ID=1: -1E5 cm

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 is 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=28/ID=2:	HAZ (1,316), Age may be incorrect
Line=47/ID=1:	WHZ (3,650), HAZ (1,621), WAZ (3,576)
Line=54/ID=3:	HAZ (-7,890), WAZ (-4,474), Age may be incorrect
Line=74/ID=2:	HAZ (1,851), Age may be incorrect
Line=80/ID=1:	HAZ (1,555), Age may be incorrect
Line=81/ID=2:	HAZ (4,344), Age may be incorrect
Line=100/ID=1:	HAZ (1,128), Height may be incorrect
Line=104/ID=1:	HAZ (3,024), WAZ (2,883), Age may be incorrect
Line=111/ID=3:	HAZ (1,059), Age may be incorrect
Line=120/ID=1:	HAZ (-4,976), Age may be incorrect
Line=122/ID=1:	HAZ (-5,895), Age may be incorrect
Line=131/ID=1:	HAZ (-5,148), Age may be incorrect
Line=136/ID=5:	HAZ (-6,260), Age may be incorrect
Line=147/ID=1:	HAZ (-14,810), Height may be incorrect
Line=148/ID=1:	HAZ (-5,084), Age may be incorrect
Line=152/ID=1:	HAZ (-5,531), Age may be incorrect
Line=156/ID=1:	HAZ (-5,764), WAZ (-4,501), Age may be incorrect
Line=175/ID=1:	HAZ (1,869), Height may be incorrect
Line=187/ID=1:	HAZ (1,298), Age may be incorrect
Line=201/ID=1:	HAZ (-5,075), Height may be incorrect
Line=215/ID=1:	HAZ (-5,718), WAZ (-4,404), Age may be incorrect
Line=217/ID=2:	HAZ (-7,137), Age may be incorrect
Line=222/ID=1:	HAZ (1,846), WAZ (2,697), Age may be incorrect
Line=229/ID=2:	HAZ (6,375), WAZ (1,816), Age may be incorrect
Line=231/ID=1:	HAZ (-5,022), Age may be incorrect
Line=240/ID=1:	HAZ (3,598), Age may be incorrect
Line=245/ID=1:	HAZ (3,626), Age may be incorrect
Line=256/ID=1:	HAZ (-8,219), WAZ (-5,042), Age may be incorrect
Line=278/ID=1:	HAZ (3,748), Age may be incorrect
Line=294/ID=1:	HAZ (-6,137), Age may be incorrect
Line=345/ID=3:	HAZ (3,031), Age may be incorrect
Line=357/ID=1:	HAZ (-5,012), Age may be incorrect
Line=371/ID=1:	HAZ (3,125), Height may be incorrect
Line=372/ID=2:	HAZ (1,079), Age may be incorrect

Line=376/ID=1: HAZ (-5,609), Age may be incorrect
Line=389/ID=1: HAZ (12,380), Height may be incorrect
Line=411/ID=1: HAZ (1,458), Age may be incorrect
Line=416/ID=2: HAZ (-7,377), Height may be incorrect
Line=456/ID=2: HAZ (-5,095), Height may be incorrect
Line=459/ID=1: HAZ (-5,131), Age may be incorrect
Line=463/ID=1: HAZ (2,243), Height may be incorrect
Line=484/ID=1: HAZ (2,722), Age may be incorrect
Line=489/ID=1: HAZ (5,213), WAZ (1,834), Age may be incorrect
Line=515/ID=1: HAZ (-5,704), Age may be incorrect
Line=523/ID=1: HAZ (1,404), Age may be incorrect
Line=542/ID=1: HAZ (-7,580), WAZ (-5,634), Age may be incorrect
Line=550/ID=1: HAZ (2,004), Age may be incorrect
Line=618/ID=2: HAZ (-5,241), Age may be incorrect
Line=619/ID=3: HAZ (-5,020), Height may be incorrect
Line=624/ID=8: HAZ (-5,084), Age may be incorrect
Line=659/ID=1: HAZ (2,034), Height may be incorrect
Line=665/ID=1: HAZ (1,827), Height may be incorrect
Line=684/ID=2: HAZ (-4,977), Age may be incorrect
Line=685/ID=3: HAZ (-6,282), WAZ (-4,378), Age may be incorrect
Line=697/ID=1: HAZ (-5,966), Age may be incorrect
Line=701/ID=3: HAZ (2,878), Age may be incorrect
Line=735/ID=2: HAZ (-8,949), Height may be incorrect
Line=792/ID=2: HAZ (1,156), Height may be incorrect

Percentage of values flagged with SMART flags:WHZ: 0,1 %, HAZ: 8,3 %, WAZ: 1,6 %

Age distribution:

Month 6 : ##########
Month 7 : ##############
Month 8 : #########
Month 9 : #############
Month 10 : ##########
Month 11 : ###############
Month 12 : ########################
Month 13 : ###############
Month 14 : ################
Month 15 : ##################
Month 16 : ###############
Month 17 : ###################
Month 18 : #################
Month 19 : ###########
Month 20 : ####################
Month 21 : ##########
Month 22 : #################
Month 23 : ###########
Month 24 : ##################################
Month 25 : ################

Month 26 : ##########
Month 27 : ########
Month 28 : ##############
Month 29 : ################
Month 30 : ########################
Month 31 : ##################
Month 32 : ########
Month 33 : ########
Month 34 : ############
Month 35 : ############
Month 36 : ########################
Month 37 : #########
Month 38 : ########
Month 39 : ############
Month 40 : #######
Month 41 : ############
Month 42 : ###############
Month 43 : ###############
Month 44 : #######
Month 45 : ####
Month 46 : ############
Month 47 : ########
Month 48 : ##################
Month 49 : #####
Month 50 : #
Month 51 : ########
Month 52 : #######
Month 53 : #######
Month 54 : ################
Month 55 : ############
Month 56 : ########
Month 57 : #######
Month 58 : ###
Month 59 : #########
Month 60 : ###

Age ratio of 6-29 months to 30-59 months: 1,21 (The value should be around 0.85).

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

Age cat.	mo.	boys	girls	total	ratio boys/girls
6 to 17	12	99/85,8 (1,2)	91/77,5 (1,2)	190/163,3 (1,2)	1,09
18 to 29	12	104/83,7 (1,2)	91/75,6 (1,2)	195/159,3 (1,2)	1,14
30 to 41	12	83/81,1 (1,0)	71/73,2 (1,0)	154/154,4 (1,0)	1,17
42 to 53	12	54/79,8 (0,7)	56/72,1 (0,8)	110/151,9 (0,7)	0,96
54 to 59	6	30/39,5 (0,8)	25/35,6 (0,7)	55/75,1 (0,7)	1,20
6 to 59	54	370/352,0 (1,1)	334/352,0 (0,9)		1,11

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

Overall sex ratio: p-value = 0,175 (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 = 0,015 (significant difference)
Overall sex/age distribution: p-value = 0,000 (significant difference)

Digit preference Weight:

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

Digit preference score: **5** (0-7 excellent, 8-12 good, 13-20 acceptable and > 20 problematic)
p-value for chi2: 0,025 (significant difference)

Digit preference Height:

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

Digit preference score: **12** (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: **11** (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:		1,07	1,06
(The SD should be between 0.8 and 1.2)			
Prevalence (< -2)			
observed:		5,6%	5,6%
calculated with current SD:		4,8%	4,7%
calculated with a SD of 1:		3,7%	3,7%
HAZ			
Standard Deviation SD:		1,87	1,25
(The SD should be between 0.8 and 1.2)			
Prevalence (< -2)			
observed:		51,4%	51,5%
calculated with current SD:		49,2%	49,5%
calculated with a SD of 1:		48,6%	49,4%
WAZ			
Standard Deviation SD:		1,18	1,09
(The SD should be between 0.8 and 1.2)			
Prevalence (< -2)			
observed:		24,7%	24,2%
calculated with current SD:		26,1%	24,4%
calculated with a SD of 1:		22,6%	22,5%

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

WHZ	p= 0,071	p= 1,000	p= 0,035
HAZ	p= 0,000	p= 1,000	p= 0,004
WAZ	p= 0,037	p= 1,000	p= 0,216

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

Skewness

WHZ	-0,09	-0,15
HAZ	0,38	0,07

WAZ	-0,05	-0,10

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

Kurtosis

WHZ	0,18	0,05
HAZ	9,10	-0,48
WAZ	0,69	-0,24

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=1,16 (p=0,232)
WHZ < -3: ID=0,92 (p=0,609)
GAM: ID=1,16 (p=0,232)
SAM: ID=0,92 (p=0,609)
HAZ < -2: ID=1,87 (p=0,001)
HAZ < -3: ID=1,62 (p=0,009)
WAZ < -2: ID=2,08 (p=0,000)
WAZ < -3: ID=1,09 (p=0,318)

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 is 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: 0,86 (n=39, f=0)  ##
02: 1,13 (n=30, f=0)  ##############
03: 1,45 (n=34, f=0)  ##########################
04: 1,09 (n=36, f=0)  ############
05: 1,09 (n=35, f=0)  ############
06: 0,88 (n=32, f=0)  ###
07: 0,98 (n=37, f=1)  ########
08: 1,15 (n=33, f=0)  ###############
09: 0,91 (n=33, f=0)  ####
10: 1,39 (n=36, f=0)  ########################
11: 1,29 (n=33, f=0)  ####################
12: 1,16 (n=33, f=0)  ################
13: 0,74 (n=35, f=0)
14: 1,13 (n=33, f=0)  ##############
15: 0,99 (n=34, f=0)  ########
16: 1,00 (n=30, f=0)  ########
17: 1,09 (n=27, f=0)  ############
18: 0,97 (n=26, f=0)  #######
19: 1,11 (n=25, f=0)  ##############
20: 0,79 (n=20, f=0)
21: 0,88 (n=17, f=0)  OOO
22: 1,11 (n=16, f=0)  OOOOOOOOOOOO
23: 1,07 (n=08, f=0)  ~~~~~~~~~~~
24: 1,36 (n=06, f=0)  ~~~~~~~~~~~~~~~~~~~~~~
25: 0,68 (n=03, f=0)
26: 1,11 (n=03, f=0)  ~~~~~~~~~~~~~
27: 0,62 (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**
n =	158	186	188	172
Percentage of values flagged with SMART flags:				
WHZ:	0,6	2,2	0,5	0,6
HAZ:	8,9	9,1	8,5	7,0
WAZ:	0,6	2,7	1,6	1,2
Age ratio of 6-29 months to 30-59 months:				
	1,68	1,21	0,90	1,23
Sex ratio (male/female):				
	1,23	0,94	1,44	0,91
Digit preference Weight (%):				

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

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

Digit preference Height (%):

.0 :	8	3	15	3
.1 :	16	12	15	15
.2 :	15	15	13	25
.3 :	13	13	11	12
.4 :	14	13	6	10
.5 :	8	12	7	5
.6 :	13	5	6	8
.7 :	6	5	4	3
.8 :	3	11	12	8
.9 :	4	10	10	10
DPS:	15	13	13	21

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

Digit preference MUAC (%):

.0 :	9	2	4	1
.1 :	14	5	11	12
.2 :	7	15	19	17
.3 :	14	24	12	13
.4 :	13	12	9	12
.5 :	11	12	8	10
.6 :	10	13	7	10
.7 :	9	11	6	7
.8 :	4	4	15	9
.9 :	9	2	10	9
DPS:	10	22	14	13

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

Standard deviation of WHZ:

SD	1,18	1,07	1,04	1,02

Prevalence (< -2) observed:

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

Prevalence (< -2) calculated with current SD:

%	7,0	5,1	3,5	3,9

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

%	4,1	4,0	3,1	3,7

Standard deviation of HAZ:

SD	1,67	2,03	1,93	1,75

observed:

%	45,2	49,5	54,3	55,8

calculated with current SD:
% 40,3 49,8 52,0 53,1
calculated with a SD of 1:
% 34,0 49,6 53,8 55,4

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	25/20,2 (1,2)	19/16,5 (1,2)	44/36,7 (1,2)	1,32
18 to 29	12	33/19,7 (1,7)	22/16,1 (1,4)	55/35,7 (1,5)	1,50
30 to 41	12	15/19,1 (0,8)	15/15,6 (1,0)	30/34,6 (0,9)	1,00
42 to 53	12	12/18,8 (0,6)	11/15,3 (0,7)	23/34,1 (0,7)	1,09
54 to 59	6	2/9,3 (0,2)	4/7,6 (0,5)	6/16,9 (0,4)	0,50
6 to 59	54	87/79,0 (1,1)	71/79,0 (0,9)		1,23

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

Overall sex ratio: p-value = 0,203 (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 = 0,239 (as expected)
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	27/20,9 (1,3)	23/22,3 (1,0)	50/43,2 (1,2)	1,17
18 to 29	12	24/20,4 (1,2)	28/21,7 (1,3)	52/42,1 (1,2)	0,86
30 to 41	12	15/19,7 (0,8)	22/21,0 (1,0)	37/40,8 (0,9)	0,68
42 to 53	12	14/19,4 (0,7)	17/20,7 (0,8)	31/40,1 (0,8)	0,82
54 to 59	6	10/9,6 (1,0)	6/10,2 (0,6)	16/19,9 (0,8)	1,67
6 to 59	54	90/93,0 (1,0)	96/93,0 (1,0)		0,94

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

Overall sex ratio: p-value = 0,660 (boys and girls equally represented)
Overall age distribution: p-value = 0,158 (as expected)
Overall age distribution for boys: p-value = 0,276 (as expected)
Overall age distribution for girls: p-value = 0,366 (as expected)
Overall sex/age distribution: p-value = 0,048 (significant difference)

Team 3:

Age cat.	mo.	boys	girls	total	ratio boys/girls
6 to 17	12	24/25,8 (0,9)	18/17,9 (1,0)	42/43,6 (1,0)	1,33
18 to 29	12	29/25,1 (1,2)	18/17,4 (1,0)	47/42,5 (1,1)	1,61
30 to 41	12	28/24,3 (1,2)	20/16,9 (1,2)	48/41,2 (1,2)	1,40
42 to 53	12	18/24,0 (0,8)	14/16,6 (0,8)	32/40,6 (0,8)	1,29
54 to 59	6	12/11,8 (1,0)	7/8,2 (0,9)	19/20,1 (0,9)	1,71
6 to 59	54	111/94,0 (1,2)	77/94,0 (0,8)		1,44

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

Overall sex ratio: p-value = 0,013 (significant excess of boys)
Overall age distribution: p-value = 0,476 (as expected)
Overall age distribution for boys: p-value = 0,600 (as expected)
Overall age distribution for girls: p-value = 0,880 (as expected)
Overall sex/age distribution: p-value = 0,035 (significant difference)

Team 4:

Age cat.	mo.	boys	girls	total	ratio boys/girls
6 to 17	12	23/19,0 (1,2)	31/20,9 (1,5)	54/39,9 (1,4)	0,74
18 to 29	12	18/18,5 (1,0)	23/20,4 (1,1)	41/38,9 (1,1)	0,78
30 to 41	12	25/18,0 (1,4)	14/19,7 (0,7)	39/37,7 (1,0)	1,79
42 to 53	12	10/17,7 (0,6)	14/19,4 (0,7)	24/37,1 (0,6)	0,71
54 to 59	6	6/8,8 (0,7)	8/9,6 (0,8)	14/18,4 (0,8)	0,75
6 to 59	54	82/86,0 (1,0)	90/86,0 (1,0)		0,91

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

Overall sex ratio: p-value = 0,542 (boys and girls equally represented)
Overall age distribution: p-value = 0,029 (significant difference)
Overall age distribution for boys: p-value = 0,099 (as expected)
Overall age distribution for girls: p-value = 0,069 (as expected)
Overall sex/age distribution: p-value = 0,002 (significant difference)

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

Team: 1

Time SD for WHZ
point 0.8 0.9 1.0 1.1 1.2 1.3 1.4 1.5 1.6 1.7 1.8 1.9 2.0 2.1 2.2 2.3
01: 1,29 (n=10, f=0) ####################

02: 1,33 (n=08, f=0) ####################
03: 1,92 (n=09, f=0) ##
04: 1,31 (n=08, f=0) ####################
05: 1,17 (n=09, f=0) ################
06: 1,08 (n=08, f=0) ############
07: 0,75 (n=10, f=0)
08: 1,38 (n=08, f=0) ########################
09: 1,21 (n=07, f=0) ################
10: 1,53 (n=08, f=0) ################################
11: 1,74 (n=07, f=0) ##
12: 1,09 (n=09, f=0) ############
13: 0,90 (n=08, f=0) ####
14: 1,32 (n=08, f=0) ####################
15: 1,21 (n=09, f=0) ################
16: 0,99 (n=09, f=0) ########
17: 0,87 (n=05, f=0) OOO
18: 0,72 (n=04, f=0)
19: 0,95 (n=04, f=0) OOOOOO
20: 0,73 (n=04, f=0)
21: 0,51 (n=03, f=0)
22: 0,59 (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 point	SD for WHZ 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: 0,45 (n=10, f=0)	
02: 1,01 (n=09, f=0)	#########
03: 1,21 (n=10, f=0)	##################
04: 1,10 (n=10, f=0)	############
05: 1,28 (n=10, f=0)	###################
06: 0,83 (n=09, f=0)	#
07: 1,49 (n=09, f=1)	##############################
08: 1,21 (n=08, f=0)	##################
09: 0,87 (n=09, f=0)	###
10: 1,26 (n=09, f=0)	###################
11: 1,20 (n=10, f=0)	##################
12: 1,36 (n=09, f=0)	########################
13: 0,73 (n=10, f=0)	
14: 0,92 (n=10, f=0)	#####
15: 0,92 (n=09, f=0)	#####
16: 1,04 (n=05, f=0)	OOOOOOOOOO
17: 0,88 (n=06, f=0)	OOO
18: 0,87 (n=05, f=0)	OOO
19: 1,10 (n=08, f=0)	###########
20: 0,78 (n=06, f=0)	

21: 0,99 (n=05, f=0) OOOOOOOO
22: 1,30 (n=04, f=0) OOOOOOOOOOOOOOOOOOOO
24: 2,26 (n=02, f=0) ~~~

03: 1,28 (n=08, f=0) ####################
04: 1,02 (n=10, f=0) #########
05: 0,89 (n=10, f=0) ####
06: 0,75 (n=09, f=0)
07: 0,63 (n=10, f=0)
08: 0,65 (n=08, f=0)
09: 0,76 (n=09, f=0)
10: 1,15 (n=10, f=0) ###############
11: 0,72 (n=07, f=0)
12: 1,09 (n=07, f=0) ############
13: 0,78 (n=09, f=0)
14: 1,34 (n=08, f=0) ########################
15: 1,11 (n=08, f=0) #############
16: 1,03 (n=07, f=0) ##########
17: 1,16 (n=08, f=0) ################
18: 0,87 (n=08, f=0) ###
19: 1,18 (n=07, f=0) #################
20: 0,58 (n=05, f=0)
21: 1,06 (n=03, f=0) OOOOOOOOOO
22: 0,33 (n=03, f=0)
23: 0,26 (n=02, f=0)

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

(for better comparison it can be helpful to cop

NUTRITION SMART SURVEY QUESTIONNAIRE(دتغذیوی SMART سروی پوښتنی)

Annex 3 Questionnaires

1.IDENTIFICATION (هویت) **1.1 Data Collector**(ارقام جمع کونکی) _____ **1.2 Team Leader**(تیم لیډر)_____ **1.3 Survey date (dd/mm/yy)** (سروی تاریخ) **----------**								
1.4 Province(ولایت)	1.5 District, ولسوالی	1.6 Division ناحیه	1.7 Location محل	1.8 Sub-Location محل فرعی	1.9 Village قریه	1.10 Cluster No کلستر نمبر	1.11 HH No دکورنی نمبر	1.12 Team No. دټیم نمبر

2. HOUSEHOLD STRUCTURE (دکورنی جوړښت)	
2.1	**How many people live together in this household & share meals** |____| **پدی کورنی کی څومره کسان یوځای ژوند کوی او په شریکه غذا خوری ؟**
2.2	**Who is the Head of the Household?** |____| [1=Husband, 2=Mother, 3=My parents, 4=others , specify] **د دی کورنی مشر څوک دی ؟** **[مشخص یی کړی ، نور =۴ ، مور اوپلار =۳ ، مور =۲ ، خاوند =۱]**
2.3	**What is the structure of your family**? |____| [1=monogamy, 2=polygamy,3=single parent] **ستاسی کورنی جوړښت څه دول دی ؟** **[بواځی 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 ۴.۲ 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) **(معاش) وظیفه** 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 ماشوم صحت او تغذیه (یواځی ۰ - ۵۹ میاشتو ماشومانو لپاره) که جواب**N/A**وی نو ۳،۶ برخی ته مراجعه وکړی **Instructions** دستور العمل: *The caregiver of the child should be the main respondent for this section*دماشوم مور یا پایواز عام وتام مسولیت لری پدی برخه کی ***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 **Child No.** دماشوم نمبر	**B**	**C**	**D**	**E**	**F**	**G**	**H**	**I**	**J**	**K**

NUTRITION SMART SURVEY QUESTIONNAIRE(دتغذیوی SMART سروی پوښتنی)

	SEXجنس 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) XX.X قد په سانتی متر	Oedema Y= Yes N= No پرسوب N = نخیر Y= بلی	MUAC (mm) XX.X موک په ملی متر	Has your child (NAME) been ill in the past two weeks? If No, please skip part K and L proceed to 3.4) ایاستاسی ماشوم (نوم) په تیرو دوه هفتو کی ناروغ شوی که جواب نه وی د Kاو L نه تیر شی او 3.4 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 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	If the child **had watery diarrhoea** in the last TWO (2) WEEKS, did the child get THERAPEUTIC zinc supplementation? که چیرته ماشوم په تیرو دوه هفتو کی اوبلن اسهال درولودو نوایا ماشوم زنک تابلیت اخیستی دی *Show sample and probe further for this component* *check the remaining drugs(confirm from mother child booklet)* نمونه ورته وښایی او د ماشوم دمور نه ځان مطمین کړی(دواکانی وګوری چی کومی دواګانی یی ورکړی دی) 1 = Yes (بلی) 2 = No (نه) 3 = Do not know (نه پوهیږم)
01										

Fever تبه دملاریا سره :
High temperature د تبه درجه لوړه لرزی سره

Cough/ARI(توخی / تنفسی مشکلات) : Any episode with severe, persistent cough or difficulty breathing
دوامداره توخی یا په ساه اخیستنه کی مشکلات

Watery diarrhoea(اوبلن اسهال) : Any episode of three or more watery stools per day
که اوبلن غایطه مواد په ورځ کی دری یا د دری ځلو نه زیات ولری

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

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 (دټولو 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 **میاشتنی 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** **تولی 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: ____.__**cm** مور یا پایواز د موک اندازه په ملی متر _____	Have you been taking iron-folate tablets? (Only for pregnant women) ایا تاسی اوسپنی کولی اخیستی (یواځی د حامله ښځو لپاره) (نمونه وښایی) 1. **Yes** بلی 2. **No** نه 3. **Don't know** نه پوهیرم
1			
2			
3			
4			

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

NUTRITION SMART SURVEY QUESTIONNAIRE(دتغذیوی SMART سروی پوښتنی)

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 ډک کړی چې د ۰ – ۲۳ میاشتو ماشوم ولري

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

3.10	A	B	C	D	E	F	G	H	I	J
Child No. دماشوم نمبر	**Number of people in the household** په کورنی کی دافرادو تعداد	**HH Ref-No** د کور نی نمبر	**Age (in months)** عمر په میاشت	**Has this child ever been breastfed?** ایا دی ماشوم کله دمور شیدی رودلی **1 = Yes** بلی **2 = No** نه ***If no go to question I*** که چیرته جواب نه وی نو سوال ته *I* 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 سینی راوڅی یعنی اورکه 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 چرګان ، جګر او توری پښتورګی او نور **3 = Legumes and Nuts** سبزی او مغذی مواد **4 = Dairy products (milk, yoghurt, chees e)** لبنیات (شیدی ، مستی ، کوچ) **5 = Eggs** هګی **6= Vitamin A rich fruits & Vegetables** د ویتامین ای نه غنی میوه او ترګاری **7 = Other Fruits and vegetables (specify___)** ن نوره میوه او ترکاری واضح یی کړی **8. Nothing** هیڅ شی **9. Others (specify)** نور مشخص یی کړی **(*Multiple responses are possible*)** شاید دیر ځوابونه انتخا ب شی	**Yesterday (During the day and at night). How many times did you feed [Name] solid and semi-solid foods?** پرون په شپه او ورځ کی څو ځلی ماشوم مو په جامدو او نیمه جامدو موادو تغذیه کړی؟ چی ماشوم یی مور کړی وی
1										
2										
3										

Team Leader Name_____**Signature** _____