AFGHANISTAN

Nutrition & Mortality SMART Survey
Final Report
Samangan Province, Afghanistan
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Action Against Hunger

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Abbreviations

ANC	Antenatal Care
ACF	Action contra la Faim/Action against Hunger
BCG	Bacillus Clamate Guerin
CDR	Crude Death Rate
CSO	Central Statistics Organization
ADDA	Agency for Assistance and Development of Afghanistan
ENA	Emergency Nutrition Assessment
GAM	Global Acute Malnutrition
HH	Household
IYCF	Infant and Young Child Feeding
MUAC	Mid Upper Arm Circumference
MW	Mean Weight
NNS	National Nutrition Survey
PNC	Postnatal Care
PPS	Proportional Population Size
RC	Reserve Cluster
SAM	Severe Acute Malnutrition
SD	Standard Deviation
SMART	Standardized Monitoring and Assessment of Relief and Transitions
U5DR	Under five Death Rates
U5	Under five
UNICEF	United Nation Children's Fund
WFP	World Food Program
WASH	Water Sanitation and Hygiene
WHZ	Weight for Height Z score
W/H	Weight for height
WHO	World Health Organization
OW	Observe Weight

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Executive summery

Nutrition and mortality SMART survey conducted in the entire province of Samangan from 27 February to 16 March 2017. It was base on the Standardized Monitoring and Assessment of Relief and Transitions (SMART) methodology and was a cross-sectional survey following a two-stage cluster sampling method. 722 children 6-59 months aged and 637 households were planned in the sample and the results included 995 children for assessment of Weight-for-Height (137.8%), and 628 households (98.6 %). The nutrition and mortality SMART survey final report provides methodology used, analysis and interpretation of the survey findings and recommendation proposed.

Summary findings

- **Total 628 households were assessed. Out of them 1,068 were children aged from 0-59 months while 996 were children aged from 6-59 months and 680 were women in the childbearing age in the selected households.**
- **The combine GAM and SAM caseload based on MUAC and WHZ on both criteria were11.4% (9.4-13.4 95% CI) and SAM was 3.7% (2.5-4.9 95% CI)) respectively.**
- **Prevalence of Global Acute Malnutrition (GAM) and sever acute malnutrition (SAM) based on Weight for Height was at 7.8% (6.2- 9.7 95% CI) and 2.1% (1.3- 3.1 95% CI). It is to be noted that, the SAM prevalence based on WHZ need to be carefully interpreted as there is little over estimation of SAM prevalence confirmed by the plausibility check. Hence, it's advised to rely mostly on the overall GAM estimation though both the estimations are statistically valid.**
- **Prevalence of global acute malnutrition based on MUAC was at 6.0% (4.5- 8.1 95% CI) While sever acute malnutrition was at 2.2 % (1.5 - 3.3 95% C.I.).**
- **Prevalence of underweight (WAZ) was at 16.1% (13.6-19.0 95% CI) While sever underweight was at 3.4% (2.3- 5.0 95% CI).**
- **Prevalence of stunting or chronic malnutrition (HAZ) was at 35.6% (31.3-40.2 95% CI) while sever stunting was at 10.1% (8.0-12.8 95% CI).**
- Crude Death Rate (CDR) was **0.19% (0.09-0.40 95%CI) with** 1.41 design effect. While under five death rate (U5DR) was 0.24 (0.08-0.74**95% CI)** with 1.0 design effect.
- **Prevalence of maternal malnutrition based on MUAC <230mm of pregnant and lactating women was at 10.8% (95% CI, 8.0-13.5).**
- **Immunization coverage such as Measles both by card and recall, BCG confirmed by scar and Polio both by card and recall were at 83.5 %, 92.3% and 86.9 % respectively.**

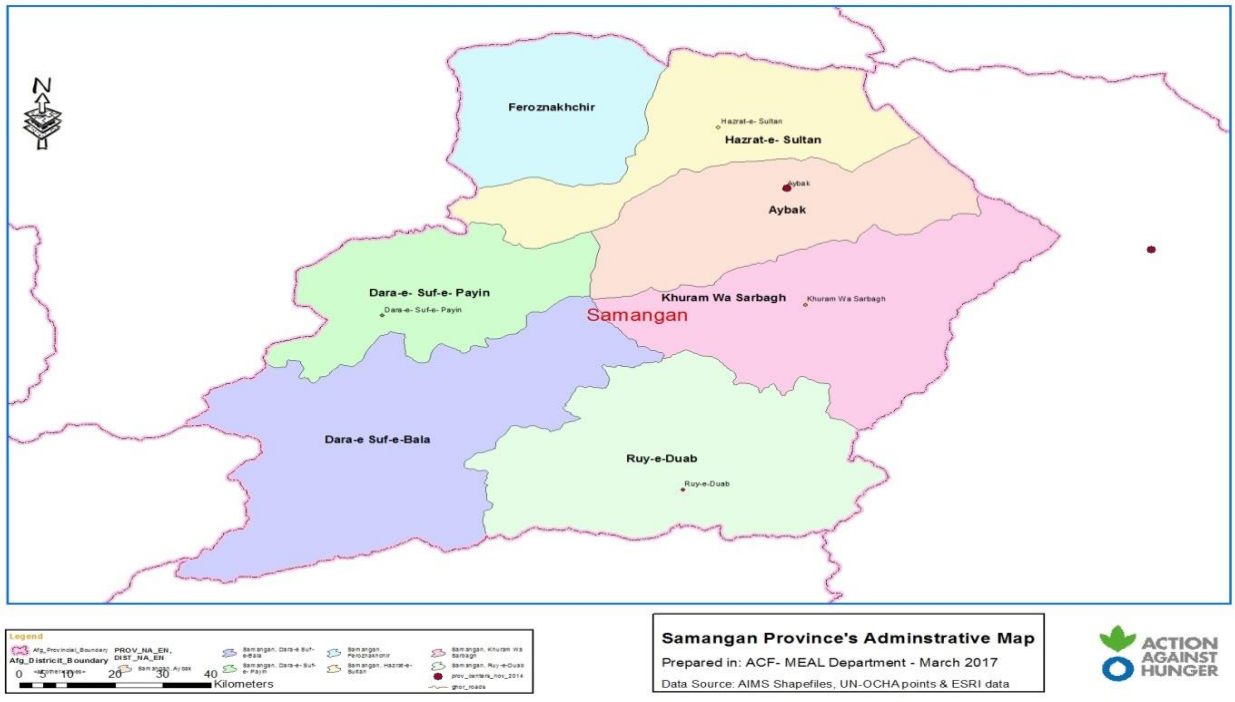
1.1 Introduction

Samangan is one of the thirty-four provinces of Afghanistan, located north of the Hindu Kush mountains in the central part of the country. The province covers 11,218 square kilometres (4,331 sq mi) and is surrounded by Sar-e Pol Province in the west, Balkh in the north, Baghlan in the east, and Bamyan in the south. The majority of the population here is Uzbek, but there also significant numbers of Pashto and Persian speakers in the province.

Samangan province is divided into 7 districts such as Darah e Sof Bala, Darah e sof Payen, Feroz Nakhchir, Hazrat Sultan, Khuram wa sarbagh, Ruye Du Ab and The city of Samangan (Aybak) serves as a provincial capital. It has a population of about 368,800 which is multi-ethnic and mostly a rural society.

The nutrition and mortality SMART survey was conduct in winter (February- March 2017) covering the entire province. ACF technically supported AADA for the implemented of this survey to investigate health, nutrition, WASH and FSL situation in the entire districts of Samangan province through the integrated nutrition and mortality SMART assessment.

Samangan Physical map:



1.2 Context and justification

The justification of the proposed assessment is to estimate the current prevalence of under-nutrition among vulnerable populations in the province. The survey also investigated the current mortality rates,

child health status (morbidity, immunization and supplementation), nutritional status of women of reproductive age (15-49 years) with special focus on pregnant and lactating women, IYCF and WASH practices. The last assessment that provided information on nutritional status of under-fives was conducted through the National Nutrition Survey in 2013 and GAM rates 7.8% (5.42 - 11.07 95 %CI) was at Poor levels of WHO classification. There are needs to investigate on the current prevalence of under-nutrition in the province. The Survey findings will be used to inform future programing in the province. It is also serves as a good opportunity of building the capacity of AADA and other stakeholders.

1.3 Survey objectives

a. Main objective

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

b. Specific objectives

- To estimate Crude Death Rate (CDR) and under five Death Rate (U5DR).
- To determine prevalence of under nutrition among children aged 6-59 months
- To determine core Infant and Young Child Feeding (IYCF) practices among children aged 0-23 months
- To determine the nutritional status of pregnant and lactating women based on MUAC assessment.
- To assess institutional birth attendance in the province.
- To assess Water, Sanitation and Hygiene (WASH) proxy indicators: household water storage, water use and caregiver hand washing practices.
- To assess morbidity among children 0-59 months based on a two weeks recall period.
- To assess food access and consumption on seven days recall period: households levels.
- To assess education of the school aged population in the province.

Methodology

Sampling Methodology

A two-stage cluster sampling methodology was implemented.

Stage 1: In the stage 1, random selection of clusters/villages was done using probability proportionate to size (PPS) using ENA software version 2011 of (9th July, 2015). A list of all updated villages (452) was amounted into the ENA for SMART software where PPS was applied. The villages with large population

have a higher chance of being selected than villages with small population and vice versa. Reserve Clusters (RCs) was also be selected by ENA software version 2011(updated 9th July 2015). Reserve clusters was only be used if 10% or more clusters was impossible to reach during the survey as highlighted in Annex 1. 49 clusters was covered if each survey team completes anthropometric measurements in 13 households in a day. At each selected village; one or more community member(s) was asked to help the survey teams to conduct their work by providing information about the village with regard to the geographical organization or the number of households. In cases where there are large villages in a cluster, the village was divided into smaller segments and a segment was selected randomly to represent the cluster. This division was done based on existing administrative units e.g. neighborhoods, or streets or natural landmarks like river, road, or public places like market, schools, and mosques.

Stage 2: random selection of households from updated and complete list of households within a given village. In this case the actual survey data collection, was incorporate 637 households randomly selected based on survey parameters calculation for anthropometric. Based on total sample size each team could covered effectively 13 households in a day. In this assessment, 6 teams were engaged during the assessments, while data collection is expected to last 8-9 days. All households was enumerated and given numbers by the survey team. The 13 households was chosen randomly from these enumerated households, by randomly drawing household numbers required from a hat or using a random number table generated from ENA for SMART software. There was difficult to obtain an updated list of households, systematic random sampling was used to identify the households to be surveyed. The teams were trained on both methods of sampling (simple and systematic random sampling) and they were also being offered with materials to assist in determining the households during the data collection exercise. All the children living in the selected house aged (0 to 59) months old was included for anthropometric measurements. Children aged (0-23) months were included for IYCF measurements. If more than one eligible child is found in a household, both were included, even if there are twins. Eligible orphans living in the selected Households was also be surveyed. All of the selected HH was included in the mortality survey as well as was respond to questions concerning the HH as a whole (ex. water storage). Any empty households, or households with missing or absent children was revisited at the end of the sampling day in each cluster; any missing or absent children that was not be subsequently found was not be included in the survey. A cluster control form was used to record all these missed and absent households.

Table 1: Details of proposed and actual sample size achieved, Samangan SMART, March 2017.

Number of HH planned	Number of HH surveyed	% of HH surveyed / planned	Number of children 6-59 months planned	Number of children 6-59 months surveyed	% of surveyed children 6-59 months/Planned
637	628	98.6%	722	996	137.9%

The household was the basic sampling unit. The term household was defined as all people eating from the same pot and living together (WFP definition). In Afghanistan, the term household is often defined and/or used synonymous with a compound – which potentially represents more than one household as defined here. In this case, a two-step process was ensured with the village leaders/community elders and then identifying compound together with the use of the list of households within the community, asking if there are multiple cooking areas to determine what members of the household/compound should be included in the study.

Sample Size

The sample size of households surveyed was determined using ENA software version 2011 (updated 9th July 2015). A two stage cluster methodology applied. In first stage, it involves random selection of clusters/villages (49 clusters) from total list of villages using probability proportion to size (PPS) method. This was done before starting of data collection at the office or training hall. Villages were the primary sampling unit for the proposed survey. In the second stage of methodology, it involve random selection of household (13 households) from an updated list of households. This was conducted at the field level. Households were the basic sampling unit for the proposed survey. The table 2 and 3 highlights sample size calculation for anthropometric and mortality surveys.

Table 2: Parameters for sample size calculation of anthropometric indicators, Samangan SMART, March 2017

Parameters for Anthropometry	Value	Assumptions based on context
Estimated prevalence of GAM (%)	7.8%	The survey team was refer to the National Nutrition survey (2013) for the planning stage of Samangan SMART survey (GAM was 7.8% (5.42 - 11.07 95% CI).The SD was above (1.7) of the recommended limit of 0.85-1.2. There was no updated data to use for the planning stages, it was used carefully for the assessment.

± Desired precision	±2.5	It was based on survey objectives in line to estimated prevalence and SMART methodology recommendations. If we use an estimate point prevalence of 7.8% as our predicted GAM prevalence then a precision of. ±2.5 is recommended.
Design Effect (if applicable)	1.5	The population living in the targeted districts is 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 are not well served by health facilities. Hence the design effect was estimated at 1.5.
Children to be included	722	Minimum sample size-children aged 6-59 months. (However to avoid possible bias of selection for younger age group, all children from 0 to 59 months old found in the selected households will be surveyed.)
Average HH Size	7.7	According to the National Nutrition Survey 2013, the average household size was 7.7 – It's the most recent result.
% Children under-5	17.4%	Based on different SMART surveys experiences in the provinces the percentage of 6-59 months age was 17.4%.
% Non-response Households	6%	The percentage of non-respondent households was estimated at 6%. Using the last experience of the SMART surveys in the different provinces. The non-response rate will cater for unforeseen circumstances to include refusal, absenteeism or population movements National Nutrition Survey of Afghanistan, UNICEF, 2013.
Households to be included	637	Minimum sample size-Households to be surveyed. Households will be the basic sampling unit for the SMART survey

Table 3: Sample size calculation for mortality survey, Samangan SMART, March 2017

Parameters for Mortality	Value	Assumptions based on context
Estimated Death Rate /10,000/day	0.5/1000 0/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 /10,000/day	0.3%	Based on survey objectives and inline to estimated death rate.
Design Effect (if applicable)	1.5	This will caters for heterogeneity in the population being sampled.
Recall Period in days	130	Starting point of recall period will be done (from the 10th of Mahram).21st Mezan the date of recall is equivalent to 12th October 2016 as per Gregorian calendar.
Population to be included	2,681	Population
Average HH Size	7.7	According to the National Nutrition Survey 2013, the average household size was 7.7 – It's the most recent result.
% Non-response Households	6%	The percentage of non-respondent households was estimated at 6%. Using the last experience of the SMART surveys in the deferent provinces. The non-response rate will cater for unforeseen circumstances to include refusal, absenteeism or population movements National Nutrition Survey of Afghanistan, UNICEF, 2013.
Households to be included	**370**	**Households**

Sample Size for Additional Indicators:

The sample size for IYCF indicators was calculate by using the Care international IYCF calculator, based on WHO, 2010. Core IYCF indicators highlighted in table 4. The core IYCF, indicators included: Exclusive Breastfeeding Rate (EBF); timely initiation of breastfeeding; minimum dietary diversity and minimum frequency. During survey data collection, a stratified proportionate sampling methodology was apply.

Training, team composition and supervision

Six teams of four members' conducted the field data collection. Each team was composed of one supervisor, one team leader and two data collector. Each team was having at least one female data collectors to ensure acceptance of the team amongst the surveyed households; particularly for IYCF

questionnaires. Each female member of the survey team was accompanied with a mahram[1] to facilitate the work of the female data collectors at the community level. The teams were supervised by ACF Nutrition SMART Deputy Program manager and AADA Nutrition focal point and nutrition manager.

The entire teams received a 7-days training on the survey methodology and all its practical aspects; conducted by ACF Nutrition SMART Deputy Program Manager. A standardization test was conducted over the period of one day, measured 6 children, in order to evaluate the accuracy and the precision of anthropometric measurement for each team members. Despite standardization test one day filed works (field test) was conducted to seek the professionalism of the team on the ground. Base on filed test, result feedback provided to the team in order to strength their weak points; 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 was organized on the last day of the training by ACF to ensure overall comprehension before going to the field.

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

Data entry and analysis

The anthropometric and mortality data was analyzed using ENA for SMART software 2011 version (9th July 2015). Survey results was interpreted in reference to WHO standards, analysis of other indicators to include IYCF, WASH, demographic and food security was done using Microsoft excel version 2010. Information generated from these indicators was used to explain the outcome indicators to include; nutritional status of under-fives and mortality (CDR and U5DR). Contextual information generated from routine monitoring was used in complementing survey finding.

Indicators: definition, calculation and interpretation

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

- **Acute Malnutrition**

Acute malnutrition in children 6-59 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)

Child's nutritional status is estimated by comparing it to the weight-for-height curves of a reference

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

population (WHO standards data). These curves have a normal shape and are characterized by the median weight (value separating the population into two groups of the same size) and its standard deviation (SD). The expression of the weight-for-height index as a Z-score (WHZ) compares the observed weight (OW) of the surveyed child to the mean weight (MW) of the reference population, for a child of the same height. The Z-score represents the number of standard deviations (SD) separating the observed weight from the mean weight of the reference population: WHZ = (OW - MW) / SD.

During the field data collection, the weight-for-height index in Z-score was calculated on the field for each child in order to refer malnourished cases to appropriate center if needed. Moreover, the results presented in Z-score using WHO reference. The classification of acute malnutrition based on WHZ is well illustrated in table below.

Mid Upper Arm Circumference (MUAC)

The mid upper arm circumference does not need to be related to any other anthropometric measurement. It is a reliable indicator of the muscular status of the child and is mainly used to identify children with a risk of mortality. The MUAC is an indicator of malnutrition only for children greater or equal to 6 months. Table 5 provides the cut-off criteria for categorizing acute malnutrition cases.

Table 4: MUAC cut-offs points for children aged 6-59 months

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

Nutritional bilateral “pitting” oedema

Nutritional bilateral pitting oedema is a sign of Kwashiorkor, one of the major clinical forms of severe acute malnutrition. When associated with Marasmus (severe wasting), it is called Marasmic-Kwashiorkor. Children with bilateral oedema are automatically categorized as being severely malnourished, regardless of their weight-for-height index. The table 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 based on WHO standards

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

- **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 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 present in table below.

Table 6: 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**

2. 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)**

The number of persons in the total population that dies over specified period of time refers to the Table 2 above for Sample size calculation for mortality surveys

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

- **Under-5 death rate (U5DR)**

The number of children aged (0-5) years that die over specified period of time Table 2 above for Sample size calculation for mortality surveys. Calculated as:

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

3. Health

- **Immunization status, deworming and vitamin A supplementation**

Mothers/caretakers of all children were asked if children received all the necessary vaccinations, which was subsequently verified by reviewing the vaccination card, if available. If the vaccination card was not available, then recall of the caregiver option was considered. The deworming and the Vitamin A supplementation of children was also recorded using samples.

- **Morbidity**

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

- **Mothers nutritional status and Iron/Folate supplementation for pregnant**

Women in childbearing age were assessed for their nutritional status based on MUAC using the cut-off of 230 mm.

4. WASH

- **Water storage and Usage**

House hold heads was asked what type of container they use for storing drinking water and also how much water they used in the HH in the last 24 hours to assess the water use per person per day.

- **Hand washing practices**

The mothers was asked on what occasions they wash their hands and also what they use to wash their hands to determine the hand washing practices in the surveyed area.

5. 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. The indicator refers to proportion of children who have ever received breast milk. It's calculated by dividing the number of children born in the last 23 months who were ever breastfed by all Children born in the last 23 months. The indicator is based

on historical recall, and a caregiver(s) is supposed to provide information of all children living or dead who were born in the last 23 months. This indicator was looking at the number of mothers who ever breast fed their children. This indicator was based on historic recall.

- **Timely initiation of breastfeeding**

Proportion of children of children aged 0- 23 months, whom were timely breast feed (breast feed at first hours of birth). The indicator is calculating by dividing the number of children aged 0 – 23 months who were timely breast feed by children age less than 24 months. The denominator and numerator include living children and deceased children who were born within the past 24 months. This indicator was based on historical recall.

- **Provision of colostrum in the first 3 days of life**

Proportion of children who received colostrum (yellowish liquid milk) within the first 3 days after birth.This indicator was look at the number of mothers with children 0-23 months who fed their children with Colostrum within the first 3 days after birth.

- **Exclusive breastfeeding under 6 months**

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

- **Continued breastfeeding at 1 year**

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

- **Introduction of solid, semi-solid or soft foods:**

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

- **Continued breastfeeding at 2 years**

Proportion of children leas then 0–24 months of age who are fed breast milk. It's calculated by dividing the number of children aged leas then 0–24 months who received breast milk during the previous day by total children aged leas the 0–24 months.

6. Maternal Health and Nutrition

Women in childbearing age were assessed for their nutritional status based on MUAC measurements. The nutritional status of pregnant and lactating mothers was derived using the MUAC cut-off of 230 mm. The indicator for iron-folate supplementation was derived from dividing the total number of pregnant mothers supplemented with Iron-folate in the last 90days by total number of pregnant mothers.

Survey Findings

Anthropometric results (based on WHO standard)

Anthropometric results are presented with exclusion of SMART flags: Z score values ranging outside- -3 to +3 for all three index (WHZ, HAZ and WAZ). The survey finding opened the distribution of the boys and girls in the sample were equally represented with (**p-value =0.229)**, the percentage of values flagged with SMART flags was WHZ: 2.0%, HAZ: 3.0% and WAZ: 0.9%,
Age ratio of 6-29 months to 30-59 months: 0.90 (The value should be around 0.85):p-value = 0.395 (as expected) for more details refer to **ANNEX 1** plausibility report.

Table 7: Distribution of age and sex of sample, Samangan SMART, March 2017

	Boys	%	Girls	%	Total	%	Ratio, boys : girls
AGE (mo)	No.	%	No.	%	No.	%	Boy:Girl
6-17	**126**	**52.5**	**114**	**47.5**	**240**	**24.1**	**1.1**
18-29	**122**	**52.8**	**109**	**47.2**	**231**	**23.2**	**1.1**
30-41	**120**	**51.7**	**112**	**48.3**	**232**	**23.3**	**1.1**
42-53	**94**	**50.8**	**91**	**49.2**	**185**	**18.6**	**1.0**
54-59	**55**	**50.9**	**53**	**49.1**	**108**	**10.8**	**1.0**
Total	**517**	**51.9**	**479**	**48.1**	**996**	**100.0**	**1.1**

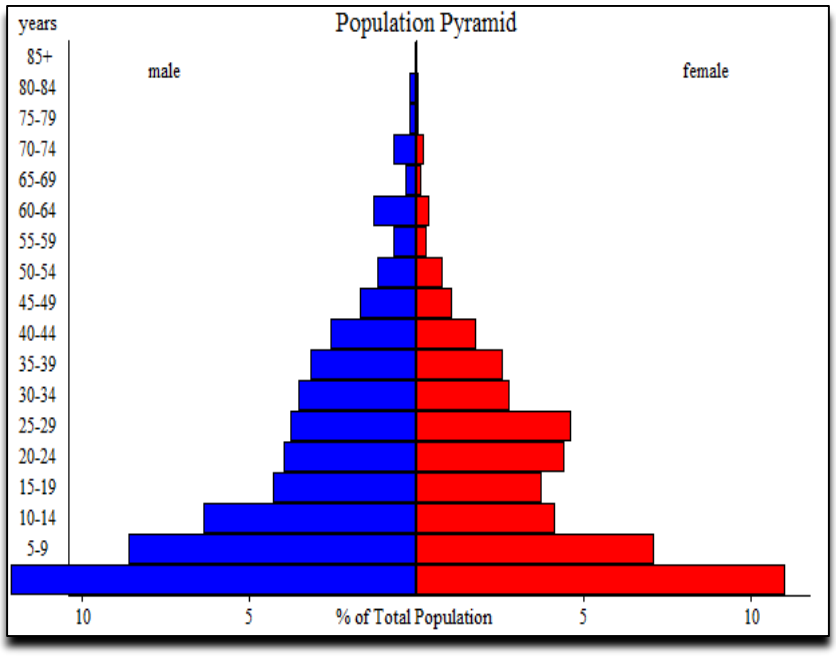


Figure 1: Distribution curves Population Pyramid, Samangan SMART, March 2017

Quality of anthropometric data

The anthropometric data were analyzed using ENA for SMART Software (version 2011, 9 July 2015 updated). The plausibility check report is available in **Annex 1.**

The summery of mean z score with Standard deveaitions, the design effects and number of the out of range data per index is indicating in table below.

Table 8: Mean z-scores, Design Effects and excluded subjects, Samangan SMART, March 2017

Indicator	n	Mean z-scores ± SD	Design Effect (z-score < -2)	z-scores not available*	z-scores out of range
Weight-for-Height	975	-0.40±1.12	1.01	1	20
Weight-for-Age	987	-1.16±0.93	1.35	0	9
Height-for-Age	966	-1.58±1.08	2.09	0	30

* contains for WHZ and WAZ the children with Oedema.

Prevalence of Acute malnutrition based on weight for height z-score:

The sex and age disaggregated results are presented in table 10 and 11 respectively. The Prevalence of wasting is higher among boys as compared to girls. The younger Children (6-29 months) seem to be more affected than older (30-59 months). There was no edematous case.

Table 9: Prevalence of acute malnutrition based on weight-for-height z-scores (and/or oedema) and by sex, Samangan SMART, March 2017.

	All n = 975	Boys n = 507	Girls n = 468
Prevalence of global malnutrition (<-2 z-score and/or oedema)	**(76) 7.8 % (6.2 - 9.7 95% C.I.)**	**(43) 8.5 % (6.3 - 11.4 95% C.I.)**	**(33) 7.1 % (4.9 - 10.0 95% C.I.)**
Prevalence of moderate malnutrition (<-2 z-score and >=-3 z-score, no oedema)	**(56) 5.7 % (4.4 - 7.5 95% C.I.)**	**(35) 6.9 % (4.8 - 9.9 95% C.I.)**	**(21) 4.5 % (3.1 - 6.5 95% C.I.)**
Prevalence of severe malnutrition (<-3 z-score and/or oedema)	**(20) 2.1 % (1.3 - 3.1 95% C.I.)**	**(8) 1.6 % (0.8 - 3.0 95% C.I.)**	**(12) 2.6 % (1.5 - 4.5 95% C.I.)**

The prevalence of oedema is 0.0 %

Table 10: Prevalence of acute malnutrition by age, based on weight-for-height z-scores and/or oedema, Samangan SMART, March 2017

		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	**234**	**4**	**1.7**	**24**	**10.3**	**206**	**88.0**	**0**	**0.0**
18-29	**224**	**8**	**3.6**	**10**	**4.5**	**206**	**92.0**	**0**	**0.0**

30-41	228	4	1.8	9	3.9	215	94.3	0	0.0
42-53	183	3	1.6	8	4.4	172	94.0	0	0.0
54-59	106	1	0.9	5	4.7	100	94.3	0	0.0
Total	975	20	2.1	56	5.7	899	92.2	0	0.0

Table 11: Distribution of acute malnutrition and oedema based on weight-for-height z-scores, Samangan SMART, March 2017

	<-3 z-score	>=-3 z-score
Oedema present	Marasmic kwashiorkor No. 0 (0.0 %)	Kwashiorkor No. 0 (0.0 %)
Oedema absent	Marasmic No. 34 (3.4 %)	Not severely malnourished No. 961 (96.6 %)

MUAC cut off classification and/ Or oedema:

The prevalence of acute malnutrition based on MUAC cut off is presented in table below.

Table 12: Prevalence of acute malnutrition based on MUAC cut off's (and/or oedema) and by sex, Samangan SMART, March 2017

	All n = 993	Boys n = 515	Girls n = 478
Prevalence of global malnutrition (< 125 mm and/or oedema)	(60) 6.0 % (4.5 - 8.1 95% C.I.)	(25) 4.9 % (3.2 - 7.3 95% C.I.)	(35) 7.3 % (5.2 - 10.2 95% C.I.)
Prevalence of moderate malnutrition (< 125 mm and >= 115 mm, no oedema)	(38) 3.8 % (2.6 - 5.5 95% C.I.)	(16) 3.1 % (1.7 - 5.5 95% C.I.)	(22) 4.6 % (2.9 - 7.1 95% C.I.)
Prevalence of severe malnutrition (< 115 mm and/or oedema)	(22) 2.2 % (1.5 - 3.3 95% C.I.)	(9) 1.7 % (0.9 - 3.2 95% C.I.)	(13) 2.7 % (1.5 - 4.9 95% C.I.)

Prevalence of MUAC cut off classification

The prevalence of acute malnutrition by age, based on MUAC cut offs and/ or oedema younger children (6-29 months) seem to be more affected then older (30-59 months).

Table 13: Prevalence of acute malnutrition by age, based on MUAC cut offs and/or oedema, Samangan SMART, March 2017

		Severe wasting (< 115 mm)		Moderate wasting (>= 115 mm and < 125 mm)		Normal (> = 125 mm)		Oedema	
Age (mo)	Total no.	No.	%	No.	%	No.	%	No.	%
6-17	237	9	3.8	22	9.3	206	86.9	0	0.0
18-29	231	4	1.7	10	4.3	217	93.9	0	0.0
30-41	232	7	3.0	4	1.7	221	95.3	0	0.0
42-53	185	1	0.5	2	1.1	182	98.4	0	0.0
54-59	108	1	0.9	0	0.0	107	99.1	0	0.0
Total	993	22	2.2	38	3.8	933	94.0	0	0.0

Prevalence of underweight (WHO 2006)

The under nutrition is defined by weight for age Z score (WAZ), the sex and age disaggregated results are present in the table below.

Table 14: Prevalence of underweight based on weight-for-age z-scores by sex, Samangan SMART, March 2017

	All n = 987	Boys n = 513	Girls n = 474
Prevalence of underweight (<-2 z-score)	(159) 16.1 % (13.6 - 19.0 95% C.I.)	(96) 18.7 % (15.3 - 22.7 95% C.I.)	(63) 13.3 % (10.2 - 17.2 95% C.I.)
Prevalence of moderate underweight (<-2 z-score and >=-3 z-score)	(125) 12.7 % (10.3 - 15.4 95% C.I.)	(73) 14.2 % (11.3 - 17.8 95% C.I.)	(52) 11.0 % (8.0 - 14.8 95% C.I.)
Prevalence of severe underweight (<-3 z-score)	(34) 3.4 % (2.3 - 5.0 95% C.I.)	(23) 4.5 % (2.9 - 6.8 95% C.I.)	(11) 2.3 % (1.3 - 4.2 95% C.I.)

Table 15: Prevalence of underweight by age, based on weight-for-age z-scores Samangan SMART, March 2017

		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	237	5	2.1	42	17.7	190	80.2	0	0.0
18-29	227	17	7.5	29	12.8	181	79.7	0	0.0
30-41	231	9	3.9	27	11.7	195	84.4	0	0.0

42-53	185	3	1.6	20	10.8	162	87.6	0	0.0
54-59	107	0	0.0	7	6.5	100	93.5	0	0.0
Total	987	34	3.4	125	12.7	828	83.9	0	0.0

Prevalence of stunting based on height for age Z score (HAZ)

The stunting or chronic malnutrition is defined by height for age Z score (HAZ), the sex and age disaggregated results are presented in table below.

Table 16: Prevalence of stunting based on height-for-age z-scores and by sex, Samangan SMART, March 2017

	All n = 966	Boys n = 500	Girls n = 466
Prevalence of stunting (<-2 z-score)	(344) 35.6 % (31.3 - 40.2 95% C.I.)	(198) 39.6 % (34.5 - 44.9 95% C.I.)	(146) 31.3 % (25.7 - 37.6 95% C.I.)
Prevalence of moderate stunting (<-2 z-score and >=-3 z-score)	(246) 25.5 % (22.5 - 28.6 95% C.I.)	(136) 27.2 % (23.4 - 31.4 95% C.I.)	(110) 23.6 % (19.5 - 28.3 95% C.I.)
Prevalence of severe stunting (<-3 z-score)	(98) 10.1 % (8.0 - 12.8 95% C.I.)	(62) 12.4 % (9.4 - 16.2 95% C.I.)	(36) 7.7 % (5.3 - 11.2 95% C.I.)

Table 17: Prevalence of stunting by age based on height-for-age z-scores, Samangan SMART, March 2017

		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	228	19	8.3	51	22.4	158	69.3
18-29	221	40	18.1	80	36.2	101	45.7
30-41	225	25	11.1	78	34.7	122	54.2
42-53	184	11	6.0	26	14.1	147	79.9
54-59	108	3	2.8	11	10.2	94	87.0
Total	966	98	10.1	246	25.5	622	64.4

Figure 2 shows the distribution of HAZ of the observed population (SMART flags excluded) compared to WHO Reference curve. In Samangan, it was strongly shifted to the left, suggesting restricted linear growth of the observed population. Further analysis (**Figure 3**) suggests that linear growth retardation is at its highest in the lower age group of children (18-29 months)

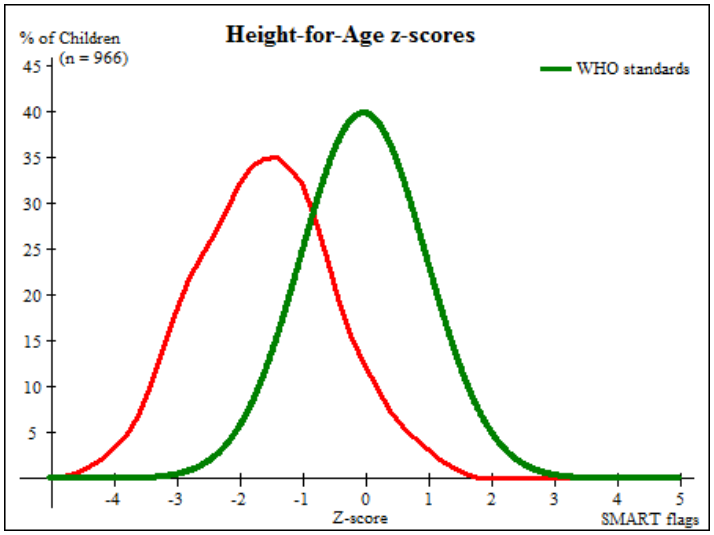


Figure 2: Gaussian distributed curve, HAZ, Samangan SMART

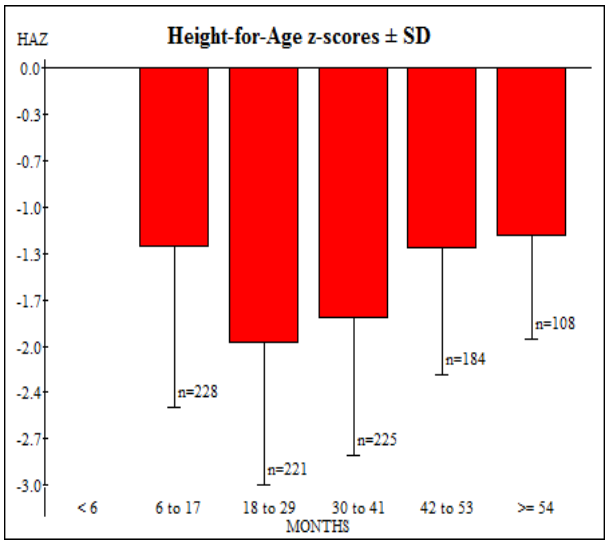


Figure 3: Trend of stunting over the age distribution

Maternal Nutrition status of women of childbearing age (WCBA)

680 mothers and care takers were living in the selected households have been surveyed, the survey results presented in table below as a proportion from the total number of pregnant and lactating measured women using MUAC cut off 230 mm and 210 mm. while to classify the early stage of nutrition status for referral OPD-MAM enrolment criteria the unique cut off 230 mm is used in Afghanistan.

Table 18: Nutrition status of reproductive women based on MUAC cut off, Samangan SMART, March 2017

PLWs MUAC cut off (N=493)	Frequency	Results 95% CI
Global Acute Malnutrition MUAC<230 mm	**53**	**10.8 % (95% CI, 8.0-13.5)**
Moderate acute malnutrition MUAC >210 mm - <230 mm	**49**	**9.9 % (95% CI, 7.3-12.6)**
Sever acute malnutrition MUAC <210 mm	**4**	**0.8 % (95% CI, 0.0-1.6)**

Table 19: Physiological status of women of reproductive age (15 - 49 years), (n=680), Samangan SMART, March 2017

Status	Frequency	%
Pregnant	136	20.0%
Lactating	357	52.5%
Non-pregnant & non-lactating	187	27.5%

Table 20: Iron foate for pregnant women based on available answers, (n=136), Samangan SMART, March 2017

Iron-folate for PLW	Frequency	%
Yes	69	50.7%
No	43	31.6%
Don't know	24	17.6%

Table 21: ANC visits in the last pregnancy, (N=680), Samangan SMART, March 2017

ANC visited by WHOM	Frequency	%
Health professional	520	76.4%
Traditional birth attendant	41	6.0%
Community health worker	17	2.5%
Relative/Friends	9	1.3%
No visited during pregnancy	131	19.3%

Table 22: Skill birth Attendance (SBA), (N=665), Samangan SMART, March 2017

		Frequency	%
Delivery at health facilities		109	16.4%
Delivery at Home	**Professional staff (midwife, community midwife, Doctor and Nurse).**	335	50.4%
	None professional staff (CHWs , TBA and relatives)	221	33.2%

Child health and immunization

Retrospective morbidity data was collected among children 0-59 months with two weeks recall period to assess for the prevalence of main disease. The survey finding shows that **61.5%** of children had at least one episode of illness in the 2 weeks period to the survey. The major illnesses reported such as fever diarrhea and ARI as a highlighted in table below.

Table 23: Major illnesses reported among children 0-59 months, Samangan SAMRT, March 2017

Parameter	Frequency (1,057)	Results
Acute Respiratory infection (ARI)	**513**	48.5%
Fever	**543**	51.4%
Diarrhea	**239**	22.6%

Table 24: Immunization coverages for BCG, measles and Polio, Samangan SMART, March 2017

Indicators	Class	Frequency	Results
Measles (children form 9-59 months) (N= 927)	Yes by cards	341	36.8%
	Yes by recall	433	46.7%
	Both by cards and recall	774	83.5%
	No	146	15.7%
	Don't know	7	0.8%
Polio (children from 0-59 months) (N= 1,057)	Yes by cards	444	42.0%
	Yes by recall	475	44.9%
	Both by cards and recall	919	86.9%
	No	127	12.0%
PENTA 3 (children from 3.5-59 months) (N=1,006)	Yes by cards	373	37.1%
	Yes by recall	457	45.4%
	Both by cards and recall	810	80.5%
	No	**160**	15.9
	Do not Know	**16**	1.6%
BCG scars (children 0-59 months (N=1,057)	By scar confirmation	**976**	92.3%
	No	**81**	7.7%
	Don't Know	**0**	0%

Vitamin-A Supplementation and Deworming

Vit-A Supplementation and deworming are proxy indicators informing community Health outreach and health seeking behaviors. A summary of the results are presented in the below. See below.

Table 25: Vitamin A supplementation and Deworming for under five children, Samangan SMART, March 2017

Indicators	Class	Frequency	Results
Vitamin A supplementation 6-59 months (N= 989)	**Yes**	663	67.0%
	No	249	25.2%
	Don't know	77	7.8%
Deworming 24-59 months (N=654)	**Yes**	390	59.6%
	No	210	32.1%
	Don't know	54	8.3%

IYCF Indicators

Indicators for infant and young child feeding (IYCF) practices included all children 0 – 23.99 months. 417 children's were included in the sample. The results present as percentage of the total answers available with confidence interval (See Table below).

Table 26: Infant and Young Child Feeding Practice, Samangan SMART, March 2017

CORE INDICATORS	DEFINITION	n	%
Child ever breastfed (N=403)	Proportion of children who have ever received breast milk	**378**	**93.8%**
Timely initiation of breastfeeding (N=403)	Proportion of children born in the last 23 months who were put to the breast within one hour of birth	**339**	**84.1%**
Provision of colostrum within first 3 days (N=403)	Proportion of children who received colostrum (yellowish liquid) within the first 3 days after birth	**364**	**90.3%**
Still breast feeding at 1 year (N=77)	Proportion of children 12-15 months of age who fed breast milk.	**63**	**81.8%**
Exclusive breast feeding (N=68)	Proportion of infants 0-5 months of age who fed exclusively with breast milk.	**56**	**82.3%**
Introduction of solid, semi-solid or soft foods (N=58)	Proportion of infants 6-8 months of age who receive solid, semi-solid or soft foods.	**20**	**34.5%**

Crude and under five Children mortality rates

The table below shows mortality rates with age and sex categorized. The crude and under five children mortality rates were below as WHO emergency threshold.

Table 27: Mortality rate by age category with design effect, Samangan SMART, March 2017

	Crude Death Rate (95% CI)	Design Effect
'Overall	**0.19 (0.09-0.40)**	**1.41**
'Sex		
'Male	**0.28 (0.13-0.58)**	**1.1**
'Female	**0.08 (0.02-0.34)**	**1**
'Years		
'0-4	**0.24 (0.08-0.74)**	**1**
'5-11	**0.00 (0.00-0.00)**	**1**
'12-17	**0.00 (0.00-0.00)**	**1**
'18-49	**0.19 (0.07-0.51)**	**1**
'50-64	**0.41 (0.05-3.09)**	**1.04**
'65-120	**1.89 (0.42-7.87)**	**1.07**

WASH Indicators

628 responders, representing 628 households and 4,080 individuals, included, either male or female. The information collected from household's regarding total amount of water consumption in litter per household, excluded those water used by animals, and subsequently organized into range of litters used. The results were then divide into the quantity of water in liters available to each household member per day; refer to figures 4 and 5 below.

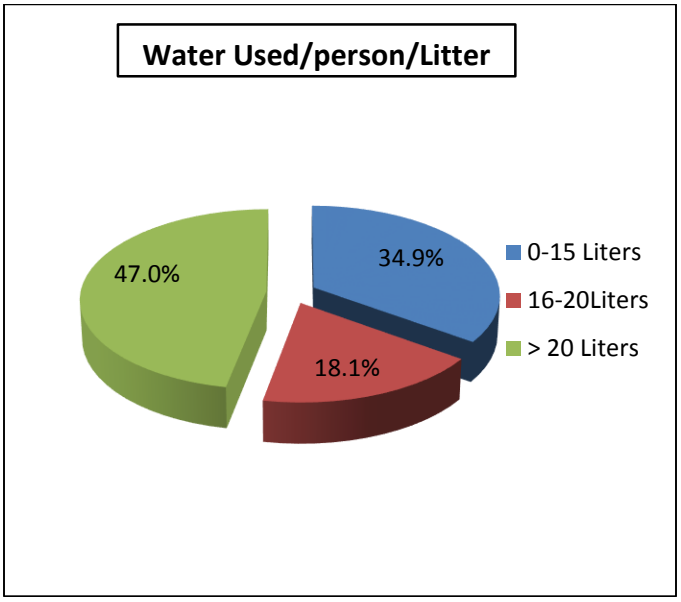


Figure 4: Percentage of household's level daily quantity Used per HH (n=556), Samangan SMART, March 2017

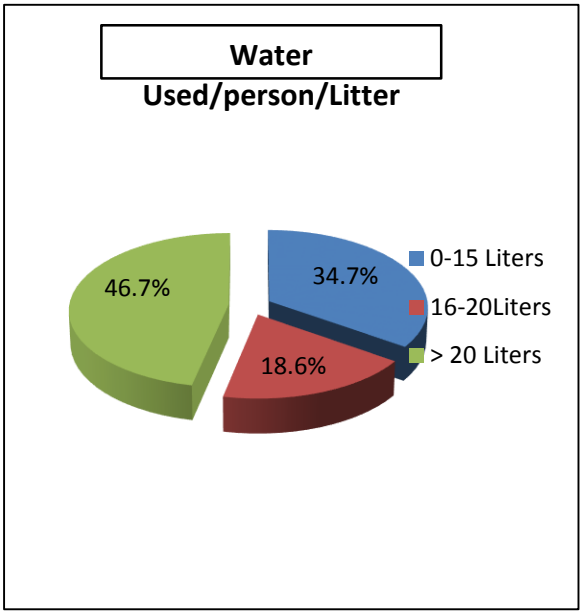


Figure 5: Percentage of access to water daily used in Liter/person/day

Table 28: Percentage of households with access to water treatment (n=629), Samangan SMART, March 2017

Water treatment	Frequency	%
Boil	**191**	30.2%
Chlorine	**28**	4.4%
Strain into the cloths	**42**	6.7%
Water filter	**40**	6.4%
Stand and settle	**338**	53.7%

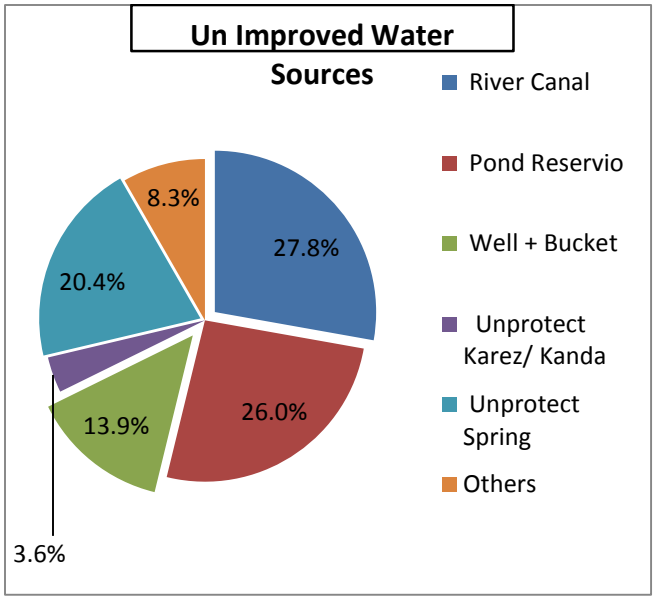


Figure 7: Households level daily-unimproved water sources (n =446), Samangan SMART, March 2017

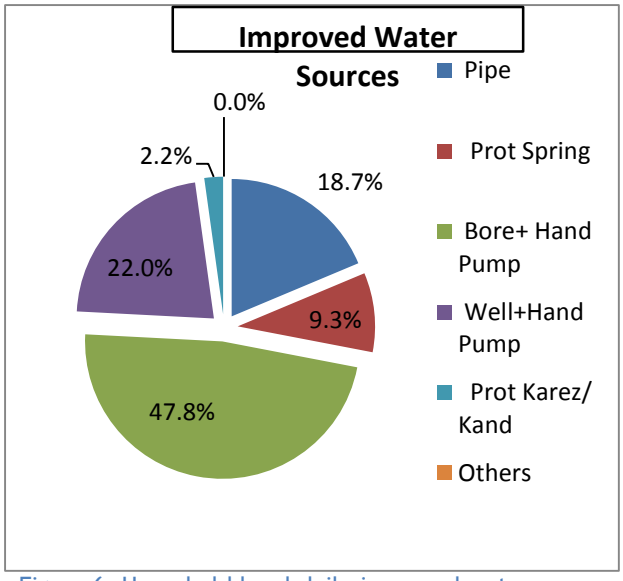


Figure 6: Household level daily-improved water sources (n=182), Samangan SMART, March 2017

Hand washing practices before and after events indicated in table below.

Table 29: Hand washing practice, Samangan SMART, March 2017

Hand Washing care takers (n=680)	Frequency	%
Only water	148	21.6%
Soap/ASH with water	526	77.3%
Wash both hands	604	88.8%
Rubs hands together at least three times	322	47.4%
Dries hands hygienically by air-drying or using a clean cloth	322	47.4%

Table 30: Hand washing practice at 5 critical moments, (n=680), Samangan SMART, March 2017

Response	Frequency	%
Wash hands at all 5 critical moments	192	28.2%
After defecation	635	93.3%
After clean baby	417	61.3%
Before food preparation	390	57.3%
Before eat	555	81.6%
Before feed child	295	43.4%

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

Food Security and livelihood

a. Food Consumption Scores and Food Based Coping Strategies

Food Consumption Scores and Food Based Coping Strategies Food security exists when all people, at all times have physical, social and economic access to sufficient, safe and nutritious food for a healthy and active life. In this survey, food consumption based on the Food Consumption Score (FCS)[2] as a description for the current short-term household food security situation is triangulated with the food-based or reduced Coping Strategy Index (rCSI)[3] to provide an indication of the food security status of the household. The triangulation of these two food security proxy indicators, instead of only food consumption, allows for capturing the interaction between household food consumption and coping strategies adopted, and hence, more properly reflects the food security situation in Ghor province.

As a result, households having poor food consumption with high or medium coping and those with borderline food consumption but with high coping are considered as ***severely food insecure***. Households having poor food consumption with low coping, households having borderline food consumption with medium coping and those having acceptable consumption but with high coping are considered as ***moderately food insecure***. Households having borderline or acceptable food consumption with low or medium coping are considered as Food Security ***(Table)***[4].

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

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

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

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

b. Food security situation

Based on triangulation of Food Consumption Score (FSC) with the food-based or reduced Coping Strategy Index (rCSI), the survey finding shows 3% of households have severely food insecurity and 18 % of households were moderately food insecurity see figure for more details.

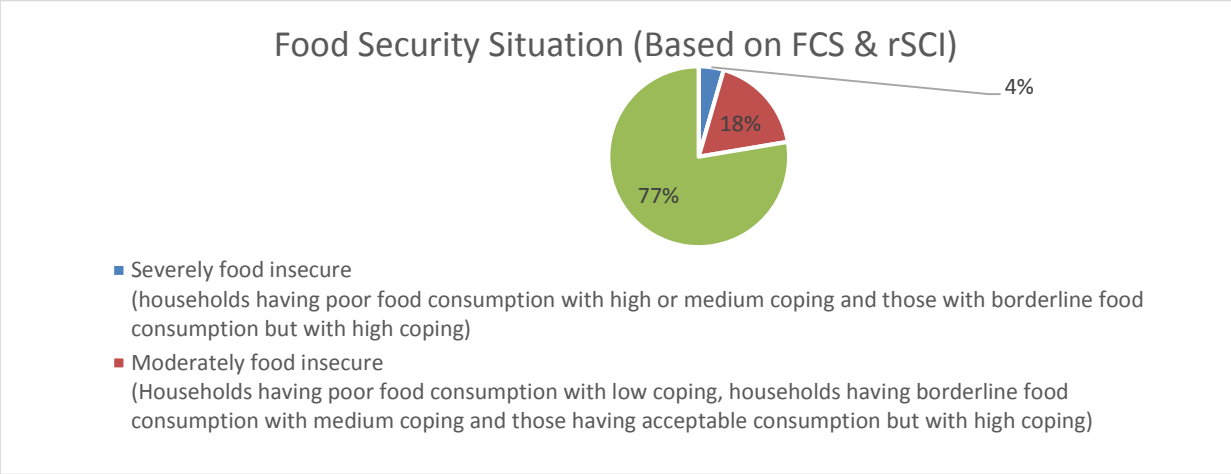
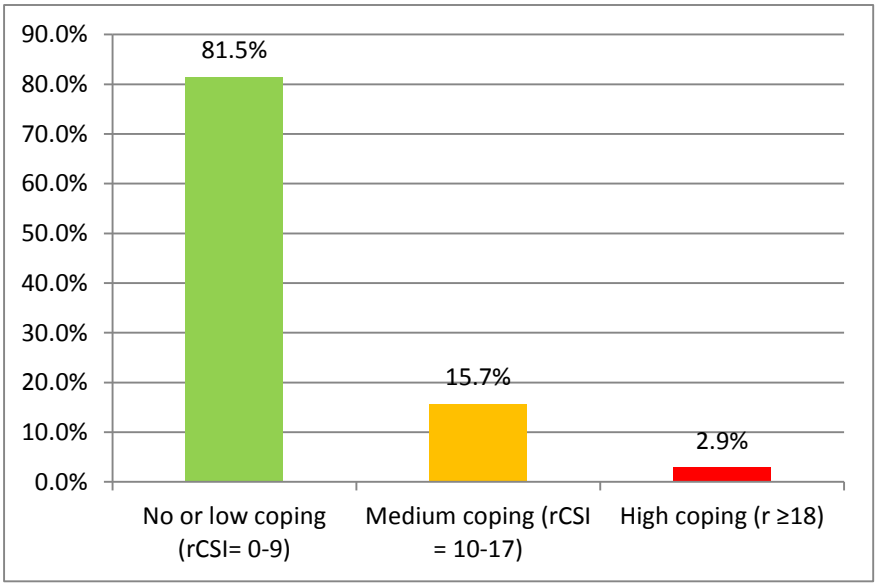


Figure 8: Food Security Situation (Based on FCS & rSCI)

c. Reduced Coping Strategy Index[5]

The Food Based Coping Strategy Index is based on measures of the frequency of use of food deprivation, such as the recourse to cheaper food, reductions of the quantity of meals, the act of borrowing food, as well as alterations in food distribution within the household to favor children. Each strategy is weight as per its severity with borrowing food and altering the distribution



Of food within the household regarded as the most severe strategies. Categories are then defined based upon these scores varying from low coping (0-9) to medium coping (10-17) and high coping (>18).

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

- ✓ 2.9% of HHs with a high level of coping (rCSI ≥18 score).
- ✓ 15.7% of HHs with a medium level of coping (rCSI= 10-17 score).
- ✓ 81.5% of HHs with No or Low level coping (rCSI=0-9 score).

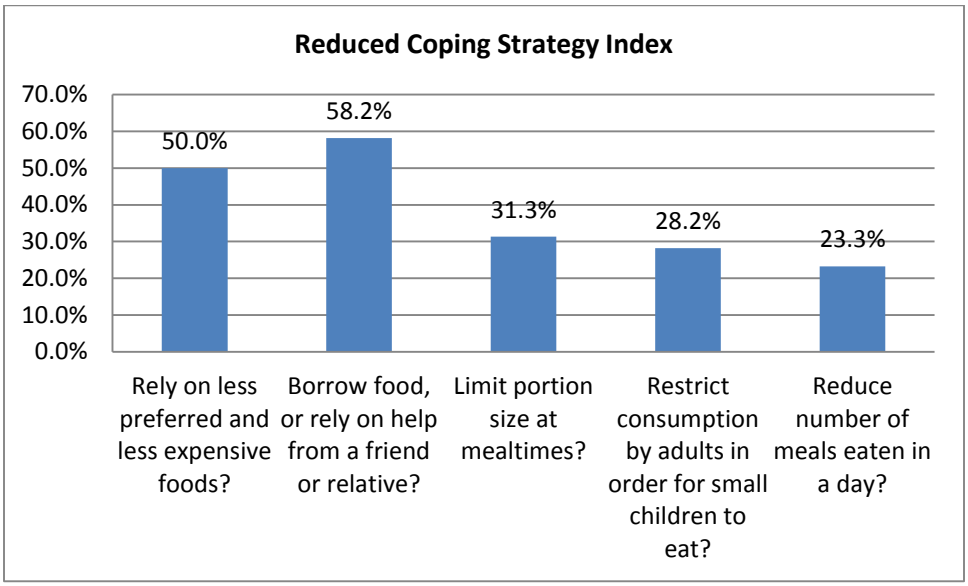


Figure 9: Reduced coping strategy index, Samangan SMART, March 2017

d. Food Consumption Score:

Food Consumption Scores are the sum of the frequency of consumption (in the 7 days prior to the interview) of each type of food item (cereal, pulses, vegetables, meat fish and eggs, dairies, oil and sugar) weighted by their nutritional value (proteins are weighted 4, cereals 2, pulses 3, and vegetables and fruits 1, while sugar is weighted 0.5). Households are then grouped into "Poor" food consumption (1.0-28), "Borderline" (28.01 – 42) and acceptable (above 42). Food consumption groups are a proxy of food consumption and reflect both the frequency and quality of food consumption.

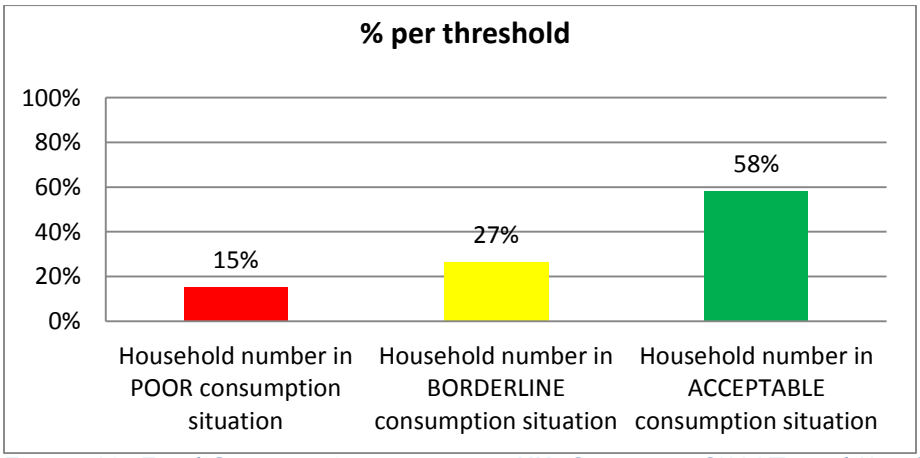


Figure 10: Food Consumption scores per HH, Samangan SMART, and March 2017

- ✓ 15 % households surveyed have Poor consumption scores (FCS = 1.0 to 28).
- ✓ 27 % households surveyed have Borderline consumption scores (FCS = 28.1 to 42).
- ✓ 58 % households surveyed have acceptable food consumption scores (FCS = >42.0).

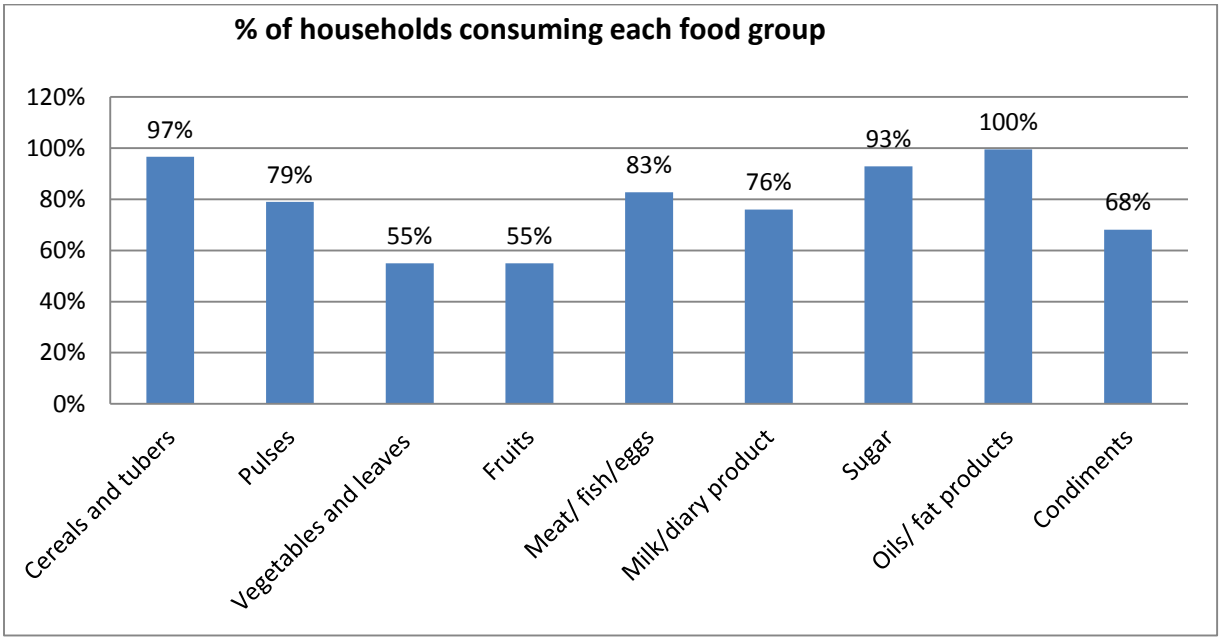


Figure 11: Households consuming each food group, Samangan SMART, March 2017

e. Food stock

Out of 628 households 628households responded for the food stock, for more detail refer to table below;

Table 31: food stock in households level, (n=628), Samangan SMART survey, March 2017

	N	%
No food stock in the households	135	21.5
Less than a week stock in the HH	159	25.3
Food stock in HHs from 1 to 3 weeks	214	34.0
Food stock in HHS up to 3 months	61	9.7
Food stock in HHs more than 3 months	58	9.2

f. Food Main Sources

The food that households used in the last 7 days prior to the survey mains sources of the food, survey finding shows most of the food was cash based, see table below for more details.

Table 32: Food main sources, Samangan SMART, March 2017

	Own production	Cash	Credit	Battering	Gift/ charity	Wild food	Food Aid	Total
Cereals and tubers	274	335	0	0	0	0	1	610
Pulses/ Nuts	13	473	1	0	0	0	3	490
Vegetables and leaves	42	309	0	0	0	4	0	355
Fruits	9	348	0	0	0	0	0	357
Meat/ fish/eggs	105	417	0	1	0	1	1	525
Milk/diary product	258	204	0	0	18	0	0	480
Sugar / Honey	5	582	0	0	0	0	0	587
Oils/ fat products	4	596	0	0	0	0	2	602
Condiments	37	386	0	0	0	0	1	424

Demography

The mortality questionnaires in SMART designed in a way that some additional useful demography data can withdraw. Summery highlighted in tables below. A total of 3854 individuals and 1222 School age children (6-18) years) were presented in the surveyed households.

Table 33: Short Summery of demography, Samangan SMART, March 2017

Indicators	Value
Average households size	6.5
Children under five	24%
People have Tazkera	39.9%

Returnees

The information collected from households regarding returnees and IDPs due to different reasons, in the survey no collected data for the reason of IDPs, see below table for more details.

Table 34: percentage of Returnees and IDPs, (N=628), Samangan SMART, March 2017

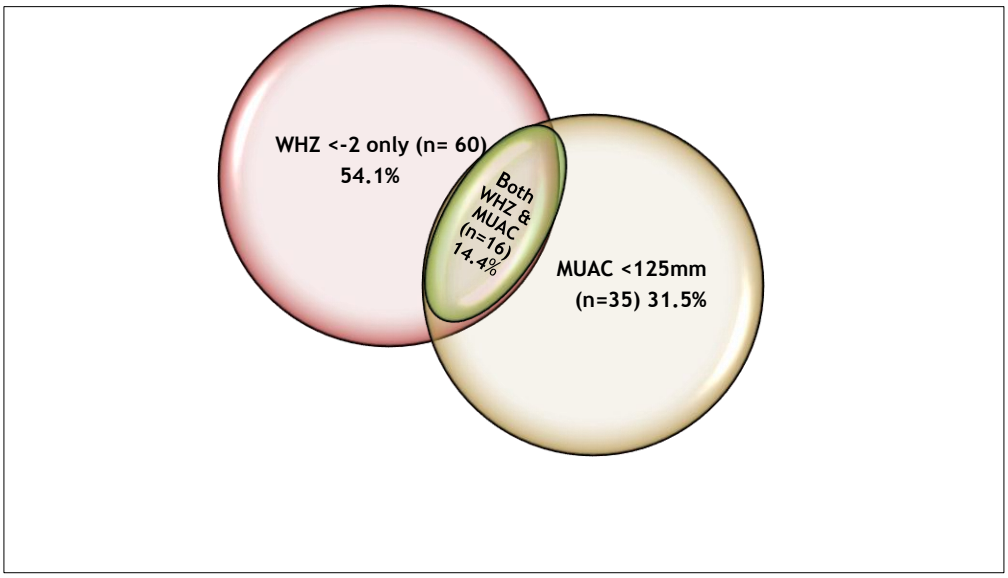
Residential status of Households	Permanent residential	607	96.6%
	Internal Displacement	20	3.2%
	Returnees	0	0.0%

Discussions

Nutrition status

The GAM rate, based on WHZ and Oedema was found **7.8% (6.2- 9.7 95% CI)** which classify the situation as poor (WHO Crisis Classification of GAM rates[6]). The SAM rate, based on WHZ, was **2.1% (1.3- 3.3 95% CI)**. The GAM rate based on MUAC<125 mm was 6.0 % (4.5 – 8.1 95% C.I.) While the SAM rate was 2.2 % (1.5 - 3.3 95% C.I) in depth, analysis indicated that the WHZ and MUAC prevalence are not based on the same Children. **Figure12** schematically proves this difference.

Figure 12 : Overlapping WHZ<-2 and MUAC<125, Samangan SMART, March 2017



Only 14.4% children in the sample detected as acutely malnourished according both criteria, children classified as wasted by WHZ only were 54.1% and those wasted by MUAC only were 31.5%. Therefore, it is likely that 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. In that regard, exploring innovation methods of community detection and screening is a must.

The use of only MUAC or only WHZ based rates might lead to under estimation of caseload when comes to programming. Data were analyzed to get the combined WHZ/MUAC GAM and SAM rates to inform better programming in Samangan province. Thus, combined **GAM was of 11.4 % (9.4-13.4 95% CI) and 3.7% (2.5-4.9 95% CI).** These rates directly classify the situation in Samangan province as serious need to strength IMAM program.

Chronic malnutrition trends in Samangan province remain worrying. The results of the present survey clearly showed that stunting was of **35.6% (31.3-40.2 95% CI)**. One in each three children included in

[6] WHO 2000 classification; <5% normal, 5-9.9% poor, 10-14.9% Serious and >15% critical

the survey were found to be stunted, while 1 in each 6 children was underweight. The high stunting rates are in line with high morbidity (61.5% reported of being ill in 2 weeks prior to survey), and poor infant feeding practices (exclusive breastfeeding was found to be 82.3% and timely complementary feeding was of 34.4%) have been known to expose children under nutrition and its potential consequences.

Maternal nutritional status

There are no commonly accepted international standards for maternal nutrition status. In line with the Afghanistan National Guideline, the MUAC cutoff for pregnant and lactating women of 230 mm used to approximately identify their status. In this survey 10.8% (8.0-- 13.5, 95 % CI) of pregnant and lactating women were found to have a MUAC<230mm, which suggest that a considerable number of PLWs in Samangan province are likely to have low nutritional status. The main concern was iron supplementation among pregnant women, which found to be very low (50.7%). 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. The Iron/Folate supplementation for pregnant women needs to be increase significantly by reinforcing the usual channels for that in BPHS/CBHC. The BPHS Implementing partner needs to make immediately significant progress by reinforcing ANC and CHW home visits to PLW.

IYCF practice

Optimal infant and young child nutrition, especially exclusive breastfeeding is estimate to prevent potentially 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 practice by the mothers. The introduction of complementary feeding after 6 months of EBF period remain relatively poor (34.4 %) and often mixed with tea (inhibits iron absorption). However, complementary feeding practice is concern as this potentially contribute to stunting in the first two years of life.

Death rates

The survey showed that the Crude Mortality Rate (CMR) and under five mortality rate (U5MR) were 0.19 (0.09-0.40) and 0.24 (0.08-0.74) respectively. Both CMR and U5MR rates were below the WHO's emergency thresholds of 2/10,000/day and 4/10,000/day respectively.

Risk factors

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 have other side effects such as reduced food intake and diarrhea. In the entire Samangan province, more than half of the sampled children had suffered from 1 form of illness or another (61.5%) such as diarrhea, fever, cough and skin infection.

The coverage of Vitamin A supplementation, 6 months prior to the survey, was poor. About 67.0% 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 high compare to the recommended WHO target of 80%, vitamin A coverage that probably happened due to effectiveness of the integrated NIDs campaign.

The proportion of all children aged 24-59 months who had received deworming in the last 6 months was poor (59.6%) in the province it has related in Nutrition for absorption of minerals and vitamins.

Conclusion

The survey findings revealed that the prevalence of Global Acute Malnutrition (GAM) based on weight-for-height z-scores (WHZ) was at **7.8% (6.2- 9.7 95% CI)** indicating a "poor" nutrition situation based on WHO[7] classification. SAM prevalence by WHZ and MUAC was at **6.0% (4.5- 8.1 95% CI)** and **2.2 % (1.5 - 3.3 95% C.I.)**Respectively.

It is also note that cases of child morbidity are high in the province; one child out of two children was report ill and has one episode of diarrhea, Acute Respiratory Infection, fever.

If both criteria are combine, overall rate of children likely to be eligible for SAM and MAM management increases to **11.4% (9.4-13.4 95% CI),** SAM combined rates is estimated to be **3.7% (2.5-4.9 95% CI)**.

[7] WHO 2000 thresholds (< 5 % acceptable, 5-9 % poor, 10-14 % serious, > 15 % critical).

It is recommended to use combined rates for estimation of GAM and SAM in the province for program design and caseload calculation. Further analysis of the data suggests that these rates do not refer to the same children. Children classified as wasted based WHZ are not fully overlapping with those classified wasted based on MUAC, for more details refer to figure 12 above.

Stunting and underweight prevalence in Samangan can be considered serious. Although poor micronutrient supplementation and deworming, low maternal nutrition status as observed in Samangan province that need to addressed if not can be contribute to growth the level of chronic malnutrition. The fact that chronic malnutrition is not give the attention in the health facilities could be a factor to aggravate the situation. Currently there is no clear guidance in Afghanistan on how to address chronic malnutrition and need to involve the multi sectors (agriculture, WASH and food security
Etc...) For reducing chronic malnutrition.
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 proximately identify their nutrition status. This nutrition and mortality survey showed for Pregnant and lactating women nutrition status was 10.8% (**95% CI, 8.0-13.5)**, which suggest that considerable number of PLWs in Samangan province are likely to have low nutrition status. The main concern was Iron supplementation prevent anemia during pregnancy and life- threatening complication during the delivery. Therefore, it decreases maternal mortality, prenatal infant loss and prematurity that can be directly related to child stunting in the first 2 years of life.

They nutrition and mortality survey showed that the Crude Death Rate and Under-five Death rates were at 0.19/10,000/day and 0.24/10,000/per day. Both CMR and U5MR rates were below the WHO emergency threshold of 2/10,000/day and 4/10,000/day respectively.

In conclusion, the survey has indicated that there is a problem of malnutrition in the province. From the results presented above it is notable that although the different measures of malnutrition (WHZ are indicating serious nutrition situation respectively, a combination of these results/measures indicate that the number of cases found malnourished is serious in the province and need to strength the program.

Recommendation

Under nutrition

- In line with assessment finding first 1000 days should be consider as windows of opportunities and promote optimal IYCF practices ,quality complementary feeding and distribution of micronutrient powder should be promoted among children age 6- 24 Months.
- In line with survey findings, it is recommending to promote nutrition Specific interventions. Those interventions that directly work to prevent or treat malnutrition such as micronutrients supplementation, food fortification, promotion of breastfeeding (timely initiation, exclusive breastfeeding), appropriate complementary feeding and treatment of malnutrition.

- Seeing to the survey finding, it is recommending to provide nutrition Sensitive interventions, those activities that are indirectly prevent malnutrition and address the underlying causes of malnutrition such as provision of safe water, hygiene, sanitation, food security, birth spacing and others.
- The survey finding representing over burden of illness experienced by children. So, it is recommended to lunch some infection prevention intervention and applying malnutrition sensitive interventions such as provision of safe drinking water, Hygiene promotion practices, sanitation.
- Continue implementing of integrated management of acute malnutrition (IMAM) program and where possible to start up new OTP sites in the BHCs too.
- In order to assess nutrition status of vulnerable people community outreach activities (massive screen on community level) referral system should be strengthen.
- In order to overcome malnutrition and promote early case detection and treatment, some long term SAM and MAM project should be lunched parallel in all health facility accross the province
- In order to enhance awareness of malnutrition; existing health education should be strength and community based advocacy seminar should be lunched.

Maternal nutrition status

Iron folic acid supplementation should be strengthening.

- To strengthen referral system for Antenatal care (ANC), postnatal care (PNC) and health seeking visits during pregnancy trough CHWs in the community level.
- TSFP program should be expanded and will enroll all malnourished mother; matching the admission criteria and quality services should be delivered

Health and immunization

- Proper monitoring of EPI services in the health facilities through regular supervisions and monitoring system.
- To increase health educations of vaccination through community health workers, Mula Imams and health shuras at the community level.
- To strengthen and regular follow ups of EPI outreach services.
- To increase awareness of health care practice in the community level.
- Promote proper care seeking practice, IYCF counselling, Vitamin A supplementation and deworming through health education at health facilities and community levels.

WASH

- Ensure access to safe drinking water through WASH interventions that are sustainable and easy to maintain to address low water access rates in rural areas
- Intervention programmers for improving water, sanitation and hygiene practices including health education to educate the community on domestic treatment of drinking water
- Integrate key hygiene actions (safe drinking water, hand-washing practice with soap, safe disposal of excreta, and food hygiene) as essential components in all targeted nutrition programs.

Annex

Annex 1: Plausibility Check report

Plausibility check for: Afghanistan, Samangan 06152017.as

Standard/Reference used for z-score calculation: WHO standards 2006
(If it is not mentioned, flagged data is included in the evaluation. Some parts of this plausibility report are more for advanced users and can be skipped for a standard evaluation)

Overall data quality

Criteria	Flags*	Unit	Excel.	Good	Accept	Problematic	Score
Flagged data (% of out of range subjects)	Incl	%	0-2.5	>2.5-5.0	>5.0-7.5	>7.5	0 (2.0 %)
			0	5	10	20	
Overall Sex ratio (Significant chi square)	Incl	p	>0.1	>0.05	>0.001	<=0.001	0 (p=0.229)
			0	2	4	10	
Age ratio(6-29 vs 30-59) (Significant chi square)	Incl	p	>0.1	>0.05	>0.001	<=0.001	0 (p=0.395)
			0	2	4	10	
Dig pref score - weight	Incl	#	0-7	8-12	13-20	> 20	0 (3)
			0	2	4	10	
Dig pref score - height	Incl	#	0-7	8-12	13-20	> 20	0 (6)
			0	2	4	10	
Dig pref score - MUAC	Incl	#	0-7	8-12	13-20	> 20	0 (4)
			0	2	4	10	
Standard Dev WHZ	Excl	SD	<1.1 and	<1.15 and	<1.20 and	>=1.20 or	
.	Excl	SD	>0.9	>0.85	>0.80	<=0.80	
			0	5	10	20	5 (1.12)
Skewness WHZ	Excl	#	<±0.2	<±0.4	<±0.6	>=±0.6	
			0	1	3	5	1 (-0.23)
Kurtosis WHZ	Excl	#	<±0.2	<±0.4	<±0.6	>=±0.6	
			0	1	3	5	1 (-0.22)
Poisson dist WHZ-2	Excl	p	>0.05	>0.01	>0.001	<=0.001	
			0	1	3	5	0 (p=0.641)
OVERALL SCORE WHZ =			0-9	10-14	15-24	>25	7 %

The overall score of this survey is 7 %, this is excellent.

There were no duplicate entries detected.

Percentage of children with no exact birthday: 75 %

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

Line=5/ID=2: WHZ (-4.484), Weight may be incorrect
Line=33/ID=2: WHZ (-4.425), Weight may be incorrect
Line=70/ID=1: HAZ (1.716), Age may be incorrect
Line=126/ID=1: WHZ (-3.888), Weight may be incorrect
Line=127/ID=3: HAZ (1.477), Age may be incorrect
Line=133/ID=1: HAZ (1.816), Age may be incorrect
Line=136/ID=2: HAZ (2.946), WAZ (2.401), Age may be incorrect
Line=182/ID=1: HAZ (1.946), Height may be incorrect
Line=318/ID=2: WHZ (3.145), WAZ (2.770), Weight may be incorrect
Line=320/ID=2: HAZ (1.719), Height may be incorrect
Line=330/ID=1: HAZ (2.722), WAZ (2.102), Age may be incorrect
Line=337/ID=2: WAZ (-4.411), Age may be incorrect
Line=383/ID=2: WHZ (-3.774), Height may be incorrect
Line=408/ID=1: WHZ (-3.825), Height may be incorrect
Line=411/ID=: HAZ (2.632), Age may be incorrect
Line=421/ID=4: HAZ (7.116), WAZ (2.132), Age may be incorrect
Line=422/ID=2: HAZ (3.338), Height may be incorrect
Line=423/ID=1: HAZ (-4.612), Height may be incorrect
Line=438/ID=1: WHZ (-4.215), WAZ (-4.322), Weight may be incorrect
Line=440/ID=1: HAZ (-8.085), Height may be incorrect
Line=452/ID=1: WHZ (2.697), Weight may be incorrect
Line=453/ID=1: HAZ (3.523), Age may be incorrect
Line=455/ID=1: WHZ (2.991), Height may be incorrect
Line=463/ID=1: WHZ (-3.495), Weight may be incorrect
Line=513/ID=1: WHZ (-3.637), Weight may be incorrect
Line=531/ID=1: WHZ (-4.227), Weight may be incorrect
Line=534/ID=2: HAZ (2.016), Age may be incorrect
Line=561/ID=2: WHZ (-4.393), WAZ (-4.537), Weight may be incorrect
Line=566/ID=1: HAZ (-4.749), Age may be incorrect
Line=567/ID=2: WHZ (-3.742), Height may be incorrect
Line=574/ID=2: HAZ (-4.769), Age may be incorrect
Line=575/ID=1: HAZ (-6.327), Age may be incorrect
Line=601/ID=1: WHZ (2.774), Height may be incorrect
Line=611/ID=1: HAZ (4.974), Height may be incorrect
Line=614/ID=1: HAZ (-5.520), Age may be incorrect
Line=629/ID=1: WHZ (-3.541), Weight may be incorrect
Line=630/ID=2: HAZ (-6.320), WAZ (-4.882), Age may be incorrect
Line=631/ID=1: HAZ (-5.145), Age may be incorrect
Line=635/ID=2: WHZ (-5.641), WAZ (-4.993), Weight may be incorrect
Line=644/ID=2: WHZ (3.221), Height may be incorrect
Line=665/ID=1: WHZ (3.014), Height may be incorrect
Line=755/ID=1: HAZ (-4.719), Height may be incorrect

Line=779/ID=1: HAZ (-6.093), Age may be incorrect
Line=780/ID=2: HAZ (7.571), Age may be incorrect
Line=810/ID=1: HAZ (-4.713), Age may be incorrect
Line=864/ID=1: HAZ (-4.742), Age may be incorrect
Line=904/ID=2: WHZ (-3.539), Height may be incorrect
Line=954/ID=1: HAZ (-6.478), Age may be incorrect
Line=974/ID=1: HAZ (2.019), Age may be incorrect
Line=976/ID=2: HAZ (1.719), Age may be incorrect
Line=1034/ID=1: HAZ (2.025), Height may be incorrect

Percentage of values flagged with SMART flags:WHZ: 2.0 %, HAZ: 3.0 %, WAZ: 0.9 %

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: 0.90 (The value should be around 0.85).: p-value = 0.395 (as expected)

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

Age cat.	mo.	boys	girls	total	ratio boys/girls
6 to 17	12	126/120.0 (1.1)	114/111.1 (1.0)	240/231.1 (1.0)	1.11
18 to 29	12	122/117.0 (1.0)	109/108.4 (1.0)	231/225.3 (1.0)	1.12
30 to 41	12	120/113.4 (1.1)	112/105.0 (1.1)	232/218.4 (1.1)	1.07
42 to 53	12	94/111.6 (0.8)	91/103.4 (0.9)	185/214.9 (0.9)	1.03
54 to 59	6	55/55.2 (1.0)	53/51.1 (1.0)	108/106.3 (1.0)	1.04
6 to 59	54	517/498.0 (1.0)	479/498.0 (1.0)		1.08

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

Overall sex ratio: p-value = 0.229 (boys and girls equally represented)
Overall age distribution: p-value = 0.237 (as expected)
Overall age distribution for boys: p-value = 0.452 (as expected)
Overall age distribution for girls: p-value = 0.720 (as expected)
Overall sex/age distribution: p-value = 0.122 (as expected)

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: 3 (0-7 excellent, 8-12 good, 13-20 acceptable and > 20 problematic)
p-value for chi2: 0.553

Digit preference Height:

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

Digit preference score: 6 (0-7 excellent, 8-12 good, 13-20 acceptable and > 20 problematic)
p-value for chi2: 0.001 (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: 4 (0-7 excellent, 8-12 good, 13-20 acceptable and > 20 problematic)
p-value for chi2: 0.180

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:	1.22	1.21	1.12
(The SD should be between 0.8 and 1.2)			
Prevalence (< -2)			
observed:	9.0%	9.0%	7.8%
calculated with current SD:	10.1%	9.8%	7.8%
calculated with a SD of 1:	5.9%	5.8%	5.5%
HAZ			
Standard Deviation SD:	1.33	1.22	1.08
(The SD should be between 0.8 and 1.2)			
Prevalence (< -2)			
observed:	35.8%	35.6%	35.6%
calculated with current SD:	37.0%	35.6%	35.0%
calculated with a SD of 1:	32.9%	32.6%	33.8%
WAZ			
Standard Deviation SD:	0.99	0.99	0.93
(The SD should be between 0.8 and 1.2)			
Prevalence (< -2)			
observed:			
calculated with current SD:			
calculated with a SD of 1:			

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

WHZ	p= 0.000	p= 0.000	p= 0.000
HAZ	p= 0.000	p= 0.000	p= 0.119
WAZ	p= 0.000	p= 0.000	p= 0.003

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

Skewness

WHZ	-0.37	-0.32	-0.23
HAZ	0.66	0.45	0.09
WAZ	-0.05	-0.05	-0.03

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	0.55	0.34	-0.22
HAZ	5.46	1.53	-0.25
WAZ	1.10	1.10	0.33

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=0.92 (p=0.641)
WHZ < -3: ID=0.91 (p=0.650)

GAM: ID=0.92 (p=0.641)
SAM: ID=0.91 (p=0.650)
HAZ < -2: ID=1.35 (p=0.053)
HAZ < -3: ID=1.23 (p=0.133)
WAZ < -2: ID=0.96 (p=0.558)
WAZ < -3: ID=1.15 (p=0.217)

Subjects with SMART flags are excluded from this analysis.

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

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

```
Time                                  SD for WHZ
point              0.8 0.9 1.0 1.1 1.2 1.3 1.4 1.5 1.6 1.7 1.8 1.9 2.0 2.1 2.2 2.3
01: 1.29 (n=49, f=2)  ####################
02: 1.41 (n=47, f=2)  ##########################
03: 1.06 (n=46, f=0)  ###########
04: 1.28 (n=42, f=1)  ####################
05: 1.21 (n=45, f=0)  #################
06: 1.33 (n=43, f=0)  #####################
07: 1.33 (n=46, f=1)  #####################
08: 1.09 (n=49, f=0)  ############
09: 1.24 (n=43, f=0)  ##################
10: 1.33 (n=44, f=3)  #####################
11: 1.24 (n=45, f=2)  ##################
12: 1.40 (n=44, f=3)  ########################
13: 1.08 (n=42, f=0)  ############
14: 0.92 (n=47, f=0)  #####
15: 1.40 (n=41, f=2)  ########################
16: 1.18 (n=42, f=1)  ################
17: 1.25 (n=41, f=1)  ###################
18: 1.34 (n=35, f=1)  #######################
19: 1.03 (n=34, f=0)  ##########
20: 1.12 (n=30, f=0)  #############
21: 1.10 (n=25, f=0)  ############
22: 1.37 (n=20, f=0)  OOOOOOOOOOOOOOOOOOOOOOOO
23: 1.25 (n=16, f=0)  OOOOOOOOOOOOOOOOOOO
24: 1.23 (n=17, f=1)  OOOOOOOOOOOOOOOOOO
25: 1.08 (n=14, f=0)  OOOOOOOOOOOO
26: 0.57 (n=11, f=0)
27: 0.62 (n=07, f=0)
28: 1.39 (n=07, f=0)  ~~~~~~~~~~~~~~~~~~~~~~~~~
29: 1.31 (n=05, f=0)  ~~~~~~~~~~~~~~~~~~~~~
30: 1.12 (n=03, f=0)  ~~~~~~~~~~~~~
31: 0.56 (n=04, f=0)
32: 1.80 (n=03, f=0)  ~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~
33: 0.62 (n=02, f=0)
```

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

Analysis by Team

Team	1	2	3	4	5	6
n =	106	148	140	190	171	241
Percentage of values flagged with SMART flags:						
WHZ:	0.9	0.7	0.0	1.6	5.3	0.4
HAZ:	0.9	2.7	3.6	0.5	4.1	2.5
WAZ:	0.0	0.0	0.0	0.0	1.2	1.2
Age ratio of 6-29 months to 30-59 months:						
	1.08	1.11	0.94	0.96	0.82	0.71
Sex ratio (male/female):						
	1.16	1.28	1.26	1.29	0.80	0.93
Digit preference Weight (%):						
.0 :	12	14	6	12	6	10
.1 :	10	10	15	14	10	8
.2 :	6	9	10	13	14	12
.3 :	13	11	9	9	11	10
.4 :	10	9	6	9	8	9
.5 :	8	11	14	13	8	10
.6 :	10	9	9	6	12	12
.7 :	9	9	10	8	9	8
.8 :	10	10	9	12	10	11
.9 :	9	6	11	5	13	10
DPS:	6	6	9	10	8	5
Digit preference score (0-7 excellent, 8-12 good, 13-20 acceptable and > 20 problematic)						
Digit preference Height (%):						
.0 :	8	8	4	12	5	12
.1 :	27	5	9	11	12	10
.2 :	10	10	11	12	13	14
.3 :	9	19	18	10	8	11
.4 :	10	8	17	8	12	10
.5 :	7	11	14	12	12	12
.6 :	7	11	10	12	9	8
.7 :	8	7	9	6	8	7
.8 :	8	5	4	8	11	10
.9 :	5	16	4	9	8	7
DPS:	20	14	16	6	8	7
Digit preference score (0-7 excellent, 8-12 good, 13-20 acceptable and > 20 problematic)						
Digit preference MUAC (%):						
.0 :	2	10	9	4	11	9
.1 :	14	2	4	11	8	15
.2 :	17	6	11	9	11	10
.3 :	13	13	21	9	9	8
.4 :	11	16	10	13	10	10
.5 :	8	9	14	12	8	9
.6 :	13	5	11	7	11	11
.7 :	4	15	9	9	11	8

.8 :	14	5	6	15	10	11
.9 :	4	19	6	13	13	8
DPS:	17	18	15	10	5	7

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

Standard deviation of WHZ:

SD	1.20	1.11	1.16	1.41	1.32	1.07

Prevalence (< -2) observed:

%	10.4	6.8	8.6	11.6	14.7	4.1

Prevalence (< -2) calculated with current SD:

%	9.3	5.9	8.9	14.7	16.5	5.4

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

%	5.6	4.2	6.0	6.9	9.8	4.3

Standard deviation of HAZ:

SD	1.11	1.31	1.39	1.40	1.58	1.13

observed:

%	33.0	39.9	42.1	39.5	33.3	29.9

calculated with current SD:

%	32.3	38.1	42.0	41.6	35.9	30.9

calculated with a SD of 1:

%	30.5	34.6	39.0	38.3	28.5	28.6

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	16/13.2 (1.2)	13/11.4 (1.1)	29/24.6 (1.2)	1.23
18 to 29	12	13/12.9 (1.0)	13/11.1 (1.2)	26/24.0 (1.1)	1.00
30 to 41	12	19/12.5 (1.5)	9/10.7 (0.8)	28/23.2 (1.2)	2.11
42 to 53	12	7/12.3 (0.6)	11/10.6 (1.0)	18/22.9 (0.8)	0.64
54 to 59	6	2/6.1 (0.3)	3/5.2 (0.6)	5/11.3 (0.4)	0.67
6 to 59	54	57/53.0 (1.1)	49/53.0 (0.9)		1.16

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

Overall sex ratio: p-value = 0.437 (boys and girls equally represented)
Overall age distribution: p-value = 0.165 (as expected)
Overall age distribution for boys: p-value = 0.061 (as expected)
Overall age distribution for girls: p-value = 0.770 (as expected)
Overall sex/age distribution: p-value = 0.018 (significant difference)

Team 2:

Age cat.	mo.	boys	girls	total	ratio boys/girls
6 to 17	12	20/19.3 (1.0)	15/15.1 (1.0)	35/34.3 (1.0)	1.33
18 to 29	12	27/18.8 (1.4)	16/14.7 (1.1)	43/33.5 (1.3)	1.69
30 to 41	12	9/18.2 (0.5)	17/14.3 (1.2)	26/32.5 (0.8)	0.53
42 to 53	12	19/17.9 (1.1)	12/14.0 (0.9)	31/31.9 (1.0)	1.58
54 to 59	6	8/8.9 (0.9)	5/6.9 (0.7)	13/15.8 (0.8)	1.60

6 to 59	54	83/74.0 (1.1)	65/74.0 (0.9)	1.28

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

Overall sex ratio: p-value = 0.139 (boys and girls equally represented)
Overall age distribution: p-value = 0.340 (as expected)
Overall age distribution for boys: p-value = 0.077 (as expected)
Overall age distribution for girls: p-value = 0.831 (as expected)
Overall sex/age distribution: p-value = 0.012 (significant difference)

Team 3:

Age cat.	mo.	boys	girls	total	ratio boys/girls
6 to 17	12	23/18.1 (1.3)	14/14.4 (1.0)	37/32.5 (1.1)	1.64
18 to 29	12	19/17.6 (1.1)	12/14.0 (0.9)	31/31.7 (1.0)	1.58
30 to 41	12	17/17.1 (1.0)	17/13.6 (1.3)	34/30.7 (1.1)	1.00
42 to 53	12	14/16.8 (0.8)	13/13.4 (1.0)	27/30.2 (0.9)	1.08
54 to 59	6	5/8.3 (0.6)	6/6.6 (0.9)	11/14.9 (0.7)	0.83
6 to 59	54	78/70.0 (1.1)	62/70.0 (0.9)		1.26

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

Overall sex ratio: p-value = 0.176 (boys and girls equally represented)
Overall age distribution: p-value = 0.666 (as expected)
Overall age distribution for boys: p-value = 0.519 (as expected)
Overall age distribution for girls: p-value = 0.874 (as expected)
Overall sex/age distribution: p-value = 0.164 (as expected)

Team 4:

Age cat.	mo.	boys	girls	total	ratio boys/girls
6 to 17	12	27/24.8 (1.1)	15/19.3 (0.8)	42/44.1 (1.0)	1.80
18 to 29	12	30/24.2 (1.2)	21/18.8 (1.1)	51/43.0 (1.2)	1.43
30 to 41	12	25/23.5 (1.1)	26/18.2 (1.4)	51/41.7 (1.2)	0.96
42 to 53	12	13/23.1 (0.6)	10/17.9 (0.6)	23/41.0 (0.6)	1.30
54 to 59	6	12/11.4 (1.1)	11/8.9 (1.2)	23/20.3 (1.1)	1.09
6 to 59	54	107/95.0 (1.1)	83/95.0 (0.9)		1.29

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

Overall sex ratio: p-value = 0.082 (boys and girls equally represented)
Overall age distribution: p-value = 0.018 (significant difference)
Overall age distribution for boys: p-value = 0.191 (as expected)
Overall age distribution for girls: p-value = 0.073 (as expected)
Overall sex/age distribution: p-value = 0.002 (significant difference)

Team 5:

Age cat.	mo.	boys	girls	total	ratio boys/girls
6 to 17	12	21/17.6 (1.2)	27/22.0 (1.2)	48/39.7 (1.2)	0.78
18 to 29	12	13/17.2 (0.8)	16/21.5 (0.7)	29/38.7 (0.7)	0.81

30 to 41	12	19/16.7 (1.1)	17/20.8 (0.8)	36/37.5 (1.0)	1.12
42 to 53	12	11/16.4 (0.7)	23/20.5 (1.1)	34/36.9 (0.9)	0.48
54 to 59	6	12/8.1 (1.5)	12/10.1 (1.2)	24/18.3 (1.3)	1.00
6 to 59	54	76/85.5 (0.9)	95/85.5 (1.1)		0.80

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

Overall sex ratio: p-value = 0.146 (boys and girls equally represented)
Overall age distribution: p-value = 0.180 (as expected)
Overall age distribution for boys: p-value = 0.228 (as expected)
Overall age distribution for girls: p-value = 0.424 (as expected)
Overall sex/age distribution: p-value = 0.022 (significant difference)

Team 6:

Age cat.	mo.	boys	girls	total	ratio boys/girls
6 to 17	12	19/26.9 (0.7)	30/29.0 (1.0)	49/55.9 (0.9)	0.63
18 to 29	12	20/26.2 (0.8)	31/28.3 (1.1)	51/54.5 (0.9)	0.65
30 to 41	12	31/25.4 (1.2)	26/27.4 (0.9)	57/52.8 (1.1)	1.19
42 to 53	12	30/25.0 (1.2)	22/27.0 (0.8)	52/52.0 (1.0)	1.36
54 to 59	6	16/12.4 (1.3)	16/13.3 (1.2)	32/25.7 (1.2)	1.00
6 to 59	54	116/120.5 (1.0)	125/120.5 (1.0)		0.93

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

Overall sex ratio: p-value = 0.562 (boys and girls equally represented)
Overall age distribution: p-value = 0.568 (as expected)
Overall age distribution for boys: p-value = 0.132 (as expected)
Overall age distribution for girls: p-value = 0.770 (as expected)
Overall sex/age distribution: p-value = 0.060 (as expected)

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

Team: 1

```
Time                                SD for WHZ
point            0.8 0.9 1.0 1.1 1.2 1.3 1.4 1.5 1.6 1.7 1.8 1.9 2.0 2.1 2.2 2.3
01: 1.35 (n=07, f=0)  ######################
02: 1.02 (n=07, f=0)  #########
03: 1.22 (n=06, f=0)  ##################
04: 0.88 (n=05, f=0)  ###
05: 0.82 (n=06, f=0)  #
06: 1.63 (n=06, f=0)  ##################################
07: 1.18 (n=06, f=0)  ################
08: 1.25 (n=07, f=0)  ###################
09: 0.62 (n=03, f=0)
10: 1.13 (n=07, f=0)  ##############
11: 1.24 (n=06, f=0)  ##################
12: 0.77 (n=05, f=0)
13: 0.36 (n=04, f=0)
14: 1.03 (n=06, f=0)  ##########
15: 3.21 (n=03, f=1)  OOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOO
16: 1.04 (n=05, f=0)  ##########
```

17: 1.17 (n=05, f=0) ################
18: 1.84 (n=03, f=0) OOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOO
19: 1.43 (n=04, f=0) ########################
20: 0.90 (n=02, f=0) OOOO

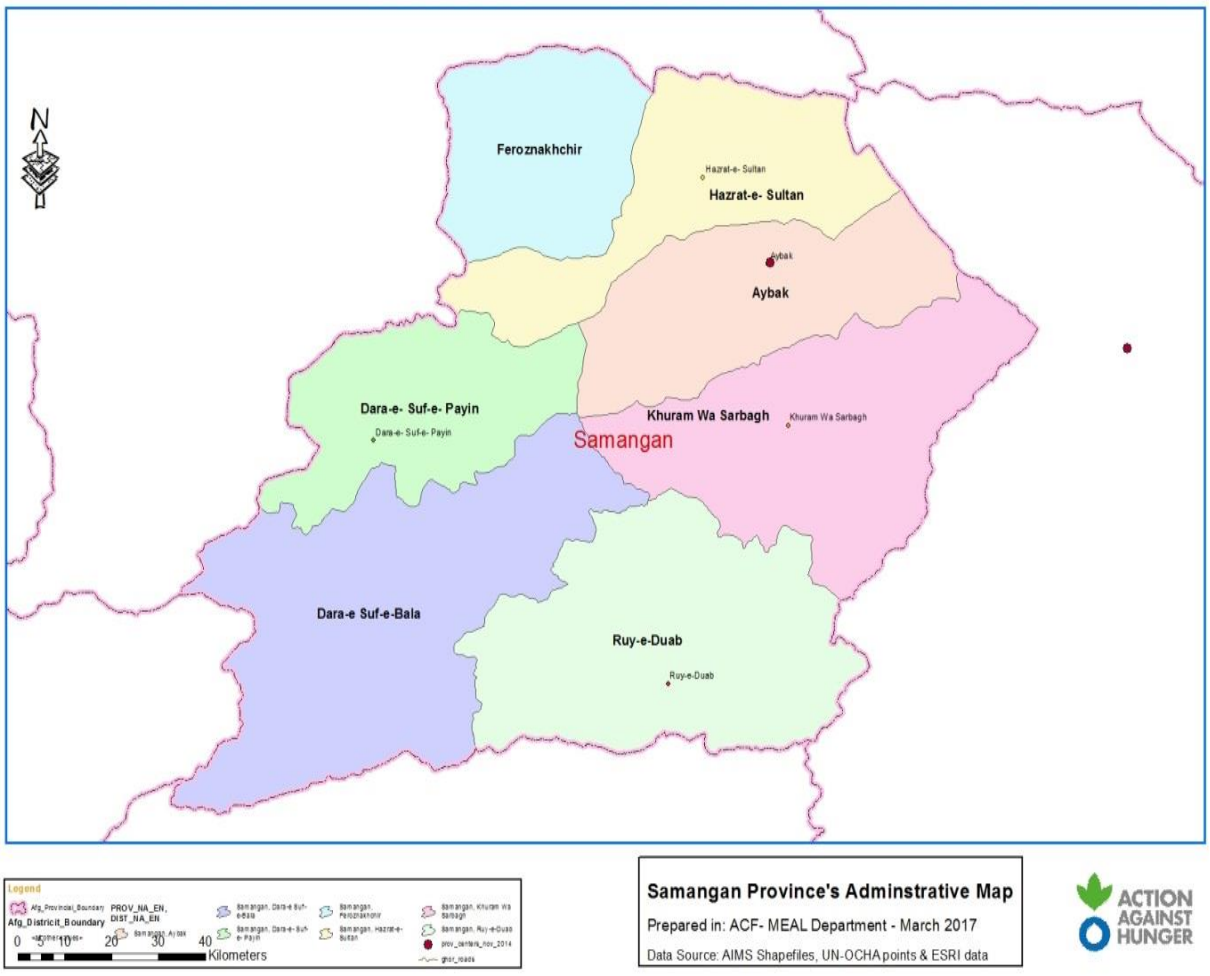
(when n is much less than the average number of subjects per cluster different symbols are used: 0 for n < 80% and ~ for n < 40%; The numbers marked "f" are the numbers of SMART flags found in the different time points)

Team: 2

Time SD for WHZ
point 0.8 0.9 1.0 1.1 1.2 1.3 1.4 1.5 1.6 1.7 1.8 1.9 2.0 2.1 2.2 2.3
01: 1.10 (n=08, f=0) ############
02: 0.89 (n=08, f=0) ####
03: 1.33 (n=07, f=0) ####################
04: 1.18 (n=08, f=0) ################
05: 0.79 (n=08, f=0)
06: 1.45 (n=06, f=1) ##########################
07: 1.37 (n=06, f=0) ######################
08: 1.10 (n=08, f=0) ############
09: 1.22 (n=08, f=0) ################
10: 0.94 (n=08, f=0) ######
11: 1.18 (n=06, f=0) ################
12: 1.11 (n=07, f=1) ############
13: 0.76 (n=06, f=0)
14: 0.72 (n=08, f=0)
15: 1.02 (n=07, f=0) ########
16: 0.70 (n=05, f=0)
17: 1.03 (n=04, f=0) OOOOOOOOO
18: 0.74 (n=03, f=0)
19: 0.83 (n=03, f=0) O
20: 0.56 (n=04, f=0)
21: 1.16 (n=04, f=0) OOOOOOOOOOOOOO
22: 0.47 (n=04, f=0)
23: 1.87 (n=02, f=0) ~~~~~~
24: 0.24 (n=03, f=0)
25: 1.30 (n=03, f=0) OOOOOOOOOOOOOOOOOOO
26: 0.66 (n=02, f=0)

(when n is much less than the average number of subjects per cluster different symbols are used

Annex 2: Map of the province



Annex 3: local event calendar

نام ماه	ماه	1391	ماه	1392	ماه	1393	ماه	1394	ماه	1395
حمل	59	نوروز . وقت شگوفه درختان . وقت نیش تاریاک د رسرد سیر . وفت کرکان وقت کیشت بهاری وقت کشت کاری در منطقه سرد سیر وقت نهال شانی در سرد سیر وقت کیشت خربوزه در سرد سیر	48	نوروز . وقت شگوفه درختان . وقت نیش تاریاک د رسرد سیر . وفت کرکان وقت کیشت بهاری وقت کشت کاری در منطقه سرد سیر وقت نهال شانی در سرد سیر وقت کیشت خربوزه در سرد سیر	36	نوروز . وقت شگوفه درختان . وقت نیش تاریاک د رسرد سیر . وفت کرکان وقت کیشت بهاری وقت کشت کاری در منطقه سرد سیر وقت نهال شانی در سرد سیر وقت کیشت خربوزه در سرد سیر	24	نوروز . وقت شگوفه درختان . وقت نیش تاریاک د رسرد سیر . وفت کرکان وقت کیشت بهاری وقت کشت کاری در منطقه سرد سیر وقت نهال شانی در سرد سیر وقت کیشت خربوزه در سرد سیر	12	نوروز . وقت شگوفه درختان . وقت نیش تاریاک د رسرد سیر . وفت کرکان وقت کیشت بهاری وقت کشت کاری در منطقه سرد سیر وقت نهال شانی در سرد سیر وقت کیشت خربوزه در سرد سیر
ثور	56	وقت بخته شدن توت . وقت حاصل تاریاک . وقت پیدا شدن مرغ های صحرای (بلبل کوک) وقت گل گلاپ کوچ کردن کوچیها	47	وقت بخته شدن توت . وقت حاصل تاریاک . وقت پیدا شدن مرغ های صحرای (بلبل کوک) وقت گل گلاپ کوچ کردن کوچیها	35	وقت بخته شدن توت . وقت حاصل تاریاک . وقت پیدا شدن مرغ های صحرای (بلبل کوک) وقت گل گلاپ کوچ کردن کوچیها	23	وقت بخته شدن توت . وقت حاصل تاریاک . وقت پیدا شدن مرغ های صحرای (بلبل کوک) وقت گل گلاپ کوچ کردن کوچیها	11	وقت بخته شدن توت . وقت حاصل تاریاک . وقت پیدا شدن مرغ های صحرای (بلبل کوک) وقت گل گلاپ کوچ کردن کوچیها
جوزا	58	اول شروع گرمی . وقت لو لور . وقت برداشت اناف . وقت برداشتن گندم	46	اول شروع گرمی . وقت لو لور . وقت برداشت اناف . وقت برداشتن گندم	34	اول شروع گرمی . وقت لو لور . وقت برداشت اناف . وقت برداشتن گندم	22	اول شروع گرمی . وقت لو لور . وقت برداشت اناف . وقت برداشتن گندم	10	اول شروع گرمی . وقت لو لور . وقت برداشت اناف . وقت برداشتن گندم
سرطان	57	جمعه کردن حاصلات جو و گندم سرد سیر . جمعه واری عدس . شروع بادهای 120 روزه	45	جمعه کردن حاصلات جو و گندم سرد سیر . جمعه واری عدس . شروع بادهای 120 روزه	33	جمعه کردن حاصلات جو و گندم سرد سیر . جمعه واری عدس . شروع بادهای 120 روزه	21	جمعه کردن حاصلات جو و گندم سرد سیر . جمعه واری عدس . شروع بادهای 120 روزه	9	جمعه کردن حاصلات جو و گندم سرد سیر . جمعه واری عدس . شروع بادهای 120 روزه
اسد	56	پخته شدن اناف میده گردن جو گندم سرد سیر	44	پخته شدن اناف میده گردن جو گندم سرد سیر	32	پخته شدن اناف میده گردن جو گندم سرد سیر	20	پخته شدن اناف میده گردن جو گندم سرد سیر	8	پخته شدن اناف میده گردن جو گندم سرد سیر

شروع مکاتب . کشت ماش و باقلی	7	شروع مکاتب . کشت ماش و باقلی	19	شروع مکاتب . کشت ماش و باقلی	31	شروع مکاتب . کشت ماش و باقلی	43	شروع مکاتب . کشت ماش و باقلی	55	سنبله
کشت ککنار . خزان شدن برگ درختان . جمع واری خنجک . وفت پیدا شدن اب در چشمها . ختم باد 120 روزه	6	کشت ککنار . خزان شدن برگ درختان . جمع واری خنجک . وفت پیدا شدن اب در چشمها . ختم باد 120 روزه	18	کشت ککنار . خزان شدن برگ درختان . جمع واری خنجک . وفت پیدا شدن اب در چشمها . ختم باد 120 روزه	30	کشت ککنار . خزان شدن برگ درختان . جمع واری خنجک . وفت پیدا شدن اب در چشمها . ختم باد 120 روزه	42	کشت ککنار . خزان شدن برگ درختان . جمع واری خنجک . وفت پیدا شدن اب در چشمها . ختم باد 120 روزه	54	میزان
کشت گندم حاضل گیری انار کشت عدس	5	کشت گندم حاضل گیری انار کشت عدس	17	کشت گندم حاضل گیری انار کشت عدس	29	کشت گندم حاضل گیری انار کشت عدس	41	کشت گندم حاضل گیری انار کشت عدس	53	عقرب
کشت زیره . شروع پوجی و سو کردن تاریاک	4	کشت زیره . شروع پوجی و سو کردن تاریاک	16	کشت زیره . شروع پوجی و سو کردن تاریاک	28	کشت زیره . شروع پوجی و سو کردن تاریاک	40	کشت زیره . شروع پوجی و سو کردن تاریاک	52	قوس
6 جدی روز تاریک تجاوز روسها . شروع زمستان . شب یلدا چله کلان وقت برداشتن زرد کشلغم	3	6 جدی روز تاریک تجاوز روسها . شروع زمستان . شب یلدا چله کلان وقت برداشتن زرد کشلغم	15	6 جدی روز تاریک تجاوز روسها . شروع زمستان . شب یلدا چله کلان وقت برداشتن زرد کشلغم	27	6 جدی روز تاریک تجاوز روسها . شروع زمستان . شب یلدا چله کلان وقت برداشتن زرد کشلغم	39	6 جدی روز تاریک تجاوز روسها . شروع زمستان . شب یلدا چله کلان وقت برداشتن زرد کشلغم	51	جدی
چله خورد . روز اسقلال روسها	2	چله خورد . روز اسقلال روسها	14	چله خورد . روز اسقلال روسها	26	چله خورد . روز اسقلال روسها	38	چله خورد . روز اسقلال روسها	50	دلوه
وقت نهال شانی . بارندگی زیات ماه اخر سال . تاند و یا پایه	1	وقت نهال شانی . بارندگی زیات ماه اخر سال . تاند و یا پایه	13	وقت نهال شانی . بارندگی زیات ماه اخر سال . تاند و یا پایه	25	وقت نهال شانی . بارندگی زیات ماه اخر سال . تاند و یا پایه	37	وقت نهال شانی . بارندگی زیات ماه اخر سال . تاند و یا پایه	49	حوت

Annex 4: Survey Questionnaires

A. Identification variables: This section is mandatory to be filled to all teams in all the HH visited during the survey. The information contained in this section are:

1. **Date of the survey:** This is the date of data collection, it should be written in the standard format for all the questionnaires administered during the survey. (Day/month/year).
2. **Name of the village:** Indicate the name of the sampled village that is visited on the particular day of data collection.
3. **Cluster number:** Indicate the number of cluster allocated for the village or area visited. This is automatically generated by ENA during the sampling stage. Sampling and cluster allocation was done together with the team at the training hall. Important to note that once Cluster number has been assigned it cannot be changed.
4. **Team ID number:** Teams was formed during the training session. Each team was assigned a unique number ranging from 1-5. Each team must indicate the team number on the questionnaires they administer.
5. **Household number:** Each HH in the selected cluster was assigned a number. There are a total of 13 HH in each cluster to be sampled. Each sampled HH should be indicated a number in order of their visit (e.g. the first randomly selected HH is allocated HH number 1 regardless of whether it is the 10th HH in the village)
6. **Starting time of the interview:** This is indicated the time of start of the interview in the selected HH.
7. **Consent:** Each team was provided with a consent form that they was required to ask for permission to conduct the survey in each HH. This is meant to seek permission from the HH head or caregiver to be allowed to conduct the assessment. It is important to note the reason for refusal in case the HH does not accept the interview.
8. **School age education:** each team was asked in the selected HH from the HHs member about the number of school aged children in the HH. A further question to check how many children are attended school in the last 4 days in the last 7 days.
9. **National ID cards:** each team was asked in the selected households how many members in the HH have Tazkera.

B. **Wash:** Description of the following key WASH indicators

1. **Source of drinking water:** This question was asked to the respondent of the HH to find out where HH are accessing their drinking water. The sources of water are categorised into two main

categories I.e. Improved sources and un-improved sources. These are based on the two main recommended categories of responses.

- Number of HH accessing water from improved sources[8]/ total number of respondent
- Number of HH accessing water from unimproved sources[9]/ total number of respondents.

2. **Water treatment methods:** This question was sought to find out what methods HH are using to make their drinking water safe. This indicator was show the proportion of HH practicing safe methods of water treatment in the survey area. The calculation of this was:
   - Total number of HH practicing safe water treatment methods[10]/ total number of respondents
   - Total number of HH not practicing safe water treatment methods/ total number of respondents.
3. **Water Use/Consumption at HH level:** This question was seeking to find out the amount of water consumed by each individual living in the household per day. The aim of this indicator is to check whether households are consuming the required minimum amount of water per person per day compared to the minimum threshold as defined by the WHO standard for HH water consumption.
4. **Hand washing practices:** Caregivers was asked on hand washing practices to ascertain instances in their daily activities and in the 5 critical points when they wash their hands. The caregiver should not be probed for answers/response rather they should be allowed to provide their response independently.
5. **Use of Soap:** A follow up question was asked to ascertain the hand washing practice by asking the caregiver to demonstrate how they wash their hands and what they use to wash their hands, they rubs both hands and drying by clean cloths .

Food access and consumption

1. **Food consumption scoring:** this question was seeking to find out the group of food to check whether households are consuming in the past 7 days and check the source of the food.
2. **Reduced coping of strategy index:** this question was check enough many and food to buy.

Child Questionnaire

Identification:

This section is mandatory to be filled to all teams in all the HH visited during the survey. The information contained in this section is:

[8] Piped scheme, protected springs, boreholes with hand pump, well with hand pump, protected karez
[9] River/ stream/ canal. Pond/ reservoir, well with bucket, unprotected karez, unprotected spring.
[10] Boil, use of water filter

Date of the survey: This is the date of data collection, it should be written in the standard format for all the questionnaires administered during the survey. (Month/Day/Year)

1. **Name of the village:** Indicate the name of the sampled village that is visited on the particular day of data collection.
2. **Cluster number:** Indicate the number of cluster allocated for the village or area visited. This is automatically generated by ENA during the sampling stage. Sampling and cluster allocation was done together with the team at the training hall._Important to note that once Cluster number has been assigned it cannot be changed.
3. **Team ID number:** Teams was formed during the training session. Each team was assigned a unique number ranging from 1-5. Each team must indicate the team number on the questionnaires they administer.
4. **Household number:** Each HH in the selected cluster was assigned a number. There are a total of 14 HH in each cluster to be sampled. Each sampled HH should be indicated a number in order of their visit (e.g. the first randomly selected HH is allocated HH number 1 regardless of whether it is the 10th HH in the village).
5. **Caregiver Number:** Each caregiver living in the selected HH was assigned a specific unique number. This is the same number that was appear in the Caregiver questionnaire. In case of more than one caregiver in a HH each was assigned a unique number to identify and distinguish them from each other. Each caregiver was linked to her/his children selected in the HH to be able to link each caregiver with the children.
6. **Child Number:** Each Child Under the age of 5 years living in the selected HH was assigned a specific unique number. In case of more than one child in a HH each was assigned a unique number to identify and distinguish them from each other. Each child was linked to her/his caregiver selected in the HH to be able to link each caregiver with the children.
7. **Age in months:** Only children between 0 and 59 months old of age were included. Height was not being considered as a valid criterion in absence of age due to the high stunting rates in the province. Age was confirmed by showing a vaccination card or a birth certificate, if available. If

these documents are not available, the use of a local event calendar built for the province was used to determine the age. The age was recorded into the questionnaire in months.

8. **Sex:** Male or female
9. **Weight (in kg):** Children were weighed to the nearest 0.1kg by using an Electronic Uni-scale. The children who can easily stand was asked to stand on the weighing scale and their weight recorded. In a situation when the children could not stand up, the double weighing method was applied.
10. **Height (in cm):** Measuring board was used to measure bare headed and barefoot children. The precision of the measurement is 1 mm. Children of less than 2 years of age was measured lying down and those equal to or above 2 years of age measured standing up.
11. **Mid-Upper Arm Circumference (in mm):**MUAC was used as an indicator of mortality risk for malnutrition and was measured to the nearest 1mm for all children with an indicated age of greater than 6 months, using the UNICEF MUAC strips. An adult MUAC tape was used to measure women of reproductive age (15-49 years) especially pregnant and lactating women.
12. **Oedema:** Only children with bilateral pitting nutrition oedema was recorded as having nutritional oedema this was checked by applying normal thumb pressure for at least 3 seconds to both feet.

Infant and Young Child Feeding

In this section only children 0-23 months was considered as eligible respondents. All children within these age groups were selected in the surveyed HH and the following indicators administered to them.

1. **Ever Breastfed:** This indicator was looking at the number of mothers who have ever breast fed their children. This was look at the last pregnancy of the mother or the current child who is between 0-23 months old.
2. **Time to Breastfeeding/Initiation to Breast milk:** This indicator was look at the amount of time it took for mothers to put their children to the breast after giving birth. The focus was on the mother's last pregnancy in which the child is between 0-23months.
3. **Colostrum feeding:** this indicator was look at the number of mothers with children 0-23 months who fed their children with Colostrum within the first 3 days after birth.
4. **Breast feeding Yesterday:** this indicator was look at the number of mothers who breast fed their children 0-23 months one day (day and Night) prior to the data collection day.
5. **Other Liquids offered to the child:** This indicator was asked the mothers of children 0-23 months what other liquids were offered to the child one day (day and night) prior to the data collection day.
6. **Minimum dietary diversity:** This indicator was asked the mothers on the types of food given to the child 0-23 months one day (day and night) prior to the day of data collection. The food

groups are categorised based on the WHO-IYCF guidelines.

7. **Complimentary feeding:** This indicator looks at the number of mothers who gave solid and semi-solid foods to children 0-23 months one day (day and night) prior to the data collection day.
8. **Minimum Meal frequency:** This indicator was asked mothers on the number of times they provided solid and semi-solid foods to their children 0-23 months one day (day and night) prior to the data collection day.

Child Health status

This section was look at all children in the HH between the ages of 0-59 months.

1. **Type of Illness:** This question was asked about the types of illness that the child (0-59 months) has had in the last 14 days prior to the data collection day. A small definition of the key illness is provided in the questionnaire to enable the data collector identify the illness correctly
2. Vitamin A supplementation: This question was asked the caregiver of child 6-59 months on whether the child has received vitamin A tablets in the previous 6 months prior to the data collection day. Each team was provided with a Sample of the Vitamin A tablet to enable the caregivers to easily identify it.
3. **Deworming:** This question was asked the caregiver of child 24-59 months on whether the child has received deworming tablets in the previous 6 months prior to the data collection day. Each team was provided with a Sample of the deworming tablet to enable the caregivers to easily identify it.
4. **BCG vaccination:** This question was asked the caregiver on whether the child 0-59 months has received BCG vaccination.
5. **PENTA vaccination:** the question was asked the care giver on whether the child 4-24 months has received PENTA3 vaccination.
6. **Measles vaccination:** the question was asked the care giver whether the child 9-59 months has received the measles vaccination.
7. **Polio vaccination:** the question was asked the care giver whether the child 0-59 months has received the polio vaccination.

Caregiver questionnaire

Identification:

This section is mandatory to be filled to all teams in all the HH visited during the survey. The information contained in this section is:

1. **Date of the survey:** This is the date of data collection, it should be written in the standard format for all the questionnaires administered during the survey. (month/ day /year)
2. **Name of the village:** Indicate the name of the sampled village that is visited on the particular day of data collection.
3. **Cluster number:** Indicate the number of cluster allocated for the village or area visited. This is automatically generated by ENA during the sampling stage. Sampling and cluster allocation was done together with the team at the training hall. Important to note that once Cluster number has been assigned it cannot be changed.
4. **Team ID number:** Teams was formed during the training session. Each team was assigned a unique number ranging from 1-5. Each team must indicate the team number on the questionnaires they administer.
5. **Household number:** Each HH in the selected cluster was assigned a number. There are a total of 13 HH in each cluster to be sampled. Each sampled HH should be indicated a number in order of their visit (e.g. the first randomly selected HH is allocated HH number 1 regardless of whether it is the 10th HH in the village)
6. **Caregiver Number:** Each caregiver living in the selected HH was assigned a specific unique number. This is the same number that was appearing in the Caregiver questionnaire. In case of more than one caregiver in a HH each was assigned a unique number to identify and distinguish them from each other. Each caregiver was linked to her/his children selected in the HH to be able to link each caregiver with the children.

Antenatal Care, delivery assist and Health seeking behavior

1. **Antenatal care:** Caregivers between the ages of 15-49 years at household level was asked on whether they sought ante-natal care during their last pregnancy. In this case last pregnancy was considered of the last child who is still between 0-59 months for purposes of having a more precise re-call period.
2. **Delivery assisted by SBA:** caregiver who respond positive to getting assistance from Skilled Birth Attendants during the last delivery.
3. **Health seeking behaviour:** Caregivers who respond positive to seeking antenatal care was asked who they sought assistance from. This question seeks to identify the health seeking pattern of the respondents from the first point of contact to the last point of contact.
4. **Distance to Health centre:** This question seeks to identify how long it takes a caregiver to access the health facility and ascertain if geographical distance is a factor affecting access to the health

centre.

Maternal Nutrition

This section seeks to identify the nutrition status of women between the ages 15-49 years (especially pregnant and lactating women).

1. **MUAC measurement:** The caregivers mid – upper arm circumference was measured using the standard WFP issued adult MUAC tape.
2. **Physiological status:** Each of the caregivers was asked about their current physiological status to ascertain whether they are currently pregnant, lactating, pregnant and lactating or not pregnant.
3. **Iron – Folate supplementation:** Caregivers who report to be currently pregnant was asked whether they are taking iron folate tablets or not. This is to ascertain the number of pregnant mothers who are supplemented and using iron –folate/ferrous.

Annex 5: selected clusters

S/N	Village Name	# Family	Population size	Cluster
1	AGHA PETO	35	368	1
2	MANQETAN PAYEN	187	1370	2
3	AIBAK City Nahia 01	3389	22274	3,4,5,6
4	AIBAK City Nahia 02	1742	12788	7,8
5	DARA ZHOWANDON PASS KANDA	118	916	9
6	DILKHAKI MASJED KALAN	234	1860	10
7	JOWI KARAIZ	165	1097	11
8	KOHNNA AIBAK	154	1110	12
9	MIRAGHLI QESHLAQ	106	838	13
10	RABATAK SHAHI KHAIL	58	520	14
11	SHALKATOO	177	1326	15
12	ZAHAR ABI CHARMGARI	144	1027	16
13	ALMALI	70	417	17
14	DAH AHMAD BAIK	115	912	18
15	GHULAM MOHAMMAD	65	513	19
16	KHOJA BOLAND PAYEN	24	281	20
17	PAI KOTAL	81	599	21
18	RAIG YALAQ	55	409	22
19	SAR BOUM BALA	206	1110	23
20	SHAIRA	34	306	24
21	WAY BALAQ	291	1851	25
22	ASHLAZ BALA	38	350	26
23	ALIKHIL BALA	422	2954	27
24	CHOBAKI	210	1126	RC
25	JETOM GHALI	560	3920	28
26	NOW AMAD	140	980	29
27	TANGI YAQOUB	250	1750	30
28	Ozan bala	705	1248	31
29	ATAULLAH	27	295	32
30	MARKAZ HOORLAMASH	234	1435	33
31	WARTA GEETI BALA	115	718	34
32	HOSH QARA	16	237	RC
33	KOKJAR	437	2829	35
34	NOW ABAD GAGRA HASSAN KHAIL	12	210	36
35	QOUSH PARA	104	667	37
36	SURKH KOTAL	86	755	38

37	BABA QAMBAR HAD MURDA	62	548	39
38	DAH NOW	69	592	40
39	HABASH KHOURAM	213	1318	41
40	LANGAR SAR BAGH	231	1314	42
41	QARA DOWNG	43	402	43
42	TANA CHOUB	195	1334	44
43	ARFA QOUL HULYA	66	463	RC
44	HARFA QOUL SUFLA	63	486	RC
45	KHOJA ZAID JONOBI	64	445	45
46	QASHQA	142	853	46
47	AB KHOURAK HULYA	108	779	47
48	HARFA QOUL KHOSHKAK	22	284	48
49	NOW ABAD PAI TANGEE	155	880	RC
50	SAR ASIAB PAYEN	27	267	49
51	AGHA PETO	35	368	1
52	MANQETAN PAYEN	187	1370	2
53	AIBAK City Nahia 01	3389	22274	3,4,5,6
54	AIBAK City Nahia 02	1742	12788	7,8
55	DARA ZHOWANDON PASS KANDA	118	916	9
56	DILKHAKI MASJED KALAN	234	1860	10

References

- WHO 2000 thresholds (< 5 % acceptable, 5-9 % poor, 10-14 % serious, > 15 % critical**).**
- WHO emergency threshold of 2/10,000/day and 4/10,000/day respectively.
- Care international IYCF calculator, based on WHO, 2010.
- National Nutrition Survey of Afghanistan, UNICEF, 2013.
- CSO: updated population 2015-2016