NUTRITION AND RETROSPECTIVE MORTALITY SURVEY

HIGHLANDS AND LOWLANDS LIVELIHOOD ZONES OF HAJJAH GOVERNORATE

FINAL SMART SURVEY REPORT

YEMEN

MARCH 2018

ACTION CONTRE LA FAIM

OCHA

ACKNOWLEDGMENT

Action Contra La Faim (ACF) wishes to express gratitude and appreciation to the parties involved in the survey process. The survey was successful due to contribution and support from:

- The Technical committee for their role of validating and ensuring survey protocol was followed and giving valuable inputs to the entire process.
- Ministry of Public Health and Population (MoPHP) Sanaa for their input and technical support in the entire survey process.
- Governorate Health Office (GHO) Hajjah for supporting the survey in several capacities including; Access negotiation with authorities, commitment to the implementation of the survey plan.
- Appreciation to the GHO survey manager, supervisors, data entry team for for their commitment to survey quality in the process from training, data collection and entry.

Gratitude's also goes to enumerators who have contributed to the success of quality data collection and not forgetting the Hajjah community members and households for allowing survey teams to conduct data collection in their communities including measuring their children and giving valuable information to the survey teams.

Appreciation also goes to ACF survey team both program, logistics and coordination team who spend their energy and time to ensure the whole process was a success.

Lastly ACF greatly appreciates UN-OCHA for funding the survey without which the whole survey could not have been possible.

This document has been produced with the financial assistance from the UN-OCHA. The views expressed herein should not be taken, in any way, to reflect the official opinion of UN-OCHA.

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LIST OF ACRONYMS

ACF	Action Contre la Faim
ARI	Acute Respiratory Infection
CI	Confidence Interval
CMR	Crude Mortality Rate
CSI	Coping strategy index
DHS	Demographic Health Survey
ENA	Emergency Nutrition Assessment
FANTA	Food and Nutrition Technical Assistance
GAM	Global Acute Malnutrition
GHO	Government Health Office
HAZ	Height-for-age Z-score
HH	Household
IYCF	Infant and Young Children Feeding
IMC	Integrated Management of Childhood Illnesses
MAM	Moderate Acute Malnutrition
MDD	Minimum Dietary Diversity
MPHP	Ministry of Public Health and Population
MUAC	Mid-Upper Arm Circumference
ODF	Open Defecation Free
OTP	Out-patient Therapeutic Program
SAM	Sever Acute Malnutrition
SD	Standard Deviation
SMART	Standardized Monitoring and Assessment of Relief and Transitions
U5	Under-five
U5MR	Under Five Mortality Rate
UNICEF	United Nations Children's Fund
WAZ	Weight-for-age Z-scores
WHZ	Weight-for-height Z-scores
WHO	World Health Organization

EXECUTIVE SUMMARY

In March 2018, Action Contre la Faim (ACF), in collaboration with Ministry of Public Health and Population (MPHP) represented by Hajjah Governmental Health Office (GHO), conducted two nutrition assessments in Lowlands and Highlands's ecological zone in 28 districts, out of 31, in the governorate. This was in response to the need to determine the malnutrition levels and trends for the different ecological zones and to inform on the intervention response for the governorate.

The main objective was to assess the current nutrition situation in Highlands and Lowlands of Hajjah governorate together with key determinants of Nutrition, Health and Food Security situation and provide key recommendations.

A two-stage cluster sampling methodology, using a probability proportional to population size (PPS) sampling methodology, was followed to randomly select 39 clusters for Highlands and 37 clusters for Lowlands ecological zones for both anthropometry and mortality assessments. A total of 1304 children aged 0-59 months (547 from Lowlands and 757 children from Highlands's zones) were sampled for anthropometry, where 1292 were measured (542 lowland and 750 from Highland) were taken anthropometric measurement. Nutritional status for women of reproductive age 15 – 49 years was determined. A total of 1771 women were assessed (780 in Lowlands and 991 in Highlands) using Mid-Upper Arm Circumference (MUAC). Other indicators collected during the survey included household demographics, Health, Water, Sanitation and Hygiene (WASH) and Food security. Data collection period was 10th to 22nd March 2018.

The survey results indicated an high Global Acute Malnutrition (GAM) rate of 14.9 % (11.8 - 18.8 95% C.I.) classified as serious and 8.9% (6.5– 12.1 95% CI) classified as poor in the Lowlands and Highlands livelihood zones respectively. The results also indicated a very high rates of chronic malnutrition of 53.3% (47.9 – 58.7 95% CI) and 55.2 % (50.2 - 60.1 95% C.I.) in Lowlands and Highlands livelihood zones respectively.

The Infant and Young Child Feeding (IYCF) results showed a low exclusive breastfeeding rates of 17.6% (8.4 -30.9 95% CI) and 30.3% (21.0 – 41 95% CI) and low minimum acceptable diet: 7.1% (3.6 -13.2 95% CI) and 4.0 % (1.8 -8.1 95% CI) for Lowlands and Highlands livelihood.

The survey results on food security indicated a household's dietary diversity of 6.7 and 7.4 for Lowlands and Highlands zones respectively. The food consumption score noted that 52.0 and 53.0 percent of households consume food from poor and borderline food consumption group in lowland and highland zones respectively.

The survey results for other key indicators are in table 1 below, the summary of recommendations generated from the findings are presented in table 2.

Table 1: Summary of Key Survey Indicator

Indicator	Hajjah Lowlands	Hajjah Highlands
Nutrition		
Global Acute Malnutrition (<-2 z-score **and/or** oedema **and/or** < 125 mm)	17.2% (14.0 - 20.9 95% CI)	12.6% (10.1-15.4 9.5 95%CI)
Severe Acute Malnutrition (<-3 z-score **and/or** oedema **and/or** < 115 mm)	3.3% (1.9 - 5.3 95% CI)	1.2 % (0.5 - 2.4 95% CI)
Global Acute Malnutrition (WHZ<-2 and/or oedema)	14.9 %(11.8 - 18.8 95% C.I.)	8.9 %(6.5 - 12.1 95% C.I.)
Severe Acute Malnutrition (WHZ<-3 and/or oedema)	2.3 % (1.3 - 4.0 95% C.I.)	0.8 % (0.3 - 2.1 95% C.I.)
Moderate Acute Malnutrition (WHZ ≥-3 and <-2)	12.7 % (9.6 - 16.5 95% C.I.)	8.1 % (6.0 - 10.9 95% C.I.)
Chronic Malnutrition (Stunting) (HAZ<-2)	53.3 % (47.9 - 58.7 95% C.I.)	55.2 % (50.2 - 60.1 95% C.I.)
Underweight (WAZ<-2)	44.2 % (38.4 - 50.1 95% C.I.)	35.6 % (31.3 - 40.1 95% C.I.)
Mortality		
Crude Death Rate (CDR)	0.36 (0.18-0.71)	0.26 (0.15-0.45)
Under Five Death Rate (U5MR)	0.37 (0.09-1.52)	0.00 (0.00-0.00)
Infant and Young Child Feeding (IYCF)		
Exclusive breastfeeding (0-5 months)	17.6% (8.4 -30.9 95% CI)	30.3 %(21.0 – 41.0 95% CI)
Continued breastfeeding at one year (12-15 months)	89.3 % (71.8 – 97.7 95% CI)	73.7% (56.9 -86.6 95% CI)
Continued breastfeeding at 2 years (20-23 months)	57.6 % (39.2 - 74.5 95% CI	37.0% (23.2 – 52.5 95%
Introduction of solid, semi-solid or soft foods (6-8 months)	66.7 % (48.7 – 80.9 95 CI)	50.0% (35.2 – 64.8 95% CI)
Minimum dietary diversity (6-23 months)	11.9 % (7.2 – 18.8 95% CI)	9.1 % (5.6 – 14.3 95% CI)
Minimum meal frequency (6-23 months)	42.7 % (35.2 – 50.7 95% CI)	28.4% (22.8 -34.8 95% CI)
Minimum acceptable diet (6-23 months)	7.1% (3.6 -13.2 95% CI)	4.0 % (1.8 -8.1 95% CI)
Water Hygiene and Sanitation		
House connected piped water	5.7%	11.7%
Defecation in open (in fields, etc.)	45.5%	20.0%
Hand washing practice		
After going to toilet	27.9%	29.6%
Before eating	65.3%	65.0%
Food Security		
Household dietary diversity	6.7	7.4
Mean Food consumption score (FCS)	37.0	41.4
Average Coping strategy index (CSI)	10.9	10.9

Table 2: Summary of recommendation

No	Indicator Result	Recommendation	Responsible Organization/ Person	Timeline
1	**Acute Malnutrition** Lowlands-14.9 % (11.8-18.8 95% C.I.)-Classified as Serious; Highland: 8.9 % (6.5 - 12.1 95% C.I.)Classified as poor	Identify malnutrition hotspots in the governorate especially Highlands where there are pockets of cases for targeted interventions Intensifying mass screening and referrals for malnourished children.	UNICEF, WHO, UN-OCHA MoPHP and implementing partners	Urgently/ continuous programmes to be enhanced
2.	**<u>High chronic malnutrition</u>** Lowlands: 53.3 %(47.9 - 58.7 95% C.I.) Highlands: 55.2 % (50.2 - 60.1 95% C.I.)	There is a need for urgent multi-sectoral meeting to plan interventions aimed at reversing the chronic malnutrition trends. Conduct studies to understand the chronic malnutrition causal pathways for targeted programming. Nutrition education to caregivers on the importance of 1000 day window of opportunity and impact action programs within this period	UNICEF, WHO, UN OCHA, MoPHP and implementing partners	Urgently
3	**High morbidity prevalence, Diarrhea:** Lowlands: 36.5%, Highlands:40.8% **ARI:** Lowlands: 48.3%, Highlands:55.8% **Fever:** Lowlands: 66.4%,Highlands: 68.7%	Health education for households on hygiene including water treatment, handwashing and safe human waste disposal. Piloting on ODF[1] communities/villages Continuous supply of IMCI Drugs health facilities for management of diseases.	MoPHP and implementing partners	Continuous

[1] Open Defection Free

4.	**Low Vitamin A supplementation** Lowland: 44.4%, Highland: 47.1%	Intensification of campaigns and outreach activities,	MoPHP and implementing partners	Continuous
5	**Poor IYCN Indicators** a) Exclusive breastfeeding **Lowland:** 17.6% (8.4 -30.9 95% CI) **Highland:** 30.3 %(21.0 – 41.0 95% CI) b) Minimum Acceptable diet (MAD Lowland: 7.1% (3.6 -13.2 95% CI) Highland: 4.0 % (1.8 -8.1 95% CI)	Identify belief and practices that influence optimal IYCF through KAP/C4D. Continuous /intensified health education to mother on the importance of adequate child care Formation of mother to mother support groups as an avenue of reaching caregivers with IYCF Message.	MoPHP and implementing partners IYCF WG	Planned immediately.
6	**<u>Poor Household Food indictors</u>** a)***Food Consumption Score*** Food consumption score: Lowlands: 37.0 ; Highlands: 41.4 b)***High Rate of coping*** strategy: Average Coping strategy index: Lowlands: 10.9 ; Highlands: 10.9	Need for households with poor food consumption to be supplied with relief food or ration increased. Encourage households to utilize available land space to grow food crops. Food security working groups to design more specific programs to improve household food security and overall nutrition situation in the governorate	MoPHP, FAO, FSWG, and other relevant line ministries	Immediately.

1. INTRODUCTION

Location and Demography

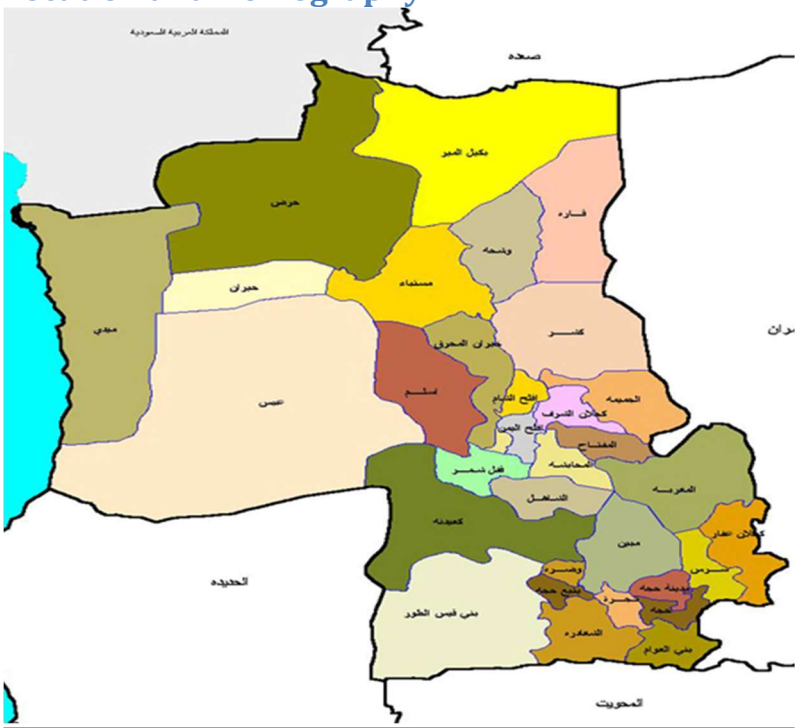

Figure 1: Map of Hajjah Governorate

Hajjah Governorate is situated 120 km North West of Sana'a with an area of 8,228 square kilometre with an estimated 2,136,213 inhabitants[2]. It borders Saudi Arabia and Sa'ada Governorate in the North, Amran Governorate in the East, Mahaweet and Hodeida governorates in the South and the Red Sea with part of Hodeida coastal area in the West[3] . Hajjah governorate, is characterized by mountainous areas representing (8.5%), intermediate areas (42.6%) and Lowlands area (48.9%). There are (72) valleys with the most famous are Wadi Mor - Wadi Laha - Wadi Hiran - Wadi Harad. Administratively Hajjah has 31 districts, with more than 3,798 villages, within more than 160 Ozlas and 10,491 Mahla. The topography of Hajjah varies from high mountains reaching 2,300 m above sea level in Kuhlan Afar and Qarah districts, to long costal line from the North Harad to the south Abs with cities such as Harad, Midi, Hayran and Abs. The climate varies according to the topography of the terrain. In mountains, the climate is temperate in summer and cold in winter, while in the Lowlands the climate is tropical hot and humid in summer session and temperate in winter. The eastern part of the governorate has the highest rainfall annually, with monsoon rains during summer[4]

Livelihood Activities in the governorate

The governorate contains of two main ecological zones: the Lowlands zone and the mountainous zone. Agriculture and grazing are the main activities of the people in this governorate. Qat cultivation is the main agriculture activity of people living in mountains zone while animal breeding and grazing and fishing is the main activity for people in the Lowlands. Whereas Qat is grown in the mountain areas, farmers in the plain lands between the mountains and the Saudi Arabian border in the north (Tihama) concentrate

[2] 2017 population projections from Yemen CSO 2004 census
[3] Hajjah MoH Humanitarian Strategic Plan for 2018
[4] Hajjah national health typography survey and SMART Survey 2015

on fruit and vegetable. Mostly sheep and goats but also cattle and camels are bred in the governorate. Fishing is another source of income on the coastline of the Red Sea.[5]

Health and Nutrition

Emergency Food Security and Nutrition Assessment (EFSNA) conducted in 2016 showed a nutrition situation in Hajjah exceeding the serious threshold according to the WHO classification with a Global Acute Malnutrition (GAM) of 11.3% (7.5 – 16.7 95% CI), and Severe Acute Malnutrition (SAM) of 1.6% (0.8 – 3.2 95 % CI) . A per December 2017 nutrition cluster analysis update, the governorate SAM and Moderate Acute Malnutrition (MAM) caseload was 31,389 and 91,808 children respectively with 149,882 Pregnant and Lactating Women (PLW)..

Conflict and Internal Displaced

Since 2009, Hajjah was affected by the conflict in the neighbor governorate, Sa'ada during the 6th war between the government and Houthis group during while thousands of Internally Displace Persons (IDPs) left their homelands in Sa'ada to stay in many settlements in Hajjah and Amran governorates. In 2012, new conflict raised within some of Hajjah districts between tribes living in these districts and Houthis groups which was resulted in new internally displacement to other districts. In October 2017, 2,014,026 individuals (335,671 households) remained in displacement as a result of the conflict in Yemen across 21 governorates; half are displaced in just four governorates; Hajjah, Taizz, Amanat Al Asimah and Amran, with Hajjah governorate receiving 376,027 persons.[6]

1.1. Rationale of the Survey

ACF with the funding from UN OCHA carried out a SMART Survey in Hajjah governorate. The purpose of conducting the survey was to provide up to date information on the nutrition and mortality situation in the governorate with the information used to inform the humanitarian response plan. The survey was conducted in coordination with Governorate Health Office (GHO) of Hajjah.

1.2. Survey Objectives

Overall Objective

The **overall objective** of the survey was to assess the nutrition situation in Highlands and Lowlands of Hajjah together with key determinants of Nutrition, Health and Food Security Situation and provide key recommendations.

Specific Objectives

The **specific objectives** of the survey were:

- To determine the prevalence of malnutrition among the children aged 6-59 months (Acute, Chronic and Underweight)
- To estimate the retrospective crude and under-five mortality rates,

[5]Hajjah national health typography survey and SMART Survey 2015

[6] Task Force on Population Movement (TFPM) Yemen, 16th Report, October 2017

- To estimate the 2 weeks' retrospective morbidity (diarrhea, acute respiratory illnesses, and fever) among children under five years,
- To estimate the vaccination coverage of Penta3 (6-59m), Measles (9-59m) and Vitamin A supplementation (6-59m) in the past 6 months,
- To assess Infant and Young Child Feeding (IYCF) Practices among 0-23months (EBF, continued breastfeeding, MDDs, MMF, MAD),
- To estimate the prevalence of acute malnutrition among the PLWs using Mid-Upper Arm Circumference (MUAC),
- To determine household Food Consumption Score,
- To assess household WASH practices (drinking water source, water storage, drinking water treatment, hand washing, and latrine,
- To present recommendations based on the survey result for planning and decision making.

2. SURVEY METHODOLOGY

2.1. Survey date

The survey team training was conducted from 3rd to 8th of March 2018 followed by data collection from 10th **to** 22nd of the same month.The survey was conducted in collaboration with MOPHP Hajjah (GHO) and national levels, and with technical and financial support from ACF.
The survey data collection was done by six teams, six supervisors while daily data entry was done by a data entry team of four. The survey was managed by one overall survey Manager from GHO, supported by ACF technical team.

2.2. Survey Area

The survey was conducted in Hajjah Governorate covering 28 districts, out of 31; in two ecological zones; Highlands (mountainous) and Lowlands (costal), each livelihood zone was considered an independent survey stratum.

Due to the current war in Yemen and the location of Hajjah governorate at the border line with Saudi Arabia Kingdom, 3 districts have been excluded (Bakeel Almeer , Haradh and Meedy) as being considered highly risky areas. In addition some sub-districts and villages were excluded from the sampling frame due to; 1) villages considered as unreachable and 2) villages considered as risky (See Annex 1), due to the experience of SMART survey conducted in 2015, in which the survey teams had experienced violent reaction from the communities in some villages.

2.3. Survey design

A two-stage cluster sampling methodology was used following SMART methodology. The first stage was involving random selection of the clusters using ENA for SMART software, the villages were considered as the smallest geographical unit. In the second stage, random selection of households within clusters was done using the random number tables. Modified EPI method was used to select the households; apart from two villages in Lowlands where an exhaustive list of households was made with help of residents

2.4. Survey population

The CSO population statistics 2004 was used as the population references. The population projection 2017 is calculated based on Yemen Central Statistics Office's 2004; the increase in the population between 2004 and 2017 is calculated using the yearly growth rate per district (Annex 2). The Hajjah GHO agreed the IDP population in the population projection was not accurate thus, population from the affected districts of Harradh, Midi and Bakeel-almeer were considered equal to the IDPs in Hajjah governorate and then distributed among the whole districts based on ratio of 40% rural and 60% urban areas as advised by the Assessment Working Group (AWG) prior to the methodology validation.

2.5. Sample size

The sample size was determined using ENA for SMART software, July 9th 2015 version, for both anthropometry and mortality survey. Before implementing the survey, relevant secondary information were collected to determine the expected malnutrition prevalence of under-five year old (U5) children and the CMR of the population. Three parameters were taken into account to calculate sample size for anthropometry: (1) Anticipated malnutrition prevalence, (2) The design effect and (3) the precision. The SMART software has automatically calculated the number of houses to be visited during the survey and by the number of children surveyed. The parameters used to calculate sample size are shown in table 3.

Table 3: Sample size calculation for anthropometric and retrospective mortality survey for Lowlands and Highlands Livelihood zones

	Lowlands		Highland	
Parameters/values	Anthropometric (6-59 months)	Mortality (HH members)	Anthropometric (6-59 months)	Mortality (HH members)
Estimated prevalence (GAM prevalence)	25.8 %[7]	0.33	13.2%	0.53
±desired precision	5[8]	0.3[9]	3.5	0.3
± design effect	1.68	1.5[10]	1.5	1.5
Recall period in days		100		100
% of U5 children	18.6%[6]		18.6	
Average household size	7[6]	7	7	7
%of non-responsive household	3%[11]	3	3%	3%
Sample	538 (473 HH)	2300 (339 HH)	587 (516 HH)	3694 (544 HH)

7 Hajjah SMART survey September 2015

[8] Based on SMART guideline precision for the anticipated prevalence

[9] SMART guideline (Based on the estimated death rate)

[10] Adjusted from the 2015 DEFF of 1.00

[11] Experience from past survey

To select the sample size the team used the higher of the two (Anthropometric sample size and Mortality). For Lowlands, 473 households was selected because it was higher than 339 for mortality. In the Highlands livelihood zone sample size for mortality was higher than anthropometry thus mortality sample size was chosen (table 3).

In table 4, below, the households to be visited in the Highlands was not 544 as in table 3. The initial planning was done with the mortality recall of 93 days which derived 585 households. During the training the team identified the recall event which fell on the 100th day as recall thus affecting the sample from 585 to 544 households. The team agreed that since the clusters had been selected based on the previous recall period and that the current sample did not reduce the sample size significantly, the initial sampled clusters which had received security clearance has been used. This was communicated to the Technical Committee.

The number of clusters to be surveyed per livelihood zone was derived from dividing the number of households the team could comfortably complete per cluster per day (based on experience and the distribution of households) by the calculated household sample size as illustrated in table 4. Clusters were sampled using probability proportional to population size (PPS).

Table 4: Determining the number of clusters to be visited.

Livelihood zone	Number of households to be visited	Number of households per cluster	Calculation	Number of clusters
Lowlands	473	13	473/13=37	37
Highlands	585	15	585/15=39	39

Due to the high population in some villages, segmentation has been done some clusters before going to the field. In Highlands, the survey teams has done segmentation for 8 clusters.

The survey collected information among children aged 0-59 months and women in reproductive age (15-49 years), 6-59 months children were considered for the anthropometric measurement (weight, oedema, height/length and MUAC), 0-6 month's children for weight only, 0 to 23 months for IYCF and women 15-49 for MUAC. The entire population were targeted for Crude Mortality Rate (CMR) and under five mortality rate. WASH practices and household food security were assessed in all households.

2.6. Training and data collection.

The survey training was conducted in Hajjah from 3rd to 8th March 2018. Training the teams is essential to improve the validity and reliability of nutrition survey. The team was trained adequately to avoid data collection errors that could lead to inaccurate measurements which can have a very large effect on survey results, including affecting the prevalence of malnutrition of the study area.
Data collection started on 10th March to 22nd March 2018, in two phases: Lowlands zone in the 1st phase and Highlands zone in the 2nd phase.

2.7. Case Definitions and inclusion Criteria

Anthropometry

Acute malnutrition (Weight-for-height Z score (WHZ))

Acute malnutrition in children 6-59 months can be expressed by using two indicators: Weight-for Height (WHZ) or Mid-Upper Arm Circumference (MUAC) as described below. A child's nutritional status is estimated by comparing it to the WHZ curves of a reference population (WHO standards data[12]). These curves have a normal shape and are characterized by the median weight (value separating the population into two groups of the same size) and its standard deviation (SD) (**table 5**). During the field data collection, the WHZ was calculated for each child using z-score chart in order to refer malnourished cases to appropriate center for management as in table 5

Table 5: Weight-for-height (WHZ), children 6-59 months (WHO 2006)

	Weight-for-height index (W/H)	Nutritional status
Children 6-59 months	≥ -2 z-score	Adequate nutrition status
	-3 z-score ≤ H/A < -2 z-score	Moderate acute malnutrition
	< -3 z-score . ≥ -2 z-score and/or oedema -3 z-score ≤ H/A < -2 z-score and/or oedema	Severe acute malnutrition

Chronic malnutrition (Height-for-age Z score (HAZ))

The HAZ measure indicates if a child of a given age is chronically malnourished (stunted). This index reflects the nutritional history of a child rather than his/her current nutritional status. The same principle is used as for WHZ; except that a child's chronic nutritional status is estimated by comparing its height with WHO standards height-for-age curves, as opposed to weight-for-height curves. The height-for-age index of a child from the studied population is expressed in Z-score (HAZ). The HAZ cut-off points are presented in table 6

Underweight (weight-for-age Z score (WAZ))

Underweight indicates the weight of the child compared to his age. It is expressed by the Weight-for-Age index and in Z-scores of WHO Standards (2006). The **table 6** below show underweight classes with their cut-off points.

Table 6: Cut offs points of the Height for Age index (HAZ) and Weight for Age (WAZ) expressed in Z-score, WHO standards

	Stunting (Height for Age -HAZ)	Underweight (Weight for Age-WAZ)
Normal	≥ -2 z-score	≥ -2 z-score
Moderate	-3 z-score ≤ H/A < -2 z-score	-3 z-score ≤ W/A < -2 z-score
Severe	< -3 z-score	< -3 z-score

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

Mid-Upper Arm Circumference (MUAC)

The mid-upper arm circumference does not need to be related to any other anthropometric measurement. It is a reliable indicator of the muscular status of the child and is mainly used to identify children with a risk of mortality. In the field the criterion below was used to determine the status of children and appropriate referrals done based on the respective cut-offs (**table 7**).

Numerous studies have shown that mid-upper arm circumference (MUAC) correlates well with body mass index (BMI) in adult populations. However, globally applicable MUAC cutoffs have not been established to classify undernutrition among adults. Increasingly, MUAC is being used to assess nutritional status and to determine eligibility for services among adults, especially in people living with HIV and/or tuberculosis. Many countries and programs have established their own MUAC cutoffs to determine eligibility for program services, but there is limited evidence supporting these cutoffs and it is not known whether the cutoffs are optimal[13].

Table 7: Cut offs points of MUAC, children 6-59 months (WHO 2006) and Women of reproductive age 15-49 Years (FANTA 2017)

Target group	MUAC (mm)	Nutritional status
Children 6-59 months	> or = 125	Adequate nutrition status
	< 125 and > or = 115	Moderate acute malnutrition
	< 115	Severe acute malnutrition
Women of child bearing age 15-49 years	>210	Adequate nutrition status
	>180<210	Moderate acute malnutrition
	< 180	Severe acute malnutrition

Nutritional bilateral pitting oedema

Nutritional bilateral pitting oedema is one of the most severe clinical forms of severe acute malnutrition. In the field children with bilateral oedema was automatically categorized as being severely malnourished, regardless of their WHZ.

Mortality

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

Crude death rate (CDR)

Number of persons in the total population that dies over a defined period of time.

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

Under-5 death rate (U5DR)

The probability for those children aged 0-5 years to die during a specific time interval. Calculated as:

[13] FANTA, 2016, Determining a Global Mid-Upper Arm Circumference Cutoff to Assess Underweight in Adults (Men and non- pregnant Women)

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

Health

Immunization status, deworming and vitamin A supplementation

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

Morbidity

Mothers/caregivers of children were asked if children had experienced an illness in the past 14 days prior the day of the survey. ARI, fever (elevated body temperature) and diarrhoea (any episode of more than 3 stools in 24 hours (bloody or not) was recorded when symptoms according to the case definition are described by the caregiver.

Water Sanitation and Hygiene (WASH)

Drinking water access

The respondents were asked about the source of drinking water and distance taken to reach the source. The distance to water, or time to collect water, is often the main constraint of access to water, and associated with the quantity of water used

Water storage

The respondents were asked what type of container they use for storing drinking water and inspect the cleanness of the container.

Hand washing practices and availability of toilet Facilities

The mothers were asked on what occasions they wash their hands and also what they use to wash their hands to determine the hand washing practices and check the availability and types of toilet facilities used in the surveyed area.

IYCF

The IYCF indicators used in the measurement of IYCF practices asked to the mothers/caregivers of children aged 0-23 months are as follows:

- **Child ever breastfed:** Proportion of children who have ever received breast milk.
- **Exclusive breastfeeding under 6 months:** Proportion of infants (0-5) months of age who are fed exclusively with breast milk.
- **Continued breastfeeding at 1 year:** Proportion of children (11-12) months of age who are fed with breast milk.
- **Minimum Dietary Diversity Score:** Proportion of 6-23 months children consumed minimum 4 food groups in the last 24 hours.
- **Continued breastfeeding at 2 years:** Proportion of children (20–23) months of age who are fed breast milk.

Food Security

Household dietary diversity: defined as the number of unique foods consumed by household members over a given period, has been validated to be a useful approach for measuring household food access. There was noted difference in the tool capturing the food groups eaten by the household with the standard quid line. There is need to harmonize the tool further to avoid confusion.

Food consumption score (FCS): The FCS is a composite score based on dietary diversity, food frequency, and relative nutritional importance

Coping strategy index (CSI): CSI is a tool is commonly used as a proxy indicator for access to food. It is a weighted score that allows one to measure the frequency and severity of coping strategies.
The tool used to collect data on coping strategy missed one form of coping mechanism thus 11 coping mechanisms were collected unlike the standard 12 coping mechanism. There is need to harmonize the tool to capture the require indicators.

2.8. Data Analysis

Before analysis data was checked for: completeness, consistency and range before by the SMART Survey focal person. Data verification and cleaning process were conducted, whereby data capture and errors have be corrected or not included for analysis. Anthropometric analysis was performed using ENA for SMART, Cross tabulations were done and the results were presented in a tabular format in terms of gender and age groups.

3. SURVEY RESULTS

3.1. Survey population characteristics

At the end of the data collection period all sampled clusters in both Highlands and Lowlands were surveyed, with data collected from 477 and 575 households in Lowlands and Highlands livelihood respectively with the number of children and women measured as summarized in table 8.

Table 8: Summary of survey outputs

	Lowlands livelihood zone	Highlands Livelihood zone
Households surveyed	477	576
Children 6-59 months all	490	662
Children 6-59 months measured	485	656
Children 0-5 months all	57	95
Children 0-5 months measured	57	94
Women 15-49 years	799	1037
Number of Households mortality was taken	477	576

The Survey also collected mortality data from which household level population was analyzed. In population pyramids shown in figure 2

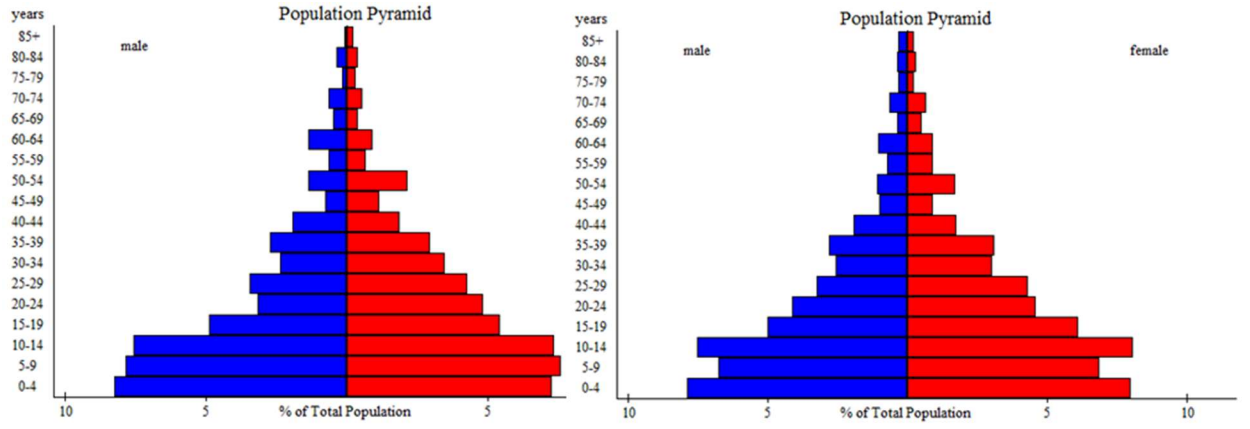

Figure 2: Population distribution Hajjah Lowland (Left), Highland (Right)

Household characteristics

The survey results shows most household male headed with above 97 percent of households in both stratum being male headed. The results also paints a high level of illiteracy among caregivers with 88 % and 70% illiteracy levels for lowland and highlands respectively. Other demographic characteristics are shown in table 9.

Table 9 : Household demographic characteristics for lowland and Highland livelihood zone.

	Lowland Livelihood Zone		Highlands Livelihood Zone	
Head of Households	N	%	N	%
Husband	465	97%	565	98%
Mother	12	3%	11	2%
Education level of Caregiver				
Illiterate	419	88%	401	70%
Read and Write	36	8%	68	12%
Basic education	7	1%	33	6%
Secondary Education	13	3%	58	10%
Higher Education	0	0%	16	3%

3.2. Anthropometric results

The number of children 6-59 months included in the sample were 490 and of 662 children in Lowlands and Highlands livelihood zones respectively. This represented 91.1 % and 112.8 % of the planned children in two livelihoods respectively. The sex ratio was within the accepted ratio of around 1, in both livelihood zone as shown in tables 10 and 11 below.

Table 10: age and sex distribution Lowland zone: age and sex distribution

	Boys		Girls		Total		Ratio
Age (months)	**no.**	**%**	**no.**	**%**	**no.**	**%**	**Boy: Girl**
6-17	55	51.9	51	48.1	106	21.6	1.1
18-29	65	50.4	64	49.6	129	26.3	1.0
30-41	64	53.8	55	46.2	119	24.3	1.2
42-53	57	62.0	35	38.0	92	18.8	1.6
54-59	23	52.3	21	47.7	44	9.0	1.1
Total	264	53.9	226	46.1	490	100.0	1.2

Table 11: Highland Livelihood zone age and sex distribution

	Boys		Girls		Total		Ratio
AGE (mo)	**no.**	**%**	**no.**	**%**	**no.**	**%**	**Boy:Girl**
6-17	71	49.7	72	50.3	143	21.6	1.0
18-29	90	54.2	76	45.8	166	25.1	1.2
30-41	81	53.6	70	46.4	151	22.8	1.2
42-53	62	43.1	82	56.9	144	21.8	0.8
54-59	29	50.0	29	50.0	58	8.8	1.0
Total	333	50.3	329	49.7	662	100.0	1.0

3.2.1. Acute malnutrition rates based on WHO standards (2006)

The GAM is defined as <-2 z scores weight-for-height (WHZ) and/or oedema, SAM is defined as <-3z scores weight-for-height and/or oedema). he results are presented with exclusion of z-scores from observed mean (SMART flags): WHZ -3 to 3; for the purposes of this report, the prevalence of malnutrition is presented according to WHO 2006 Growth Standards. There was no cases of oedema in both strata. Thus, the rates of acute malnutrition were only made of wasted children. The analysis of acute malnutrition included data from 485 and 656 children 6-59 months in lowland and Highlands's zones respectively. The Combined GAM and SAM among children 6-59 months based on WHZ and or MUAC (mm) is shown in table 12.

Table 12 : Prevalence of combined Acute Malnutrition based on WHZ and MUAC

Combine Indicator	Prevalence Lowlands	Prevalence Highlands
Global Acute Malnutrition (<-2 z-score and/or oedema and/or < 125 mm)	17.2% (14.0 - 20.9 95% CI)	12.6% (10.1-15.4 9.5 95%CI)
Moderate Acute Malnutrition (WHZ ≥-3 and <-2)and/or < 115 mm)	13.9% (10.9 - 17.3 95% CI)	11.3 % (9.0 -14.0 95%CI)
Severe Acute Malnutrition (<-3 z-score and/or oedema and/or < 115 mm)	3.3% (1.9 - 5.3 95% CI)	1.2 % (0.5 - 2.4 95% CI)

The malnutrition rate by GAM and Severe acute Malnutrition (SAM) based on WHZ in Lowlands and Highlands livelihood zones was 14.9 % (11.8 – 18.8 95% C.I.) and 2.3 % (1.3 – 4.0 95% C.I.) for lowlands while in the Highlands was 8.9 %(6.5 – 12.1 95% C.I.), and 0.8 %(0.3 – 2.1 95% C.I.) , as in tables 13 and 14.

The results indicate a significant difference in GAM and MAM between boys and girls in both livelihood zones with respective p-values; the distribution of measurements is shown in figure 3.

Table 13: Prevalence of acute malnutrition based on weight-for-height z-scores (and/or oedema) and by sex in Lowlands livelihood zone

	All n = 482	**Boys** n = 257	**Girls** n = 225	**P-value**
Prevalence of global malnutrition (<-2 z-score and/or oedema)	(72) 14.9 % (11.8 - 18.8 95% C.I.)	(49) 19.1 % (14.3 - 25.0 95% C.I.)	(23) 10.2 % (7.2 - 14.3 95% C.I.)	0.006
Prevalence of moderate malnutrition (<-2 z-score and >=-3 z-score, no oedema)	(61) 12.7 % (9.6 - 16.5 95% C.I.)	(42) 16.3 % (11.8 - 22.2 95% C.I.)	(19) 8.4 % (5.5 - 12.8 95% C.I.)	0.012
Prevalence of severe malnutrition	(11) 2.3 % (1.3 - 4.0 95% C.I.)	(7) 2.7 % (1.3 - 5.8 95%	(4) 1.8 % (0.7 - 4.7 95%	0.483

(<-3 z-score and/or oedema)		C.I.)	C.I.)	

The prevalence of oedema is 0.0 %

Table 14: Prevalence of acute malnutrition based on weight-for-height z-scores (and/or oedema) and by sex in Highlands livelihood zone.

	All n = 652	**Boys** n = 328	**Girls** n = 324	**P-Value**
Prevalence of global malnutrition (<-2 z-score and/or oedema)	(58) 8.9 % (6.5 - 12.1 95% C.I.)	(38) 11.6 % (7.9 - 16.6 95% C.I.)	(20) 6.2 % (3.8 - 10.0 95% C.I.)	0.042
Prevalence of moderate malnutrition(<-2 z-score and >=-3 z-score, no oedema)	(53) 8.1 % (6.0 - 10.9 95% C.I.)	(35) 10.7 % (7.4 - 15.1 95% C.I.)	(18) 5.6 % (3.3 - 9.1 95% C.I.)	0.032
Prevalence of severe malnutrition (<-3 z-score and/or oedema)	(5) 0.8 % (0.3 - 2.1 95% C.I.)	(3) 0.9 % (0.3 - 2.8 95% C.I.)	(2) 0.6 % (0.2 - 2.5 95% C.I.)	0.610

The prevalence of oedema is 0.0 %

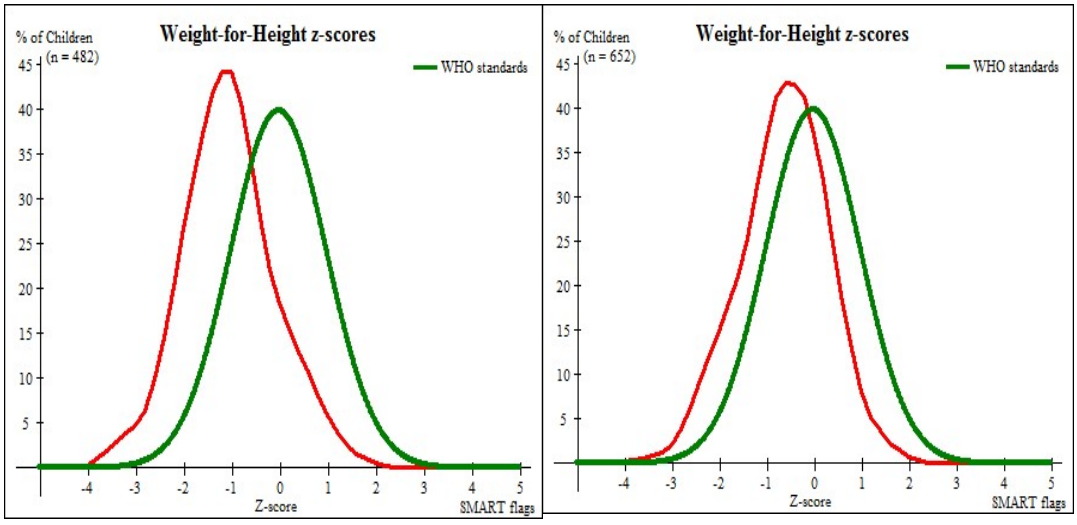

Figure 3 : Observed distribution (WHZ) for Lowlands (Left) and Highlands (Right)

3.2.2. Acute malnutrition based on MUAC cut-offs and/or oedema

Acute malnutrition based on MUAC cut-offs and/or oedema in both strata is shown in (tables 15 and 16) with results indicating, highlands more affected than lowlands. The GAM prevalence of by MUAC for Highlands compares with GAM by weight for height. The results show no significant difference in malnutrition between sexes;

Table 15: Prevalence of acute malnutrition based on MUAC cut off's (and/or oedema) and by sex in Lowlands

	All n = 485	**Boys** n = 260	**Girls** n = 225	**P-values**
Prevalence of global malnutrition (< 125 mm and/or oedema)	(27) 5.6 % (3.5 - 8.7 95% C.I.)	(13) 5.0 % (2.6 - 9.4 95% C.I.)	(14) 6.2 % (3.6 - 10.6 95% C.I.)	0.601
Prevalence of moderate malnutrition (< 125 mm and >= 115 mm, no oedema)	(20) 4.1 % (2.4 - 7.0 95% C.I.)	(10) 3.8 % (1.8 - 7.8 95% C.I.)	(10) 4.4 % (2.3 - 8.5 95% C.I.)	0.753
Prevalence of severe malnutrition (< 115 mm and/or oedema)	(7) 1.4 % (0.7 - 3.1 95% C.I.)	(3) 1.2 % (0.4 - 3.5 95% C.I.)	(4) 1.8 % (0.7 - 4.6 95% C.I.)	0.571

Table 16 : Prevalence of acute malnutrition based on MUAC cut off's (and/or oedema) and by sex in Highlands

	All n = 656	**Boys** n = 330	**Girls** n = 326	**P-value**
Prevalence of global malnutrition (< 125 mm and/or oedema)	(48) 7.3 % (5.3 - 10.1 95% C.I.)	(21) 6.4 % (4.0 - 10.1 95% C.I.)	(27) 8.3 % (5.4 - 12.4 95% C.I.)	0.405
Prevalence of moderate malnutrition (< 125 mm and >= 115 mm, no oedema)	(43) 6.6 % (4.7 - 9.1 95% C.I.)	(17) 5.2 % (3.2 - 8.3 95% C.I.)	(26) 8.0 % (5.1 - 12.3 95% C.I.)	0.195
Prevalence of severe malnutrition (< 115 mm and/or oedema)	(5) 0.8 % (0.3 - 1.8 95% C.I.)	(4) 1.2 % (0.5 - 3.1 95% C.I.)	(1) 0.3 % (0.0 - 2.3 95% C.I.)	-

3.2.3. Chronic malnutrition expressed in Height-for-Age z-scores (WHO 2006)

Chronic malnutrition is a manifestation of long term effect of malnutrition where children affected are shorter for their age. The survey results indicated very high chronic malnutrition rates of above 50% with lowland at 53.3% (47.9-58.7 95% CI) and Highlands at 55.2% (50.2-60.1 95% CI) which is above the 40 percent WHO classification threshold for very high prevalence (tables 17 and 18).

The results further indicated no significant difference in stunting among sexes in all livelihood zones except moderate stunting in Lowlands which can be attributes to low number of girls compared with boys. The distribution of chronic malnutrition among children in both livelihood zones is shown in figure 4.

Table 17 : Prevalence of stunting based on height-for-age z-scores and by sex in Lowlands

	All n = 478	Boys n = 256	Girls n = 222	p-values
Prevalence of stunting (<-2 z-score)	(255) 53.3 % (47.9 - 58.7 95% C.I.)	(148) 57.8 % (51.0 - 64.3 95% C.I.)	(107) 48.2 % (41.0 - 55.4 95% C.I.)	0.052
Prevalence of moderate stunting (<-2 z-score and >=-3 z-score)	(172) 36.0 % (31.0 - 41.3 95% C.I.)	(104) 40.6 % (33.8 - 47.8 95% C.I.)	(68) 30.6 % (24.4 - 37.7 95% C.I.)	0.039
Prevalence of severe stunting (<-3 z-score)	(83) 17.4 % (13.7 - 21.7 95% C.I.)	(44) 17.2 % (12.6 - 23.0 95% C.I.)	(39) 17.6 % (12.5 - 24.0 95% C.I.)	0.918

Table 18: Prevalence of stunting based on height-for-age z-scores and by sex in Highlands

	All n = 645	Boys n = 324	Girls n = 321	P-value
Prevalence of stunting (<-2 z-score)	(356) 55.2 % (50.2 - 60.1 95% C.I.)	(187) 57.7 % (51.6 - 63.6 95% C.I.)	(169) 52.6 % (46.5 - 58.8 95% C.I.)	0.233
Prevalence of moderate stunting (<-2 z-score and >=-3 z-score)	(220) 34.1 % (30.1 - 38.4 95% C.I.)	(107) 33.0 % (28.2 - 38.2 95% C.I.)	(113) 35.2 % (30.1 - 40.6 95% C.I.)	0.543
Prevalence of severe stunting (<-3 z-score)	(136) 21.1 % (16.7 - 26.3 95% C.I.)	(80) 24.7 % (18.7 - 31.8 95% C.I.)	(56) 17.4 % (12.7 - 23.6 95% C.I.)	0.085

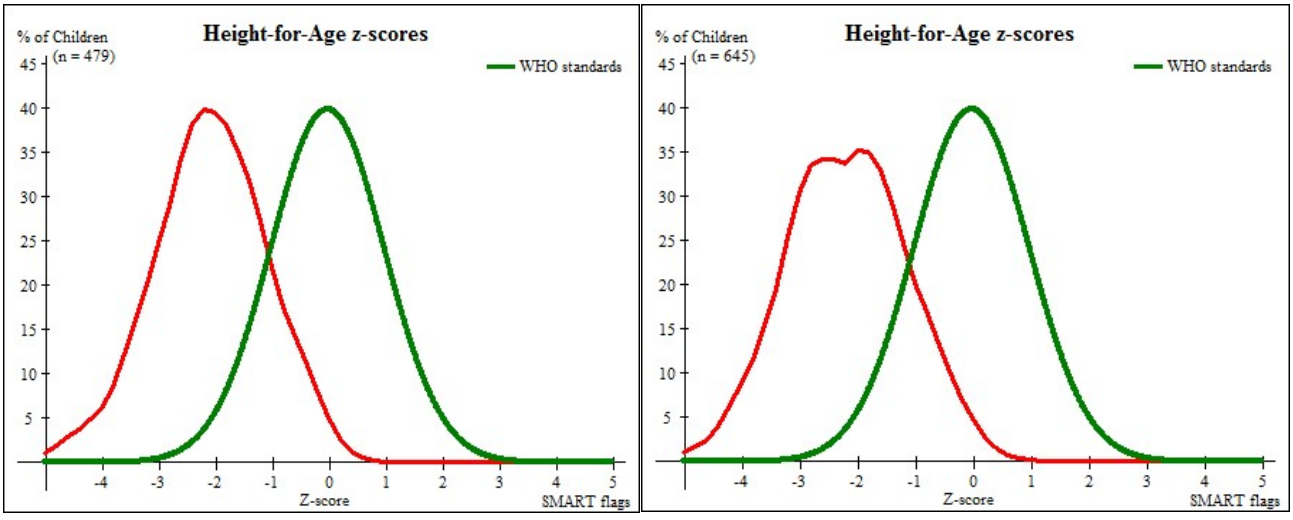

Figure 4: Observed distribution (HAZ) for Lowlands (Left) and Highlands (Right)

3.2.4. Underweight malnutrition expressed in Weight-for-Age z-scores (WHO 2006)

Underweight, based on weight for-age, is a composite measure of stunting and wasting and is recommended as the indicator to assess changes in the magnitude of malnutrition over time[14]. The survey results indicated that underweight in Lowlands was at 44.2% (38.4-50.1 95% CI) with the prevalence of severe underweight 11.2% (8.7-14.3 95% CI). In Highlands, the prevalence was 35.6% (31.3-40.1 95% CI), severe underweight 8.1% (5.9-11.0 95% CI). The results further show no significant difference of moderate malnutrition between sexes as shown in table 19 and 20. The distribution of underweight among children in the two livelihood zones is shown in figure 5.

Table 19: Prevalence of underweight based on weight-for-age z-scores by sex in Lowlands

	All n = 482	**Boys** n = 258	**Girls** n = 224	**P-Vavue**
Prevalence of underweight (<-2 z-score)	(213) 44.2 % (38.4 - 50.1 95% C.I.)	(122) 47.3 % (40.9 - 53.8 95% C.I.)	(91) 40.6 % (32.9 - 48.9 95% C.I.)	0.191
Prevalence of moderate underweight (<-2 z-score and >=-3 z-score)	(159) 33.0 % (28.3 - 38.0 95% C.I.)	(88) 34.1 % (28.7 - 40.0 95% C.I.)	(71) 31.7 % (24.9 - 39.4 95% C.I.)	0.633
Prevalence of severe underweight (<-3 z-score)	(54) 11.2 % (8.7 - 14.3 95% C.I.)	(34) 13.2 % (9.7 - 17.7 95% C.I.)	(20) 8.9 % (5.6 - 13.9 95% C.I.)	0.129

Table 20: Prevalence of underweight based on weight-for-age z-scores by sex in Highlands

	All n = 652	**Boys** n = 328	**Girls** n = 324	**P-Value**
Prevalence of underweight (<-2 z-score)	(232) 35.6 % (31.3 - 40.1 95% C.I.)	(129) 39.3 % (33.6 - 45.3 95% C.I.)	(103) 31.8 % (26.1 - 38.0 95% C.I.)	0.075
Prevalence of moderate underweight (<-2 z-score and >=-3 z-score)	(179) 27.5 % (24.3 - 30.8 95% C.I.)	(100) 30.5 % (25.2 - 36.3 95% C.I.)	(79) 24.4 % (20.6 - 28.6 95% C.I.)	0.078
Prevalence of severe underweight (<-3 z-score)	(53) 8.1 % (5.9 - 11.0 95% C.I.)	(29) 8.8 % (6.3 - 12.3 95% C.I.)	(24) 7.4 % (4.1 - 12.9 95% C.I.)	0.586

[14] PubMed 2017, Prevalence of malnutrition and associated factors in children aged 6–59 months among rural dwellers of damot gale district, south Ethiopia: community based cross sectional study

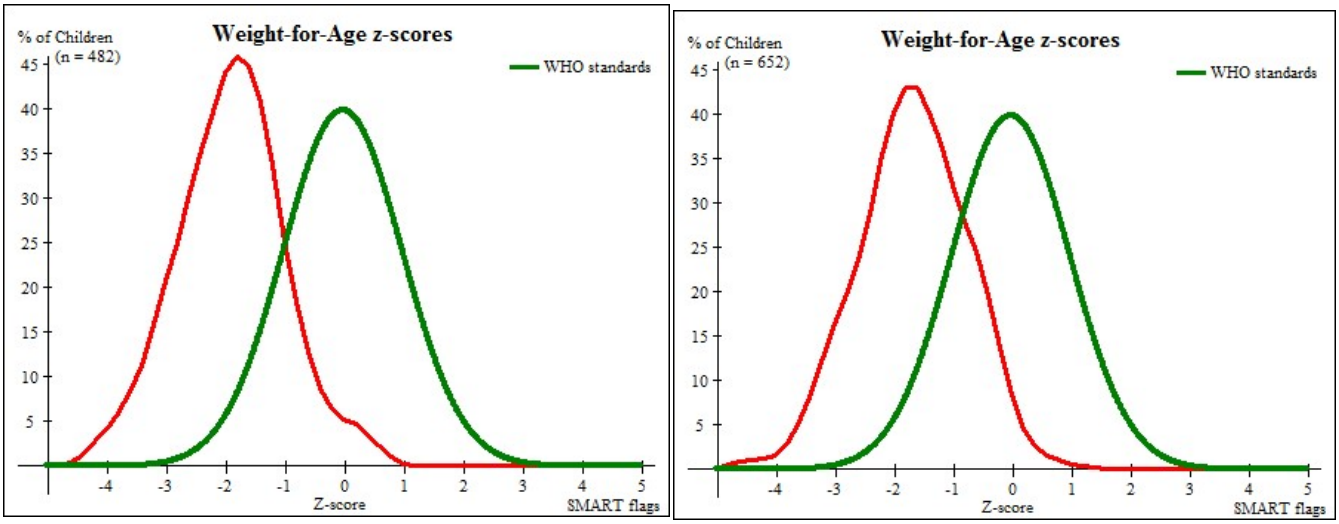

Figure 5 : Observed distribution (WAZ) for Lowlands (Left) and Highlands (Right)

3.2.5. Underweight for children 0-5 months.

Weight for children less than six months was taken by the survey team. This was as a results of the technical committee input to have this specific cohort measured for their weight only, which was then used to determine their underweight status. The results indicated a high underweight prevalence in Lowlands with 35.7 %(25.1 - 47.9 95% C.I.), while Highlands had a prevalence 16.3 %(9.0 - 27.6 95% C.I.), as in table 21 and 22.

Table 21: Prevalence of underweight for children 0-5 months in Lowlands Livelihood zone

	All ,n=56	Boys,n=29	Girls, N=27
Prevalence of underweight (<-2 z-score)	(20) 35.7 %(25.1 - 47.9 95% C.I.)	(12) 41.4 %(25.1 - 59.7 95% C.I.)	(8) 29.6 %(15.8 - 48.6 95% C.I.)
Prevalence of moderate underweight(<-2 z-score and >=-3 z-score)	(13) 23.2 %(13.2 - 37.5 95% C.I.)	(7) 24.1 %(10.0 - 47.6 95% C.I.)	(6) 22.2 %(10.9 - 39.9 95% C.I.)
Prevalence of severe underweight(<-3 z-score)	(7) 12.5 %(6.6 - 22.4 95% C.I.)	(5) 17.2 %(7.6 - 34.5 95% C.I.)	(2) 7.4 %(1.9 - 25.1 95% C.I.)

Table 22: Prevalence of underweight for children 0-5 months Highlands Livelihood zone

	All n = 92	Boys n = 43	Girls, ,n = 49
Prevalence of underweight (<-2 z-score)	(15) 16.3 %(9.0 - 27.6 95% C.I.)	(8) 18.6 %(8.8-35.2 95% C.I.)	(7) 14.3 %(5.4 - 32.8 95% C.I.)
Prevalence of moderate underweight(<-2 z-score and >=-3 z-score)	(6) 6.5 %(3.0 - 13.8 95% C.I.)	(2) 4.7 %(1.1 - 17.5 95% C.I.)	(4) 8.2 %(3.0 - 20.3 95% C.I.)
Prevalence of severe underweight(<-3 z-score)	(9) 9.8 %(5.3 - 17.3 95% C.I.)	(6) 14.0 %(6.4 - 27.8 95% C.I.)	(3) 6.1 %- 18.4 95% C.I.)

3.2.6. Nutrition Status for women of reproductive age 15-49 years

The survey team measured the nutrition status of women of reproductive age 15-49 years by use of MUAC tapes. A total of 780 and 991 women were measured in the Lowlands and Highlands livelihood zone respectively with results shown in table 23.

Table 23 : Malnutrtion prevalence of women of reproductive age 15-49 years and PLW

	Lowland Livelihood zone N=780	Highland Livelihood Zone N=991
Prevalence of acute malnutrition All Women (< 210 mm)	18.5 % (15.8- 21.4 95% C.I.) (n=144, N=780)	9.7 % (7.9 –11.7 95% C.I.) (n=96, N=991)
Prevalence of acute malnutrition PLW(< 210 mm)	20.2% (15.3 – 25.8 95% C.I.) (n=48, N=238)	9.1 % (6.2- 12.8 95% C.I.) (n=30, N=329)

3.3. Retrospective Mortality Results

Crude mortality rate and under five mortality rate are estimated at 0.36 (0.18-0.71, 95% CI) and 0.37 (0.09-1.52 95% CI) and 0.26 (0.15-0.45, 95% CI) and 0.00 (0.00-0.00, 95% CI) for both Lowlands and Highlands respectively (Table 16). In Both CMR and U5MR were below the emergency threshold of above 1 person/10,000/day and 2 children/10,000/day for CMR and U5MR respectively as in table 24.

Table 24 : Retrospective Mortality Results

	Lowlands	Highlands
Total Number of Households	477	576
Total Number of HHs with children U5	329	417
Average household size	6.9	7.8
Mid interval Population Size	3373	4663
Percentage of children under five	18.1	18.9
Birth Rate	0.89	1.22
In-migration Rate (Joined)	11.18	13.02
Out-Migration Rate (Left)	13.02	21.4
Crude Death Rate (95% CI)	0.36 (0.18-0.71)	0.26 (0.15-0.45)
Under Five Death Rate (95% CI)	0.37 (0.09-1.52)	0.00 (0.00-0.00)

3.4. Child Morbidity

Illness data were collected from children 0-59 months of age for a recall period of 14 days prior the survey. Analysis of morbidity in the two livelihood zones showed 54.7% and 61.3% of assessed children had more than one cause of morbidity out of the three in the Lowlands and highland respectively. The prevalence of specific diseases and comparison per livelihood zone is shown in Figure 6

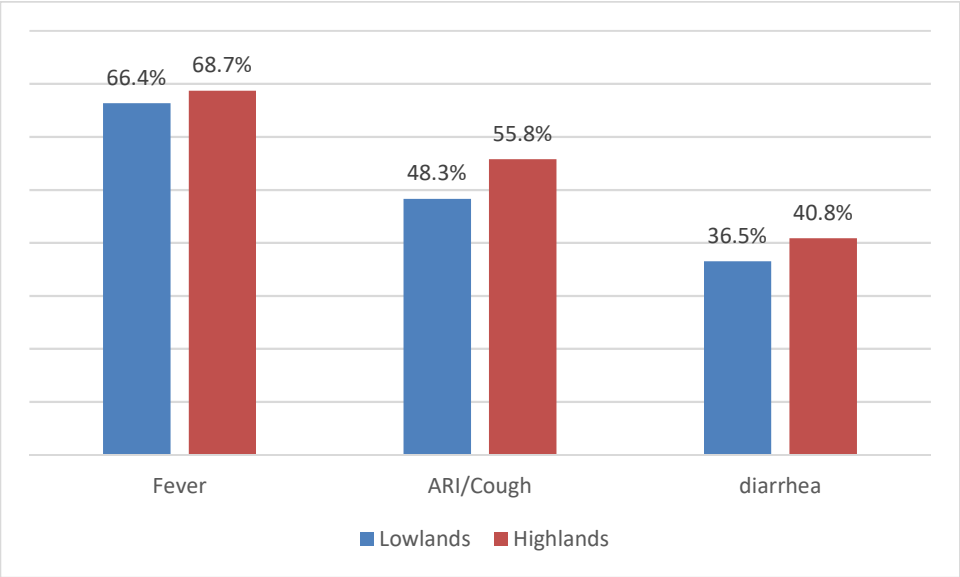

Figure 6: Morbidity prevalence among children 0-59 months (14 day recall)

3.5. Supplementation and vaccination coverage

The survey results indicated a low vitamin A supplementation coverage in the two livelihood zones, while Pentavalent and measles vaccination coverage were high at above 70% in all livelihood zones as in table 25.

Table 25: Vitamin A Supplementation and Vaccination coverage

Antigen	Lowland	Highland
Vitamin A	44.4% (n=215)	47.1% (n=295)
Pentavalent	74.7% (n=363)	70.5 (n=442)
Measles	72.1 % (n=326)	70.1% (n=413)

3.6. Infant and Young Child Feeding

Undernutrition is estimated to be associated with 2.7 million child deaths annually or 45% of all child deaths. IYCF is a key area to improve child survival and promote healthy growth and development. The first 2 years of a child's life are particularly important, as optimal nutrition during this period lowers morbidity and mortality, reduces the risk of chronic disease, and fosters better development overall. The survey analyzed exclusive breastfeeding, Continued breastfeeding at 1 year and 2 years and

complementary feeding indicators.

3.6.1. Breastfeeding Practices

The survey findings showed exclusive breastfeeding rate of 16.1% (7.6 -28.3 95% CI) and 30.1 %(21.0 – 40.5 95% CI) in Lowlands and Highlands livelihood zones respectively. The results further indicated a high prevalence of continued breastfeeding at one year, but decrease to less than 50% of children being breasted at two year, as shown in table 26.

Table 26 : Breastfeeding indicators

Indicator	Lowlands (%)	Highlands (%)
Exclusive breastfeeding (0-5 months)	17.6% (8.4 -30.9 95% CI) (n=9)	30.3 %(21.0 – 41.0 95% CI) (n=27)
Continued breastfeeding at one year (12-15 months)	89.3 % (71.8 – 97.7 95% CI) (n=25)	73.7% (56.9 -86.6 95% CI) (n=28)
Continued breastfeeding at 2 years (20-23 months)	57.6 % (39.2 - 74.5 95% CI) (n=19)	37.0% (23.2 – 52.5 95% CI) (n= 17)

3.6.2. Complementary Feeding

Complementary feeding is defined as the process starting when breast milk alone is no longer sufficient to meet the nutritional requirements of infants and young child, and therefore other foods and liquids are needed, along with breast milk. The transition from exclusive breastfeeding to family foods is a critical period of growth during which nutrient deficiencies and illnesses contribute globally to higher rates of undernutrition among children under five years of age. The survey results indicated that a low percentage of children have started complementary food on time. The introduction of solid, semi-solid or soft foods for children 6 to 8 months 66.7 % (48.7 – 80.9 95 CI) (n= 20, N=30) and 50.0% (35.2 – 64.8 95% CI) (n=20, N=40) for Lowlands and Highlands respectively.

The survey assessed the **minimum dietary diversity** for children aged 6-23 months. The finding indicated that 11.9 % (7.2 – 18.8 95% CI) (n= 15, N=126) and 9.1 % (5.6 – 14.3 95% CI) (n= 16, N=176) children 6–23 months of age received foods from 4 or more food groups during the previous day for Lowlands and Highlands respectively.

The survey also assessed the **minimum meal frequency** for children who consumed solid, semi-solid or soft food. This is an age-specific indicator and its recommended that breastfed children aged 6-8 should be fed with solid, semi-solid or soft food twice a day while those aged 9-23 months should be fed three times. The guideline further recommends, non-breastfed children 6-23 months be given solid, semi-solid or soft food four times a day including milk feeds. The finding indicated that 42.7 % (35.2 – 50.7 95% CI) and 28.4% (22.8 -34.8 95% CI children 6–23 months of age consumed solid, semi-solid or soft food the recommended times the previous day according to their age and breastfeeding status, in Lowlands and Highlands respectively. Further age-specific analysis are shown in table 27.

Table 27: Minimum meal frequency of children 6-23 months

	Lowlands	Highlands
All (children 6-23 months)	42.7 % (35.2 – 50.7 95% CI) (N=152, n=65)	28.4% (22.8 -34.8 95% CI) (N=215, n=61)
Breastfed children 6-23 months	40.2% (32.0 –48.9 95% CI) (N=127,n=51)	29.9% (23.3 – 37.5 95% CI) (N=157,n=47)
Non-breastfed children 6-23 months	56.0% (37.1– 73.4 95% CI) (N=25,n=14)	24.1% (14.9 – 36.6 95% CI) (N=58,n=14)

An analysis of food consumed by children 6-23 months in the governorates indicates a high consumption of Cereals and Tuber, Legumes and nuts. There was a low consumption of vegetables and fruits, milk and milk products, eggs and meat as shown in Fig 7.

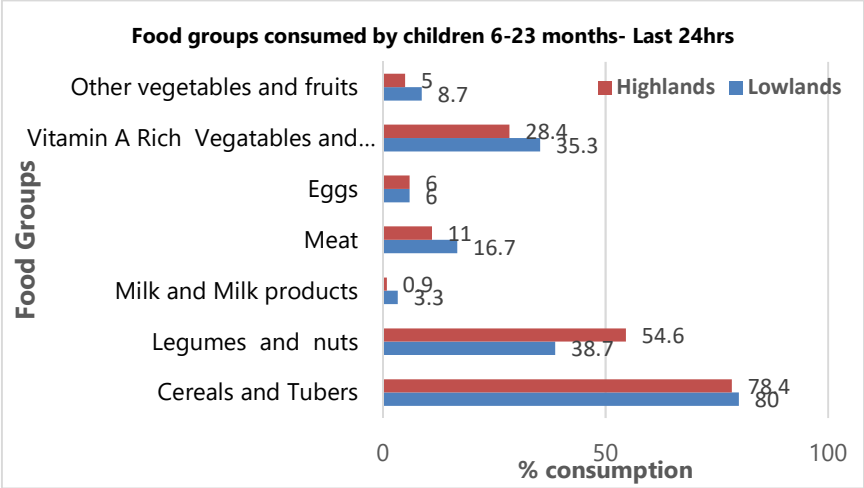

Figure 7: Food consumed by children 6-23 months (last 24hrs)

The **minimum acceptable diet** among children 6-23 months was determined. This is an age specific indicator and combines both minimum dietary diversity and minimum meal frequency. This is an indicator to assess the diet quality and quantity dimensions of children. The finding indicated that only 7.1% (3.6 - 13.2 95% CI) and 4.0 % (1.8 -8.1 95% CI) of children 6–23 months of age consumed an acceptable diet in Lowlands and Highlands respectively.

The summary of Infant and Young Child (IYCF) indicators is presented in **table 28.**

Table 28: Prevalence for complementary feeding practices

Indicator	Lowlands	Highlands
Introduction of solid, semi-solid or soft foods (6-8 months)	66.7 % (48.7 – 80.9 95 CI) (N=30, n= 20)	50.0% (35.2 – 64.8 95% CI) (N=40, n=20)

Minimum dietary diversity (6-23 months)	11.9 % (7.2 – 18.8 95% CI) (N=126, n= 15)	9.1 % (5.6 – 14.3 95% CI) (N=176, n= 16)
Minimum meal frequency (6-23 months)	42.7 % (35.2 – 50.7 95% CI) (N=152, n=65)	28.4% (22.8 -34.8 95% CI) (N=215, n=61)
Minimum acceptable diet (6-23 months)	7.1% (3.6 -13.2 95% CI) (N=126, n=9)	4.0 % (1.8 -8.1 95% CI) (N=176, n=7)

3.6.3. Water Sanitation and Hygiene (WASH)

Household's main source of drinking water

Households were asked about the main current source of drinking water. The results show high use of unprotected water sources by households with unprotected well-being mostly used by 59.7% and 20.9% in Lowlands and Highlands respectively. There was low utilization of protected (safe) water sources by households i.e. piped water, public taps and protected wells in all livelihood zones as in figure 8.

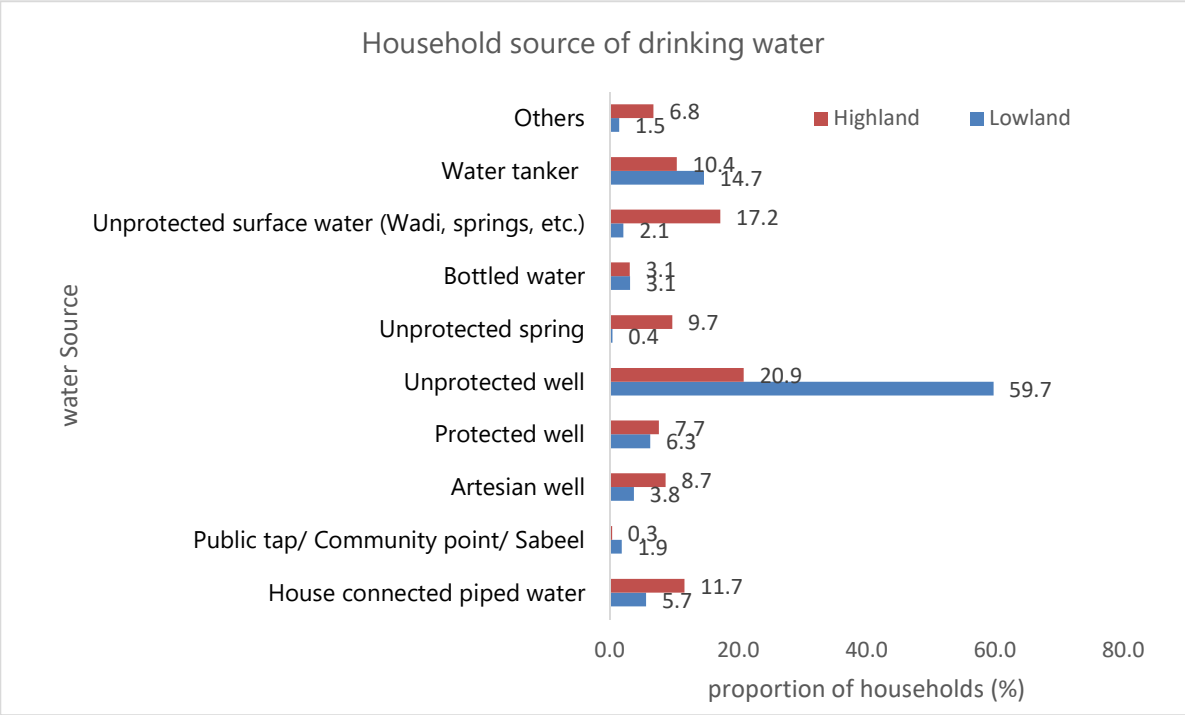

Figure 8: Household source of drinking water

Households were further asked whether they treat their water before drinking. The results indicated low water treatment with 19.5% (16.0-23.4 95% CI) and 35.8% (31.9-40.0 95% CI) of households treating their drinking water in Lowlands and Highlands livelihood respectively. The most preferred method of water treatment by households in both livelihood zone was ceramic/sand filters and filtering through clothes among other methods as in table 29.

Table 29 : Method of water treatment

Method of water treatment	Lowlands	Highlands
Ceramic / sand filters	65.9% (55.0 – 75.7 95% CI)	73.6 % (66.9 – 79.6 95% CI)
Filtering with clothes	17.0% (9.9 – 26.6 95% CI)	15.2% (10.5 – 21.5 95% CI)
Choloration	8.0% (3.3 – 15.7 95% CI)	4.6% (2.1 – 8.5 95% CI)
Boiling	9.1% (4.0 – 17.1 95% CI)	5.6% (2.8 – 9.8 95% CI)

The survey also collected information on where households defecate and handwashing practices. The most utilized type of toilets by households in both Lowlands and Highlands livelihood zones were: flush to sceptic, flush to drain and flush to pipe sewer system among others. The results further showed a higher proportion of households using open defecation at 45% in Lowland and 20% in highland Livelihood zones.as shown in table 30.

Table 30: Household latrine and handwashing

Household Latrine Type	Lowlands		Highlands	
	n	%	n	%
Flush to piped sewer system	0	0.0	29	5.0
Flush to septic tank	103	21.6	117	20.3
Flush to pit latrine	14	2.9	24	4.2
Flush to open drain	113	23.7	232	40.3
Ventilated improved pit latrine	1	0.2	6	1.0
Pit latrine without slab/ open pit	12	2.5	25	4.3
Bucket	5	1.0	11	1.9
Hanging latrine	5	1.0	7	1.2
Defecation in open (in fields, etc.)	217	45.5	115	20.0

Households were asked if they washed their hands before eating and after visiting toilet. The survey results show larger proportion of households wash their hands before eating and less after visiting toilet. There is higher utilization of soap after visiting toilets compared to before eating across both zones (table 31). Other substances used to wash hands by households include water sand and stones while other mentioned water only.

Table 31: Household handwashing practices

	Lowlands Livelihood zone		**Highlands Livelihood zone**	
	Washed hands (%)	Washed with soap	Percentage washed hands	Washed with soap
After visiting toilet	27.9% n =133	81.3% n= 109	29.6%, n=170	81.3% n = 139
Before eating	65.3% n =311	68.4% n = 216	65.0% n = 374	67.1% n =255

3.7. Food Security and Livelihood

Household Income

The survey asked household about their income; losing income in the last year and average monthly expenditure. The result indicated that 85.2% and 89.4% of household in Lowland and Highland Livelihood zone lost income in the past one year. The results further showed an average household expenditure of 34,918 and 40,644 Yemeni Reyals for Lowland and Highland Livelihood zone respectively.

Food consumption score is a composite score based on dietary diversity, food frequency, and relative nutritional importance of different food groups. This is an acceptable proxy indicator to measure caloric intake and diet quality at household level, giving an indication of food security status of the household if combined with other household access indicators.

The food consumption results shows 52.0% and 43.0% of household in lowland and highland livelihood zone are consuming from poor and borderline food consumption. The lowland has a higher proportion of household (17.2%) with poor food consumption scores as in table 32. The mean Food Consumption Score is 37.0 for Lowlands and 41.4 for Highlands.

Table 32: Food consumption score for both Lowland and Highland

	Poor Food consumption (FCS<21)	Borderline food consumption (FCS 21.5-35)	Acceptable food consumption (FCS>35)	Mean Food Consumption Score
Lowland (% of households) N=477	17.2% (82)	34.8% (166)	48.0%(229)	37.0
Highlands (% of households) N=575	9.6% (n=55)	33.4% (n=192)	57.0% (328)	41.4

Coping strategy: Households in the study area were asked instances in the past seven days when they did not have enough food or money to buy food and how they coped with the situation. The data collection tool used miss one coping mechanism to make the required 12 mechanisms.

The results shows 50.3% (n=240) and 49.7% (n=285) of households used one form of coping mechanism in Lowlands and Highlands respectively. The mean coping strategy index was 10.9 for both Lowland and Highland Livelihood zone.

4. DISCUSSIONS

Acute Malnutrition

Hajjah governorate nutrition situation is classified as serious to critical in Lowlands livelihood zone, while in the Highlands is classified between poor and serious. The point GAM prevalence for the Lowlands of 14.9 percent is Just below the WHO critical level threshold and the upper limit stretches to 18.8 percent which is critical nutrition situation.

The Highlands's point GAM prevalence is at 8.9 percent which is classified as poor according to WHO standards however the upper confidence level is at 12.1 percent, classified as serious. The survey quality for the Highlands livelihood zone showed a passion distribution of (3), which indicated, that there were pockets of malnutrition. Upon analysis of the data there were noted elevated cases on malnutrition in clusters 13, 14, 17, 27 and 30.

According to UNICEF conceptual framework, acute malnutrition is directly caused by either inadequate dietary intakes or disease. The results of morbidity in the survey indicates a 54.7 and 61.3 percent of children assessed had more than one form of morbidity, and diarrhea at 36.4 and 40.7 percent for Lowlands and Highlands. The high morbidly correlate with the low vitamin A coverage among other causes.

The high GAM rate can also be attributed to poor food consumptions scores (FCS) with 17.2 and 9.6 percent of households having poor food consumption score of less than 21 in the Lowlands and Highlands livelihood zone respectively. It can also be attributed to high morbidity prevalence with above; 60%, 48% and 34% of children having Fever, ARI and Diarrhea respectively.

Chronic Malnutrition (Stunting)

Stunting, identify as low height for age z-score, is caused by long-term insufficient nutrient intake and/or frequent infections. Stunting generally occurs before age two, and effects can be irreversible after the age of two. These include delayed motor development, impaired cognitive function and poor school performance. The stunting rates in both livelihood zones in Hajjah governorate is categorized very high according to WHO thresholds of (H/A≥40). The results of 53.3 %(47.9 – 58.7 95% CI) and 55.2% (50.2 – 60.1 95% CI) for Lowlands and Highlands livelihood zone respectively indicate one in every two children is stunted. The high chronic malnutrition in the governorate can be attributed to prolonged acute malnutrition among children due to low coverage attributed to poor access. The poor IYCF indicators in the governorate can be linked to the high stunting rates in the governorate.

Other possible causes of high chronic malnutrition in the governorates is the poor hygiene practices which leads to a condition called environmental enteropathy which has been linked to stunting in other developing counties.

Health

There is a high prevalence of Acute Respiratory Infection (ARI)/cough, Fever and Diarrhea. The high diarrhea a prevalence could be attributed to poor hygiene practices at household level i.e. Low

handwashing after visiting toilet and the high open defection both in the Lowlands and Highlands. Other causes of diarrhea in the governorate can be attributed to use of unprotected water sources and low drinking water treatment at 19.5 and 35.8 percent for Lowlands and Highlands respectively. The high morbidity can also be attributed to the low Vitamin A among children in all livelihood zones at 44.4 and 47.1 percent for Lowlands and Highlands. Several immune system functions are dependent on sufficient vitamin A, which is why it is known as an important immune booting vitamin.

The vitamin A supplementation, DPT and measles coverage are all below 80% WHO threshold in all the livelihoods, with vitamin A coverage being the lowest. The low coverage of Pentavalent which is a proxy indicator of fully immunized children (FIC), implies low coverage of Fully Immunized children in both livelihood zones.

Water Sanitation and Hygiene

The high utilization of unprotected source for drinking water in both livelihoods, with the low water treatment prevalence can be a cause of the high prevalence of diarrhea the survey results found. This is worsened by the evident unhygienic human waste disposal mechanisms in all livelihood with a high prevalence of open defection (45.5% in Lowlands and 20.0% in Highlands) among other unhygienic waste disposal mechanisms. The survey results also noted low handwashing instances after visiting toilet (29.7% in Lowlands and 29.6% in Highlands). This can also be a cause of the high prevalence of high diarrhea as it increases the risk transmitting from person to person through person-to-person contact.

From the results of the survey the team developed recommendations for action as in table 35

Table 33: Survey Recommendations

No	Indicator Result	Recommendation	Responsible Organization/ Person	Timeline
1	**Acute Malnutrition** Lowlands-14.9 % (11.8-18.8 95% C.I.)-Classified as Serious; Highland: 8.9 % (6.5 - 12.1 95% C.I.)Classified as poor	Identify malnutrition hotspots in the governorate especially Highlands where there are pockets of cases for targeted interventions Intensifying mass screening and referrals for malnourished children.	UNICEF, WHO, UN-OCHA MoPHP and implementing partners	Urgently/ continuous programmes to be enhanced
2.	**<u>High chronic malnutrition</u>** Lowlands: 53.3 %(47.9 - 58.7 95% C.I.) Highlands: 55.2 % (50.2 - 60.1 95% C.I.)	There is a need for urgent multi-sectoral meeting to plan interventions aimed at reversing the chronic malnutrition trends. Conduct studies to understand the chronic malnutrition causal pathways for targeted programming. Nutrition education to caregivers on the importance of 1000 day window of opportunity and impact action programs within this period	UNICEF, WHO, UN OCHA, MoPHP and implementing partners	Urgently
3	**High morbidity prevalence, Diarrhea:** Lowlands: 36.5%, Highlands:40.8% **ARI:** Lowlands: 48.3%, Highlands:55.8% **Fever:** Lowlands: 66.4%,Highlands: 68.7%	Health education for households on hygiene including water treatment, handwashing and safe human waste disposal. Piloting on ODF[15] communities/villages Continuous supply of IMCI Drugs health facilities for management of diseases.	MoPHP and implementing partners	Continuous

[15] Open Defection Free

4.	**Low Vitamin A supplementation** Lowland: 44.4%, Highland: 47.1%	Intensification of campaigns and outreach activities,	MoPHP and implementing partners	Continuous
5	**Poor IYCN Indicators** c) Exclusive breastfeeding **Lowland:** 17.6% (8.4 -30.9 95% CI) **Highland:** 30.3 %(21.0 – 41.0 95% CI) d) Minimum Acceptable diet (MAD Lowland: 7.1% (3.6 -13.2 95% CI) Highland: 4.0 % (1.8 -8.1 95% CI)	Identify belief and practices that influence optimal IYCF through KAP/C4D. Continuous /intensified health education to mother on the importance of adequate child care and feeding practices Formation of mother to mother support groups as an avenue of reaching caregivers with IYCF Message.	MoPHP and implementing partners IYCF WG	Planned immediately.
6	**<u>Poor Household Food indictors</u>** a) ***Food Consumption Score*** Food consumption score: Lowlands: 37.0 ; Highlands: 41.4 b)***High Rate of coping*** strategy: Average Coping strategy index: Lowlands: 10.9 ; Highlands: 10.9	Need for households with poor food consumption to be supplied with relief food or ration increased. Encourage households to utilize available land space to grow food crops. Food security working groups to design more specific programs to improve household food security and overall nutrition situation in the governorate	MoPHP, FAO, FSWG, and other relevant line ministries	Immediately.

5. ANNEXES

Annex 1: Summary of population division according layers (Highland, Lowland, and Excluded areas) in Hajjah governorate districts according the population projection for 2017

District	Highlands	Lowlands	Excluded areas	Total
Aslam		88283		88283
Aflah Alsham	78422			78422
Aflah Alyemen	26558	32052		58610
Algomima	59892		1938	61830
Alshahel	48126			48126
Alshaghadera	53002	20260		73262
Almahabesha	68939	7393		76332
Almaghraba	94197		355	94552
Almeftah	49164			49164
Bakeel Almeer			31204	31204
Bani Alawam	73914		3593	77507
Bani Qais Altoor		82360		82360
Hajjah	28953	14507		43460
Haradh			132678	132678
Hayran		25169	5117	30286
Khayran Almahraq	19362	88574		107936
Shares	24394			24394
Abs		229539	22255	251794
Qara	48108		680	48788
Qofl Shamr	52697	22569		75266
Kohlan Alsharaf	68408			68408
Kohlan Afar	59922			59922
Koshar	106209		8987	115196
Koaidena	15749	89512		105261
Mabyan	62472	12372	90	74934
Hajjah City	82922		608	83530
Mostaba		75668	5194	80862
Meedi			24099	24099
Nagra	52834			52834
Washha	50708	57674		108382
Wadhra	16261			16261
Grand total	**1,241,213**	**845,932**	**236,798**	**2,323,943**
Average	**53.4%**	**36.4%**	**10.2%**	

Annex 2: Population Estimation Hajjah Governorate

Population Estimated in Hajjah Districts with IDPs

		2004	2017			2018	OCHA Data	Modify			
District	District Pcode	census 2004	CSO Population-Projections 2017	%Increase since 2004	%Increase per Year (% Growth)	CSO Population-Projections 2018	IDPs from Outside of the District	IDPs from Outside of the District	% IDPs	Population With IDPs	%Increase with IDP since 2004
Bakil Al Mir	1701	21,701	31,207	43.81%	3.37%	31,938	7,878	0	0.00%	31207	43.81%
Haradh	1702	91,040	132,675	45.73%	3.52%	135,878	6,240	0	0.00%	132675	45.73%
Midi	1703	16,431	24,102	46.69%	3.59%	24,692	2,514	0	0.00%	24102	46.69%
Abs	1704	133,183	194,190	45.81%	3.52%	198,882	95,106	57,610	29.70%	251800	89.06%
Hayran	1705	15,485	22,481	45.18%	3.48%	23,019	12,882	7,803	34.70%	30284	95.57%
Mustaba	1706	43,979	61,396	39.60%	3.05%	62,736	32,136	19,466	31.70%	80862	83.86%
Kushar	1707	74,424	107,070	43.86%	3.37%	109,581	13,422	8,130	7.60%	115200	54.79%
Al Jamimah	1708	41,076	59,129	43.95%	3.38%	60,517	4,452	2,697	4.60%	61826	50.52%
Kuhlan Ash Sharaf	1709	44,748	64,189	43.45%	3.34%	65,685	6,972	4,223	6.60%	68412	52.88%
Aflah Ash Shawm	1710	54,049	77,019	42.50%	3.27%	78,786	2,322	1,407	1.80%	78426	45.10%
Khayran Al Muharraq	1711	68,675	99,446	44.81%	3.45%	101,813	14,010	8,487	8.50%	107933	57.16%
Aslem	1712	49,192	71,886	46.13%	3.55%	73,632	27,066	16,395	22.80%	88281	79.46%
Qafl Shamer	1713	50,389	73,340	45.55%	3.50%	75,106	3,192	1,934	2.60%	75274	49.39%
Aflah Al Yaman	1714	38,847	55,829	43.71%	3.36%	57,135	4,590	2,780	5.00%	58609	50.87%
Al Mahabishah	1715	50,641	73,557	45.25%	3.48%	75,319	4,590	2,780	3.80%	76337	50.74%
Al Miftah	1716	31,677	46,319	46.22%	3.56%	47,446	4,704	2,849	6.20%	49168	55.22%
Al Maghrabah	1717	64,440	91,396	41.83%	3.22%	93,469	5,208	3,155	3.50%	94551	46.73%
Kuhlan Affar	1718	40,268	58,146	44.40%	3.42%	59,522	2,940	1,781	3.10%	59927	48.82%
Sharas	1719	15,669	22,635	44.46%	3.42%	23,170	2,904	1,759	7.80%	24394	55.68%
Mabyan	1720	50,711	73,729	45.39%	3.49%	75,500	1,992	1,207	1.60%	74936	47.77%
Ash Shahil	1721	32,504	47,520	46.20%	3.55%	48,675	1,014	614	1.30%	48134	48.08%
Ku'aydinah	1722	69,283	101,541	46.56%	3.58%	104,022	6,132	3,714	3.70%	105255	51.92%
Wadhrah	1723	10,925	15,672	43.45%	3.34%	16,037	972	589	3.80%	16261	48.84%
Bani Qa'is	1724	54,161	79,012	45.88%	3.53%	80,923	5,526	3,347	4.20%	82359	52.06%
Ash Shaghadirah	1725	48,735	70,758	45.19%	3.48%	72,452	4,146	2,511	3.50%	73269	50.34%
Najrah	1726	35,895	51,793	44.29%	3.41%	53,016	1,716	1,039	2.00%	52832	47.18%
Bani Al Awam	1727	52,222	75,211	44.02%	3.39%	76,979	3,804	2,304	3.10%	77515	48.43%
Hajjah City	1728	52,843	78,362	48.29%	3.71%	80,325	8,538	5,172	6.60%	83534	58.08%
Hajjah	1729	29,533	42,774	44.83%	3.45%	43,792	1,134	687	1.60%	43461	47.16%
Washhah	1730	62,617	89,330	42.66%	3.28%	91,384	31,458	19,056	21.30%	108386	73.09%
Qarah	1731	30,641	44,502	45.24%	3.48%	45,568	7,068	4,281	9.60%	48783	59.21%
TOTAL		**1,475,984**	**2,136,213**	**44.73%**	**3.44%**	**2,187,000**	**326,628**	**187,777**	**8.80%**	**2323990**	**57.45%**

Annex 3: Sampled Clusters Highland Livelihood Zone

District code	District	Sub-district code	Sub-district	Geographical unit	Population size	Cluster
7	Koshar	22	Khamis Alqadhi	Algabali	354	1
7	Koshar	24	Alhamarieen	Almadhaia'a	419	2
7	Koshar	27	Anham Algharb	Alza'akera	3120	3
7	Koshar	29	Alobaisah+Alabadelah	Alqaim	1209	4
8	Algomaimah	21	Algomaimah	Bani Mofadhl	5471	5
8	Algomaimah	27	Dhahai	Sahl Alshami	569	6
9	Kohlan Alsharaf	24	Nawsan	Nosan	4832	7
10	Aflah Alsham	21	Bani Harbi	Lag Bani Amer	940	8
10	Aflah Alsham	22	Bani Abu Alhadi and Alobad	Almehwalah	5720	9
10	Aflah Alsham	24	Bani Hafeez and Almakaremah	Alaiz	5357	10
11	Khayran almahraq	23	Bani Hamlah	Haza Abo Jaber	995	11
13	Qofl shamr	24	Shamreen	Souq Shamr	1297	12
14	Aflah alyemen	21	Gayah	Alme'zab	3274	13
15	Almahabeshah	21	Almahabeshah	Almahabesha Bait Almaghrabi	1071	14
15	Almahabeshah	22	Hagar	Bani Asad	3345	15
15	Almahabeshah	24	Bani Mogai'a	Mathrooh	3302	16
17	Almaghrabah	21	Wakkeh	Alboitah	1312	17
17	Almaghrabah	22	Bani Godailah	Almalh	2857	18
17	Almaghrabah	23	Neesa	Hesn Neesa	2550	19
17	Almaghrabah	23	Neesa	Wadi Alyamani	2510	20
18	Kohlan afar	24	Bani Oshb	Bait Alwali	1551	21
19	Shares	23	Bait Qadam	Maghraba Alrohaimy	424	22
20	Mabyan	22	Algabr	Alqathf	2055	23
20	Mabyan	26	Almarahebah	Wadi Saleh	585	24
21	Alshahel	22	Ganeb Alsham	Alshahel city center	5144	25
22	Koaidenah	27	Koaidenah	Koaidenah	3303	26
23	Wadharah	25	Alnosairy	Marooh	847	27
25	Alshaghaderah	26	Alma'tan	Almarow	3024	28
26	Nagrah	21	Qadam	Qadam	5112	29
26	Nagrah	24	Alsha'temah	Alawlah	1978	30
27	Bani Alawam	21	Radman	Dhahran	2840	31
27	Bani Alawam	24	Gabal Namer	Bait Khalil	467	32
27	Bani Alawam	28	Qita'ah Alsarabi	Bait Gayash	111	33
28	Hajjah City	21	Hajjah City	Alatharah	2553	34

28	Hajjah City	21	Hajjah City	Alhaswi Algharbi	1801	35
28	Hajjah City	24	Abs	Alsharqi Alasfal	571	36
30	Washha	21	Dha'en	Alnasab	1485	37
31	Qarah	21	Qara	Alqemmah	2065	38
31	Qarah	21	Qara	Qaflah Maswar	2777	39
9	Kohlan alsharaf	22	Afsar	Tho Ali	2080	RC
16	Almeftah	21	Algabr Ala'la	Alqolai'a	218	RC
18	Kohlan Afar	27	Bani Mawhab	Almash'eeb	770	RC
29	Hajjah	25	Alghozzi	Ma'zeeb Alghozzi	760	RC

Annex 4: Sampled Clusters Lowland Livelihood Zone

District code	District	Sub-district code	Sub-district	Geographical unit	Population size	Cluster
4	Abs	21	Bani Hassan	Alkadef Alsagheer	1218	1
4	Abs	21	Bani Hassan	Bani Kaynah	443	2
4	Abs	22	Bani Thawab	Abs Almagd	1206	3
4	Abs	22	Bani Thawab	Abs Bani Thawab	1303	4
4	Abs	22	Bani Thawab	Shafar Khodaish Alsharqi	3373	5
4	Abs	22	Bani Thawab	Shafar Deer Abdo	3485	6
4	Abs	23	Bani Othabi	Alqahmah	90	7
4	Abs	25	Matwalah	Deer Aloqm	1267	8
4	Abs	27	Qatabah	Alhosain	386	9
5	Hayran	21	Aldeer	Alawga'a	4833	10
6	Mostaba	21	Gharb Mostaba	Almakhafi	3444	11
6	Mostaba	21	Gharb Mostaba	Almozat	1921	12
6	Mostaba	22	Shraq Mostaba	Mahla	2069	13
6	Mostaba	23	Far Shraq Mostaba	Khadlan	7976	14
11	Khayran Almahraq	22	Masrooh	Deer Alsho'ba	1759	15
11	Khayran Almahraq	22	Masrooh	Aldohaish alasfal	465	16
11	Khayran Almahraq	24	Sharqi Alkhamseen	Alrabiah Bani Hogain	2250	17
11	Khayran Almahraq	25	Gharbi Alkhamseen	Alsooda	750	18
12	Aslam	21	Aslam Alyemen	Almeklah	1019	19
12	Aslam	22	Aslam Alsham	Almashat	404	20
12	Aslam	22	Aslam Alsham	Aldarmah	91	21
12	Aslam	23	Aslam Alwasat	Algerbah	264	22
13	Qofl shamr	22	Aldane'i	Aldobaya Alolia	206	23
14	Aflah Alyemen	22	Algawan and Alqatabiah	Bait Faishan	366	24
14	Aflah Alyemen	25	Bani Yous	Waheej Alma'yna	172	25
22	Koaidenah	21	Bani Nashr	Alareesh	859	26

22	Koaidenah	22	Althulth	Alqat'a	250	27
22	Koaidenah	23	Sawakh	Alqoaify	199	28
22	Koaidenah	26	Algharbi	Wadi Albab	640	29
24	Bani Qais Altoor	21	Rob'a Masood	Almanasera	3918	30
24	Bani Qais Altoor	22	Rob'a Albooni	Haija Bani Wahban	3118	31
24	Bani Qais Altoor	24	Rob'a Alshamri	Alzomahiah Alolia	308	32
25	Alshaghaderah	21	Hameed Castle	Almahdaidah	419	33
29	Hajjah	27	Khawlan	Gabal Ghaishan	2357	34
30	Washha	24	Bani Sa'ad	Almarwa	557	35
30	Washha	23	Bano Hanni	Alwaqeera	649	36
30	Washha	23	Bano Hanni	Ghareb Haytham	2375	37
4	Abs	22	Bani Thawab	Mawada	1685	RC
4	Abs	26	Albatariah	Alsaqayef	431	RC
20	Mabyan	23	Aladba'ah	Gabal Aladba'ah	1933	RC
24	Bani Qais Altoor	23	Rob'a Hafg	Almedhaya	3151	RC

Annex 5: Plausibility Lowlands (Automatically generated

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** (0.6 %)
Overall Sex ratio (Significant chi square)	Incl	p	>0.1 0	>0.05 2	>0.001 4	<=0.001 10	**2** (p=0.086)
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=0.371)
Dig pref score - weight	Incl	#	0-7 0	8-12 2	13-20 4	> 20 10	**0** (7)
Dig pref score - height	Incl	#	0-7 0	8-12 2	13-20 4	> 20 10	**0** (6)
Dig pref score - MUAC	Incl	#	0-7 0	8-12 2	13-20 4	> 20 10	**0** (5)
Standard Dev WHZ . .	Excl Excl	SD SD	<1.1 and >0.9 0	<1.15 and >0.85 5	<1.20 and >0.80 10	>=1.20 or <=0.80 20	**0** (0.96)
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** (0.17)

Poisson dist WHZ-2	Excl	p	>0.05	>0.01	>0.001	<=0.001	
			0	1	3	5	**0** (p=0.296)
OVERALL SCORE WHZ =			0-9	10-14	15-24	>25	**2** %

The overall score of this survey is 2 %, this is excellent.

There were no duplicate entries detected.

Annex 6:Plausibility check for: Highland Livelihood zone

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

Overall data quality

Criteria	Flags*	Unit	Excel.	Good	Accept	Problematic	**Score**
Flagged data	Incl	%	0-2.5	>2.5-5.0	>5.0-7.5	>7.5	
(% of out of range subjects)			0	5	10	20	**0** (0.6 %)
Overall Sex ratio	Incl	p	>0.1	>0.05	>0.001	<=0.001	
(Significant chi square)			0	2	4	10	**0** (p=0.876)
Age ratio(6-29 vs 30-59)	Incl	p	>0.1	>0.05	>0.001	<=0.001	
(Significant chi square)			0	2	4	10	**0** (p=0.706)
Dig pref score - weight	Incl	#	0-7	8-12	13-20	> 20	
			0	2	4	10	**0** (5)
Dig pref score - height	Incl	#	0-7	8-12	13-20	> 20	
			0	2	4	10	**0** (5)
Dig pref score - MUAC	Incl	#	0-7	8-12	13-20	> 20	
			0	2	4	10	**0** (4)
Standard Dev WHZ	Excl	SD	<1.1	<1.15	<1.20	>=1.20	
.			and	and	and	or	
.	Excl	SD	>0.9	>0.85	>0.80	<=0.80	
			0	5	10	20	**0** (0.93)
Skewness WHZ	Excl	#	<±0.2	<±0.4	<±0.6	>=±0.6	
			0	1	3	5	**1** (-0.21)
Kurtosis WHZ	Excl	#	<±0.2	<±0.4	<±0.6	>=±0.6	
			0	1	3	5	**0** (0.03)
Poisson dist WHZ-2	Excl	p	>0.05	>0.01	>0.001	<=0.001	
			0	1	3	5	**3** (p=0.007)
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.

Annex 7: Standardization Test Report

Standardisation test results					Precision				Accuracy		OUTCOME		
Weight		subjects	mean	SD	max	Technical	TEM/mea	Coef of re	Bias from	Bias from	result		
		#	kg	kg	kg	TEM (kg)	TEM (%)	R (%)	Bias (kg)	Bias (kg)			
	Supervisor	10	13.3	1.6	0.1	0.04	0.3	99.9	-	0.75	TEM acceptable	R value good	Bias reject
	Enumerator 1	10	13.2	1.5	0.2	0.09	0.7	99.6	-0.05	0.7	TEM acceptable	R value good	Bias reject
	Enumerator 2	10	13.2	1.5	0.2	0.07	0.6	99.8	0	0.75	TEM acceptable	R value good	Bias reject
	Enumerator 3	10	13.2	1.6	0.2	0.08	0.6	99.7	-0.02	0.73	TEM acceptable	R value good	Bias reject
	Enumerator 4	10	13.2	1.6	0.2	0.1	0.8	99.5	-0.05	0.7	TEM poor	R value good	Bias reject
	Enumerator 5	10	13.3	1.5	0.2	0.07	0.6	99.8	0.01	0.76	TEM acceptable	R value good	Bias reject
	enum inter 1st	5x10	13.2	1.5	-	0.09	0.7	99.7	-	-	TEM good	R value good	
	enum inter 2nd	5x10	13.2	1.5	-	0.04	0.3	99.9	-	-	TEM good	R value good	
	inter enum + sup	6x10	13.2	1.5	-	0.07	0.5	99.8	-	-	TEM good	R value good	
	TOTAL intra+inter	5x10	-	-	-	0.11	0.8	99.5	-0.02	0.73	TEM acceptable	R value good	Bias reject
	TOTAL+ sup	6x10	-	-	-	0.11	0.8	99.5	-	-	TEM acceptable	R value good	
Height		subjects	mean	SD	max	Technical	TEM/mea	Coef of re	Bias from	Bias from	result		
		#	cm	cm	cm	TEM (cm)	TEM (%)	R (%)	Bias (cm)	Bias (cm)			
	Supervisor	10	95.3	7.4	0.2	0.06	0.1	100	-	1.46	TEM good	R value good	
	Enumerator 1	10	94.9	7.7	0.6	0.23	0.2	99.9	-0.4	1.07	TEM good	R value good	Bias good
	Enumerator 2	10	94.8	7.6	0.6	0.27	0.3	99.9	-0.48	0.98	TEM good	R value good	Bias good
	Enumerator 3	10	94.9	7.6	0.5	0.24	0.3	99.9	-0.33	1.13	TEM good	R value good	Bias good
	Enumerator 4	10	94.8	7.5	0.8	0.33	0.3	99.8	-0.49	0.97	TEM good	R value good	Bias good
	Enumerator 5	10	94.9	7.6	0.6	0.26	0.3	99.9	-0.39	1.07	TEM good	R value good	Bias good
	enum inter 1st	5x10	94.7	7.5	-	0.35	0.4	99.8	-	-	TEM good	R value good	
	enum inter 2nd	5x10	95	7.4	-	0.22	0.2	99.9	-	-	TEM good	R value good	
	inter enum + sup	6x10	94.9	7.4	-	0.34	0.4	99.8	-	-	TEM good	R value good	
	TOTAL intra+inter	5x10	-	-	-	0.4	0.4	99.7	-0.42	1.12	TEM good	R value good	Bias good
	TOTAL+ sup	6x10	-	-	-	0.43	0.5	99.7	-	-	TEM good	R value good	
MUAC		subjects	mean	SD	max	Technical	TEM/mea	Coef of re	Bias from	Bias from	result		
		#	mm	mm	mm	TEM (mm)	TEM (%)	R (%)	Bias (mm)	Bias (mm)			
	Supervisor		14			0.	(	9	-	-0.	TEM good	R value accep	Bias good
	Enumerator 1	10	149.9	6.8	4	1.57	1	94.7	0.3	-0.05	TEM good	R value poor	Bias good
	Enumerator 2	10	151.3	7.2	5	2.17	1.4	91	1.65	1.3	TEM acceptable	R value poor	Bias acceptable
	Enumerator 3	10	152.1	6.7	5	2.45	1.6	86.5	2.45	2.1	TEM acceptable	R value reject	Bias poor
	Enumerator 4	10	151.7	7	8	3.41	2.2	76.2	2.05	1.7	TEM reject	R value reject	Bias acceptable
	Enumerator 5	10	152.3	6.6	6	3.17	2.1	77.3	2.6	2.25	TEM poor	R value reject	Bias poor
	enum inter 1st	5x10	152.2	7.1	-	2.72	1.8	85.4	-	-	TEM poor	R value reject	
	enum inter 2nd	5x10	150.7	6.4	-	1.43	1	95	-	-	TEM good	R value poor	
	inter enum + sup	6x10	151.2	6.9	-	2.58	1.7	84.9	-	-	TEM acceptable	R value reject	
	TOTAL intra+inter	5x10	-	-	-	3.42	2.3	74.5	1.81	1.16	TEM reject	R value reject	Bias acceptable
	TOTAL+ sup	6x10	-	-	-	3.64	2.4	72.1	-	-	TEM reject	R value reject	

Annex 8 :SMART survey questionnaire

Republic of Yemen
Ministry of Public Health and Population
Public Health and Population Office
Nutritional and mortality status Evaluation in Abyan governorate,
in January **2018**

Family Questionnaire (Sample A)

First : it's explained to the occupants (the adult ones) about the assessment program and the facility conducting it and the working personnel (team members), then obtaining verbal approval from them				
Approval	1.	Yes		
	2.	No		Move to the next page

Is the family resident or displaced?		
1.	Resident	
2.	Displaced	

In case of resident families. Is there a displaced family or families residing with you?			
1.	Yes	In cases where a displaced family is staying with a resident family the data of both families should be filled in two separate questionnaires except for death file which should be in a single file for both families, attached with the resident's family questionnaire.	
2.	No		

District	Isolated entity	Village/ neighborhood

Date of Interview	Day		Month		Year				Family serial No.			

Name of the family head	

	Team	Name	Signature

Assessment Team No. (----------)	Researcher 1		
	Researcher 2 + 3		
	Team Leader		
	Field supervisor		

The following data are copied from x1- family and mortality (death) data to the form of discharge of cluster collection

Number of family members	Number of children less than 5 years	Number of children less than 6 months	Number of women in childbearing age 15-49	Number of individuals of mortality (death) form

Indicate if there is :		
1.	Absence of the family at the first visit requiring a second visit	
2.	Absence of the woman at the first visit requiring a second visit	
3.	Absence of a child at the first visit requiring a second visit*	

*in case of absence of a child, all his data are taken except for anthropometric measurements and edema status which are taken in his presence

Note: data in the cover are for field and administrative use by the team member

Filled by team leader (used for data entry)

Interview date	Day		Month		Year			
Team Number								
Code of village/neighborhood			Code of the isolation entity					
Code of the district			Code of the governorate					
Code of assessment level			Number of the cluster					
Is the area urban (1) or rural (2)?								
Absence of the family even after the second visit (1 yes, 2 No)								
Acceptance (approval) (1 yes, 2 No) If (No) move to the next family								
Family questionnaire No.								
The family is resident (1) or displaced (2)								
In case of a resident family : does it host a displaced family (1 yes, 2 No)								
Displaced families serial								

Office Work

	Name	day		month		year				signature
Data entry operator										
Data entry operator										
Review										

Notes

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Q001: Data of the family (only the alive ones and those who live currently in the family).

H001a	Number of family members(only the alive and those who currently live in the family on the day of the visit)	The Number	
H001b	Number of children less than 5 years (only the alive currently residing in the family on the day of the visit)	The Number	
H001c	Number of children less than 6 months (only the alive currently residing in the family on the day of the visit)	The Number	
H001d	Number of women at the age 15 – 49 years old (currently residing in the family on the day of the day of the visit)	The Number	

Q002: Data on the gender of the head of the family (the person responsible for spending on the family)

H002	**What is the gender of the head of the family?**			
	1.	**Male**		
	2.	**Female**		

Q003 – 005: Data on the sponsor of the family (the person taking care of the family especially children).

H003	What is the gender of the family sponsor?			
	1.	Male		
	2.	Female		

H004	Marital status of the family sponsor			
	1.	married		
	2.	Widow (widower)		
	3.	divorced		
	4.	Separated(angry)		
	5.	Single		

H005	The educational level of the family sponsor			
	1.	Illiterate		
	2.	Reads and writes		
	3.	Primary education		
	4.	Secondary education		
	5.	Higher education (university, college or institute)		

Q 006- 007 : Data on family income and expenditure.

H006	Did the family income decrease during the past twelve (12) months ?			
	1.	Yes		
	2.	No		
	3.	I don't know		

H007	What is the average expenditure (household expenditure) in Yemeni Riyals ?			Expenditure amount (in Y.R)	
	1.	Daily spending			
	2.	Weekly spending			
	3.	Monthly spending			
		Total			

Q 008- 0012: Data on water, sanitation and hygiene

	What is the main source of drinking water in your house ? (only one option)			Moved to
	1.	Water supply system delivered to houses (public or private)		
	2.	Public Faucet / Community Water Point / benevolent(charity) Water		

H008	3.	Artesian well		
	4.	Covered well		
	5.	Unprotected well		
	6.	Covered spring		
	7.	Unprotected water spring		
	8.	Treated water (mineral or Kawther)		→ H010
	9.	Surface water , stream / rivulet/ irrigation channels		
	10.	Protected rainwater harvesting		
	11.	Unprotected rainwater harvesting (water tank /pond/Magel -a wide water pool -)		
	12.	Water transport vehicles.		
	13.	Others: mentioned		

H009a	Do you purify (treat) water before drinking ?			
	1.	Yes		
	2.	No		→ H010
	3.	I don't know		→ H010

H009b	What is the main method used for treatment (purification) of drinking water (only one option)			
	1.	Boiling water before drinking		
	2.	Water chlorination		
	3.	Filtration through a clean cloth		
	4.	Use a ceramic, sand or similar filter (filter or dropper)		
	5.	Leave the water still before drinking to precipitate the impurities		
	6.	Using alum		
	7.	Others: mentioned ……		

H010	Note: Check the availability of water storage points for drinking water: Is the container containing the drinking water clean (algae free)?			
	1.	Yes (algae free)		
	2.	No (algae present)		

	Where does defecation take place ? (select one of the following)- check the availability of the facilities and the practices			
	1.	Toilet (WC)- equipped with water pouring for self-cleaning(siphon or bucket) to public sewer		
	2.	Toilet (WC)- equipped with water pouring for self-cleaning(siphon or bucket) to ---------		

H011	**3.**	**Toilet (WC)- equipped with water pouring for self-cleaning(siphon or bucket) into a pit toilet**		
	4.	**Toilet (WC)- equipped with water pouring for self-cleaning(siphon or bucket) to outdoors**		
	5.	**Toilet (WC)- equipped with water pouring for self-cleaning(siphon or bucket) into an unknown site**		
	6.	**An improved toilet hole –ventilated.**		
	7.	**Toilet hole with pad**		
	8.	**Toilet hole without pad/ not covered**		
	9.	**Toilet fertilizer**		
	10.	**Bucket**		
	11.	**Hanging toilet**		
	12.	**Defecating outdoors (e.g. In the field, etc..)**		
	13.	**Other: mentioned ……**		

H012	**H012a When did you wash your hands** (Write only if one or both of the situations were mentioned)		**1.Mentioned** → **2. Not mentioned (move to H013)**	If the answer was (1) in H012a Question ↓ **H012b : By what do you wash your hands?**						
				a	**Water only**	**b**	**Water with Soap (Piece, Powder, liquid, Paste)**	**c**	**Water with ash / soil/ /stones/ leaves**
				1 **2**	**Yes** **No**	**1** **2**	**Yes** **No**	**1** **2**	**Yes** **No**
	a.	**After going out from Bathroom**								
	b.	**Before eating**								

Q 013 – 015: Food consumption and adaptation mechanisms

H013	**Did the family eat any of the following nourishment or food groups.** **First column answer with: Yes or No (1 or 2)** **Second column answer with : Number of days during last 7 days**	**H013a**	**H013b**
		Did the family eat during the last 7 days	**If the answer was yes in the previous question How many days did they eat during the last 7**
		1. Yes **2. No**	

			If no move to the next option	days (Answer is from 1 to 7)
	a.	Corn, Millet, Barley, Pastries, or any products made from Cereals.		
	b.	Rice or Pasta.		
	c.	Potato.		
	d.	Vegetables (Green Vegetables, Tomato, Pepper, Carrot, ….).		
	e.	Fruits (Mangoes, Bananas, Grapes, ... etc).		
	f.	Meat (Beef, Sheep), Livers, kidneys.		
	g.	Poultry.		
	h.	Egg.		
	i.	Fish (Fresh, Dried or Canned)		
	j.	Legumes (Beans, Lentils, Peas, ...)		
	k.	Milk products (Milk, Cheese, Yogurt, ...)		
	l.	Oils / Fats (Margarine, Butter, Vegetable Oil, ...)		
	m.	Sugar, Sweets, Honey, Dried Fruits (Dates, Raisins)		
	n.	Spices, Tea, Coffee		

H014a	During the last 7 days did the family have no adequate amount of food or money to buy food.		Move to
	1-	Yes	
	2-	No	H015 →

H014b	How many days during the last 7 days the family resorted to one of the following procedures as result of not having enough food or money to buy enough amount of food.		Number of days (Answer is from Ø to 7)	
	a.	Depend on low quality or cheap food.		
	b.	Borrow food or deepened on aids form family and friends.		
	c.	Lowering the main meals portion (amount).		

	d.	Lowering the portion of adults meals in order to offer it to children.		
	e.	Lowering the number of daily meals.		
	f.	Purchasing food by loan or pledge		
	g.	Collect food from bushes or harvesting immature food.		
	h.	Consumed farming seeds of next farming season.		
	i.	Sending family members to eat food in other places.		
	j.	Sending family members for begging people.		
	k.	Living a whole day with eating no food at all		

H015	**Did any member of your family do any of the following procedures due to food shortage during the last 30 days?** **(Ø) Never** **(1) Rarely (Once or twice during last 30 days)** **(2) Usually (From 3-10 times during last 30 days)** **(3) Always (More than 10 times during last 30 days)**		**Ø. Never** **1. Rarely** **2. Usually** **3. Always**	
	a.	**Selling assets/ House stuff (Furniture, Jewelries, clothes ….ect).**		
	b.	**Purchasing food by loan or pledge due to having no many at time of buying.**		
	c.	**Expenditure of savings.**		
	d.	**Borrow money.**		
	e.	**Selling productive assets or transportation means (Sewing machine, car, bicycle, …. ect).**		
	f.	**Consumed farming seeds of next farming season.**		
	g.	**Drop off children from going to school.**		
	h.	**Selling the family house or lands.**		
	i.	**Begging**		
	j.	**Selling the last female cattle the family have.**		
	k.	**Lowering expenditures in Education and Health (including medical drugs).**		

Q 016 – 020: Mid Upper Arm Circumference For Women in Childbearing Age (15 - 49 years).

		Q016	Q017	Q018	Q019	Q020
Woman No.	Woman First Name	Woman Age (By Years)	Marital Status: 1= Married 2= Widowed 3= Divorced 4= Separated (angry) 5= Single (If Answer was 5= Single, Move to Q019)	The statues of the women now: 1= Pregnant 2= Breastfeeding 3= Not pregnant nor breastfeeding	Mid Upper Arm Circumference (by cm) MUAC 88.8 = Refused 99.9 = Absent	How much time did the women spend out of her house yesterday ?
1.						
2.						
3.						
4.						
5.						
6.						
7.						
8.						
9.						
10.						

Q 021 – 023: Children Age (All children aged from 0 to 5 years should be registered, start with the older)

		Q021	Q022	Q023a	Q023b	
Child No.	**Child First Name**	**Gander 1= Male 2= Female**	**Women No. (Taken from the women previous page)**	**Birth Date (Hajeri or Gregorian) For children aged:(0- 59) months**	**Child Age (By Months)**	**What did the mother say about the child's age?**
1.				Day Month Year		
2.				Day Month Year		
3.				Day Month Year		
4.				Day Month Year		
5.				Day Month Year		
6.				Day Month Year		
7.				Day Month Year		
8.				Day Month Year		
9.				Day Month Year		
10.				Day Month Year		

Q 024 – 026: Anthropometric Measurements for Children between 6-59 Months (leave it empty for children less than 6 months)

			Q024	Q025	Q026
Child No. (Take it from previous page)	**Child's First Name (Take it from previous page)**	**Child Age –Month (Take it from previous page)**	**Wight (KG – Gm)** **88.8 = Refused** **99.9 = Absent**	**Height (Cm – Mm)** **888.8 = Refused** **999.9 = Absent**	**Mid Upper Arm Circumference MUAC** **88.8 = Refused** **99.9 = Absent**
			.	.	.
			.	.	.
			.	.	.
			.	.	.
			.	.	.
			.	.	.
			.	.	.
			.	.	.
			.	.	.
			.	.	.

Q 027 – 033: Edema, Vaccination and Childhood diseases for children between (0-59) months in the family (For every child under 5 years old)

			Q027	Q028	Q029	Q030	Q031	Q032	Q033
			For every child between (0-59) months				For children older than 6 months		For children older than 9 months
Child No. (Take it from previous page)	Child First Name (Take it from previous page)	Child Age By month (Take it from previous page)	Edema in both legs 1= Yes 2= No 8= Refused 9= Absent	Diarrhea* During last 2 weeks 1= Yes 2= No	Caught or Difficulty of Breathing During last 2 weeks 1= Yes 2= No	Fever During last 2 weeks 1= Yes 2= No	Did child receive Vit. (A) during last 6 months? 1= Yes 2= No 3= Don't know	Did child receive Pentavalent vaccine (Injection in thigh) 1= Yes, from vaccination card 2= Yes, as they remember 3= Don't know 4= Didn't Vaccinated	Did child vaccinated against Measles (Injection in LF. Hand) 1= Yes, from vaccination card 2= Yes, as they remember 3= Don't know 4= Didn't Vaccinated

***Diarrhea: Increase number of times for passing watery stool**

Q 034- 035: write down breastfeeding for children between 0 and 24 months in the past 24 hours (leave empty for children older than 24 months).

Child No. (copied from the previous page)	Child's first name (from the previous page)	Child's age (in months) (from the previous page)	C034	C035				
			Is the baby breastfed by his mother (breast feeding) In the last 24 hours? 1 = Yes 2 = No	Record the number of times the child ate yesterday (record 0 if the child didn't eat)				
				C035a	C035b	C035c	C035d	C035e
				If the answer is Yes in the previous question How many times has the baby been breastfed and how many times has the baby been given breast milk in the last 24 hours?	How many times did the child have Infant (formula) milk during the last 24 hours?	How many times did the child have Any other milk, powder, milk, or fresh milk or canned milk or animal source milk during the last 24 hours?	How many times did the child have Yoghurt, Laban during the last 24 hours?	How many times did the child have Other food Provided they are solid, semi-solid or soft (such as banana)

Q 036: Children Feeding Practice aged between (0-24) months, during last 24 hours (Leave it empty if the child is older than 24 months).

Child No. (Take it from previous page	Child First Name (Take it from previous page)	Child Age By month (Take it from previous page)	Q036								
			Did the child eat any of the following food groups below (Start asking from the time the child woke up until he got sleep yesterday) let the mother answer then mention to her the food groups below.								
			Q036a	Q036b	Q036c	Q036d	Q036e	Q036f	Q036g	Q036h	Q036i
			Water with or without sugar	Grain: Porridge, chips, bread, rice, Pasta, or any cereal food. Tubers: White potatoes or any other Tuberous Foods.	Beans: Any foods made from beans, beans, basil, lentils, peanuts or any other legumes.	Cheese or Ice cream	Meat: Livers, kidneys, heart s or other intestines. Meets: beef, sheep, goats or poultry. Fresh, dried or canned fish.	Eggs	vegetables and fruits: Pumpkin, carrot or sweet potato with yellow or orange core. Any dark green leaves vegetables. Mature Mango or Boubia.	Any other fruits or vegetables not mentioned in the previous box.	Any other beverages or foods (Except baby milk, any other types of milks, Yogurt and Laban)

Assessment of nutritional and mortality status in Lahj governorate, March - April 2017

Demographic Monitoring Form during the period since 19 December 2016 (model 2)

Assessed Directorate: _____ District / Town: _____ Date: _____ Cluster Number: _____

Team Number: _____ Family Questionnaire Number: _____ Assessment Rank:_____

	Name	Sex (male or female)	Age in years	Joined the family at or after the anniversary of the Prophet's birth	Left the family at or after the anniversary of the prophet's birth	Born at or after the anniversary of the prophet's birth	Deceased at or after the anniversary of the prophet's birth	Cause of death	Site of death
List members of the family who are currently with the family, and then use the sign (✓) to indicate whether the person joined the family or were born at or after the birth of the Prophet									
1									
2									
3									
4									
5									
6									
7									
8									
9									
10									
11									
12									
13									
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18									
19									
20									
21									
22									
23									
24									
25									

Continued to the previous page

	Name	Sex (male or female)	Age in years	Joined the family at or after the anniversary of the Prophet's birth	Left the family at or after the anniversary of the prophet's birth	Born at or after the anniversary of the prophet's birth	Deceased at or after the anniversary of the prophet's birth	Cause of death	Place of death
Make a list of those who left the family at or after the date of the birth of the Prophet, then use the sign (✓) to indicate whether the person joined the family or were born at or after the birth of the Prophet									
1					✓				
2					✓				
3					✓				
4					✓				
5					✓				
6					✓				
7					✓				
8					✓				
9					✓				
10					✓				
11					✓				
12					✓				

	Name	Sex (male or female)	Age in years	Joined the family at or after the anniversary of the Prophet's birth	Left the family at or after the anniversary of the prophet's birth	Born at or after the anniversary of the prophet's birth	Deceased at or after the anniversary of the prophet's birth	Cause of death	Site of death
Make a list of those who died at or after the date of birth of the Prophet, then use the sign (✓) to indicate whether the person joined the family or were born at or after the birth of the Prophet									
1							✓		
2							✓		
3							✓		
4							✓		
5							✓		

Was there any pregnant women in the family since the anniversary of the prophet birth.	1- Yes		If yes, how many pregnant women	

Codes of Death Causes	
1= Unknown	5= Malnutrition
2= Accident or Injury	6= Fever
3= Diarrhea	7= Others (Mention)
4= Respiratory Problems	

	Codes of Death Places	
	1= Current Place	
	2= During Immigration	
	3= Last Place Resided	
	4= Others (Mention)	