AFGHANISTAN

Integrated Nutrition and Mortality SMART Survey
Final Report
Bamyan Province, Afghanistan
03rd to 12th April, 2021

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Action Against Hunger | Action Contre La Faim
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Abbreviation

ACF/AAH	Action Contre la Faim / Action Against Hunger
AIM-TWG	Assessment and Information Management Technical Working Group
AOGs	Armed Opposition Groups
ARI	Acute Respiratory Infection
BHC	Basic Health Centre
BPHS	Basic Package of Health Services
BSU	Basic Sampling Unit
CBA	Child-Bearing Age
CDR	Crude Death Rate
CHA	Coordination of Humanitarian Assistance
CHC	Comprehensive Health Centre
CI	Confidence Interval
DEFF	Design Effect
DH	District Hospital
DP	Desired precision
EBF	Exclusive Breast Feeding
ECHO	European Commissions Humanitarian Aid
ENA	Emergency Nutrition Assessment
EPHS	Essential Public Health Services
EPI	Expanded Program on Immunization
FHH	Family Health House
FSC	Food Security Score
GAC	Global Affairs Canada
GAM	Global Acute Malnutrition
HAZ	Height for Age Z-score
HF	Health Facilities
HHs	Households
IDPs	Internally Displaced People
IPC	Integrated Food Insecurity Phase Classification
IPC	Infection Prevention and Control
IPD-SAM	Inpatient Department for Severe Acute Malnutrition
IYCF	Infant and Young Child Feeding
M&EHIS	Monitoring and Evaluation - Health Information System
MHT	Mobile Health Team
MM	Millimetres
MoPH	Ministry of Public Health
MUAC	Mid-Upper Arm Circumference
MW	Mean Weight
NGO	Non-Governmental Organization
NNS	National Nutrition Survey
NSIA	National Statistics and Information Authorities
NSSSSC	Nutrition Small Scale Surveys Steering Committee
OPD-MAM	Outpatient Department for Moderate Acute Malnutrition
OPD-SAM	Outpatient Department for Severe Acute Malnutrition
OW	Observed Weight
PH	Provincial Hospital
PHC	Prison Health Center

PHC	Primary Health Care
PLW	Pregnant and Lactating Women
PND	Public Nutrition Directorate
PNO	Public Nutrition Officer
PPHD	Provincial Public Health Directorate
PPS	Probability Proportional to Size
PSU	Primary Sampling Unit
RC	Reserve Cluster
rCSI	Reduced Coping Strategy Index
RUSF	Ready to Use Supplementary Food
RUTF	Ready to Use Therapeutic Food
SAM	Severe Acute Malnutrition
SD	Standard Deviation
SHC	Sub Health Center
SMART	Standardized Monitoring and Assessment of Relief and Transitions
TSFP	Targeted Supplementary Feeding Program
U5DR	Under-five Death Rate
UNICEF	United Nations Children's Fund
W/H	Weight for Height
WASH	Water, Sanitation and Hygiene
WAZ	Weight for Age Z-Score
WFP	World Food Program
WHO	World Health Organization
WHZ	Weight for Height Z-score

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1. EXECUTIVE SUMMARY

Bamyan is one of the 34 provinces of Afghanistan, located in the north-west part of the country. It is divided into 8 districts and has a population of about 495,5571. The city of Bamyan is the capital of Bamyan province. The survey design was a cross-sectional population-representative survey following the Standardized Monitoring and Assessment of Relief and Transitions (SMART) methodology. The survey applied two-stage cluster sampling using the SMART methodology based on probability proportional to size (PPS) for cluster selection. Stage one sampling involved the sampling of the Villages/clusters to be included in the survey while the second stage sampling involved the random selection of the households within the sampled clusters. The smallest geographical unit in Bamyan defined as a cluster is a village. A total of 694 children aged 0-59 months were assessed and among them, 631 were 6-59 months old. The data collection took place from 03rd to 12th April, 2021, during the spring season in Afghanistan. Out of 470 households planned, 470 all household were successfully assessed.

The survey results indicated a Global Acute Malnutrition (GAM) rate for children 6-59 months old based on WHZ is 9.0% (7.1 - 11.2 95% CI). The results also indicated a very high level of chronic malnutrition of 39.3% (34.4 - 44.3 95% CI) exceeding the 30% critical threshold[2]. The result for malnourished pregnant & lactating women based on MUAC (<230 mm) was at 21.0% (15.9 – 27.2 95.CI).

The final report presents the analysis and interpretation of the nutritional status of children under five, the nutritional status of women 15-49 years old, pregnant, and lactating women (PLW), measles immunization coverage, morbidity fever, ARI and diarrhoea in the last 14 days, and retrospective mortality rates. The summary of the key findings is presented in table 1 below.

Table 1: Summary of Findings

Malnutrition prevalence – Children U5	
Indicator	Prevalence
GAM prevalence among children 6-59 months per WHZ <-2SD	9.0 % (7.1 - 11.2 95% C.I.)
SAM prevalence among children 6-59 months per WHZ <-3SD	1.3 % (0.7 - 2.4 95% C.I.)
GAM prevalence among children 0-59 months per WHZ <-2SD	9.3 % (7.5 - 11.5 95% C.I.)
SAM prevalence among children 0-59 months per WHZ <-3SD	1.3 % (0.7 - 2.4 95% C.I.)
GAM prevalence among children 6-59 months per MUAC <125 mm	9.8 % (7.9 - 12.2 95% C.I.)
SAM prevalence among children 6-59 months per MUAC <115 mm	1.7 % (1.0 - 3.2 95% C.I.)

[1] National Statistics and Information Authority – NSIA_ Update Population 2020-21.

[2] Prevalence thresholds for wasting, overweight and stunting in children under 5 years, August 2018.

Combined GAM prevalence among children 6-59 months per WHZ <-2SD and/or MUAC <125mm and/or Oedema	14.6 % (12.0 - 17.6 95% C.I.)
Combined SAM prevalence among children 6-59 months per WHZ <-3SD and/or MUAC <115 mm and/or Oedema	2.9 % (1.8 - 4.4 95% C.I.)
Stunting among children 6-59 months per HAZ <-2SD	39.3 % (34.4 - 44.3 95% C.I.)
Severe Stunting among children 6-59 months per HAZ <-3SD	7.9 % (5.3 - 11.5 95% C.I.)
Underweight among children 6-59 months per WAZ <-2SD	17.6 % (14.5 - 21.1 95% C.I.)
Severe Underweight among children 6-59 months per WAZ <-3SD	2.7 % (1.7 - 4.3 95% C.I.)
Overweight among children 6-59 months per WHZ >2SD	0.3 % (0.1 - 1.3 95% C.I.)

*GAM and SAM prevalence by any indicator include cases of nutritional oedema

Nutritional status of Women 15-49 years old Women and PLW	
Indicator	Result
Malnutrition among all (CBA) women 15-49 years including PLW and Not PLW per MUAC <230mm	19.0% (15.2 – 23.4 95.CI)
Malnutrition among pregnant and lactating women (PLW) per MUAC <230 mm	21.0 % (15.9 – 27.2 95.CI)

Crude and Under Five Death Rate (Death/10,000/Day)	
Indicator	Result
Crude Death Rate (CDR)	0.37 (0.22-0.63 95% CI)
Under five Death Rate (U5DR)	0.28 (0.07-1.14 95% CI)

Child Immunization		
Indicator	First Dose (9-59 months)	Second Dose (18-59 months)
Measles vaccination among children confirmed by vaccination card	71.0% (65.0 – 76.3 95.CI)	64.3% (58.0 – 70.1 95.CI)
Measles vaccination among children confirmed by caregiver recall	14.4% (10.6 – 19.2 95.CI)	14.7% (10.6 – 20.0 95.CI)
Overall Measles vaccination among children confirmed by either vaccination	85.3% (79.2 – 89.8 95.CI)	78.9% (71.7 – 84.7 95.CI)

card or caregiver recall		

2. INTRODUCTION

Bamyan Province is one of the thirty-four provinces of Afghanistan, located in the central highlands of the country. Its terrain is mountainous or semi-mountainous, at the western end of the Hindu Kush Mountains concurrent with the Himalayas. The province is divided into eight districts such as Shebar, Saighan, Kahmard, Yakawlang, Panjab, Waras, Yalawlang No 2 and Bamyan city is the capital of the province, The province has 495,557 population NSIA 2020-21.The province has borders with Samangan to the north, Baghlan, Parwan and Wardak to the east, Ghazni and Daykundi to the south, Ghor and Sar-e Pol to the west. It is the largest province in the Hazarajat region of Afghanistan, and is the cultural capital of the Hazara ethnic group that predominates in the region. Many statues of Buddha are carved into the sides of cliffs facing Bamyan city.

In 2008, Bamyan was found to be the home of the world's oldest oil paintings.

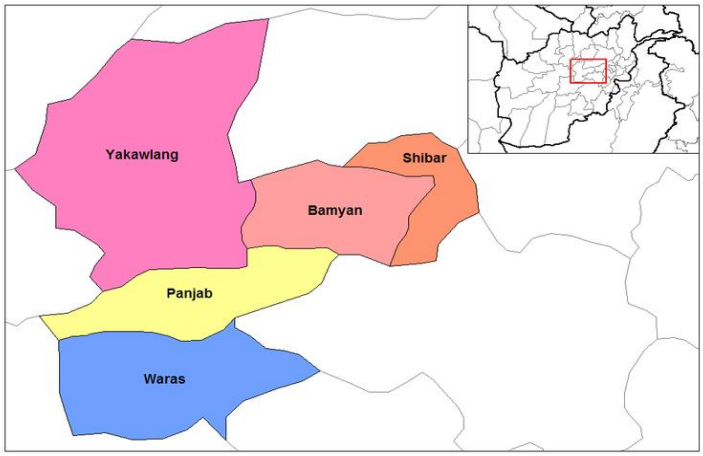


Figure 1: Bamyan Province Map

The province has several famous historical sites, including the now-destroyed Budhas of Bamyan, around which are more than 3,000 caves, the Bande Amir National park, Dara-i-Ajhdar, Gholghola and Zakhak ancient towns, the Feroz Bahar, Astopa, Klegan, Gaohargin, Kaferan and Cheldukhtaran. Most of the residents of Bamyan Province speak Hazaragi Language,

Based on the 2017 SMART survey in the province, the combined GAM rate (MUAC + WHZ score + Oedema) was 15.8% (13.4-18.2 95% CI)[3], and the combined SAM rate was 2.8% (1.7-3.9 95% CI) respectively. Chronic malnutrition in the province was at 42.2% (38.1-46.4 95% CI)[4] exceeding the critical threshold for stunting (30%). Meanwhile, 25.8%. Of women of reproductive age were malnourished based on low MUAC (<230mm).

Based on the 2017 SMART survey, the Prevalence of morbidity among children was also found high, 51.6% of children under five were sick based on two weeks recall method, diarrhea (31.1%), fever (38.9%), and acute respiratory infection (28.1%) were the leading illness reported. Measles

[3] SMART survey August-2017

vaccination coverage both by the caregiver's recall and by card confirmation was 83.9 % which was far below the 90 % target threshold; the proportion of all children aged 6-59 months who had received vitamin A in the last 6 months before the survey was 91.5% which was above the 80 % WHO recommended threshold.

However, the Crude Death Rate (0.18 death/10,000/Day) and under-five death rate (0.30 death/10,000/Day) were well below the WHO emergency threshold for CDR (1/10,000/Day) and U5DR (2/10,000/Day), perhaps an indication of effectiveness and efficiency of humanitarian interventions cushioning the most vulnerable from effects of emergencies.

WASH situation was much better with 51.9% of the households having access to improved water sources as well as the majority meeting the over 23.2 Liters per day per person water usage. The majority of the household (74.6%) were food secure based on the confluence of the Food Security Score (FSC) and reduced coping strategy index (rCSI) indicators.

2.1. Agriculture and Industry

Bamyan is an agricultural province that most of its residents work on their farms. Bamyan is famous for producing Qroot (Dried curd), Named (wool carpet) and potatoes. Animal husbandry, agricultural productivity, pasture improvement, value adding (product processing), postharvest technology and irrigation system improvement (high lands and lower rivers) are some of potential areas for development. Bamyan is identified one of the provinces having neither industrial zone nor any big or small factories to support and bolster economy of the province's poverty-stricken masses. Even the widely known Bamyan has an undersized bazaar, forcing people to use their items and stuff from Kabul, Mazar and Ghazni provinces. Trade market is not booming in the province at the 4,000 available shops do business in retail and whole selling. In terms of food security, Bamyan is one of the provinces which has recently been classified in IPC phase 3[7]. From November 2020 to March 2021, an estimated 11.3 million people (37% of the total population) will experience severe acute food insecurity throughout the country. During the mentioned period about 159,496 (25 %) [5]people in Bamyan province will to suffer from severe food insecurity.

2.2. Description of the survey area

This SMART survey was conducted in all 8 districts of Bamyan province; the sampling frame was all the villages in the eight districts of Bamyan province, Bamyan city (capital) Shebar, Saighan, Kahmard, Yakawlang, Panjab, Waras, and Yalawlang No 2. Seven districts of the Bamyan province are considered as rural areas (except the Bamyan City) and were accessible for the survey teams, except 31 out of the total of 878 villages (3.5 % of the total target area). These 31 inaccessible clusters/villages were mainly in Kahmard, Panjab, Waras and Saighan districts due

[5] IPC Afghanistan report 2020

to the recent peak of the insecurity and presence of Armed Opposition Groups (AOGs) with continued fighting in the areas. From the cultural, ethnic, and linguistic perspective, the inhabitants of the excluded villages are homogenous with the residence of the surveyed parts of the Bamyan province.

A full SMART Data collection was conducted in Bamyan province from 03rd to 12th April, 2021 [The Month of Hamal 1400 in Solar Calendar] at the beginning of the spring season by the technical team of Action Against Hunger, Afghanistan mission. The survey covered the entire province, including partially secure and completely secure villages throughout the province. The survey was conducted in close coordination with AIM-TWG and MoPH (M&EHIS Directorate) and the local public health authorities.

2.3. Health, Nutrition and Food Security

A SMART assessment carried out in Bamyan province in August 2017 revealed a GAM rate of 8.6% (6.6-11.1 95% CI) by WHZ which is classified as a medium level according to the new UNICEF-WHO threshold. The GAM based on MUAC was 10.4% (8.2-13.2 95% CI). Currently, 10 national and international humanitarian organizations are providing health and nutrition services in the province. The implementer NGO of Aga Khan Health Services "AKHS" is implementing the EPHS and BPHS SEHATMANDI project in Bamyan province. The BPHS covers a total of 79 health facilities providing health services (1 PH, 3 DH, 1 CHC+, 9 CHC, 23 BHC, 42 SHC, 5 FHH, 1 Prison Health Center, and a total of 12 mobile health teams and 530 health posts offering Primary Health Care (PHC) package in all the 8 districts of Bamyan province, A total of 62 of the health facilities provide OPD SAM, 4 provides IPD SAM; and 35 OPD program in Bamyan province.

2.4. COVID situation in Bamyan

The COVID-19 pandemic in Afghanistan is part of the worldwide pandemic of coronavirus disease 2019 (COVID-19) caused by severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2). Afghanistan confirmed the 1st case of the virus on 24th February 2020 in Herat province on 24th February 2020 in Herat. According to Bamyan provincial public health directorate report, the first case of COVID-19 was detected on 08th April 2020 in Bamyan province. According to the COVID-19 pandemic in Afghanistan report, from 08th April 2020 to 31st January 2021, 4,357 tests were done, with a total of 1022 positive cases (out of them 1003 were recovered and 19 have died) in Bamyan province. Since February 1st, no new case has been reported for Bamyan province, although COVID-19 cases may still be present at the provincial level. Due to social stigma related to COVID-19, limited public health resources and testing capacity, as well as the absence of a national death register, confirmed cases and deaths related to COVID-19 are likely to be under-reported in Afghanistan in general.

The epidemiological situation related to COVID-19 in Bamyan province enough improved these days and allowing to lunch household survey and will require the implementation of preventive specific rules; Considering the current situation of Covid-19 pandemic in the country, and the necessity to generate updated data to guide nutrition programming in this province, this survey was implement and we ensure the respect of all IPC recommendations to reduce the spread of Covid-19 through this activity, to protected our teams and our beneficiaries. During survey implementation, necessary technical and operational recommendations were followed as per interim guidelines to ensure adequate safety precautions for the beneficiaries as well as for the survey team[6].

2.5. Survey Justification

- Since the implementation of the last SMART assessment in 2017, there has been no updated nutrition status data available from the Bamyan province. This assessment helped to capture the most recent snapshot of the nutrition status of the province and enabled the tracking of trends of malnutrition over the past four years; the survey also investigated the current mortality rates, child health status (morbidity, and immunization), and nutritional status of women of reproductive age (15-49 years) with special focus on PLWs.
- It was also an opportunity to build the technical capacity of the provincial level program staff on SMART methodology.
- Bamyan province is classified in phase 3 of the IPC classification, it indicates that the population is living in crises in terms of food security (IPC_ November 2020).

3. SURVEY OBJECTIVES

3.1 General objective

The overall objective of the survey is to assess the nutrition situation of under-five children and women of reproductive age, crude and under-five retrospective mortality in Bamyan province.

3.2. Specific objectives

1. To estimate the prevalence of undernutrition (Stunting, Wasting, and Underweight) among children aged 0-59 months based on WHZ and MUAC.
2. To estimate the Crude Death Rate (CDR) and under-five Death Rate (U5DR).
3. To estimate both doses of measles vaccination coverage among children 9-59 months.
4. To determine the nutritional status of pregnant and lactating women (PLW) as well as women of reproductive age (15-49 years) based on MUAC assessment.
5. To estimate the morbidity prevalence (Fever, Diarrhoea and ARI) among children age 0-59 months in the past 2 weeks recall period.

[6]Interim guidance on restarting population level surveys and household level data collection in humanitarian situations during covid-19 pandemic, SMART, 8th October 2020

To note that survey objectives were limited according to the interim guidance for conduction household survey during COVID-19 for the sake to limit the interview duration, for instance, IYCF, WASH and FSL indicators were not included.

4. METHODOLOGY

4.1. Survey Design Considerations during Covid-19 pandemic

- The survey design was cross-sectional using the SMART methodology with two-stage clusters sampling.
- The number of included in a survey have been kept to an absolute minimum to respect the ideally a maximum of 20 questions and indicators minutes of interview.
- The survey manager has kept the sample size to a necessary minimum to ensure minimally acceptable precision as per the SMART guidelines. A higher non-response rate may be considered to account for household refusal as well as a household exclusion that has given COVID-19 exposure or symptoms.
- The survey followed the usual methods for measuring MUAC, weight, height, and age using trained measurers as per the SMART guidelines.
- All enumerators were <60 years of age and without comorbidities known to increase the risk of COVID-19 complications.
- Before the interview, the team members screened respondents and all measured subjects. If any individual in the household meets any of the following conditions (See annex 6.1 health screening checklist), the house hold was excluded from the survey.

4.2. Geographic target area and population group

A full SMART assessment targeted the whole Bamyan province. The household was the basic sampling unit (BSU). The surveyed population were children from the age of 0-59 months and Pregnant and Lactating Women (PLW) and Women from 15-49 years in addition to the household indicators.

4.3. Survey period

Six days long training was organized from 27th March to 01st April 2021 and the data collection took place from 03rd to 12th April 2021 in all 8 districts of the Bamyan province.

4.4. Survey design

The survey design was cross-sectional using the SMART methodology, following two stages cluster sampling method.

4.5. Sample Size

The household sample size for this survey was determined by using ENA for SMART software version 2020 (updated 11th Jan 2020). The sample size used was 467 households and 505 children 6-59 months. Table 2 and Table 3 highlights the parameters used for sample size calculation for anthropometric and mortality surveys;

Table 2: Parameters for sample size calculation for anthropometry

Parameters for Anthropometry	Value	Assumptions Based on Context
The estimated prevalence of GAM (%)	11.1%	According to the last SMART assessment in Bamyan province in August 2017, the estimated prevalence of GAM was 8.6 % (6.6-11.1; 95% C.I.) Considering the situation has worsened than 2017, hence the upper CI value of 11.1% of the previous GAM by WHZ is considered here for the planning purpose as the worst-case scenario.
Desired precision	±3.5	As per the SMART survey guideline recommendation.
Design Effect	1.5	According to August 2017 SMART survey, DEFF was 1.37 for GAM by WHZ in Bamyan province. But a slightly higher DEFF (1.5) is assumed here for planning purpose.
Children to be included	**505**	**The minimum sample size for children aged 6-59 months in the selected households that will be surveyed**
Average HH Size	7.4	Based on the Bamyan SMART Survey August 2017
% Children under five	17.3 %	Based on the Bamyan SMART Survey August 2017
%Non-response Households	6 %	In the context of COVID-19, and the last SMART survey experience the Non-Response Rate (NRR) that is estimated at 6%.
Households to be included	**467**	**Minimum sample size-Households (BSU) to be surveyed**

Table 3: Sample size calculation for mortality surveys

Parameters for Mortality	Value	Assumptions based on context
Estimated Death Rate /10,000/day	0.18	Based on the Bamyan SMART survey in August 2017 mortality rate was 0.18 (0.09-0.35).

Desired precision /10,000/day	±0.25	A bit higher precision is assumed here for the planning purpose based on the low CDR observed during the last SMART survey in August 2017.
Design Effect	1.5	According to August 2017 SMART survey, DEFF was 1.37 for GAM by WHZ in Bamyan province. But a slightly higher DEFF (1.5) is assumed here for planning purpose.
Recall Period in days	104	The starting point of the recall period is 26th December 2020 (6th Jadee 1399) **(The occupying Russians were invading Afghanistan)** and data collection took place from 03 to 12 April. Hence the the mid-point of data collection was on 08th April 2021).
Population to be included	**1,737**	**Population**
Average HH Size	7.4	Based on Bamyan SMART Survey in Aug 2016.
% Non-response Households	6 %	In the context of COVID-19, and the last SMART survey experience the Non-Response Rate (NRR) that is estimated at 6%.
Households to be included	**250**	**Households (BSU) to be included**

Based on the SMART methodology, between the calculated anthropometry and mortality sample sizes, the largest sample size was used for the survey. In this case, the largest sample size was 467 households.

The number of households to be completed per day was determined according to the time the team could spend in the field excluding transportation, other procedures, and break times. The details in table 4 below are taken into consideration when performing this calculation based on the given context:

Table 4: Household selection per day time table

Total working time	**8:30 AM to 4:00 PM (7 Hours 30 Min = 450 minutes**
Time for transportation (round trip)	450 - 120 = 330 minutes
Coordination with village elder and preparation of HH list - 30 min	330 – 30 = 300 minutes
Time for a break and pray – 50 Min	300 - 50 =250 minutes
The average duration of the HH interview	15 minutes
Distance from one HH to another HH	5 minutes
Time for cleaning of Height board, weighing scales	5 minutes

disinfection and other IPC measures by chlorine	
Average HH per day per cluster by one team	250 ÷ 25 = 10 HHs

The above gives an average of 250 min of working time in each cluster. If on average, teams spend 15 min in each HH and 5.0 min traveling from one HH to another, each team can comfortably reach 10 HH per day, (250/25=10 HHs).

The total number of households in the sample divided by the number of households to be completed in one day to determine the number of clusters to be included in the survey. (467 HHs)/ (10HHs per cluster) =46.7 Clusters (rounded up to 47 clusters). Therefore, the survey team attempt to survey 470 HHs

4.6. Sampling Methodology

A two-stage cluster sampling methodology was adopted based on probability proportional to size (PPS); the villages with a large population had a higher chance of being selected than villages with a small population and vice versa. The village was the Primary Sampling Unit (PSU) while the household was the Basic Sampling Unit (BSU). The first stage involved the selection of clusters/villages from a total list of villages. A list of all updated villages was uploaded into the ENA for SMART software where PPS was applied. The list of villages/cluster was gathered from the Basic Package of Health Services (BPHS) providers in consultation with PPHD to finalize the sampling frame. Based on the latest EPI micro-plan, all insecure or inaccessible villages were identified and systematically excluded from the final sampling frame; the final list consisted of 847 out of 878 villages (31 inaccessible/insecure villages were excluded). The clusters generated using the ENA software version included 5 Reserve Clusters (RCs). Reserve clusters were planned to be surveyed only if 10% or more clusters were not possible to be surveyed.

Based on the estimated time to travel to the survey area, select and survey the households, it was estimated that each team could effectively survey 10 HHs per day. (467/10=46.7 clusters, rounded up to 47 Clusters). In each selected village, one or more community member(s) was asked to help the survey teams to survey by providing information about the village concerning the geographical organization or the number of households. In cases of large villages or semi-urban zones/small cities in a cluster, the village/zones were divided into smaller segments and a segment selected randomly (if similar in size) or using PPS to represent the cluster. This division was done based on existing administrative units e.g. neighborhoods, streets, or natural landmarks like a river, road, mountains, or public places like schools, and masjid.

The second stage involved the random selection of households from a complete and updated list of households. This was conducted at the field level. The **Household definition**[7] adopted was: **"a group of people living under the same roof and sharing food from the same pot".** In households with multiple wives, those living and eating in different houses were considered as separate HHs.

[7]WFP household definition.

4.6.1. Field Procedures

Stage 2 selection of households:

The survey covered/achieved a total of 470 households from 47 total clusters surveyed, (out of a total of 47 planned). Each team was responsible for cover effectively 10 households per day. Households were chosen within each cluster using systematic random sampling as described below. A total of 6 teams were engaged during the assessments, while data collection was conducted in 10 days.

On arrival at the Chief/Malik:

The survey team introduced themselves and the objective of the survey to the Chief/Malik leader.

- In collaboration with the Chief/Malik leader, the team prepared a list of all households in the cluster. Abandoned absent households were not listed/excluded.
- The required number of households were selected using systematic random sampling.
- The sampling interval was determined by:

$$\text{Sampling interval} = \frac{\text{Total number of sampling units in the cluster}}{\text{Number of sampling units to be surveyed (10)}}$$

Equation 1: Sampling Interval

- Every household was asked for voluntary consent to take part in the survey process before any data was collected.
- All children 0 to 59 months living in the selected house was included for anthropometric measurements, including twins and orphans or unrelated children living with the sampled household.
- If a child of a surveyed household was absent due to enrolment in an IPD treatment centre at the time the household was surveyed, teams were not visited any treatment centre to measure that child.
- Households without children were still assessed for household-level questions (PLW nutritional status, and mortality).
- Any absent households with missing or absent women or children were revisited at the end of the day before leaving the cluster.
- The missing or absent child that was not found after multiple visits were not included in the survey.
- A cluster control form was used to record all household visits and note any missed and absent households.

4.6.2. Household inclusion and exclusion criteria:

Before the interview, the team members screened respondents and all measured subjects. If any individual in the household met any of the following conditions (annex 4. for household check), the household was excluded from the survey.

NOTE:

Households excluded for this reason should be marked in the cluster control forms and the percentage of nonresponse due to COVID-19 specific reasons outlined above should be included in the final report.

To ensure reaching a maximum number of targeted samples and mitigating the issue of possible high Non-response rate (NRR) due to sample exclusion based on the COVID-19 health checklist, all the households were followed-up and accordingly revisited. Households were excluded based on the child's, mother and caregiver high fever (>100.4°F/38°C) some of children have a high fever during the day of data collection and that was due to other morbidity/diseases and not COVID-19. There were no child and respondents affected by COVID-19 (with possible signs, symptoms of COVID-19). Therefore, no need to revisiting of any household that is why our non-response rate was lees then from the plan. Health and safety measures during filed work and no anyone household was excluded from the survey:

Key technical and operational recommendations were followed to ensure all Infection Prevention Control (IPC), health and safety measures for the beneficiaries as well as for the survey teams are as below:

During field data collection:

- Introduction, consent, interviews, and measurement was done outside in an open area with enough space for proper physical distancing considering a persons' or family's privacy.
- All survey team members were provided with face masks and gloves. Each team carried a safety box/bag and safely dispose all used personal protective equipment at the end of data collection.
- Household members who were directly in contact with the survey team (survey respondents and measured children/adults above 2 years of age) were requested to wear a face mask during the entire household interview process. The survey teams offered a face mask to the key household members before the start of the interview if they were not available in the household.
- During the interview, the interviewer and respondent maintained a distance of at least one 1-meter even if wearing a mask
- All team members have sanitized their hands immediately before entering a household using soap and water or alcohol-based hand sanitizer with at least 60% alcohol.

- ❖ All surveys followed the usual methods for measuring oedema, MUAC, weight, height and age using trained measurers as per the SMART guidelines. Anthropometric equipment (e.g. scales, height boards, MUAC tapes) was disinfected between households.
- ❖ New MUAC tapes were used for each household and the previously used tapes were collected back by the survey team and were destroyed in a safe place at the end of the day.
- ❖ Prevented congregation of others (household or community members) around the place of interview considering the social distancing and privacy.
- ❖ Well-functioning vehicles with enough space for sitting were hired for the survey teams and were disinfected regularly. Face masks and hand gloves were also provided to all drivers.

Currently, the case definitions of COVID 19 in Afghanistan are:

Suspect case:

A person who meets the clinical and epidemiological criteria has a high temperature (>100.4 °F/38 °C) with at least one symptom of COVID-19 (e.g. dry cough, sneezing, shortness of breath, chest pain or pressure, loss of speech or movement, etc.).

Probable cause:

A patient who meets clinical criteria above and is a contact of a probable or confirmed case, or epidemiologically linked to a cluster with at least one confirmed case.

Confirmed case:

A person with laboratory confirmation of COVID-19 infection, irrespective of clinical signs and symptoms. (E.g. dry cough, sneezing, shortness of breath, chest pain or pressure, loss of speech or movement, etc.) It called a confirmed case of COVID-19

Related to the survey methodology and human resources management:

- ✓ Every team member had been monitored his/her symptoms twice a day and reported those to the team leader (morning before fieldwork and after return from the field). Self-assessment (ideally supervised by another team member) should at least include reporting of temperature check for fever (i.e. temperature ≥100.4 °F/38 °C) and reporting of new/worsening cough.
- ✓ In case a team member develops symptoms that are consistent with the local suspect COVID-19 case definition the survey manager had been withdraw the entire team from fieldwork for the remaining duration of the survey or until it were confirmed that all team members are negative for SARS-COV-2 and replace it with a reserve team or other team available.

- ✓ Two survey teams (6 enumerators) were kept as a reserve and the necessary supplies for IPCs equipment's were made available. But, fortunately, we didn't had to use them because no team member was affected by COVID-19.
- ✓ All survey team members have received training on modules necessary for implementing a SMART survey (e.g. Logistics, Objectives, etc.) as well as a review of additional field safety procedures during COVID-19 as described above.

4.7. Indicators: Definition, Calculation, and Interpretation

4.7.1. Overview of Indicators

The anthropometric indicators assessed by this survey and the corresponding target population are presented in Table 5 below.

Table 5: Standardized Integrated SMART Indicators

Indicator	Target Population
Anthropometry	
Acute Malnutrition by WHZ and/or Oedema	Children 0-59 and 6-59 months
Acute Malnutrition by MUAC and/or Oedema	Children 6-59 months
Acute Malnutrition by Combined Criteria (WHZ and/or MUAC and/or Oedema)	
Chronic Malnutrition by HAZ	
Underweight by WAZ	
Overweight by WHZ	
Mortality	
Crude Mortality Rate (CDR)	Entire population
Under Five Death Rate (U5DR)	Children under five
Morbidity	
Fever (In the pasts 2 weeks of the recall period)	Children 0-59 months
ARI (In the pasts 2 weeks of the recall period)	
Diarrhea (In the pasts 2 weeks of the recall period)	
Health	
Measles Vaccination (First and Second Doses)	Children 9-59 months
Women of Reproductive Age & PLW	
Nutritional Status of PLW by MUAC	Women (15-49 years) and PLW

4.7.2. Anthropometric, Immunization and Health Indicators

Age

Age was recorded among children 0-59 months as of the date of birth (Year/Month/Day) according to the Solar Calendar in the field, and later on, was converted to the Gregorian calendar for analysis. The exact date of birth was recorded only if the information was confirmed by supportive documents, such as a vaccination card or birth certificate. Where the above-mentioned documents were unavailable or questionable, age was estimated using a local calendar of events and recorded in months. In this assessment, the survey teams equally relied on the utilization of the event calendar and deriving the birth date from vaccination cards.

Weight

Weight was recorded among children 0-59 months in Kg to the nearest 0.1 kg using an electronic SECA scale with the 2-in-1 (mother/child) weighing function. Children who could easily stand up were weighed on their own. When children could not stand independently, the 2-in-1 weighing method was applied with the help of a caregiver. Two team members worked in unison to take the measurements of each child.

Height

Height was recorded among children 0-59 months in cm to the nearest 0.1 cm. A height board was used to measure bareheaded and barefoot children. Children less than two years old were measured lying down and those more than two years old were measured standing up. Two team members worked in unison to take the measurements of each child.

MUAC

MUAC was recorded among children 6-59 months and women 15-49 years to the nearest mm. All subjects were measured on the left arm using standard MUAC tapes.

Oedema

The presence of oedema among children 0-59 months was recorded as “yes” or “no”. All children were checked for the presence of oedema by applying pressure with thumbs for three continuous seconds on the tops of both feet. Any suspected cases required confirmation by multiple team members, a supervisor if present, and photo-documented when possible.

Morbidity

During the survey, all the eligible children age 0-59 months were assessed for fever, diarrhea and ARI in the pasts 2 weeks based on the recall period.

Fever

Fever defined as mother checking child’s forehead and is warm accompanied my general malaise.

Diarrhea

Diarrhea defined as the passage of loose, watery/liquid stools three or more times a day or 24Hrs.

ARI

Child who has cough, breathing faster than usual with short, quick breaths or having difficulty breathing together with fever. This excludes children that has only a blocked nose.

4.7.3. Acute malnutrition

Acute malnutrition in children 6-59 months is expressed by using three indicators:

Weight for Height (W/H) and MUAC as described below, nutritional oedema as the third indicator of severe acute malnutrition. Additionally, the prevalence of GAM amongst 0-59 was reported.

WHZ

A child's nutritional status is estimated by comparing it to the weight-for-height distribution curves of 2006 WHO growth standards reference population. 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 data collection, the weight-for-height index in Z-score was calculated in the field for each child to refer malnourished cases to the appropriate center if needed. Moreover, the results were presented in Z-score using WHO reference in the final report. The classification of acute malnutrition based on WHZ is well illustrated in Table 6.

Table 6: Definition of Acute Malnutrition, Chronic Malnutrition, Underweight and Overweight according to WHO Reference 2006

Severity	ACUTE MALNUTRITION (WHZ)	CHRONIC MALNUTRITION (HAZ)	UNDERWEIGHT (WAZ)	Overweight (WHZ)
GLOBAL	<-2 z-score and/or oedema	<-2 z-score	<-2 z-score	>2 z-score
MODERATE	<-2 z-score and ≥ -3 z-score	<-2 z-score and ≥ -3 z-score	<-2 z-score and ≥ -3 z-score	>2 z-score and <3 z-score
SEVERE	<-3 z-score and/or oedema	<-3 z-score	<-3 z-score	>3 z-score

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 7 provides the cut-off criteria for categorizing acute malnutrition cases.

Table 7: WHO Definition of Acute Malnutrition According to Cut-off Values for MUAC

Severity	MUAC (mm)
GLOBAL	<125 (and/or oedema)

MODERATE	≥ 115 and < 125
SEVERE	<115 (and/or oedema)

4.7.4. 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.

4.7.5. Combined GAM

In Afghanistan, but also at a worldwide level, it has been demonstrated that there is a large discrepancy between the prevalence of GAM by WHZ and GAM by MUAC. Therefore, Action Against Hunger routinely reports the prevalence of GAM by WHZ or MUAC as "Combined GAM" among children 6-59 months. Combined GAM considers the cut-offs of both WHZ<-2 SD score and/or MUAC<125 mm and/or Presence of bilateral pitting Oedema.

4.7.6. Chronic malnutrition

Chronic malnutrition is the physical manifestation of longer-term malnutrition which retards growth. Also known as stunting, it reflects the failure to achieve one's optimal height. In children 6-59 months, chronic malnutrition is estimated using the Height-for-Age z-score (HAZ).

HAZ is calculated using ENA Software for SMART by comparing the observed height of a selected child to the mean height of children from the reference population for a given age. When using HAZ, the distribution of the sample is compared against the 2006 WHO reference population. Global chronic malnutrition is the sum of moderate and severe chronic malnutrition.

4.7.7. Underweight

Underweight is the physical manifestation of both acute malnutrition and chronic malnutrition. In children 6-59 months, underweight is estimated using Weight-for-Age (WAZ) z-score. WAZ is calculated using ENA Software for SMART by comparing the observed weight of a selected child to the mean weight of children from the reference population for a given age. When using WAZ, the distribution of the sample is compared against the 2006 WHO reference population. Global underweight is the sum of moderate and severe underweight. WAZ cut-offs are presented in Table 8 below.

The prevalence of malnutrition as identified by WHZ, HAZ and WAZ have also been classified by the WHO in terms of severity of public health significance. The thresholds are presented in table 8 below.

Table 8: Classification for Severity of Malnutrition by Prevalence among Children Under-Five

LABELS	PREVALENCE THRESHOLDS (%)			
	WASTING	OVERWEIGHT	STUNTING	UNDERWEIGHT[8]
Very low	<2.5	<2.5	<2.5	
Low	2.5-<5	2.5-<5	2.5-<10	<10
Medium	5-<10	5-<10	10-<20	10-19.9
High	10-<15	10-<15	20-<30	20-29.9
Very high	≥15	≥15	≥30	≥30

4.7.8. The proportion of acutely malnourished children enrolled in or referred to a Program

All children 6-59 months identified as severely acutely malnourished by MUAC and WHZ during the data collection were assessed for current enrolment status. All malnourished children not enrolled in a treatment program were referred to the nearest nutrition program if possible.

4.7.9. Malnutrition prevalence among women 15-49 years based on MUAC criterion

All women 15-49 years, including PLW, were assessed for nutritional status based on MUAC measurement. Low MUAC was defined as MUAC <230mm.

4.7.10. Retrospective mortality

Demography and mortality were assessed for all households, regardless of the presence of children. All members of the household were counted according to the household definition.

CDR refers to the number of persons in the total population that died over the mortality recall period (104 days). It is calculated by ENA Software for SMART using the following formula:

$$CDR = \frac{Nb\ of\ deaths * 10,000\ persons}{population\ at\ mid - interval * time\ inerval\ in\ days}$$

Equation 2: Crude Mortality Rate

$$U5DR = \frac{Nb\ of\ deaths\ of\ U5s * 10,000\ U5s}{population\ of\ U5s\ at\ mid - interval * time\ interval\ in\ days}$$

U5DR refers to the number of children under five years that die over the same mortality recall period.

Equation 3: Under-five Death Rate

4.7.11. Measles Both Doses Coverage

Calculated as the proportion of children 9-59 months who received two doses of the measles vaccine. Assessed based on vaccination card or caregiver recall. As part of the Expanded Program

[8] WHO threshold

on Immunization (EPI), the first dose of measles immunization is given to infants aged between 9 to 18 months, with the second given at 18 months. Second dose the last vaccination dose given to a child under five as per the recommended immunization schedule, the second dose measles coverage indicator can also be used as a proxy for overall immunization status and access to healthcare.

5. ORGANIZATION OF THE SURVEY

5.1. Survey Coordination and Collaboration

Survey methodology was shared with the AIM-TWG, Research and Evaluation Directorate for validation and presented in the small-scale steering committee for their comments before deploying the SMART technical team to the province. Meetings were held with the respective administrative authorities on arrival by the survey team to brief them on the survey objective, methodology, procedures and Afghanistan interim guidance on restarting population level surveys and household level data collection during covid-19 pandemic as well as get relevant updated information on security, access, and village level population.

5.2. Survey Teams

Six teams each comprising of four members collected data in all the selected clusters in the province. Each team was composed of one team leader, two measures, and one interviewer. Each team will have one female surveyor to ensure acceptance of the team amongst the surveyed households, particularly for mother MUAC in caregiver questionnaires. Each female member of the survey team was accompanied by a mahram to facilitate the work of the female data collectors at the community level. In each selected village, one or more community member (s) was asked to lead and guide the survey team within the village in locating the selected households.

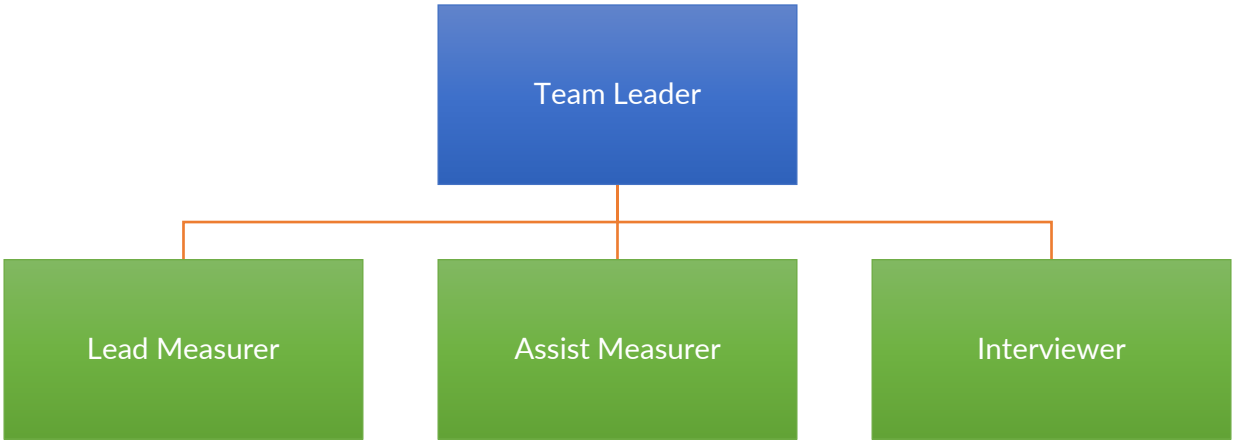


Figure 2: Survey Team Composition

5.3. Training of the survey teams and supervision

The training took place in Bamyan province (Center of the Bamyan province), all the survey team including supervisors and enumerators received a 6-days training (27th March to 1st April 2021) on the survey methodology and all its practical aspects as well as reviewed the additional field safety procedures during COVID-19 according to the Afghanistan interim guidance on restarting population level surveys and household level data collection during COVID-19 pandemic, Faciletated by the Action Against Hunger technical team. A large and well-ventilated room was booked for the training and standardization test to respet physical distance according the guidline.

As the majority of the population speaks Dari, therefore the training conducted in Dari and Dari version of the tools and questionnaires used.

Every team member symptoms for COVID-19 were daily monitored during the training using the health check and reported to the survey manager.

The Action Against Hunger technical team organized standardization test aimed to measure at least 10 children twice. 5 children were measured at one time and 5 teams participated at any point in time (each team was consist of measurer and assistant measurer).

A. 1st half of the day: 5 children measured twice by a maximum of 5 teams (Group 1). The same 5 children are measured twice by the remaining teams (Group 2) maintaining the limit of 5 or fewer teams at a time.
B. 2nd half of the day: 5 new children measured twice by Group1. The same 5 children are measured twice by Group 2.) To evaluate the accuracy and the precision of the team members in taking the anthropometric measurements.

Additionally, the teams had conducted a one-day field test to evaluate their work in real field conditions, the field test was piloted in Mula Ghulam village of Bamyan city. Feedback was provided to the team regarding the results of the field test; particularly concerning digit preferences and data collection. Refresher training on anthropometric measurements and the filling of the questionnaires and the household's selection was organized on the last day of the training by Action Against Hunger to ensure overall comprehension before going to the field.

A field guidelines document with instructions including household definition and selection was provided to each team member.

All documents, such as local event calendar, questionnaires, and informed consent letters were translated into Dari languages, for better understanding and to avoid direct translation during the data collection.

Table 9: PPE equipment required for the surveys

IPC types of equipment as per new Guidelines	Minimum requirement	Final requirement (including 15% additional buffer) & rounded up	Unit
Hand-held Infrared Thermometer (including buffer stock)	8	9	1 pcs per team
Goggles for eye protection	40	46	3 pcs per person/per survey
Gloves for team members	10 box	12 box	pcs
Face Mask for team members	10 box	12 box	pcs
Face Mask for household members	13 box	15 box	pcs
Hand Sanitizer (60% alcohol)	14	16	Bottle (200 ml)
Disinfectant supplies for equipment (70% alcohol or 0.1% (1000ppm) chlorine solution)	12	14	Bottle-handgun sprayer (500 ml)
Supplies for safely dispose of used personal protective equipment	12	14	Safety bag

6. Data Analysis

The anthropometric and mortality data were analyzed using update ENA for SMART software 2020 version (11th Jan 2020). Survey results were interpreted referencing to the WHO standards 2006; Analysis of other indicators to include illness and demographics was done using Microsoft Excel version 2016. Contextual information in the field and from routine monitoring was used in complementing survey findings and strengthening the analysis. Interpretation of each result was done based on the existing thresholds for different indicators as well as comparing with other available data sources at the national and provincial levels.

7. SURVEY FINDINGS

7.1. Survey Sample & Demographics

Overall, the survey assessed 47 clusters out of 47 planned clusters, A total of 469 households, 3,742 individuals, 706 womens 15-49 years old, 694 childrens under five (0-59m), and 631 childrens 6-59 months were assessed in the 47 clusters. Among the 470 households the survey teams surveyed, no one household was absent and/or refused from the survey, resulting in a non-response rate of 0.0 %. This rate is lower than the estimate done at the planning stage (6 %)

Overall, 100.0 % of the planned households and 24.9 % of children 6-59 months were assessed more than plan, which is presented in Table 10 below.

Table 10: Proportion of household and child sample achieved

No. of Cluster planned	No. of Cluster surveyed	% of cluster surveyed	No. of households planned	No. of households surveyed	No. of children 6-59 months planned	No. of children 6-59 months surveyed	% of children surveyed
47	47	100.0 %	470	470	505	631	124.9%

The mortality questionnaire was designed to gather demographic data and capture in- and out-migration. Household demographics and movement are presented in Table 11 below. The survey findings indicate that the average household size was 7.8 persons per household (compared to 7.4 used at the planning stage); 50.7% of the population were female, 49.3% were male; the proportion of children under five was 19.4%. The observed rate of in-migration (0.47) and the out-migration (2.52) during the recall period may have been influenced by the 104 recall period days.

Table 11: Demographic data summary

Indicator	Values
Total number of clusters	47
Total number of HHs	470
Total number of HHs with children under five	425
Average household size	7.8
Female % of the population	50.7%
Male % of the population	49.3%
Children under five % of the population	19.4%
Birth Rate	1.1
In-migration Rate (Joined)	0.47
Out-migration Rate (Left)	2.52

Households were also assessed for residential status. Among the 470 surveyed households, 97.0% were residents of the area, 1.9% were internally displaced, 1.1% were refugee of the population and there were No nomadic (Kuchi[9]) residents found in the province.

Table 12: Household residential status by the proportion

Residential Status of Households	Resident	456	97.0%

[9] Kuchi is a local term refers to Nomad

N= 470	IDP	9	1.9%
	Refugee	5	1.1.0%
	Returnee	0	0.0%
	Nomad	0	0.0%

As the age and sex of all household members were assessed, it was possible to disaggregate the population by sex and five year age interval, as presented in Figure 3 below. The pyramid is wide at the base and narrows towards the apex, indicating a generally youthful population.

The surveyed sample of children 6-59 months was 631. The distribution as disaggregated by age and sex are presented in Table 13 below. The overall sex ratio (male/female) 1.1, indicating a sample with almost equal representation of boys and girls with a slight access of boys. The exact birth date was not possible to determine (through proper documents) for 17% of the children; only 83% of the surveyed children had documentation of evidence of their exact date of birth. This may have compromised the quality of the age determination to some extent, and therefore may have impacted the estimation of the stunting and underweight prevalence as well.

Figure 3: Bamyan Province Population Pyramid.

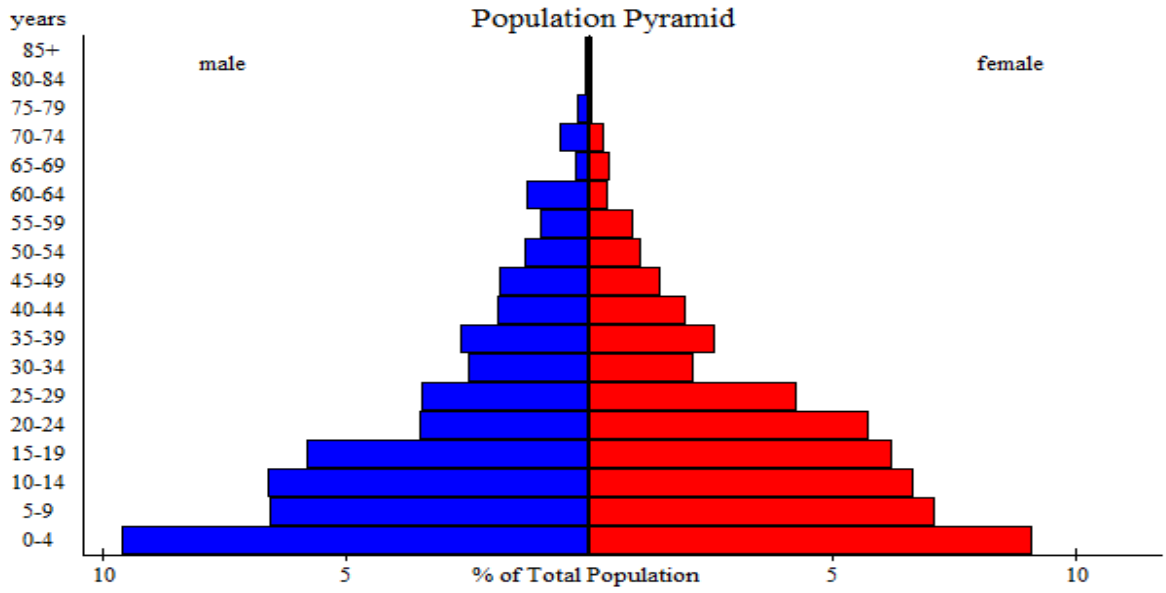


Table 13: Distribution of Age and Sex among Children 6-59 months

	Boys		Girls		Total		Ratio
AGE (mo)	no.	%	no.	%	no.	%	Boy: girl
6-17	89	55.3	72	44.7	161	25.5	1.2
18-29	74	50.7	72	49.3	146	23.1	1.0
30-41	73	52.5	66	47.5	139	22.0	1.1
42-53	52	46.4	60	53.6	112	17.7	0.9

54-59	40	54.8	33	45.2	73	11.6	1.2
Total	328	52.0	303	48.0	631	100.0	1.1

7.2. Data Quality

Six children were excluded as outliers from WHZ analysis per SMART flags[10] resulting in an overall percentage of flagged data of 1.0 % and categorized as excellent by the ENA Plausibility Check. The standard deviation, design effect, missing values, and flagged values are listed for WHZ, HAZ, and WAZ in Table 14 below. The SD of WHZ was 1.00, the SD of HAZ was 0.96, and the SD of WAZ was 0.80. All WHZ, HAZ, and WAZ met the normal range (0.80 and 1.20) indicating an adequate distribution of data around the mean and data of excellent quality.

The overall ENA Plausibility Check score was 4%, which is considered a survey of excellent quality. However, there was slightly excess of younger children (6-29m) compared to the older children aged 30-59 months with a ratio of 0.95 (p-value = 0.172). In most nutrition surveys, the younger children are over-represented compared to the older age group; this could be among other things the older children being in school or running errands outside homes. In Bamyan province, this over-representation could be linked with the caregivers' attention to the younger children's health and willingness, plus a high absence rate of older children at home. Some digit preferences were also observed for children's age data, especially those whose exact date of birth was not available. A summary of the Bamyan ENA Plausibility Check report is presented in Annex5. The full plausibility report can be generated from the ENA dataset.

Table 14: Mean Z-scores, Design Effects, Missing and Out-of-Range Data of Anthropometric Indicators among Children 6-59 Months

Indicator	N	Mean z-scores ± SD	Design effect (z-score < -2)	Z-scores not available*	Z-scores out of range
Weight-for-Height*	625	-0.57±1.00	1.00	0	6
Weight-for-Age*	631	-1.34±0.80	1.16	0	0
Height-for-Age	624	-1.69±0.96	1.60	0	7

*No oedema case found in the survey

7.3. Prevalence of Acute Malnutrition

7.3.1 Acute Malnutrition by WHZ

[10] ENA SMART software version 2020 (updated 11th Jan 2020)

The prevalence of GAM per WHZ among children 6-59 months in Bamyan was 9.0% (7.1 - 11.2 95% C.I.) as presented in Table 15 below and was categorized as medium. This prevalence seems slightly higher in boys than girls but it is not statistically significant (P-value = 0.0931).
The prevalence of SAM per WHZ among children 6-59 months was 1.3% (0.7 – 2.4 95% C.I.) According to the national prioritization cut-off points, the prevalence was less than the threshold of 3%.

Table 15: Prevalence of Acute Malnutrition by WHZ (and/or oedema) by Severity and Sex among Children 6-59 months, WHO 2006 Reference

Indicators	All n = 625	Boys n = 324	Girls n = 301
Prevalence of global acute malnutrition (<-2 z-score and/or oedema)	(56) 9.0 % (7.1 - 11.2 95% C.I.)	(35) 10.8 % (7.9 - 14.7 95% C.I.)	(21) 7.0 % (4.5 - 10.7 95% C.I.)
Prevalence of moderate acute malnutrition (<-2 to ≥-3 z-score)	(48) 7.7 % (6.0 - 9.8 95% C.I.)	(30) 9.3 % (6.8 - 12.6 95% C.I.)	(18) 6.0 % (3.5 - 9.9 95% C.I.)
Prevalence of severe acute malnutrition (<-3 z-score and/or oedema)	(8) 1.3 % (0.7 - 2.4 95% C.I.)	(5) 1.5 % (0.7 - 3.6 95% C.I.)	(3) 1.0 % (0.3 - 3.0 95% C.I.)

*There were 0.0% oedema cases in the sample

The prevalence of acute malnutrition by WHZ was also assessed among children 0-59 months. The GAM per WHZ was 9.3 % (7.5-11.5 95% C.I), as presented in Table 16 below. The prevalence of SAM per WHZ among children 0-59 months was 1.3 % (0.7 – 2.4 95% CI).

Table 16: Prevalence of Acute Malnutrition by WHZ (and/or oedema) by Severity and Sex among Children 6-23 months, WHO 2006 Reference

Indicators	All n = 235	Boys n = 133	Girls n = 102
Prevalence of global acute malnutrition (<-2 z-score and/or oedema)	(42) 17.9 % (13.3 - 23.7 95% C.I.)	(28) 21.1 % (14.2 - 30.0 95% C.I.)	(14) 13.7 % (8.3 - 21.8 95% C.I.)
Prevalence of moderate acute malnutrition (<-2 to ≥-3 z-score)	(32) 13.6 % (9.8 - 18.7 95% C.I.)	(21) 15.8 % (10.4 - 23.2 95% C.I.)	(11) 10.8 % (5.9 - 19.0 95% C.I.)

Prevalence of severe acute malnutrition (<-3 z-score and/or oedema)	(10) 4.3 % (2.4 - 7.5 95% C.I.)	(7) 5.3 % (2.6 - 10.3 95% C.I.)	(3) 2.9 % (0.9 - 8.9 95% C.I.)

Table 17: Prevalence of Acute Malnutrition by WHZ (and/or oedema) by Severity and Sex among Children 24-59 months, WHO 2006 Reference

Indicators	All n = 392	Boys n = 194	Girls n = 198
Prevalence of global acute malnutrition (<-2 z-score and/or oedema)	(16) 4.1 % (2.6 - 6.4 95% C.I.)	(9) 4.6 % (2.3 - 9.0 95% C.I.)	(7) 3.5 % (1.8 - 6.9 95% C.I.)
Prevalence of moderate acute malnutrition (<-2 to ≥-3 z-score)	(16) 4.1 % (2.6 - 6.4 95% C.I.)	(9) 4.6 % (2.3 - 9.0 95% C.I.)	(7) 3.5 % (1.8 - 6.9 95% C.I.)
Prevalence of severe acute malnutrition (<-3 z-score and/or oedema)	(0) 0.0 % (0.0 - 0.0 95% C.I.)	(0) 0.0 % (0.0 - 0.0 95% C.I.)	(0) 0.0 % (0.0 - 0.0 95% C.I.)

Table 18: Prevalence of Acute Malnutrition by WHZ (and/or oedema) by Severity and Sex among Children 0-59 months, WHO 2006 Reference

Indicators	All n = 680	Boys n = 350	Girls n = 330
Prevalence of global acute malnutrition (<-2 z-score and/or oedema)	(63) 9.3 % (7.5 - 11.5 95% C.I.)	(36) 10.3 % (7.5 - 13.9 95% C.I.)	(27) 8.2 % (5.7 - 11.5 95% C.I.)
Prevalence of moderate acute malnutrition (<-2 to ≥-3 z-score)	(54) 7.9 % (6.3 - 10.0 95% C.I.)	(31) 8.9 % (6.5 - 11.9 95% C.I.)	(23) 7.0 % (4.6 - 10.5 95% C.I.)
Prevalence of severe acute malnutrition (<-3 z-score and/or oedema)	(9) 1.3 % (0.7 - 2.4 95% C.I.)	(5) 1.4 % (0.6 - 3.3 95% C.I.)	(4) 1.2 % (0.5 - 3.1 95% C.I.)

When disaggregated by age group, the group with the highest MAM and SAM was 6-17 months, as presented in Table 19 below. The age group with the lowest MAM was 54-59 and 42-53 months and there was no SAM case in the age group of 18-29, 30-41, 42-53 and 54-59 months. Results of this disaggregation suggest that the younger age groups (6-29) were more vulnerable to acute malnutrition than older groups (30-59) according to the WHZ criterion (p-value <0.05).

Table 19: Prevalence of Acute Malnutrition per WHZ Severity and Age Group of 6-59 months

Age (months)	N	Severe wasting* (WHZ <-3)	Moderate wasting (WHZ ≥-3 to <-2)	Normal (WHZ ≥-2)	Oedema

		n	%	N	%	N	%	n	%
6-17	159	8	5.0	23	14.5	128	80.5	0	0.0
18-29	143	0	0.0	16	11.2	127	88.8	0	0.0
30-41	139	0	0.0	6	4.3	133	95.7	0	0.0
42-53	111	0	0.0	2	1.8	109	98.2	0	0.0
54-59	73	0	0.0	1	1.4	72	98.6	0	0.0
Total	625	8	1.3	48	7.7	569	91.0	0	0.0

*There were 0 oedema cases in the sample

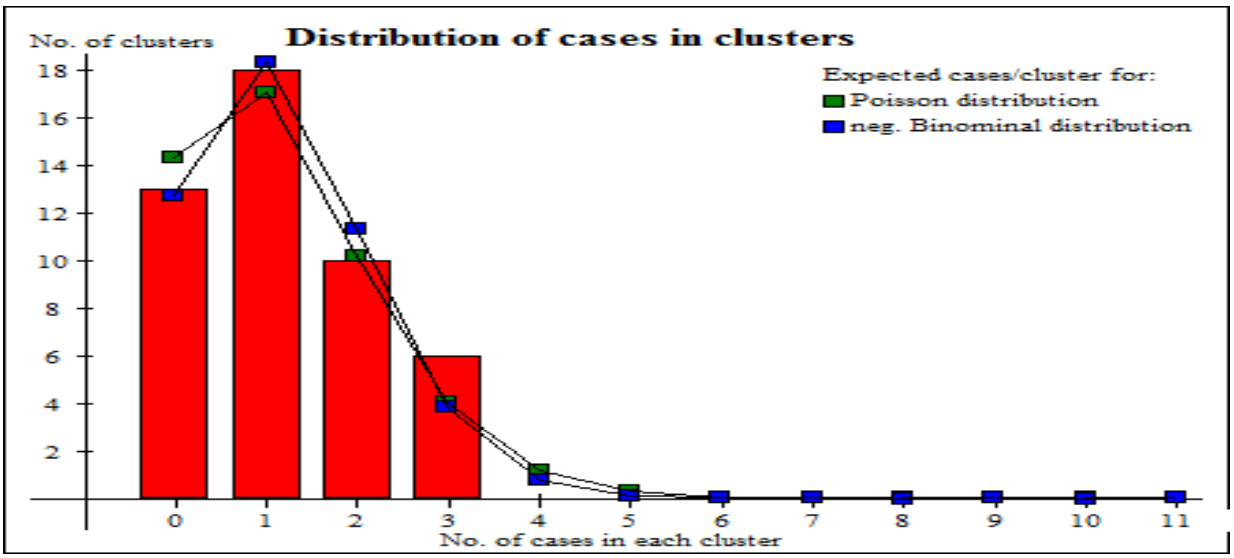
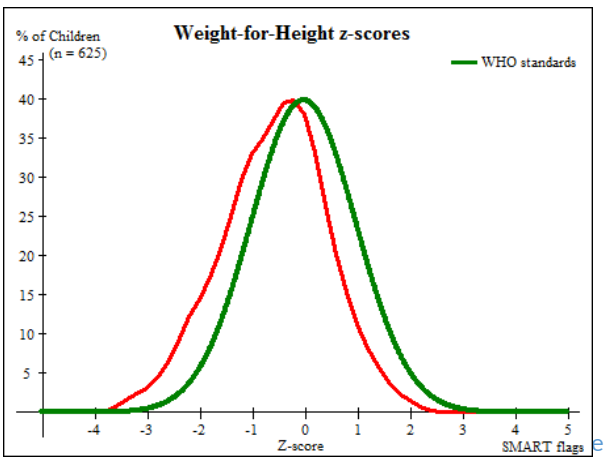


Figure 4: Distribution of cases (WHZ <-2) in clusters, Poisson distribution

However, according to Poisson distribution, there were no pocket data of malnutrition observed based on the Index of Dispersion for WHZ <-2 (ID=0.83; p=0.793).

The WHZ distribution curve (in red) as compared to the WHO 2006 reference WHZ distribution curve (in green) and as presented in Figure 4 below demonstrates a shift to the left, suggesting a malnourished population. Figure 6 illustrates the mean WHZ for age categories and more affected children were 6-17 months.



WHO 2006 WHZ Reference Curve

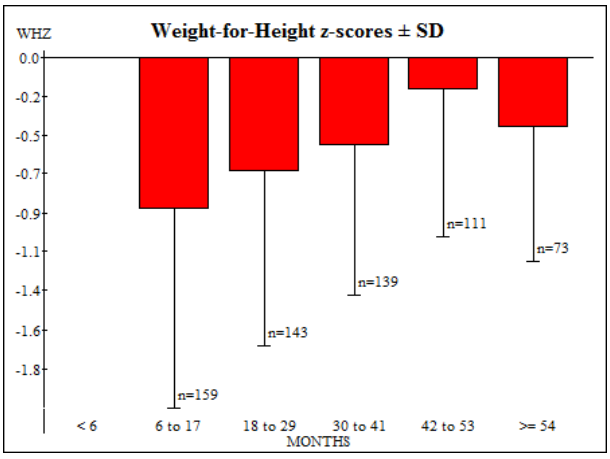


Figure 6: Means WHZ by age groups

7.3.2 Acute malnutrition by MUAC

The prevalence of GAM per MUAC among children 6-59 months in Bamyan was 9.8% (7.9-12.2 95% CI). The prevalence of SAM per MUAC among children 6-59 months was 1.7% (1.0- 3.2 95% CI). As presented in Table 20 below.

Table 20: Prevalence of Acute Malnutrition by MUAC (and/or oedema) by Severity and Sex among children 6-59 months

Indicators	All n = 631	Boys n = 328	Girls n = 303
Prevalence of global malnutrition (<125 mm and/or Oedema)[11]	(62) 9.8 % (7.9 - 12.2 95% C.I.)	(32) 9.8 % (6.9 - 13.7 95% C.I.)	(30) 9.9 % (7.5 - 13.0 95% C.I.)
Prevalence of moderate malnutrition (< 125 mm to ≥115 mm, no Oedema)	(51) 8.1 % (6.2 - 10.4 95% C.I.)	(25) 7.6 % (4.9 - 11.7 95% C.I.)	(26) 8.6 % (6.3 - 11.6 95% C.I.)
Prevalence of severe malnutrition(< 115 mm and/or Oedema)	(11) 1.7 % (1.0 - 3.2 95% C.I.)	(7) 2.1 % (0.9 - 4.8 95% C.I.)	(4) 1.3 % (0.5 - 3.5 95% C.I.)

When disaggregated by age group, 6-17 months had the highest MAM and SAM, Table 21 shows The older age groups 30-41, 42-53 and 54-59 months had no SAM cases. The younger age groups (6-29) were statistically more vulnerable to acute malnutrition compared to older groups (30-59) as per the MUAC criteria (p-value < 0.05).

Table 21: Prevalence of Acute Malnutrition per MUAC and/or Oedema by Severity and Age Group.

Age (months)	N	Severe wasting* (MUAC<115 mm)		Moderate wasting (MUAC ≥115 mm and <125 mm)		Normal (MUAC ≥125 mm)		Oedema	
		N	%	N	%	N	%	n	%
6-17	161	8	5.0	34	21.1	119	73.9	0	0.0
18-29	146	3	2.1	11	7.5	132	90.4	0	0.0
30-41	139	0	0.0	5	3.6	134	96.4	0	0.0

42-53	112	0	0.0	1	0.9	111	99.1	0	0.0
54-59	73	0	0.0	0	0.0	73	100.0	0	0.0
Total	631	11	1.7	51	8.1	569	90.2	0	0.0

7.3.3 Acute Malnutrition by Oedema

No Oedema case was observed in the sample. Table 22 below illustrates data for the presence and absence of oedema cases.

Table 22: Distribution of Severe Acute Malnutrition per Oedema among Children 6-59 Months

	WHZ <-3	WHZ>=-3
Presence of Oedema*	Marasmic kwashiorkor. 0 (0.0 %)	Kwashiorkor No. 0 (0.0 %)
Absence of Oedema	Marasmic No. 13 (2.1 %)	Not severely malnourished. 618 (97.9 %)

*There were not oedema cases in the sample

7.3.4 Combined Acute Malnutrition by WHZ and/or MUAC and/or Oedema

The prevalence of Combined GAM & SMA among children 6-59 months in Bamyan was 14.6% and 2.9% respectively All though there is not globally established threshold for Combined GAM, the GAM and SAM prevalence was slightly higher than for WHZ or MUAC separately, confirming that MUAC and WHA are independent indicators for malnutrition see below table 23 for the Combine GAM results.

Table 23: Prevalence of combining Acute Malnutrition by WHZ + MUAC by Severity and Sex among Children 6-59 months

Indicators	All n = 631	Boys n = 328	Girls n = 303
Prevalence of Global Acute Malnutrition (MUAC<125 mm and/or WHZ<-2SD and/or Oedema)	(92) 14.6 % (12.0 - 17.6 95% C.I.)	(51) 15.5 % (11.9 - 20.0 95% C.I.)	(41) 13.5 % (10.4 - 17.4 95% C.I.)

Prevalence of Severe Acute Malnutrition (MUAC<115 mm and/or WHZ<-3SD and/or Oedema)	(18) 2.9 % (1.8 - 4.4 95% C.I.)	(11) 3.4 % (1.8 - 6.3 95% C.I.)	(7) 2.3 % (1.1 - 4.6 95% C.I.)

* There were not oedema cases in the sample

7.3.5 Enrolment in nutrition program: OPD/IPD for SAM/MAM cases

The proportion of children identified as acutely malnourished and their corresponding treatment enrolment status are presented in Table 24 below.

Overall, out of 62 children 6-59 months old identified as acutely malnourished by MUAC by the teams in field, 51 were MAM cases and 11 were SAM cases. The proxy program coverage for all malnourished cases was 61.3 %. The majority of 24 (38.7 %) out of 62 children identified as malnourished were not in any program and were referred to the nearby appropriate program in the respective area.

Table 24: Proportion of Acutely Malnourished Children 6-59 Months enrolled in a Treatment Program

Sample	Enrolled in an OPD SAM	Enrolled in an OPD MAM	Enrolled in an IPD SAM	Not Enrolled/ Referred
Acutely malnourished children 6-59 months by MUAC and WHZ, or oedema (N=62)	8	30	0	24

7.7. Prevalence of Chronic Malnutrition

The prevalence of stunting per HAZ among children 6-59 months in Bamyan province was 39.3%, as presented in Table 25 below. According to UNICEF-WHO prevalence thresholds 2018[12], this prevalence was categorized as “Very High”. This prevalence seems slightly higher in boys than girls but it is not statistically significant.

Table 25: Prevalence of Chronic Malnutrition by HAZ by Severity and Sex among Children 6-59 months, WHO 2006 Reference.

	All n = 624	**Boys** n = 324	**Girls** n = 300
Prevalence of stunting (<-2 z-score)	(245) 39.3 %	(135) 41.7 %	(110) 36.7 %

[12] UNICEF-WHO thresholds 2018_ file:///C:/Users/ACF/Downloads/JME-2018-brochure-.pdf

	(34.4 - 44.3 95% C.I.)	(35.4 - 48.2 95% C.I.)	(30.5 - 43.3 95% C.I.)
Prevalence of moderate stunting (<-2 z-score and >=-3 z-score)	(196) 31.4 % (27.6 - 35.5 95% C.I.)	(105) 32.4 % (27.2 - 38.1 95% C.I.)	91) 30.3 % (25.2 - 36.0 95% C.I.)
Prevalence of severe stunting (<-3 z-score)	(49) 7.9 % (5.3 - 11.5 95% C.I.)	(30) 9.3 % (6.0 - 14.0 95% C.I.)	(19) 6.3 % (3.5 - 11.3 95% C.I.)

When disaggregated by age group, the age group 18-29 months had the highest severe chronic malnutrition, Table 26, while the age group 54-59 months had the lowest chronic malnutrition.

Table 26: Prevalence of Chronic Malnutrition per HAZ by Severity and Age Group

Age (months)	N	Severe stunting (HAZ <-3)		Moderate stunting (HAZ >= -3 to <-2)		Normal (HAZ>= -2)	
		N	%	N	%	N	%
6-17	158	6	3.8	45	28.5	107	67.7
18-29	143	21	14.7	49	34.3	73	51.0
30-41	138	10	7.2	51	37.0	77	55.8
42-53	112	9	8.0	29	25.9	74	66.1
54-59	73	3	4.1	22	30.1	48	65.8
Total	624	49	7.9	196	31.4	379	60.7

The HAZ distribution curve (in red) as compared to the WHO 2006 reference HAZ distribution curve (in green) as presented in Figure 9 below demonstrates a shift to the left, suggesting a very stunted population in comparison to the normal population. Further analysis suggests that linear severe growth retardation is at its highest in the group of children aged 18-29 months as shown

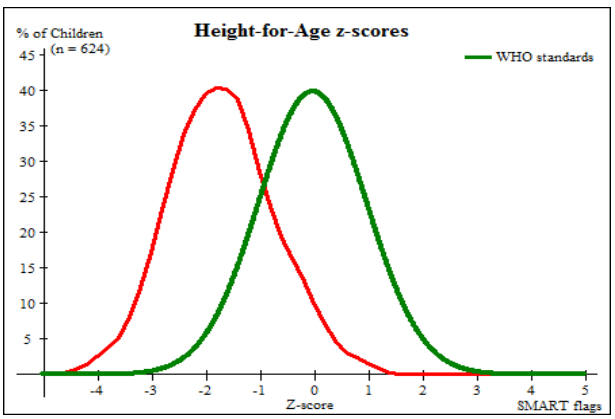


Figure 7: Distribution of HAZ Sample Compared to the WHO 2006 WHZ Reference Curve

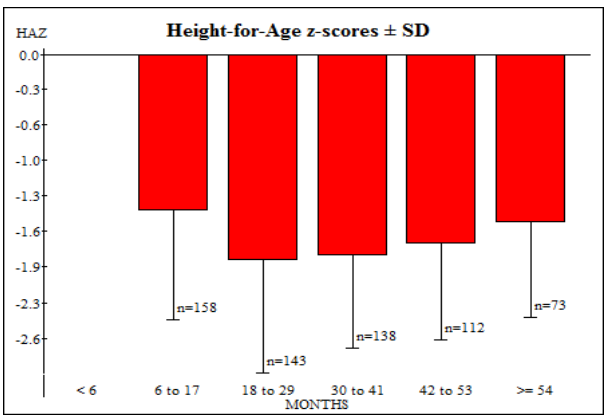


Figure 8: Mean HAZ by Age Group

7.8. Prevalence of Underweight

The prevalence of underweight per WAZ among children 6-59 months in Bamyan was 17.6 %, as presented in Table 27 below, According to WHO severity thresholds[13], prevalence categorized Medium the prevalence of severe underweight per WAZ among children 6-59months was 2.7%.

Table 27: Prevalence of Underweight by WAZ by Severity and Sex among Children 6-59 months, WHO 2006 Reference

Indicators	All n = 631	Boys n = 328	Girls n = 303
Prevalence of underweight (WAZ <-2 SD)	(111) 17.6 % (14.5 - 21.1 95% C.I.)	(71) 21.6 % (17.7 - 26.1 95% C.I.)	(40) 13.2 % (9.5 - 18.1 95% C.I.)
Prevalence of moderate underweight (WAZ <-2 and >=-3 SD)	(94) 14.9 % (12.3 - 18.0 95% C.I.)	(57) 17.4 % (13.9 - 21.5 95% C.I.)	(37) 12.2 % (8.5 - 17.2 95% C.I.)
Prevalence of severe underweight (WAZ <-3SD)	(17) 2.7 % (1.7 - 4.3 95% C.I.)	(14) 4.3 % (2.6 - 6.8 95% C.I.)	(3) 1.0 % (0.2 - 4.3 95% C.I.)

When disaggregated by age group, the age group with the highest severe underweight was 18-29 months, as presented in Table 28 below. The age groups with the lowest severe underweight were in 42-53 and 54-59 months.

Table 28: Prevalence of Underweight per WAZ by Severity and Age Group

Age (months)	N	Severe underweight (WAZ <-3)		Moderate underweight (WAZ ≥-3 to <-2)		Normal (WHZ ≥-2)	
		n	%	N	%	N	%
6-17	161	8	5.0	29	18.0	124	77.0
18-29	146	8	5.5	28	19.2	110	75.3
30-41	139	1	0.7	23	16.5	115	82.7
42-53	112	0	0.0	7	6.3	105	93.8
54-59	73	0	0.0	7	9.6	66	90.4
Total	631	17	2.7	94	14.9	520	82.4

[13] <10 low, 10-<20 medium, 20-<30 high and 30≥Very high

The WAZ distribution curve (in red) as compared to the WHO 2006 reference WAZ distribution curve (in green) as presented in figure 10 below demonstrates a large shift to the left, suggesting a very underweighted population in comparison to the normal population. Further analysis suggests that linear underweight is at its highest in the group of children aged 18-29 months as shown in figure 10.

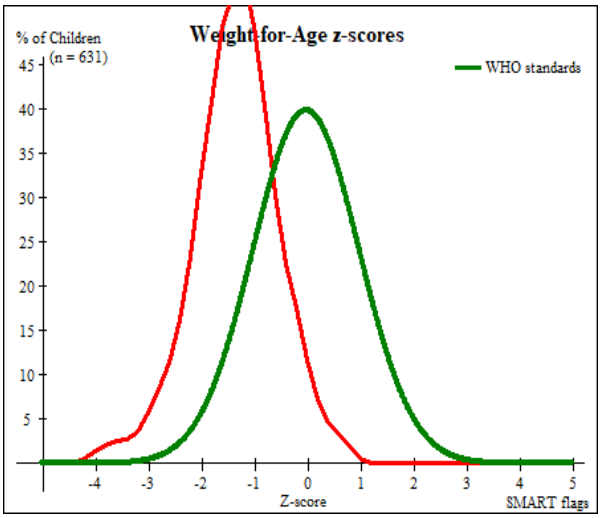


Figure 10: Mean WAZ by Age Group

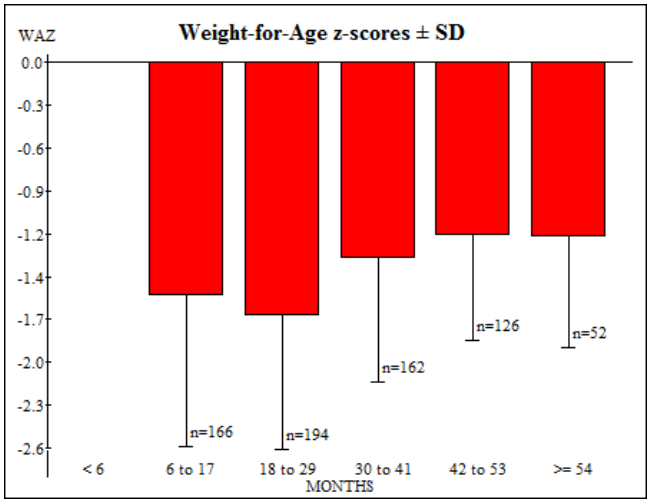


Figure 9: Distribution of WAZ Sample Compared to the WHO 2006 with Reference Curve.

7.9. Prevalence of Overweight

The prevalence of overweight per W/H among children 6-59 months in Bamyan province was 0.3%, as presented in Table 25 below. According to UNICEF-WHO prevalence thresholds 2018, this prevalence was categorized as very low and higher in girls than boys.

Table 29: Prevalence of overweight based on weight for height cut-offs and by sex (no oedema) among children age 6- 59 months.

Indicators	All n = 625	Boys n = 324	Girls n = 301
Prevalence of overweight (WHZ > 2)	(2) 0.3 % (0.1 - 1.3 95% C.I.)	(0) 0.0 % (0.0 - 0.0 95% C.I.)	(2) 0.7 % (0.2 - 2.7 95% C.I.)
Prevalence of severe overweight (WHZ > 3)	(0) 0.0 % (0.0 - 0.0 95% C.I.)	(0) 0.0 % (0.0 - 0.0 95% C.I.)	(0) 0.0 % (0.0 - 0.0 95% C.I.)

Table 30: Prevalence of overweight by age, based on weight for height (no oedema)

		Overweight (WHZ > 2)		Severe Overweight (WHZ > 3)	
Age (mo)	**Total no.**	**No.**	**%**	**No.**	**%**
6-17	159	1	0.6	0	0.0

18-29	143	1	0.7	0	0.0
30-41	139	0	0.0	0	0.0
42-53	111	0	0.0	0	0.0
54-59	73	0	0.0	0	0.0
Total	625	2	0.3	0	0.0

7.9 Malnutrition prevalence among Women 15-49 years old based on MUAC criterion

All women of child-bearing age (15-49 years) were included in the survey. A total of 706 women were assessed for nutrition status by MUAC. The analysis further disaggregating the sample by physiological status (pregnant, lactating, both); the prevalence of malnutrition by MUAC was 19.0%; more details are presented in Table 31 below.

Table 31: Prevalence of Acute Malnutrition among Women per MUAC

Indicators	N	MUAC <230 mm	
		n	%
All women 15-49 years with MUAC <230 mm	706	134	19.0% (15.2 – 23.4 95% CI)
Pregnant women <230 mm	41	7	17.1% (9.1 – 29.7 95% CI)
Lactating women <230 mm	256	54	21.1% (15.1 – 28.6 95% CI)
Both pregnant and lactating women (at the same time) <230 mm[14]	22	6	27.3% (11.6 – 51.8 95% CI)
Non-pregnant and non-lactating women <230 mm	387	67	17.3% (13.3 – 22.2 95% CI)
All PLWs <230 mm	319	67	21.0% (15.9 – 27.2 95% CI)

7.10. Retrospective Mortality

The overall death rate for the surveyed population was 0.37 (0.22-0.63 95% CI) which is below the WHO emergency thresholds of 1.0/10,000/day. The death rate was slightly higher for females compared to males in the population. The age group with the highest death rate was 65-120 years, followed by the age group 0-4 years. Death rate was 0.28 (0.07-1.14 95% CI) recorded during the 104 days recall period in Bamyan province.

Table 32: Death Rate by Age and Sex with Reported Design Effect

Population	Death Rate (/10,000/Day)	Design Effect

[14] *Women that were simultaneously pregnant and lactating

Overall	0.37 (0.22-0.63)	1.00
Male	0.32 (0.15-0.70)	1.00
Female	0.41 (0.22-0.79)	1.00
'0-4	0.28 (0.07-1.14)	1.00
'5-11	0.14 (0.02-1.03)	1.00
'12-17	0.18 (0.02-1.30)	1.00
'18-49	0.33 (0.14-0.80)	1.00
'50-64	0.88 (0.21-3.61)	1.02
65-120	3.41 (1.05-10.49)	1.01

Information collected about apparent causes of death showed most of the deaths attributed to illness (42.9%). Figure 12 below summarizes the causes of deaths.

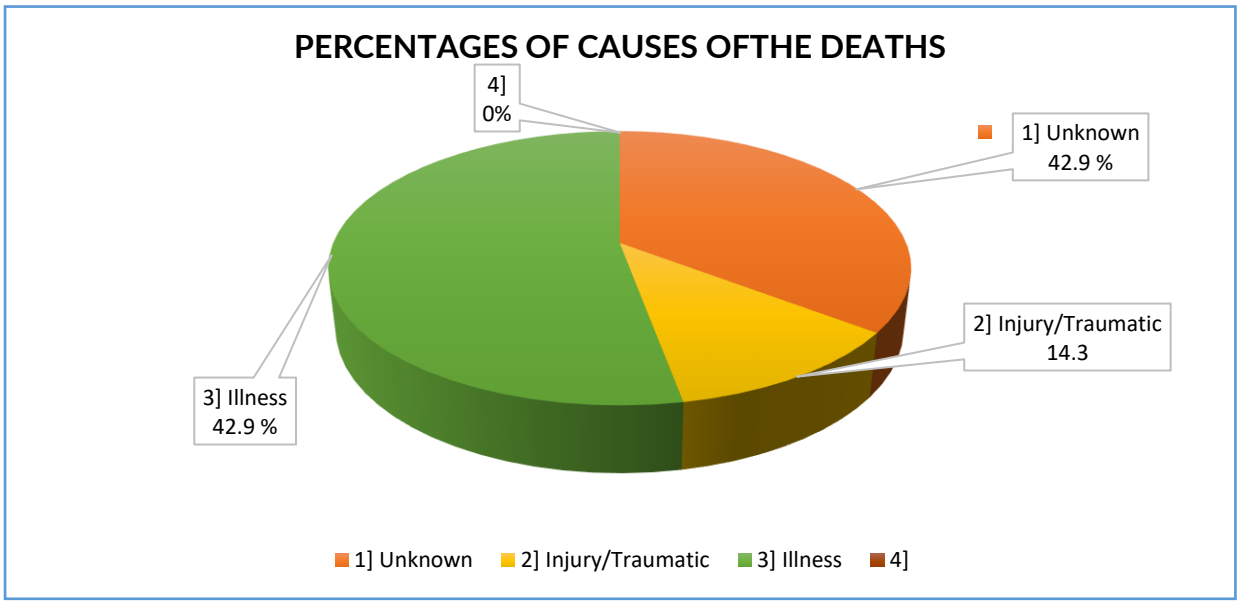


Figure 11: Percentages of causes of the deaths

7.11. Child health and Immunization Status

In Bamyan, the survey results indicated that 85.3% (79.2 – 89.8 95.CI) of children age 9-59 months and 78.9% (71.7 – 84.7 95.CI) of children 18-59 months had received the first and second doses of measles immunization, as confirmed either by vaccination card or caregiver recall. Table 34 below illustrates the data on both doses of measles immunization coverage.

Table 33: Measles Immunization Coverages among Children 9-59 Months

Indicator	Response	First Dose 9-59m (N=599)		Second Dose 18-59m (N=470)	
		n	%	n	%

Both Doses Measles Immunization	Yes by card	425	71.0% (65.0 -76.3 95% CI)	302	64.3% (58.0 – 70.1 95% CI)
	Yes by recall	86	14.4% (10.6 – 19.2 95% CI)	69	14.7% (10.6 – 20.0 95% CI)
	Yes by card or recall	**511**	**85.3% (79.2 – 89.8 95% CI)**	**371**	**78.9% (71.7 – 84.7 95% CI)**
	No	88	14.7% (10.2 – 20.8 95% CI)	99	21.1% (15.3 – 28.3 95% CI)
	Don't know	0	0.0%	0	0.0%
	Total	599	100.0%	470	100.0%

7.12. Child health

Retrospective morbidity data were collected among children 0-59 months with two weeks recall period to assess the prevalence of the main disease. The survey finds shows that 44.9 % of children had at least one episode of illness in the 2 weeks recall period to the survey. The major illnesses reported such as Fever, diarrhea and ARI as highlighted in table 35 below.

Table 34: Major illnesses reported among children 0-59 months

Parameter	Response	n = (694)	Results
Illness (N= 694)	Yes	312	45.0% (39.7 – 50.3 95.CI)
	No	382	55.0% (49.7 – 60.3 95.CI)
	DK	0	0.0 %
	Total	694	100.0 %
Acute Respiratory infection (ARI) (N= 694)	Yes	205	29.5% (24.8 – 34.8 95.CI)
	No	489	70.5 % (65.2 – 75.2 95.CI)
	DK	0	0.0 %
	Total	694	100.0 %
Diarrhea (N= 694)	Yes	122	17.6% (13.8 – 22.1 95.CI)
	No	572	82.4% (77.9 – 86.2 95.CI)
	DK	0	0.0 %
	Total	694	100.0 %
Fever (N= 694)	Yes	194	28.0% (22.0 – 34.9 95.CI)
	No	500	72.0% (65.1 – 78.0 95.CI)
	DK	0	0.0 %
	Total	694	100.0 %

8. DISCUSSION

8.1. Nutritional Status of children

The results of this survey are not a reflection of the national nutrition situation but they are only representative of the population living in all 8 districts of the Bamyan province. The results of this survey showed a GAM and SAM prevalence of 9.0% (7.1 – 11.2 95% CI) and a 1.3% (0.7-2.4 95% CI) respectively; based on MUAC, the prevalence is at 9.8% (7.9 – 12.2 95% CI) and 1.7 % (1.0 - 3.2 95% CI) GAM and SAM respectively. The prevalence (by WHZ) falls under the medium category of emergency-threshold classification as per the latest update WHO/UNICEF 2018 threshold. The SAM rate by WHZ is however below the 3.0% threshold established by the MoPH, Nutrition Cluster, and the AIM-WG for the response prioritization in the Afghanistan context as contrary. The WHZ GAM rate observed in the current survey indicates a slight increase in the prevalence of acute malnutrition since SMART 2017 the GAM prevalence was 8.6% (6.6 – 11.1 95% CI) and SAM was 1.0% (0.5 – 1.8 95% CI).

Estimation of the prevalence of malnutrition based on Combined GAM continues to add impetus to the importance of the independent diagnosis criteria of GAM by WHZ and MUAC in the identification of malnutrition hence ensuring greater coverage of children in need of treatment as demonstrated by the 14.6% (12.0 – 17.6 95% CI) combined GAM rate as opposed to 9.0 % (7.1 –11.2) based on WHZ alone. This translates to a significant difference in the caseload of acutely malnourished children.

Chronic malnutrition in Bamyan province remains of public health concern. The prevalence of chronic malnutrition among children 6-59 months was 39.3 % (34.4 – 44.3 95% CI), which is classified as very high according to the UNICEF-WHO 2018 thresholds. In other words, about 2 in 3 children in Bamyan province are not reaching optimal growth and development. Statistically, significant deterioration was observed in chronic malnutrition; the prevalence of total stunting increased to 42.2 % (38.1 – 46.4 95% CI) in SMART survey August 2017 compared to 39.3 % (34.4 – 44.3 95% CI) in April 2021.

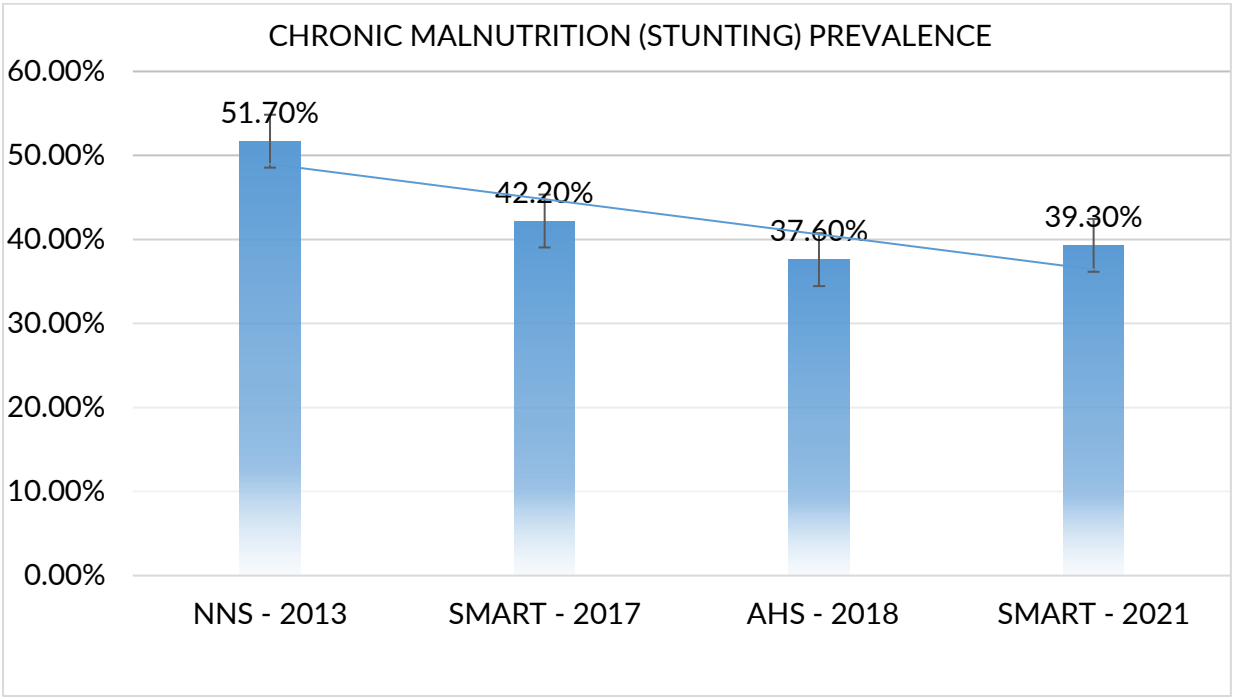


Figure 12: Stunting over time

The high prevalence is compounded further by the simultaneous/concurrent presence of acute malnutrition resulting in a double burden of malnutrition. Recent research has concluded that children who are both stunted and wasted are at a heightened risk of mortality[15], further suggesting that this should be a priority group for treatment interventions. In Bamyan province, it was found that among the 245 stunted children, 33 of them (13.5%) were also wasted by both criteria (WHZ<-2SD + MUAC<125 mm) and 10 of them (4.1%) were severely wasted.

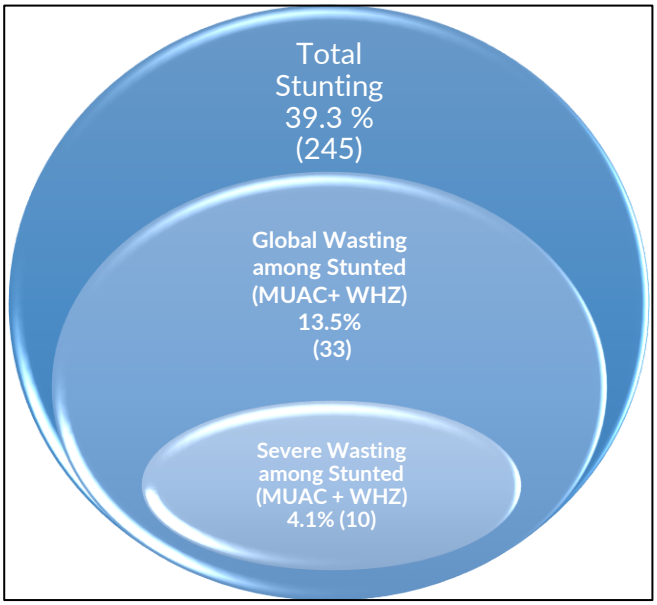


Figure 13: Among Stunted Children 6-59 Months, those Simultaneous Wasted (WHZ)

[15] Myatt, M. et al (2018) Children who are both wasted and stunted are also underweight and have a high risk of death: a descriptive epidemiology of multiple anthropometric deficits using data from 51 countries

8.2. Maternal nutrition status

Acute malnutrition among women in Bamyan province is always of concern, the results indicated that 21.0% of pregnant and lactating women (PLW) were suffering from acute malnutrition. Although there is no globally defined cut-off for acute malnutrition among women by MUAC. However, rate observed in the current survey indicates a slight a decline in the prevalence of PLWs compared to the findings of SMART surveys in 2017, as the results were 25.8%;

Immunization is an important public health intervention that protects children from illness and disability. Based on this survey, 85.3 % of children age 9-59 months, and 78.9% of the surveyed children between 18 to 59 months were immunized against measles. This coverage does not indicate satisfaction, but it is still poor than the national target of 90.0%, thanks to a well-functioning Expanded Program on Immunization "EPI" at the national and provincial levels. Figure 20 illustrates the changes in measles second dose vaccination over the past two years.

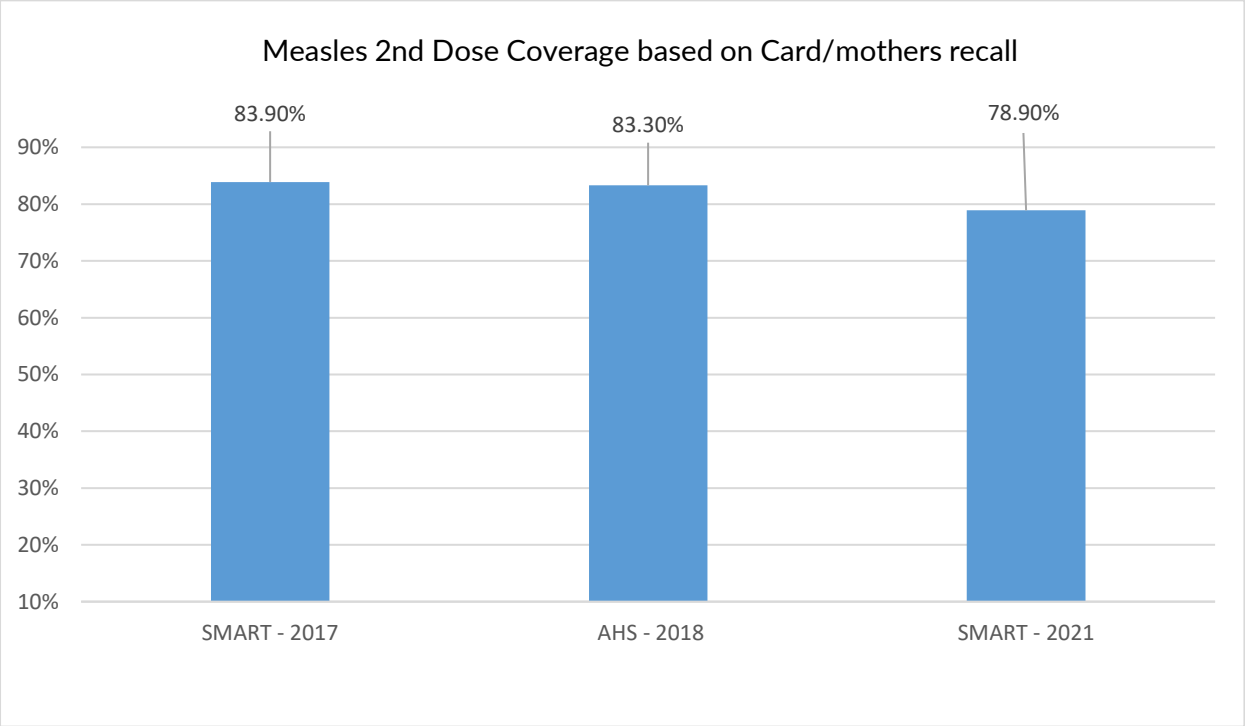


Figure 14: Measles 2nd dose vaccination coverage since 2017 – Bamyan province

8.4. Mortality rate

The CDR and U5DR were below the WHO emergency threshold, with CDR of 0.37 death/10,000/Day and U5DR 0.28 death/10,000/Day. The death rate was higher in the current survey compared to SMART survey 2017 the CDR was 0.18 (0.09 - 0.35) and U5DR was 0.30 (0.10 - 0.93).

9. RECOMMENDATION

Section	Indicators	Survey Findings	Recommendation	Actors	Timeline
Children Nutrition Status	Prevalence of GAM (WHZ)	Prevalence of GAM (WHZ) among children 6-59 months is 9.0% which is categorized Medium level of the threshold. MAM= 7.7% SAM= 1.3 % And among children 0-59 months GAM=9.3%, MAM= 7.9% & SAM= 1.3 %. - A high number of not enrolled cases 38.7% (24 out of 62 cases) were observed in the community during the survey.	- Strengthen community nutrition program to maintain acceptable rates of undernutrition for CU5 to enable early cases identification and referral for appropriate management. - To integrate other nutrition sensitive activities to ensure a comprehensive package for prevention: hygiene and WASH interventions, health education at community level… - To ensure strong nutrition program for proper management of cases: well-trained HR, strong supply chain of nutrition supplies.	- All nutrition partners at provincial level	continuous
	Prevalence of GAM (MUAC)	Prevalence of GAM (MUAC) among children 6-59 months is 9.8% MAM= 8.1% SAM = 1.7% - Total 75 HFs out of the 35 had OPD-MAM program & 62 had OPD-SAM service			
	Prevalence of Stunting (HAZ)	Prevalence of Stunting (HAZ) among children 6-59 months is very high			

		GAM= 39.3% MAM= 31.4% SAM= 7.9%			
	Prevalence of underweight (WAZ)	Prevalence of underweight (WAZ) Among children 6-59 months is in the Medium level of the threshold. GAM= 17.8 % MAM= 14.9% SAM= 2.7%			
	Prevalence of Combined GAM and SAM (WHZ+MUAC)	Prevalence (MUAC<125 mm and/or WHZ <-2) and/or oedema, of GAM is 14.6 % and SAM is 2.9 %			
Women Nutrition Status	Prevalence of CBA	19.0% Malnutrition in CBA (15-49 years)	- To target specific groups of girls and women of reproductive age in our nutrition programming for both prevention and curative services. - Strengthening of Maternal, Infant and Young Child Nutrition service at HF and community level	All nutrition partners	continuous
	Prevalence of PLWs	21.0% Malnutrition in PLWs (15-49 years)			
Immunization Coverage	Coverage of Measles Vaccine (1st and 2nd Dose)	1st Dose coverage= 85.3% 2nd Dose coverage=78.9%	- To capitalize the good practices and ensure we continuously strengthen EPI	Health partners in the province	continuous

		The measles immunization coverage is acceptable considering the national EPI threshold for Afghanistan (95%)	services so that no child could be left behind		
Morbidity	Illness	45.0% among children 0-59 months	- Educate the communities for healthcare seeking and danger signs for childhood illness (health education at HF& Community level) - Strengthening of awareness on hygiene	Health and nutrition partners	continuous
	Acute Respiratory infection	29.5% among children 0-59 months			
	Diarrhea	17.6% among children 0-59 months			

Annexes 1: Standard Integrated Smart Survey Questionnaire (English)

Date (dd/mm/year)			**Cluster Name**		
Cluster Number		**Team Number**		**HH Number**	

Household Questionnaire

Start date/event of recall period: 3rd August 2020 (13th Asad 1399) **(The occupying Russians were invading Afghanistan)**

1	2	3	4	5	6	7	8
No.	Name	Sex (m/f)	Age (years)	Joined on or after	Left on or after	Born on or after	Died on or after
List all current household members*							
1	Head of household						
2							
3							
4							
5							
6							
7							
8							
9							
10							
11							
12							
13							
14							
15							
List all household members which left since the start of the recall period							
1					Y		
2					Y		
3					Y		
4					Y		
5					Y		

Cause of died: 1= unknown , 2= Trauma/ Injury 3= Illnesses , 4= others					Cause code		
1							Y
2							Y
3							Y
4							Y
5							Y

*Household defined as all people eating from the same pot and living together (WFP definition)

Date (dd/mm/year)			**Cluster Name**		
Cluster Number		**Team Number**		**HH Number**	

Household Questionnaire

Q1. What is the household resident status? 1=Resident of this area 2=Internally displaced 3=Refugee 4=Nomadic	

Date (dd/mm/year)			**Cluster Name**		
Cluster Number		**Team Number**		**HH Number**	

Child Questionnaire 0-59 months

1	2	3	4	5	6	7	8	9	10
Child ID	**Sex** (f/m)	**Birthday** (dd/mm/yyyy)	**Age** (months)	**Weight** (00.0 kg)	**Height or length** (00.0 cm)	**Measure** (l/h)*	**Bilateral edema**	**MUAC** (000 mm) *Left-arm*	**With clothes** (y/n)
1									
2									
3									
4									
5									
6									
7									
8									

Note only if the length is measured for a child who is older than 2 years or height is measured for a child who is younger than 2 years, due to unavoidable circumstances in the field

Child (6-59 months) ID Number					
For any child that is identified as acutely malnourished (WHZ, MUAC, or edema) **Q2. Is the child currently receiving any malnutrition treatment services?** *Probe, ask for enrollment card, and observe the treatment food (RUTF / RUSF) to identify the type of treatment service* 1=OPD SAM 2=OPD MAM 3=IPD SAM 4=No treatment 98=Don't know					
If the child is not enrolled in a treatment program, refer to the nearest appropriate treatment center **Q3. Did you refer the child?** 1=yes 0=no					

Caregiver Questionnaire

Woman (15-49 years) HH Member ID Number					
Q4. statuts of woman 1=Pregnant 2=Lactating 3=Pregnant and lactating 4=None					
MUAC measurement (mm)					

Child (9-59 months) CHILD ID NUMBER					
Q5. **Has the child received the <u>first dose of</u> measles vaccination?** (on the upper right arm) *Ask for a vaccination card to verify the **first dose** if available* 0=Has did not receive one dose 1=Received one dose as confirmed by vaccination card 2=Received one dose as confirmed by caregiver recall 98=Don't know					
*Ask for a vaccination card to verify the **second dose** if available* 0=Has did not receive two doses 1=Received two doses as confirmed by vaccination card 2=Received two doses as confirmed by caregiver recall 98=Don't know					

Child morbidity (0-59 months), CHILD ID NUMBER *[Please use the same child ID used in the anthropometry section above]*					
Q6: **Has the child (*name*) ever been ill/sick in the past 14 days (last two weeks)?** 0= No , 1= Yes , 98 Don't know					
Q1a: Acute Watery Diarrhea* [0= No , 1= Yes , 98 Don't know]					
Q1b: ARI** [0= No , 1= Yes , 98 Don't know]					
Q1d: Fever [0= No , 1= Yes , 98 Don't know]					
Q1d: Others [0= No , 1= Yes , 98 Don't know]					

** Diarrhea defined as the passage of loose, watery/liquid stools three or more times a day or 24Hrs.*
***perceptions of a child who has a cough, is breathing faster than usual with short, quick breaths or is having difficulty breathing and a fever, excluding children that had only a blocked nose.*
****Fever defined as mother checking child's forehead and is warm accompanied my general malaise.*

General comments (optional)

Annexes 2: Geographical Units surveyed in Bamyan province.

Selected Area For Bamyan SMART					
Province Name	**Organization**	**HFs Name**	**Geographical unit**	1120	**Cluster**
Bamyan	AKHS	PH Hopital	سنگ چسپان	840	1
Bamyan	AKHS	PH Hopital	کلال ها ف، قلعه شاپور	520	2
Bamyan	AKHS	PH Hopital	دشت سید	810	3
Bamyan	AKHS	ARCs BHC	خواجه روشنای،	800	4
Bamyan	AKHS	ARCs BHC	نوا بالا،نواپائین	686	5
Bamyan	AKHS	CHC Shahidan	غارغلامک ،ده رضا،لدو پائین	700	6
Bamyan	AKHS	SC Topchy	گلستان	903	7
Bamyan	AKHS	CHC Foladi	قلعه پیره ،قلعه طاهر	896	8
Bamyan	AKHS	CHC Foladi	بند بالای قاضان ، بغل لیس	2499	9
Bamyan	AKHS	BHC Haidarbad	حیدراباد	315	10
Bamyan	AKHS	BHC Haidarbad	سید اباد	805	11
Bamyan	AKHS	CHC Sadat	کتوای بالا ،کتوای پائین ،رباط	588	12
Bamyan	AKHS	CHC Sadat	فیروزک ، سه قلعه	2574	13
Bamyan	AKHS	SC Shahmamh	سراسیاب	3686	14
Bamyan	AKHS	SC Shahmamh	شهرک توحید	400	15
Bamyan	AKHS	Sc Kamaty	کمتی بالا	1700	16
Bamyan	AKHS	DH Yakawlang	جمک ، بازار کهنه ، تپه وحدت	630	17
Bamyan	AKHS	DH Yakawlang	محمد شرف ، یکه سومک	266	18
Bamyan	AKHS	DH Yakawlang	سنک ،سوراخ ، نیک ، تتک	560	19
Bamyan	AKHS	CHC Daga	سرخ بید ، ابدال	301	20
Bamyan	AKHS	CHC Dehsorkh	نو اباد ،سرجر	280	21
Bamyan	AKHS	CHC Dehsorkh	سرسنک ، خاک متک ،	210	22
Bamyan	AKHS	BHC Syadara	سرخ میچید	217	23
Bamyan	AKHS	BHC Sarqol	منار علیا و سنک سوراخ	249	24
Bamyan	AKHS	SC Solich	قلعه غشار	750	25
Bamyan	AKHS	SC Doshakh	مرکز مدر	357	26
Bamyan	AKHS	BHC Dashtsafid	نوا باد	1330	27
Bamyan	AKHS	BHC Hajer	ده تا جک	630	28
Bamyan	AKHS	CHC Roysang	قاغر	252	29
Bamyan	AKHS	DH Panjab	سیاه خار ،سرقول	179	30
Bamyan	AKHS	BHC Shenyah	قلعه سوخته ، بغلک ،	214	31
Bamyan	AKHS	BHC Kafshab	خشک نیل علیاو سفلا	146	32
Bamyan	AKHS	SC Kerman	نوراه ، بد ده ، پای کیچ	800	33
Bamyan	AKHS	CHC Saighan	قرونه لعل محمد	455	34
Bamyan	AKHS	BHC Khojaganj	گاو پریده ،شاخدار ، ایر گنه	1280	35
Bamyan	AKHS	BHC Baiany	بیان فولی ،وسیلی	301	36

Bamyan	AKHS	BHC Kalow	سیاه خاک ،شنیه ،کوته نیک قدم	500	37
Bamyan	AKHS	SC Aeraq	قلابالا ،قلعه سادات ،	154	38
Bamyan	AKHS	BHC Shunbul	خوردگا ، جملی	260	39
Bamyan	AKHS	CHC Danysabzak	چاکه چای ،سرمنده علیات	325	40
Bamyan	AKHS	CHC Danysabzak	خاک بی بی	200	41
Bamyan	AKHS	BHC Regjoy	دهن بزگیرک ، دولت قدم ، دهن سیاخرک	72	42
Bamyan	AKHS	BHC Regjoy	اهنگران ، پاده گگ	446	43
Bamyan	AKHS	DH	اب پران ،مرکز ورس،کرم زرک	314	44
Bamyan	AKHS	DH	ده کته ها ، اجه نی ، دهن ترکمن سرترکمن	300	45
Bamyan	AKHS	DH	تکا بشه ،سرخ دایک، سیاه گلی ،سفید سنگ وکیلو,برغسونگ	355	46
Bamyan	AKHS	BHC Pajandor	خک بچکان تسور	1120	47

Annexes 3: Standardization test report

	Weight	Height	MUAC
Supervisor	TEM good	TEM good	TEM good
Enumerator 1	TEM good	TEM good	TEM good
Enumerator 2	TEM acceptable	TEM good	TEM acceptable
Enumerator 3	TEM good	TEM good	TEM good
Enumerator 4	TEM poor	TEM acceptable	TEM acceptable
Enumerator 5	TEM good	TEM acceptable	TEM acceptable
Enumerator 6	TEM acceptable	TEM good	TEM good
Enumerator 7	TEM poor	TEM good	TEM good
Enumerator 8	TEM poor	TEM good	TEM good
Enumerator 9	TEM good	TEM acceptable	TEM poor
Enumerator 10	TEM acceptable	TEM good	TEM good
Enumerator 11	TEM poor	TEM acceptable	TEM acceptable
Enumerator 12	TEM acceptable	TEM good	TEM good
Enumerator 13	TEM good	TEM acceptable	TEM good

Enumerator 14	TEM poor	TEM acceptable	TEM poor
Enumerator 15	TEM acceptable	TEM good	TEM good
Enumerator 16	TEM poor	TEM good	TEM acceptable
Enumerator 17	TEM acceptable	TEM good	TEM good
Enumerator 18	TEM good	TEM good	TEM good
Enumerator 19	TEM acceptable	TEM good	TEM good
Enumerator 20	TEM good	TEM good	TEM good

Annexes 4: Observation Checklist

Observation checklist **د څارنې چک لیست**
1. Did respondent and or any of eligible children have high temperature (>100.4F/38C) with at least one symptom of COVID-19 (e.g. dry cough, sneezing, shortness of breath, chest pain or pressure, loss of speech or movement etc.) 1. ایا ځواب ویونکي یا کوم وړ ماشومان د تودوخي درجه (100.4F / 38C <) لري د COVID-19 لرټرلږه د یوه نښې سره (د بیلګې په توګه وچ ټوخی ، ټوخی کول ، ساه لنډې ، د سینې درد یا فشار ، د بیان یا حرکت ضایع کول او نور
2. Did anyone in this household has tested positive case for COVID-19 within the past 14 days? 2. ایا پدی کورنۍ کې کوم چا په تیرو-14 ورځو کې د COVID-19 لپاره مثبته پیښی ازمویښه کړې؟
3. Did any household member have been close contact with a confirmed COVID-19 positive patient within at least 14-days? 3. ایا د کورنی کوم غړی مو لږترلږه په 14-ورځو کې د تایید شوي COVID-19 مثبت ناروغ سره نږدې تماس درلود؟
4. Did any household member are currently in home quarantine or quarantine in centre for isolation? 4. آیا دکورني کوم غړی مو فعلا په کور یا په مرکز د قرنطینه کی قرنطین دی

Plausibility check for: AFG-04202021 AAH-Bamyan_SMART.as

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

Overall data quality

Criteria	Flags*	Unit	Excel.	Good	Accept	Problematic	**Score**
Flagged data (% of out of range subjects)	Incl	%	0-2.5 0	>2.5-5.0 5	>5.0-7.5 10	>7.5 20	**0** (1.0 %)
Overall Sex ratio (Significant chi square)	Incl	p	>0.1 0	>0.05 2	>0.001 4	<=0.001 10	**0** (p=0.320)
Age ratio(6-29 vs 30-59) (Significant chi square)	Incl	p	>0.1 0	>0.05 2	>0.001 4	<=0.001 10	**0** (p=0.172)
Dig pref score - weight	Incl	#	0-7 0	8-12 2	13-20 4	> 20 10	**0** (5)
Dig pref score - height	Incl	#	0-7 0	8-12 2	13-20 4	> 20 10	**2** (9)
Dig pref score - MUAC	Incl	#	0-7 0	8-12 2	13-20 4	> 20 10	**2** (10)
Standard Dev WHZ .	Excl	SD	<1.1 and	<1.15 and	<1.20 and	>=1.20 or	
.	Excl	SD	>0.9 0	>0.85 5	>0.80 10	<=0.80 20	**0** (1.00)
Skewness WHZ	Excl	#	<±0.2 0	<±0.4 1	<±0.6 3	>=±0.6 5	**0** (-0.19)
Kurtosis WHZ	Excl	#	<±0.2 0	<±0.4 1	<±0.6 3	>=±0.6 5	**0** (-0.10)
Poisson dist WHZ-2	Excl	p	>0.05 0	>0.01 1	>0.001 3	<=0.001 5	**0** (p=0.793)
OVERALL SCORE WHZ =			0-9	10-14	15-24	>25	**4** %

The overall score of this survey is 4 %, this is excellent.

There were no duplicate entries detected.

Percentage of children with no exact birthday: 17 %

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=30/ID=1: **WHZ (-3.982)**, Height may be incorrect
Line=59/ID=2: **WHZ (-3.624)**, Weight may be incorrect
Line=147/ID=1: **WHZ (2.470)**, Weight may be incorrect
Line=160/ID=1: HAZ (1.427), Age may be incorrect
Line=183/ID=1: **WHZ (-4.421)**, Weight may be incorrect
Line=229/ID=1: HAZ (1.758), Age may be incorrect
Line=240/ID=2: HAZ (1.648), Age may be incorrect
Line=400/ID=1: **WHZ (-3.718)**, Weight may be incorrect
Line=534/ID=1: HAZ (1.500), Height may be incorrect
Line=623/ID=1: **WHZ (-3.613)**, Weight may be incorrect
Line=638/ID=2: HAZ (3.633), Height may be incorrect
Line=669/ID=2: HAZ (-4.858), Age may be incorrect
Line=692/ID=1: HAZ (-4.865), Height may be incorrect

Percentage of values flagged with SMART flags:WHZ: 1.0 %, HAZ: 1.1 %, WAZ: 0.0 %

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: 0.95 (The value should be around 0.85).:
p-value = 0.172 (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	89/76.3 (1.2)	72/70.5 (1.0)	161/146.7 (1.1)	1.24
18 to 29	12	74/73.6 (1.0)	72/68.0 (1.1)	146/141.6 (1.0)	1.03
30 to 41	12	73/72.1 (1.0)	66/66.6 (1.0)	139/138.7 (1.0)	1.11
42 to 53	12	52/70.9 (0.7)	60/65.5 (0.9)	112/136.5 (0.8)	0.87
54 to 59	6	40/35.1 (1.1)	33/32.4 (1.0)	73/67.5 (1.1)	1.21
6 to 59	54	328/315.5 (1.0)	303/315.5 (1.0)		1.08

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

Overall sex ratio: p-value = 0.320 (boys and girls equally represented)
Overall age distribution: p-value = 0.174 (as expected)
Overall age distribution for boys: p-value = 0.096 (as expected)
Overall age distribution for girls: p-value = 0.945 (as expected)
Overall sex/age distribution: p-value = 0.042 (significant difference)

Distribution of month of birth

Jan: ##################
Feb: ##########################
Mar: ################################
Apr: ################################
May: ################################
Jun: ##########################
Jul: ############################
Aug: ############################
Sep: ######################
Oct: ##########################
Nov: ###################
Dec: ######################

Digit preference Weight:

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

Digit preference score: **5** (0-7 excellent, 8-12 good, 13-20 acceptable and > 20 problematic)
p-value for chi2: 0.056

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: **9** (0-7 excellent, 8-12 good, 13-20 acceptable and > 20 problematic)
p-value for chi2: 0.000 (significant difference)

Digit preference MUAC:

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

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

Digit preference score: **10** (0-7 excellent, 8-12 good, 13-20 acceptable and > 20 problematic)
p-value for chi2: 0.000 (significant difference)

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

.	**no exclusion**	**exclusion from reference mean (WHO flags)**	**exclusion from observed mean (SMART flags)**
WHZ			
Standard Deviation SD:	1.05	1.05	1.00
(The SD should be between 0.8 and 1.2)			
Prevalence (< -2)			
observed:	9.7%	9.7%	9.0%
calculated with current SD:	9.0%	9.0%	7.7%
calculated with a SD of 1:	8.0%	8.0%	7.7%
HAZ			
Standard Deviation SD:	1.02	1.02	0.96
(The SD should be between 0.8 and 1.2)			
Prevalence (< -2)			
observed:	39.1%	39.1%	
calculated with current SD:	37.4%	37.4%	
calculated with a SD of 1:	37.2%	37.2%	
WAZ			
Standard Deviation SD:	0.80	0.80	0.80
(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= 0.005	p= 0.005	p= 0.049
HAZ	p= 0.000	p= 0.000	p= 0.239
WAZ	p= 0.000	p= 0.000	p= 0.000

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

Skewness

WHZ	-0.32	-0.32	-0.19

HAZ	0.42	0.42	0.17
WAZ	-0.29	-0.29	-0.29

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	0.33	0.33	-0.10
HAZ	1.30	1.30	-0.08
WAZ	0.63	0.63	0.63

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=0.83 (p=0.793)
WHZ < -3: ID=0.85 (p=0.758)
GAM: ID=0.83 (p=0.793)
SAM: ID=0.85 (p=0.758)
HAZ < -2: ID=1.18 (p=0.193)
HAZ < -3: ID=1.92 (p=0.000)
WAZ < -2: ID=1.09 (p=0.306)
WAZ < -3: ID=0.89 (p=0.679)

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: 0.87 (n=47, f=0)  ###
02: 1.12 (n=44, f=1)  #############
03: 0.84 (n=46, f=0)  ##
04: 1.13 (n=46, f=1)  ##############
05: 0.95 (n=46, f=0)  ######
06: 0.85 (n=43, f=1)  ##
07: 1.18 (n=45, f=1)  ################
08: 1.10 (n=44, f=0)  #############
09: 0.93 (n=45, f=0)  #####
10: 1.01 (n=41, f=0)  #########
11: 1.22 (n=42, f=2)  ##################
12: 1.19 (n=33, f=0)  ################
13: 1.12 (n=33, f=0)  ##############
14: 1.02 (n=26, f=0)  OOOOOOOOO
15: 1.04 (n=17, f=0)  OOOOOOOOOO
16: 1.17 (n=15, f=0)  OOOOOOOOOOOOOOO
17: 1.13 (n=12, f=0)  ~~~~~~~~~~~~~~
18: 1.54 (n=05, 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 =	103	105	118	105	100	100
Percentage of values flagged with SMART flags:						
WHZ:	1.9	1.9	0.0	1.0	1.0	0.0
HAZ:	1.0	1.0	0.0	2.9	0.0	0.0
WAZ:	0.0	0.0	0.0	0.0	0.0	0.0
Age ratio of 6-29 months to 30-59 months:						
	1.06	0.64	1.15	0.94	1.13	0.85
Sex ratio (male/female):						
	1.24	1.28	0.97	0.98	0.96	1.13
Digit preference Weight (%):						
.0 :	11	8	10	1	10	10
.1 :	11	14	8	12	4	10
.2 :	12	8	12	10	9	7
.3 :	6	6	15	9	5	7
.4 :	10	10	14	10	10	14
.5 :	9	10	9	14	14	12
.6 :	8	7	8	10	12	5
.7 :	11	10	8	8	9	13
.8 :	15	16	9	14	15	12
.9 :	10	11	5	12	12	10
DPS:	7	11	10	12	11	9

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

Digit preference Height (%):

.0 :	6	5	18	2	7	2
.1 :	16	10	7	8	15	7
.2 :	17	10	16	12	15	17
.3 :	15	4	12	14	16	10
.4 :	5	10	5	10	6	12
.5 :	13	16	20	11	9	7
.6 :	3	13	3	13	11	16
.7 :	8	10	3	8	5	13
.8 :	8	10	4	10	2	7
.9 :	12	10	12	12	14	9
DPS:	15	11	21	12	16	15

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

Digit preference MUAC (%):

.0 :	5	8	14	6	7	15
.1 :	10	14	12	7	12	6
.2 :	19	16	14	22	19	12
.3 :	10	11	9	14	11	11
.4 :	10	9	12	24	12	12
.5 :	6	9	15	4	9	15
.6 :	9	10	10	6	13	7
.7 :	12	7	6	5	6	7
.8 :	10	10	6	8	2	7
.9 :	11	7	2	6	9	8
DPS:	12	10	14	23	15	11

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

Standard deviation of WHZ:

SD	1.02	1.09	0.97	1.14	1.07	0.93

Prevalence (< -2) observed:

%	7.8	14.3		9.5	10.0

Prevalence (< -2) calculated with current SD:

%	7.8	16.4		8.5	8.8

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

%	7.5	14.2		5.9	7.4

Standard deviation of HAZ:

SD	0.95	1.05	1.03	1.14	0.93	0.94

observed:

%	29.5	40.7	33.3

calculated with current SD:

%	27.7	38.2	34.5

calculated with a SD of 1:

%	26.8	37.9	32.5

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	15/13.3 (1.1)	10/10.7 (0.9)	25/24.0 (1.0)	1.50
18 to 29	12	13/12.8 (1.0)	15/10.3 (1.5)	28/23.1 (1.2)	0.87
30 to 41	12	14/12.5 (1.1)	14/10.1 (1.4)	28/22.6 (1.2)	1.00

42 to 53	12	7/12.3 (0.6)	4/9.9 (0.4)	11/22.3 (0.5)	1.75
54 to 59	6	8/6.1 (1.3)	3/4.9 (0.6)	11/11.0 (1.0)	2.67
6 to 59	54	57/51.5 (1.1)	46/51.5 (0.9)		1.24

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

Overall sex ratio: p-value = 0.278 (boys and girls equally represented)
Overall age distribution: p-value = 0.089 (as expected)
Overall age distribution for boys: p-value = 0.509 (as expected)
Overall age distribution for girls: p-value = 0.093 (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	16/13.7 (1.2)	9/10.7 (0.8)	25/24.4 (1.0)	1.78
18 to 29	12	9/13.2 (0.7)	7/10.3 (0.7)	16/23.6 (0.7)	1.29
30 to 41	12	13/13.0 (1.0)	8/10.1 (0.8)	21/23.1 (0.9)	1.63
42 to 53	12	12/12.8 (0.9)	10/9.9 (1.0)	22/22.7 (1.0)	1.20
54 to 59	6	9/6.3 (1.4)	12/4.9 (2.4)	21/11.2 (1.9)	0.75
6 to 59	54	59/52.5 (1.1)	46/52.5 (0.9)		1.28

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

Overall sex ratio: p-value = 0.205 (boys and girls equally represented)
Overall age distribution: p-value = 0.025 (significant difference)
Overall age distribution for boys: p-value = 0.570 (as expected)
Overall age distribution for girls: p-value = 0.018 (significant difference)
Overall sex/age distribution: p-value = 0.004 (significant difference)

Team 3:

Age cat.	mo.	boys	girls	total	ratio boys/girls
6 to 17	12	14/13.5 (1.0)	16/14.0 (1.1)	30/27.4 (1.1)	0.88
18 to 29	12	18/13.0 (1.4)	15/13.5 (1.1)	33/26.5 (1.2)	1.20
30 to 41	12	8/12.7 (0.6)	12/13.2 (0.9)	20/25.9 (0.8)	0.67
42 to 53	12	10/12.5 (0.8)	13/13.0 (1.0)	23/25.5 (0.9)	0.77
54 to 59	6	8/6.2 (1.3)	4/6.4 (0.6)	12/12.6 (1.0)	2.00
6 to 59	54	58/59.0 (1.0)	60/59.0 (1.0)		0.97

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

Overall sex ratio: p-value = 0.854 (boys and girls equally represented)
Overall age distribution: p-value = 0.481 (as expected)
Overall age distribution for boys: p-value = 0.316 (as expected)
Overall age distribution for girls: p-value = 0.828 (as expected)
Overall sex/age distribution: p-value = 0.185 (as expected)

Team 4:

Age cat.	mo.	boys	girls	total	ratio boys/girls
6 to 17	12	16/12.1 (1.3)	11/12.3 (0.9)	27/24.4 (1.1)	1.45
18 to 29	12	11/11.7 (0.9)	13/11.9 (1.1)	24/23.6 (1.0)	0.85
30 to 41	12	11/11.4 (1.0)	13/11.6 (1.1)	24/23.1 (1.0)	0.85
42 to 53	12	7/11.2 (0.6)	12/11.5 (1.0)	19/22.7 (0.8)	0.58
54 to 59	6	7/5.6 (1.3)	4/5.7 (0.7)	11/11.2 (1.0)	1.75
6 to 59	54	52/52.5 (1.0)	53/52.5 (1.0)		0.98

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

Overall sex ratio: p-value = 0.922 (boys and girls equally represented)
Overall age distribution: p-value = 0.920 (as expected)
Overall age distribution for boys: p-value = 0.510 (as expected)
Overall age distribution for girls: p-value = 0.922 (as expected)
Overall sex/age distribution: p-value = 0.380 (as expected)

Team 5:

Age cat.	mo.	boys	girls	total	ratio boys/girls
6 to 17	12	15/11.4 (1.3)	18/11.9 (1.5)	33/23.3 (1.4)	0.83
18 to 29	12	10/11.0 (0.9)	10/11.4 (0.9)	20/22.4 (0.9)	1.00
30 to 41	12	13/10.8 (1.2)	9/11.2 (0.8)	22/22.0 (1.0)	1.44
42 to 53	12	8/10.6 (0.8)	11/11.0 (1.0)	19/21.6 (0.9)	0.73
54 to 59	6	3/5.2 (0.6)	3/5.5 (0.5)	6/10.7 (0.6)	1.00
6 to 59	54	49/50.0 (1.0)	51/50.0 (1.0)		0.96

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

Overall sex ratio: p-value = 0.841 (boys and girls equally represented)
Overall age distribution: p-value = 0.151 (as expected)
Overall age distribution for boys: p-value = 0.511 (as expected)
Overall age distribution for girls: p-value = 0.298 (as expected)
Overall sex/age distribution: p-value = 0.082 (as expected)

Team 6:

Age cat.	mo.	boys	girls	total	ratio boys/girls
6 to 17	12	13/12.3 (1.1)	8/10.9 (0.7)	21/23.3 (0.9)	1.63
18 to 29	12	13/11.9 (1.1)	12/10.5 (1.1)	25/22.4 (1.1)	1.08
30 to 41	12	14/11.6 (1.2)	10/10.3 (1.0)	24/22.0 (1.1)	1.40
42 to 53	12	8/11.5 (0.7)	10/10.2 (1.0)	18/21.6 (0.8)	0.80
54 to 59	6	5/5.7 (0.9)	7/5.0 (1.4)	12/10.7 (1.1)	0.71
6 to 59	54	53/50.0 (1.1)	47/50.0 (0.9)		1.13

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

Overall sex ratio: p-value = 0.549 (boys and girls equally represented)
Overall age distribution: p-value = 0.833 (as expected)
Overall age distribution for boys: p-value = 0.783 (as expected)
Overall age distribution for girls: p-value = 0.778 (as expected)
Overall sex/age distribution: p-value = 0.424 (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: 0.70 (n=08, f=0)
02: 0.78 (n=07, f=0)
03: 0.76 (n=08, f=0)
04: 0.63 (n=07, f=0)
05: 0.87 (n=08, f=0)  ###
06: 1.27 (n=06, f=1)  ####################
07: 1.84 (n=08, f=1)  ##############################################
08: 1.10 (n=08, f=0)  ############
09: 0.62 (n=08, f=0)
10: 1.05 (n=07, f=0)  ##########
11: 0.87 (n=07, f=0)  ###
12: 1.46 (n=06, f=0)  ############################
13: 1.05 (n=05, f=0)  ############
14: 0.59 (n=03, f=0)
15: 0.75 (n=03, f=0)
16: 0.41 (n=03, f=0)
```

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

Team: 2

```
Time                              SD for WHZ
point          0.8 0.9 1.0 1.1 1.2 1.3 1.4 1.5 1.6 1.7 1.8 1.9 2.0 2.1 2.2 2.3
01: 0.67 (n=07, f=0)
02: 1.16 (n=07, f=1)  ###############
03: 1.04 (n=07, f=0)  ##########
04: 1.30 (n=07, f=0)  ####################
05: 0.66 (n=07, f=0)
06: 0.74 (n=07, f=0)
07: 1.03 (n=07, f=0)  ##########
08: 0.98 (n=07, f=0)  #######
09: 1.21 (n=07, f=0)  #################
10: 0.87 (n=06, f=0)  ###
11: 1.29 (n=07, f=0)  ####################
12: 1.02 (n=05, f=0)  #########
```

13: 0.52 (n=06, f=0)
14: 1.01 (n=07, f=0) #########
15: 1.54 (n=05, f=0) ##############################
16: 1.74 (n=03, f=0) OOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOO
17: 0.28 (n=02, f=0)

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

Team: 3

Time SD for WHZ
point 0.8 0.9 1.0 1.1 1.2 1.3 1.4 1.5 1.6 1.7 1.8 1.9 2.0 2.1 2.2 2.3
01: 0.65 (n=08, f=0)
02: 1.01 (n=08, f=0) #########
03: 0.81 (n=08, f=0)
04: 1.05 (n=08, f=0) ###########
05: 0.65 (n=08, f=0)
06: 0.89 (n=08, f=0) ####
07: 0.73 (n=08, f=0)
08: 1.09 (n=08, f=0) ############
09: 0.99 (n=08, f=0) ########
10: 1.16 (n=08, f=0) ###############
11: 0.96 (n=06, f=0) #######
12: 0.97 (n=07, f=0) #######
13: 1.25 (n=07, f=0) ###################
14: 0.99 (n=07, f=0) ########
15: 0.47 (n=04, f=0)
16: 0.70 (n=03, f=0)
17: 1.84 (n=03, f=0)
OOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOO

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

Team: 4

Time SD for WHZ
point 0.8 0.9 1.0 1.1 1.2 1.3 1.4 1.5 1.6 1.7 1.8 1.9 2.0 2.1 2.2 2.3
01: 0.82 (n=09, f=0) #
02: 1.42 (n=09, f=0) ##########################
03: 1.08 (n=08, f=0) ############
04: 0.67 (n=09, f=0)
05: 1.03 (n=08, f=0) ##########
06: 0.63 (n=08, f=0)
07: 0.88 (n=08, f=0) ###
08: 1.34 (n=07, f=0) ######################
09: 1.04 (n=09, f=0) ##########
10: 0.83 (n=07, f=0) #
11: 1.75 (n=08, f=1) ##
12: 1.32 (n=05, f=0) ####################

13: 1.05 (n=05, f=0) ##########
14: 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)

Team: 5

Time SD for WHZ
point 0.8 0.9 1.0 1.1 1.2 1.3 1.4 1.5 1.6 1.7 1.8 1.9 2.0 2.1 2.2 2.3
01: 0.64 (n=08, f=0)
02: 1.15 (n=07, f=0) ###############
03: 0.46 (n=08, f=0)
04: 1.71 (n=08, f=1) ######################################
05: 0.69 (n=08, f=0)
06: 0.76 (n=07, f=0)
07: 1.27 (n=07, f=0) ####################
08: 1.59 (n=07, f=0) ################################
09: 0.69 (n=07, f=0)
10: 0.68 (n=07, f=0)
11: 0.62 (n=07, f=0)
12: 1.14 (n=05, f=0) ##############
13: 1.72 (n=05, f=0) ##
14: 0.64 (n=02, f=0)
15: 0.62 (n=03, f=0)
17: 0.29 (n=02, f=0)

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

Team: 6

Time SD for WHZ
point 0.8 0.9 1.0 1.1 1.2 1.3 1.4 1.5 1.6 1.7 1.8 1.9 2.0 2.1 2.2 2.3
01: 1.59 (n=07, f=0) ################################
02: 0.58 (n=06, f=0)
03: 0.65 (n=07, f=0)
04: 1.17 (n=07, f=0) ################
05: 1.21 (n=07, f=0) #################
06: 0.54 (n=07, f=0)
07: 0.80 (n=07, f=0)
08: 0.46 (n=07, f=0)
09: 0.74 (n=06, f=0)
10: 0.82 (n=06, f=0) #
11: 0.66 (n=07, f=0)
12: 1.08 (n=05, f=0) ############
13: 1.01 (n=05, f=0) #########
14: 1.16 (n=05, f=0) ###############
16: 1.26 (n=04, f=0) OOOOOOOOOOOOOOOOOOOO
17: 1.05 (n=03, f=0) OOOOOOOOOOO
18: 1.80 (n=02, f=0) ~~~~~~

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

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

Annexes 6: Local Events Calendar developed and used in Bamyan SMART 2021

اسم ماه	ماه	1395	ماه	1396	ماه	1397	ماه	1398	ماه	1399	ماه	1400
حمل			49	رخصتی نوروز، جشن دهقان، نهال شانی و شاخه بوری، قلبه نمودن زمین، کشت و مکتب رفتن شاگردان، فصل آب خیزي وباراني، وقت شکوفه درختان، وقت زنده شدن حشرات غجی و پرندگان نایاب، میلاد امام زمان	37	رخصتی نوروز، جشن دهقان، نهال شانی و شاخه بوری، قلبه نمودن زمین، کشت و مکتب رفتن شاگردان، فصل آب خیزي وباراني، وقت شکوفه درختان، وقت زنده شدن حشرات غجی و پرندگان نایاب، میلاد امام زمان	25	رخصتی نوروز، جشن دهقان، نهال شانی و شاخه بوری، قلبه نمودن زمین، کشت و مکتب رفتن شاگردان، فصل آب خیزي وباراني، وقت شکوفه درختان، وقت زنده شدن حشرات غجی و پرندگان نایاب، میلاد امام زمان	13	رخصتی نوروز، جشن دهقان، نهال شانی و شاخه بوری، قلبه نمودن زمین، کشت و مکتب رفتن شاگردان، فصل آب خیزي وباراني، وقت شکوفه درختان، وقت زنده شدن حشرات غجی و پرندگان نایاب، میلاد امام زمان	1	رخصتی نوروز، جشن دهقان، نهال شانی وشاخه بوری، قلبه نمودن زمین، کشت و مکتب رفتن شاگردان، فصل آب خیزي وباراني، وقت شکوفه درختان، وقت زنده شدن حشرات غجی و پرندگان نایاب، میلاد امام زمان
ثور			48	موسم باران و غوره کردن درختان، جشن پیروزی مجاهدین، وقتی شورش ماهی یا ماهی گیری، کشت نمودن کچالو و سبزیجات، عید سعید الفطر	36	موسم باران و غوره کردن درختان، جشن پیروزی مجاهدین، وقتی شورش ماهی یا ماهی گیری، کشت نمودن کچالو و سبزیجات، عید سعید الفطر	24	موسم باران و غوره کردن درختان، جشن پیروزی مجاهدین، وقتی شورش ماهی یا ماهی گیری، کشت نمودن کچالو و سبزیجات، عید سعید الفطر	12	موسم باران و غوره کردن درختان، جشن پیروزی مجاهدین، وقتی شورش ماهی یا ماهی گیری، کشت نمودن کچالو و سبزیجات، عید سعید الفطر		
جوزا	59	وقت کود دادن کچالو و گندم ، وقت ایاتق زراعتی ، کم شدن آب خیزی، جشن گل کچالو، وقتی ، توت پخته شدن	47	وقت کود دادن کچالو و گندم ، وقت ایاتق رفتن، وقتی یوجی کردن زمین های زراعتی ، کم شدن آب خیزی، جشن گل کچالو، وقتی ، توت پخته شدن	35	وقت کود دادن کچالو و گندم ، وقت ایاتق رفتن، وقتی یوجی کردن زمین های زراعتی ، کم شدن آب خیزی، جشن گل کچالو، وقتی ، توت پخته شدن	23	وقت کود دادن کچالو و گندم ، وقت ایاتق رفتن، وقتی یوجی کردن زمین های زراعتی ، کم شدن آب خیزی، جشن گل کچالو، وقتی ، توت پخته شدن	11	وقت کود دادن کچالو و گندم ، وقت ایاتق رفتن، وقتی یوجی کردن زمین های زراعتی ، کم شدن آب خیزی، جشن گل کچالو، وقتی ، توت پخته شدن		
سرطان	58	شروع تابستان، پخته شدن زردالو، جلتی، امتحان جهارنیماهه، کچالو خاکی ، ایاتق رفتن	46	شروع تابستان، پخته شدن زردالو، جلتی، امتحان جهارنیماهه، کچالو خاکی ، ایاتق رفتن	34	شروع تابستان، پخته شدن زردالو، جلتی، امتحان جهارنیماهه، کچالو خاکی ، ایاتق رفتن	22	شروع تابستان، پخته شدن زردالو، جلتی، امتحان جهارنیماهه، کچالو خاکی ، ایاتق رفتن	10	شروع تابستان، پخته شدن زردالو، جلتی، امتحان جهارنیماهه، کچالو خاکی ، ایاتق رفتن		
اسد	57	رخصتی تابستانی ، ریشقه درو، روز استقلال،رفتن حاجیان، گندم درو، علف دروی در کوه، مال کلی،	45	رخصتی تابستانی ، ریشقه درو، روز استقلال،رفتن حاجیان، گندم درو، علف دروی در کوه، مال کلی،	33	رخصتی تابستانی ، ریشقه درو، روز استقلال،رفتن حاجیان، گندم درو، علف دروی در کوه، مال کلی،	21	رخصتی تابستانی ، ریشقه درو، روز استقلال،رفتن حاجیان، گندم درو، علف دروی در کوه، مال کلی،	9	رخصتی تابستانی ، ریشقه درو، روز استقلال،رفتن حاجیان، گندم درو، علف دروی در کوه، مال کلی،		
سنبله	56	عید قربان، شروع مکاتب، رسیدن میوه ها و سبزیجات، تاله دروی، علف کتنی از کوه، وقت شیر و قروت، امدن از ایاتق، ۱۸سنبله هفته شهدا، روز محرم	44	عید قربان، شروع مکاتب، رسیدن میوه ها و سبزیجات، تاله دروی، علف کتنی از کوه، وقت شیر و قروت، امدن از ایاتق، ۱۸سنبله هفته شهدا، روز محرم	32	عید قربان، شروع مکاتب، رسیدن میوه ها و سبزیجات، تاله دروی، علف کتنی از کوه، وقت شیر و قروت، امدن از ایاتق، ۱۸سنبله هفته شهدا، روز محرم	20	عید قربان، شروع مکاتب، رسیدن میوه ها و سبزیجات، تاله دروی، علف کتنی از کوه، وقت شیر و قروت، امدن از ایاتق، ۱۸سنبله هفته شهدا، روز محرم	8	عید قربان، شروع مکاتب، رسیدن میوه ها و سبزیجات، تاله دروی، علف کتنی از کوه، وقت شیر و قروت، امدن از ایاتق، ۱۸سنبله هفته شهدا، روز محرم		
میزان	55	برگ ریزی درختان، جمع اوری محصولات کچالو، شروع کشت خزانی تیر ماهی، جمع اور علوفه جات، نرم کاری علف کوهی، جمع اوری و چیر نمودن گندوم للمی، چهار شنبه سوری	43	برگ ریزی درختان، جمع اوری محصولات کچالو، شروع کشت خزانی تیر ماهی، جمع اور علوفه جات، نرم کاری علف کوهی، جمع اوری و چیر نمودن گندوم للمی، چهار شنبه سوری	31	برگ ریزی درختان، جمع اوری محصولات کچالو، شروع کشت خزانی تیر ماهی، جمع اور علوفه جات، نرم کاری علف کوهی، جمع اوری و چیر نمودن گندوم للمی، چهار شنبه سوری	19	برگ ریزی درختان، جمع اوری محصولات کچالو، شروع کشت خزانی تیر ماهی، جمع اور علوفه جات، نرم کاری علف کوهی، جمع اوری و چیر نمودن گندوم للمی، چهار شنبه سوری	7	برگ ریزی درختان، جمع اوری محصولات کچالو، شروع کشت خزانی تیر ماهی، جمع اور علوفه جات، نرم کاری علف کوهی، جمع اوری و چیر نمودن گندوم للمی، چهار شنبه سوری		
عقرب	54	شروع امتحانات مکاتب، جمع اوری هیزوم،آبیاری کشت تیرماهی، شروع سردی هوا و باریدن باران، آرد گندم و دیگر غله جات، بسته شدن مکاتب، جمع اوری برگ درختان، شدیار نمودن زمین، کاه گیل کردن بام ها	42	شروع امتحانات مکاتب، جمع اوری هیزوم،آبیاری کشت تیرماهی، شروع سردی هوا و باریدن باران، آرد گندم و دیگر غله جات، بسته شدن مکاتب، جمع اوری برگ درختان، شدیار نمودن زمین، کاه گیل کردن بام ها	30	شروع امتحانات مکاتب، جمع اوری هیزوم،آبیاری کشت تیرماهی، شروع سردی هوا و باریدن باران، آرد گندم و دیگر غله جات، بسته شدن مکاتب، جمع اوری برگ درختان، شدیار نمودن زمین، کاه گیل کردن بام ها	18	شروع امتحانات مکاتب، جمع اوری هیزوم،آبیاری کشت تیرماهی، شروع سردی هوا و باریدن باران، آرد گندم و دیگر غله جات، بسته شدن مکاتب، جمع اوری برگ درختان، شدیار نمودن زمین، کاه گیل کردن بام ها	6	شروع امتحانات مکاتب، جمع اوری هیزوم،آبیاری کشت تیرماهی،شروع سردی هوا و باریدن باران، آرد گندم و دیگر غله جات، بسته شدن مکاتب، جمع اوری برگ درختان، شدیار نمودن زمین، کاه گیل کردن بام ها		
قوس	53	شروع بارندگی باران و برف، یخ زدن اب ها، روز گردیتی، شب یلدا، تعطیل شدن دانشگاه ها، شاندن بخاری و ساختن گرم خانه، جمع اوری سیب های قوس، شروع طوغل و عقرب	41	شروع بارندگی باران و برف، یخ زدن اب ها، روز گردیتی، شب یلدا، تعطیل شدن دانشگاه ها، شاندن بخاری و ساختن گرم خانه، جمع اوری سیب های قوس، شروع طوغل و عقرب	29	شروع بارندگی باران و برف، یخ زدن اب ها، روز گردیتی، شب یلدا، تعطیل شدن دانشگاه ها، شاندن بخاری و ساختن گرم خانه، جمع اوری سیب های قوس، شروع طوغل و عقرب	17	شروع بارندگی باران و برف، یخ زدن اب ها، روز گردیتی، شب یلدا، تعطیل شدن دانشگاه ها، شاندن بخاری و ساختن گرم خانه، جمع اوری سیب های قوس، شروع طوغل و عقرب	5	شروع بارندگی باران و برف، یخ زدن اب ها، روز گردیتی، شب یلدا، تعطیل شدن دانشگاه ها، شاندن بخاری و ساختن گرم خانه، جمع اوری سیب های قوس، شروع طوغل و عقرب		
جدی	52	شروع جله کاتن، شروع مکتب های زمستانی، شروع برف باری، شروع کورس زمستانی	40	شروع جله کاتن، شروع مکتب های زمستانی، شروع برف باری، شروع کورس زمستانی	28	شروع جله کاتن، شروع مکتب های زمستانی، شروع برف باری، شروع کورس زمستانی	16	شروع جله کاتن، شروع مکتب های زمستانی، شروع برف باری، شروع کورس زمستانی	4	شروع جله کاتن، شروع مکتب های زمستانی، شروع برف باری، شروع کورس زمستانی		
دلو	51	اواخر جله کاتن، جله خورد، زوز مادر و زن	39	اواخر جله کاتن، جله خورد، زوز مادر و زن	27	اواخر جله کاتن، جله خورد، زوز مادر و زن	15	اواخر جله کاتن، جله خورد، زوز مادر و زن	3	اواخر جله کاتن، جله خورد، زوز مادر و زن		
حوت	50	شروع بادهای سرد، شروع باران، شاخه بوری درختان، کچالو شانی(کهمر و سیغان) باروکتی، گاو خنک، شخم شدن زمین، سورجه زنی	38	شروع بادهای سرد، شروع باران، شاخه بوری درختان، کچالو شانی(کهمر و سیغان) باروکتی، گاو خنک، شخم شدن زمین، سورجه زنی	26	شروع بادهای سرد، شروع باران، شاخه بوری درختان، کچالو شانی(کهمر و سیغان) باروکتی، گاو خنک، شخم شدن زمین، سورجه زنی	14	شروع بادهای سرد، شروع باران، شاخه بوری درختان، کچالو شانی(کهمر و سیغان) باروکتی، گاو خنک، شخم شدن زمین، سورجه زنی	2	شروع بادهای سرد، شروع باران، شاخه بوری درختان، کچالو شانی(کهمر و سیغان) باروکتی، گاو خنک، شخم شدن زمین، سورجه زنی		

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