Republic of Yemen

Ministry of Public Health and Population

Nutrition and Mortality Survey Report

Ibb Governorate, Yemen

25 March to 6 April 2017

unicef

United Nations CERF Central Emergency Response Fund

Acknowledgements

The Yemen Ministry of Public Health and Population (MoPHP)/ Ibb Governorate Public Health and Population Office, in collaboration with UNICEF Yemen Country Office and UNICEF Taiz Zone, acknowledge the contribution of the various stakeholders in this survey.

The UNICEF Yemen Country Office provided technical support, employing SMART methodology. The Survey Manager and his assistants were provided by Hodeidah, Taiz GHOs, Hajjah GHO and the central MoPHP. Survey enumerators and team leaders were provided by GHO of Ibb. Data entry team were provided by GHOs of Hajjah and Ibb. The protocol was finalised by Nutrition Department at MoPHP with technical of UNICEF YCO. UNICEF YCO provided technical assistance especially that related to daily quality check, data analysis and report writing were made by UNICEF YCO

Ibb Governorate Public Health and Population over saw the political and logistical arrangements for the survey, ensuring its smooth operation. The Nutrition survey was supported financially by UNICEF under a grant from the United Nations Central Emergency Response Fund (CERF); this support is greatly appreciated. The contribution of local authorities in ensuring the survey teams' security during fieldwork and in providing office facilities is gratefully appreciated.

The data could not have been obtained without the co-operation and support of the communities assessed, especially the mothers and caretakers who took time off from their busy schedules to respond to the interviewers. Their involvement and cooperation is highly appreciated.

MoPHP and UNICEF also express their sincere appreciation to the entire survey team for the high level of commitment and diligence demonstrated during all stages of the assessment to ensure high quality of data collected, and the successful accomplishment of the exercise.

Content

Acknowledgements 1
Content 1
Introduction 3
Assessment objectives 4
Methodology 6
Study and sampling design 6
Sampling Procedure (The second stage) 7
Survey Population and Data Collection Process 7
Measurement Standardization and Quality Control 8
Data Entry and Analysis 8
Results and discussion 11
The survey sample 11
Background indicators 11
Household income situation 12
Water, sanitation and hygiene 13
Child Nutrition 15
Acute malnutrition by WHZ 15
Acute malnutrition by MUAC 17
Underweight 19
Stunting 20
Mean z scores, design effects and flags 22
Change in Nutrition status between 2012 and 2017 23
IYCF practices 24
Child morbidity 24
Vitamin A supplementation and child vaccination 25
Women nutrition 25
Mortality 26
Associations of the nutritional status 27
Acute malnutrition 27
Underweight 28
Stunting 29
Child nutrition in related to mother nutrition 33
Recommendations 35

Global, moderate and severe acute malnutrition prevalence used for caseload calculation 36
References 37
Annexes 38
Annex 1: Ibb March-April 2017 Nutrition Survey Questionnaire 39
Annex 3: Calendar of events 56
Annex 4: Age determination job aid 57
Annex 5: Ibb March-April 2017 Survey Plausibility Check 58
Annex 6: Ibb Nutrition Survey Standardization Test Report for Evaluation of Teams 59
Annex 7: Clusters for Ibb March-April 2017 Nutrition Survey 60
Annex 8: Tables of Weighted Levels of Anthropometrical Indicators 62
Annex 9: Decision Tree for Household Selection (SMART Sampling Guideline, June 2012) 65

Introduction

Ibb Governorate is a central one located 193 kilometres south to Sana'a City and 214 kilometres north to Aden City. The Governorate in the map is taking a rhombus shape located in the middle of five governorates. Dhamar in the west, north and east, Al Baidha in the east, Ad Dhale' in the east and south, Taiz in the south and west, and in the west. The Governorate area is 5.868 square kilometres (1.8% of the country area) in where a population size of 2,892,000 are living as the per 2017 projection (10.8% of the country population) with a sex ratio of 0.93 male: 1 female.

Administratively, the Governorate consists of 20 districts, namely Ad Dhihar, Al Makhadir, Al Mashannah, Al Qafr, Al Udayn, An Nadirah, Ar Radmah, As Sabrah, As Saddah, As Sayyani, Ash Sha'ir, Ba'dan, Dhi As Sufal, Far Al Udayn, Hazm Al Udayn, Hubaysh, Ibb (the capital of the Governorate), Jiblah, Mudhaykhirah, and Yarim. Ecologically, Ibb is a mountainous governorate in where 11 districts are classified as temperate highlands and 9 districts dry highlands based on CSO Yemen ecological division. On these highlands, man built the terraces for cultivation of crops. Fertile valleys of the western part of Ibb flow into the Tihama Plain, while valleys lie east of the Governorate flow into the south and then into the Gulf of Aden.

The Governorate has a mild climate throughout the year with heavy rains especially in the summer. The annual rainfall rate exceeds 1,000 mm in the western and southern mountains. Abundance of water encouraged farmers to cultivate all the land despite the difficult mountains and steep terrains. The Governorate earned the nickname of "green province" for its green terraces. Agriculture is the main economic activity that includes crops cultivation of grains (wheat, barley, and millet), fruits and vegetables, coffee, and Qat, while livestock breeding on the other hand is widely grazed.

Health services are provided by 321 health facilities in the whole Governorate (16 hospitals, 118 health centres and 187 health units). Among these facilities, 305 deliver EPI services, 283 deliver IMCI services, 220 deliver CMAM services (25 of them provides SAM treatment services only), and 223 deliver reproductive health services.

The national nutrition information system has shown that number of SAM admitted children increased from 11,930 cases (reported by 120 sites) in 2014 to 12,092 cases (reported by 140 sites) in 2015 that in 2016 increased to 18,508 cases (reported by 220 sites). This indicates that average admitted cases per reporting sites decreased from 99.4 in 2014 to 86.4 in 2015 then slightly decrease to 84.1 in 2016.

The first SMART survey conducted in Ibb was in November/ December 2012 in two zones. Global acute malnutrition (GAM) was found as 7.6% (with 1.2% SAM) in Eastern Highlands and 8.6% (with 0.9% SAM) in Western Highlands (the weighted average was 8.0% GAM and 1.1% SAM). The DHS 2013 survey indicated a prevalence of wasting as 10.9% (with 2.7% SAM) while the CFSS 2014 indicated higher GAM levels (14.7%) but with almost same levels (2.6%). The most recent EFSNA that was conducted in November 2016 indicated GAM levels similar to that of SMART 2012 (8.0%) but with SAM levels of 1.7%.

Almost 68% of Ibb households are food insecure as revealed by the EFSNA November 2016. This level is significantly higher that the pre-crises one (43%) as shown by CFSS 2014. However the IPC classification of Ibb since 2012 is IPC 3 (Crisis).

Ibb is one of governorates which had heavily participated in the Peaceful Youth Revaluation of 2011 establishing one of largest sit-in squares in the country called "Gulf of Freedom". That crisis ended by signing the GCC Initiative by different political parties. Ibb after that participated in the National Dialogue Conference in 2013. After Houthi forces have controlled the Capital Sana'a in September 2014 and allied with forces loyal of the former president, a severe political/military crises raised that ended as an internal war by March 2015. Ibb has not witnessed large-scale military operations such as those in governorates of Taiz, Aden, Lahj, Abyan and Marib, but on the other hand, it was the governorate to which large numbers of families from Taiz and southern governorates displaced to. In August 2015, limited military operations have taken place in the governorate during which anti-Houthis could controlled 8 districts of Ibb, However, those operations were quickly foiled and the situation returned back to the rest.

Although war operations is not heavily taking place in Ibb, the Governorate is indirectly affected by the crisis. The deterioration of national economy, losing of income sources and livelihood, the inflation due to continuous deterioration of the value of the local currency and the increase of prices of food of fuel are all driven to poor affordability and accessibility to accepted quantity and quality food. Accessing essential service such as health and education is also challenging.

Assessment objectives

The overall objective of the survey was to assess the current nutrition situation in Ibb Governorate and key determinants. Specific objectives are:

1. To assess the level of acute malnutrition (wasting), stunting and underweight among children aged 6-59 months in Western Highlands and Eastern Highlands of Ibb Governorate.
2. To assess the prevalence of exclusive breastfeeding among under six months, breastfeeding continuation at 1 and 2 years, children aged 6 to 23 months with proper complementary feeding practices in Western Highlands and Eastern Highlands of Ibb Governorate.
3. To assess the child morbidity through determining the prevalence of diarrhoea, ARI and fever in Western Highlands and Eastern Highlands of Ibb Governorate.
4. To assess the routine polio vaccination coverage among children aged 3 to 59 months, measles vaccination coverage among children aged 9 to 59 months and vitamin A supplementation coverage within the last 6 months prior to survey among children aged 6 to 59 months in Western Highlands and Eastern Highlands of Ibb Governorate.
5. To assess the level of acute malnutrition among women at child bearing age (15 to 49 years) in Western Highlands and Eastern Highlands of Ibb Governorate.
6. To assess the food consumption scoring (FCS) in past 7 days in Western Highlands and Eastern Highlands of Ibb Governorate.
7. To assess the mean coping strategy index (CSI) of households in Western Highlands and Eastern Highlands of Ibb Governorate.
8. To assess the household practice of a set of stress, crisis and emergency coping strategies in Western Highlands and Eastern Highlands of Ibb Governorate.
9. To assess the household head losing of income sources in Western Highlands and Eastern Highlands of Ibb Governorate due to the current conflict crisis.

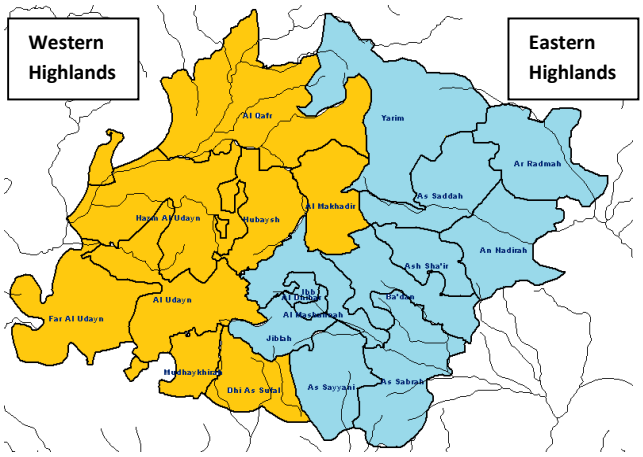
10. To assess the monthly household expenditure of households in Western Highlands and Eastern Highlands of Ibb Governorate.
11. To assess the education level of household caregivers in Western Highlands and Eastern Highlands of Ibb Governorate.
12. To assess the main household drinking water source, the quality classification of the water sources and the cleanness of drinking water storage in Western Highlands and Eastern Highlands of Ibb Governorate.
13. To assess the household latrine type and the quality classification of sanitation facilities in Western Highlands and Eastern Highlands of Ibb Governorate.
14. To assess the practice of handwashing with water and soap (or soap alternatives) by household care giver after toilet and before the meal in Western Highlands and Eastern Highlands of Ibb Governorate.
15. To assess the crude and under-five mortality rates in Western Highlands and Eastern Highlands of Ibb Governorate during the past three and a half months.[*]

[*] The recall period was determined from the day the Anniversary of Prophet Muhammad's Birth.

Methodology

The Governorate of Ibb was assessed as two strata. Western Highlands that includes 8 districts namely Al Makhadir, Al Udayn, Far Al Udayn, Hazm Al Udayn, Al Qafr, Dhi As Sufal, Hubaysh, and Mudhaykhirah, and Eastern Highlands that includes 12 districts namely Al Dhihar, Al Mashannah, Al Nadirah, Al Sabrah, Ash Sha'ir, Al Radmah, As Saddah, As Sayyani, Ba'dan, Yarim, Jiblah, and Ibb. Almost 41% of the Governorate population inhabit the Western Highlands while the remaining 59% inhabit the Eastern Highlands. The assessment was taken place during March 25th to April 4th, 2017 after one week of training and logistic preparation.

Figure 1. Ibb Governorate map shows the survey



All IDP settlements were not added to the sample frames. All clash and inaccessible areas have been excluded from frames before the selection of clusters. Excluded places were distributed in the two survey strata as the following:

- Al Udayn District: The two villages of Ramadha and Al Zarra of Erdan *Ozla*.
- Al Sabrah District: The village of Al Miqhaya of Bilad Al Shpaibi As Sofla *Ozla*.
- Ba'dan District: 5 villages namely are Al Athareb and Bayar (Al Athareb *Ozla*), Bait Al A'abeli, Dhi Ar Rekham and Bait Al Qatini (Bani Mansour *Ozla*).

Proportions of excluded population were 0.3% and 0.4% in Western Highlands and Eastern Highlands respectively. On the other hand, IDPs from other governorates living with host communities were considered during the update of the frames.

Study and sampling design

A two-staged cluster cross sectional assessment was conducted. The methods used, including sampling design and sample size determination were following SMART approach and ENA for SMART software. The sample size was calculated using the parameters as shown in table 2. The sample size was calculated based on achieving statistical confidence for anthropometric and mortality objectives. Thus, the highest determined size from each of the two objectives was selected.

Table 2. Parameters used in the Sample Size Determination

Parameters	Western Highlands	Eastern Highlands
Anthropometry		
Expected prevalence (p)[†]	8.0	8.0
Relative desired precision (d)	3	3
Design Effect (DEFF)	1.5	1.5
Average household size[‡]	7.4	7.4

[†] EFSNA November 2016
[‡] CSO Statistics

% of U5 in population[§]	17.2	17.6
% Non-response	3	3
Mortality		
Estimated crude death rate (CDR) per 10000/day[**]	0.15	0.15
Relative desired precision (d) per 10000/day	0.2	0.2
Design Effect (DEFF)	1.5	1.5
Recall period in days (RP)	98	105
Average household size	7.4	7.4
% Non-response	3	3

The sample size calculated was higher in anthropometry than in mortality. The highest calculated sample sizes for households were 462 and 451 for Western Highlands and Eastern Highlands respectively. With these numbers of households, the expected numbers of underfive children are 513 children in each survey stratum.

The survey has taken place in 30 clusters in each stratum. These clusters were selected following Probability Proportional to Size (PPS) approach. The number of households per cluster was planned as 17 households for Western Highlands and 16 households for Eastern Highlands.

The most updated list of sub villages (*Mahallas*) was used as the frame (as provided by CSO office) after excluding conflict and inaccessible places as provided by Ibb Governorate Health Office. The cluster in this survey was defined as a sub-village (*Mahalla*). Frames of the two strata were not including IDPs settlements, however Ibb GHO update frames considering IDPs living in host communities.

Sampling Procedure (The second stage)

The selection of households at the cluster level was made following the decision tree mentioned in SMART sampling guideline of June 2012 (Annex 9). For 28 clusters in Western Highlands and 24 clusters in Eastern Highlands, listing of households was made by team heads and villagers then the target number of households were randomly selected using SRS approach. For the remaining 2 clusters in Western Highlands and 6 clusters in Eastern Highlands, the SRS was also followed but after segmentation. For the purpose of listing, the survey operation room in Ibb was providing teams in daily basis with special forms called "Sample listing and selection form" as well as numbering strips that used by teams to complete selection process. At the end of the day, these forms together with the daily cluster reports and filled questionnaire were submitted to the survey manager at the survey operation room in Ibb city. The EPI random walking methods was not used in this survey.

Survey Population and Data Collection Process

The survey population consisted of: 1) anthropometry: children aged 6 to 59, 2) mortality: all people that have lived at the household (currently residing, left, born or died) over a recall period started from day of Anniversary of Prophet Muhammad's Birth; 3) IYCF: children 0-24 months; 4) morbidity: children 0-59 months. Age estimation was based on birth or immunization card details and/or supported with events calendar that includes governorate specific events and national events that are widely known (Annex 3: Events Calendar and Annex 4: Age determination job aid).

[§] EPI Programme Estimates

[**] EFSNA November 2016

Six field teams and four data entry persons (Annex 2: March-April 2017 Ibb Governorate Nutrition Survey Team) were trained for 6 days by the survey manager and the survey field supervisors. The training consisted of anthropometry, filling of questionnaire, and the field procedures following by rigorous standardization exercise (Annex 6: March-April 2017 Ibb Governorate Nutrition Survey Standardization Test Report) and field test before commencing the data collection phase. Out of the 6 trained teams, the best 5 teams were selected to complete the data collection over a 12 days period.

Selected households were given a brief overview of the survey and invited to participate. Verbal consent to participate was obtained after the household participant heard the survey overview from the survey team. After consent was given, the survey teams assisted a member from each selected household to complete a questionnaire comprising of 1) background demographics; 2) gender of household head, 3) gender, education and marital status of household caretaker; 4) information on household income and expenditure; 5) WASH indicators; 6) household food consumption and coping strategies; 7) marital status, physiological status and MUAC of woman at child bearing age; 8) child vaccination and vitamin A supplementation; 9) child anthropometry; 10) child morbidity; 11) IYCF practices; and 12) crude and underfive mortality. (Annex 1: March-April 2017 Ibb Governorate Nutrition Survey Questionnaire).

Retrospective mortality data were collected from all randomly selected households, irrespective of presence or absence of children aged 6-59 months. A recall was calculated from the day of the anniversary of Prophet Muhammad's Birth that was 98 days for the Western Highlands and 105 days for the Eastern Highlands.

Measurement Standardization and Quality Control

The survey teams has undergone to a concentrated practical training prior to the survey covering all areas related to the field work including standardisation test of the enumerators. Data quality was ensured through (i) monitoring of fieldwork by field technical supervisors; (ii) crosschecking of filled questionnaires on a daily basis, recording of observations and daily de-briefing and discussion; (iii) confirmation of measles, severe malnutrition especially oedema cases and death cases by supervisors; (iv) daily entry of anthropometric data; (v) doing the plausibility check in daily basis for the overall quality scoring and identification each team quality using 10 scoring criteria (statistical tests), plus ensuring each team was given feedback on the quality of previous day's data before the start of a new day; (v) daily equipment calibration, (vi) additional check done at the data entry level to enable entry only of relevant possible responses and measurements which was assisted by the auto check sheet that was specially designed for the data entry; and (vii) continuous reinforcement of good practices. For a quality concerns two clusters in the Western Highlands were revisited by the teams under supervision making sure that process of sampling, measurement and filling the questionnaire was completed properly.

Clear job descriptions were provided to field teams during the training and before commencing the data collection in order to ensuring appropriate guidance in completing the assigned tasks. Field team head was reviewing the filed questionnaires and verify the accuracy of the details before the team was leaving the cluster site, thus minimizing possibility of incomplete data (missing variables) and outlier data. The overall plausibility scores were 10% and 8% (excellent) for Western Highlands and Eastern Highlands respectively (Annex 5: Assessment Plausibility Check Report)

Data Entry and Analysis

The data in the filled questionnaires and mortality forms were entered into an Excel spread sheet created for the purpose of this survey. The spreadsheet contained all required self-check formulas as well as converting dates from Hijri to Gregorian. The verification of data entry was made by randomly

selection of 10% of records (households), dataset was considered verified since more than 95% of the selected records approved an accurate data entry work.

The anthropometrical data then were copied to ENA for SMART for interpretation to z scores as well as creation of the final plausibility check report and results of nutritional anthropometry status tables and curves. Similarly, the data of mortality were transferred to ENA for the analysis purposes and getting out the final death results with population pyramid.

Household variables and the remaining child-related variables (vaccination, vitamin A supplementation, feeding practices and morbidity) were analysed using Epi Info$^{(TM)}$ 3.5.3. The anthropometry indices (z-scores) for Weight for Height (wasting), Height for Age (stunting) and Weight for Age (underweight) were generated and compared with WHO 2006 Growth Standards. Children/cases with extreme z-score values were flagged and investigated and appropriately excluded in the final analysis if deviating from the observed mean (SMART flags).

In Epi Info, frequencies and cross-tabulations were used to give percentages, means and standard deviations in the descriptive analysis and presentation of general household and child characteristics. Significances was defined as ($P<0.05$).

The classification the nutritional status using the above indices as well as MUAC was made following the WHO classification (WHO 2006) and (WHO 2013). For acute malnutrition, additional calculation was made for programmatic purposes that showing the prevalence of GAM and SAM combining the respective cut-off thresholds of WHZ and MUAC considering the presence of bilateral biting oedema.

For IYCF indicators related to breast feeding and complementary feeding, the WHO guidelines on assessing infant and young child feeding practices were used (WHO 2008).

For the calculation of the value for Minimum Dietary Diversity (MDD), a 7 food group score variable was created. The 7 foods groups used for calculation are 1) grains, roots and tubers; 2) legumes and nuts; 3) dairy products (milk, yogurt, cheese); 4) flesh foods (meat, fish, poultry and liver/organ meats); 5) eggs; 6) vitamin-A rich fruits and vegetables; 7) other fruits and vegetables. Another indicator is the Minimum meal frequency (MMF) which is measuring the child consumption for solid, semi-solid, or soft foods. Minimum acceptable diet (MAD) is combining both MDD and MMF. The methods and analysis for the MDD, MMF and MAD were based as recommended by the WHO (WHO 2008).

The classification of MUAC of Women is not made based on the global one but based on that WFP is using for Yemen (CFSS 2011 & CFSS 2014). Woman is considered severely wasted if her MUAC is below 21.3 cm, moderately wasted if her MUAC is equal or more than 21.3 cm and below 22.2 cm, and of normal MUAC if the measurement is not less than 22.2 cm.

For sources of drink water indicators, the sources listed in the classification were classified to improved and unimproved sources. Improver drinking water sources are: 1) House connected piped water; 2) Artesian well; 3) Protected well; 4) Protected spring; and 5) Protected rainwater harvesting. Unimproved sources are: 1) Public tap/ Community point/ Sabeel; 2) Unprotected well; 3) Unprotected spring; 4) Bottled water; 5) Unprotected surface water (Wadi, springs, etc.); 6) Unprotected rainwater harvesting; 7) Water tanker; and 8) any other unclassified sources other those mentioned above.

Sanitation was also classified as improved and unimproved based on the type of latrine. Improved latrines are 1) Flush to piped sewer system; 2) Flush to septic tank; 3) Flush to pit latrine; 4) Ventilated improved pit latrine; 5) Pit latrine with slab; and 6) Composting toilet. Unimproved latrines include 1) Flush to open drain; 2) Flush to DK where; 3) Pit latrine without slab/ open pit; 4) Bucket; 5) Hanging latrine; 6) Defecation in open (in fields, etc.) and 7) any other unclassified sources than those previously mentioned.

Food consumption scores (FCS) were calculated based on the consumption during the last 7 days from the 8 food groups following WFP guidelines. The classification of FCS is not made following the global WFP one but based on the WFP Yemen way as the following:

- Below of equal to 28: Poor food consumption
- Above 28 to 42: Border line food consumption
- Above 42: Acceptable food consumption

The coping strategy index CSI scoring was done following WFP guidelines. It made depending on practicing of a list of 11 coping strategies. Another extended list of coping strategies in this survey was used to determine households who are practicing no coping strategies, stress coping strategies, crisis coping strategies and emergency coping strategies during the last 30 days as shown below:

Stress coping strategies:	Selling households assets/belongings (furniture, jewellery, clothes, etc.)
	Buying food by credit or pawning
	Spending from saving
	Borrowing money
Crisis coping strategies:	Selling of production assets or transport means (sewing machine, car or motorcycle, etc.)
	Consuming the stock of seeds that is reserved for the coming season
	Withdraw children out of school
	Reduce spending on education and health (including drugs)
Emergency coping strategies:	Selling the house or land
	Begging
	Selling the last female of cattle the household has

Results and discussion

The survey sample

A total of 510 and 539 households were targeted by the survey field teams in Western Highlands and Eastern Highlands respectively as shown in Table 3. Absence and refusal were less than 1% in Western Highlands and less than 2% in Eastern Highlands. Data were collected from a total number of 509 households including 611 children and 899 women in Western Highlands and from 531 households including 581 children and 989 women in Eastern Highlands.

Table 3. Sampled households, children and women in the two survey layers

	Western Highlands	Eastern Highlands
Households visited	510	539
Absence	0 (0.00%)	3 (0.56%)
Refusal	1 (0.20%)	5 (0.93%)
Households with completed questionnaires	509 (99.8%)	531 (98.5%)
Households with below 5 years children	346 (68.0%)	367 (69.1%)
Households with below 6 months children	38 (7.74%)	56 (10.6%)
Households with 15 to 49 women	484 (95.1%)	522 (98.3%)
Under 5 years children	611	581
Under 6 months children	39	58
6 to 59 months children	572	523
15 to 49 women	899	989
Average household size	6.98	7.19

The number of households visited was 10% more than the planned in Western Highlands and 19% in Eastern Highlands. The notable increase in households was seen in three clusters in Western Highlands and in six clusters in Eastern Households.

Household characteristics

Background indicators

Man was found a head of the household in 96.1% and 97.2% of households in Western Highlands and Eastern Highlands respectively, while woman was found the main household caretaker in 97.6% and 97% of households in Western Highlands and Eastern Highlands respectively. Around of 92% of household heads were found married in two survey strata.

Illiteracy was found high among household caretakers who are women in majority. 75% and 65% of caretakers in Western Highlands and Eastern Highlands respectively were found illiterate, while those of basic education and beyond are only 11% in Western Highlands and 15% in Eastern Highlands. Details are in table 4

Table 4. Background data on household head and household caretaker

Background indicator	Western Highlands		Eastern Highlands	
	N	% (95% CI)	N	% (95% CI)
The gender of household head				
Man	488	96.1 (93.9 – 97.5)	516	97.2 (95.3 – 98.4)

Background indicator	Western Highlands		Eastern Highlands	
	N	% (95% CI)	N	% (95% CI)
Woman	20	3.9 (2.5 – 6.1)	15	2.8 (1.6 – 4.7)
The gender of household caretaker				
Woman	497	97.6 (95.8 – 98.7)	515	97.0 (95.0 – 98.2)
Man	12	2.4 (1.3 – 4.2)	16	3.0 (1.8 – 5.0)
Marital status of household head				
Married	470	92.3 (89.6 – 94.4)	491	92.5 (89.8 – 94.5)
Widow	36	7.1 (5.1 – 9.7)	35	6.6 (4.7 – 9.1)
Divorced	3	0.6 (0.2 – 1.9)	1	0.2 (0.0 – 1.2)
Single	0	0.0 (0.0 – 0.0)	4	0.8 (0.2 – 2.1)
Education level of household caretaker				
Illiterate	382	75.0 (71.0 – 78.7)	345	65 (60.7 – 69.0)
Can read and write	71	13.9 (11.1 – 17.3)	106	20 (16.7 – 23.7)
Basic education	33	6.5 (4.6 – 9.1)	35	6.6 (4.7 – 9.1)
Secondary education	19	3.7 (2.3 – 5.9)	33	6.2 (4.4 – 8.7)
Higher education (university, college or institute)	4	0.8 (0.3 – 2.1)	12	2.3 (1.2 – 4.0)

Household income situation

As seen in table 5, around 82% of households in Western Highlands and 90% in Eastern Highlands reported losing - partially or fully - their income sources during the current crisis (since March 2015). These levels are much higher than that seen in Shabwa Governorate in January 2017 (around 25%), higher than that reported in Adh Dhale' Governorate in August 2016 (around 65%), and higher than that of Sana'a and Sa'ada governorates in May 2016 (around 65% and 66% respectively).

Table 5. Crisis effect on the household income

indicator	Western Highlands		Eastern Highlands	
	N	% (95% CI)	N	% (95% CI)
The impact on household income				
Regular salary or income has not been affected	89	17.6 (14.4 – 21.2)	51	9.6 (7.3 – 12.5)
Salary or income partially or totally lost	418	82.4 (78.8 – 85.6)	479	90.4 (87.5 – 92.7)

Median expenditures as shown in table 6 are 34,000 and 35,000 Yemeni Riyals in Western Highlands and Eastern Highlands respectively[††]. Higher expenditure in the Western Highlands was found in households with no coping strategies, while in Eastern Highlands the higher expenditure was found in households with emergency coping strategies. The median expenditures in Ibb was found lower than that found in Shabwa (50,000 to 60,000 Yemeni Riyals) in January 2017.

Table 6. Median monthly household expenditure in Yemeni Riyals distributed based on type of coping strategies

[††] The average rate of 1 USD in March/April 2017 is YR 350 in parallel market.

Income median	Western Highlands	Eastern Highlands
	Median (±SD)	Median (±SD)
Monthly expenditure in YR (n=506, 528)	34,000 (23,194)	35,000 (20,082)
Monthly expenditure means based on category of coping strategy (in 30 days)		
No coping strategy (n=88, 55)	40500 (28236)	32000 (17433)
Stress coping strategy (n=193, 206)	32000 (24045)	34000 (19965)
Crisis coping strategy (n=196, 251)	32000 (18986)	36000 (20274)
Emergency coping strategy (n=29, 16)	32000 (20524)	40500 (25470)

Water, sanitation and hygiene

As shown in table 7, household connected piped water is the main drinking water source found for half of households in Eastern Highlands while it is the main source for on 16% of households in the Western Highlands. Unprotected wells is the main source for almost fourth of households in the Western Highlands, while it is only the main source for 5.3% of households in the Eastern Highlands. Protected and unprotected springs are main sources for 21% of households in the Western Highlands and 24% of households in the Eastern Highlands.

Using of improved drinking water sources was significantly higher in Eastern Highlands (79.2%) than in Western Highlands (49.3%). However, treatment of water before drinking was found higher Western Highlands than in Eastern Highlands (10.1% and 5%) that is relatively low in the two survey strata. Storage of drinking water was found clean in about 73% and 87% of households in Western Highlands and Eastern Highlands respectively.

Flush toilet is the main latrine type used by over 80% of households in the two survey strata, however the type of flush to open drain is highly used in Western Highlands (49.5%) than in Eastern Highlands (30.1%). On the other hand, using of flush to sewer system is significantly higher in Eastern Highlands (28.6%) then in Western Highlands (0.2%). In total, using of improved latrine is significantly higher in Eastern Highlands (58.2%) than in Western Highlands (37.1%). Defecation in open was found around 8% in both survey strata as shown in Table 7.

The practice of handwashing with water and soap (or soap alternatives) practiced by household caretakers was mentioned as after the toilet by 44.8% and 36.2% of household caretaker in Western Highlands and Eastern Highlands respectively, and as before meal by 41.7% and 36.2% of household caretakers in Western Highlands and Eastern Highlands respectively.

Table 7. Water, sanitation and hygiene indicators

	Western Highlands		Eastern Highlands	
WASH indicators	**N**	**% (95% CI)**	**N**	**% (95% CI)**
The main household drinking water main source				
House connected piped water	83	16.3 (13.3 – 19.9)	286	54.0 (49.6 – 58.3)
Unprotected well	120	23.6 (20.0 – 27.6)	28	5.3 (3.6 – 7.6)
Protected spring	52	10.2 (7.8 – 13.3)	84	15.8 (12.9 – 19.3)
Unprotected spring	55	10.8 (8.3 – 13.9)	45	8.5 (6.3 – 11.3)
Artesian well	70	13.8 (10.9 – 17.1)	19	3.6 (2.2 – 5.6)

	Western Highlands		Eastern Highlands	
WASH indicators	**N**	**% (95% CI)**	**N**	**% (95% CI)**
Water tanker	38	7.5 (5.4 – 10.2)	21	4.0 (2.5 – 6.1)
Protected well	10	2.0 (1.0 – 3.7)	30	5.7 (3.9 – 8.1)
Protected rainwater harvesting	36	7.1 (5.1 – 9.7)	1	0.2 (0.0 – 1.2)
Public tap/ Community point/ Sabeel	16	3.1 (1.9 – 5.2)	7	1.3 (0.6 – 2.8)
Unprotected surface water (Wadi, springs, etc.)	18	3.5 (2.2 – 5.6)	2	0.4 (0.1 – 1.5)
Bottled water	3	0.6 (0.2 – 1.9)	7	1.3 (0.6 – 2.8)
Unprotected rainwater harvesting	8	1.6 (0.7 – 3.2)	0	0.0 (0.0 – 0.0)
Category of the main household drinking water main source				
Improved	251	49.3 (44.9 – 53.7)	420	79.2 (75.5 – 82.6)
Unimproved	258	50.7 (46.3 – 55.1)	110	20.8 (17.4 – 24.5)
Treatment of water before drinking (n=505, 524)	51	10.1 (7.7 – 13.1)	26	5.0 (3.3 – 7.3)
Clean drinking water storage (n=506, 531)	369	72.9 (68.8 – 76.7)	461	86.8 (83.6 – 89.5)
The main facility for defecation				
Flush to open drain	252	49.5 (45.1 – 53.9)	160	30.1 (26.3 – 34.3)
Flush to septic tank	130	25.5 (21.9 – 29.6)	132	24.9 (21.3 – 28.8)
Flush to piped sewer system	1	0.2 (0.0 – 1.3)	152	28.6 (24.9 – 32.7)
Defecation in open (in fields, etc.)	43	8.4 (6.2 – 11.3)	41	7.7 (5.7 – 10.4)
Flush to pit latrine	32	6.3 (4.4 – 8.9)	7	1.3 (0.6 – 2.8)
Pit latrine without slab/ open pit	21	4.1 (2.6 – 6.3)	7	1.3 (0.6 – 2.8)
Pit latrine with slab	17	3.3 (2.0 – 5.4)	8	1.5 (0.7 – 3.1)
Ventilated improved pit latrine	8	1.6 (0.7 – 3.2)	5	0.9 (0.3 – 2.3)
Bucket	0	0.0 (0.0 – 0.0)	7	1.3 (0.6 – 2.8)
Hanging latrine	2	0.4 (0.1 – 1.6)	4	0.8 (0.2 – 2.1)
Composting toilet	1	0.2 (0.0 – 1.3)	5	0.9 (0.3 – 2.3)
Flush to DK where	2	0.4 (0.1 – 1.6)	3	0.6 (0.1 – 1.8)
The type of the latrine				
Improved	189	37.1 (32.9 – 41.5)	309	58.2 (53.9 – 62.4)
Unimproved	320	62.9 (58.5 – 67.1)	222	41.8 (37.6 – 46.1)
Handwashing practice by household caretaker				
After the toilet (n=509, 530)	228	44.8 (40.4 – 49.2)	192	36.2 (32.2 – 40.5)
Before meal (n=509, 531)	212	41.7 (37.3 – 46.1)	192	36.2 (32.1 – 40.4)

Household food security

Food consumption scoring (FCS) was calculated based on the food consumption of 8 groups during the last 7 days and classified using the WFP (Yemen) thresholds. As shown in table 8 below, 76.2% and 73.6% of households in Western Highlands and Eastern Highlands respectively were classified as a food insecure. Severe food insecurity was found in two out of five households in the two survey strata.

Table 8: Food consumption classification

	Western Highlands		Eastern Highlands	
Food consumption classification	**N**	**% (95% CI)**	**N**	**% (95% CI)**
Household food consumption (WFP Yemen classification)				
Acceptable	200	39.3 (35.0 – 43.7)	203	38.4 (34.2 – 42.7)
borderline	188	36.9 (32.8 – 41.3)	186	35.2 (31.1 – 39.4)
Poor	121	23.8 (20.2 – 27.8)	140	26.5 (22.8 – 30.5)

Coping strategies were measured using the full coping strategy index (CSI). The mean scores in the two survey strata of Ibb Governorate were found as 6.46 in Western Highlands and 7.71 in Eastern Highlands. The average CSI for those have not practiced coping strategies during the last 30 days was 0.78 and 1.11 in Western Highlands and Eastern Highlands respectively, while it is highest among those reported practicing emergency coping strategies with mean CSI of 14.55 and 10.50 in Western Highlands and Eastern Highlands respectively as seen in table 9.

For the two survey strata, means CSI in different food consumption groupings were found lower in 'acceptable' group and higher in 'poor' groups as shown in the table 9.

Table 9. Means of CSI

	Western Highlands	Eastern Highlands
Coping Strategy Index (CSI)	**Mean (±SD)**	**Mean (±SD)**
Coping strategy index (CSI) in 7 days (n=509, 528)	6.46 (10.02)	7.71 (10.77)
CSI means based on category of coping strategy (in 30 days)		
No coping strategy (n=88, 55)	0.78 (3.80)	1.11 (3.28)
Stress coping strategy (n=194, 208)	4.77 (7.61)	7.77 (8.89)
Crisis coping strategy (n=198, 249)	9.45 (11.39)	8.95 (12.52)
Emergency coping strategy (n=29, 16)	14.55 (14.61)	10.50 (12.61)
CSI means based on food consumption (WFP Yemen classification)		
Acceptable (n=200, 203)	5.16 (8.96)	4.32 (8.39)
borderline (n=188, 186)	5.54 (8.89)	8.60 (11.43)
Poor (n=121, 137)	10.06 (12.31)	11.62 (11.54)

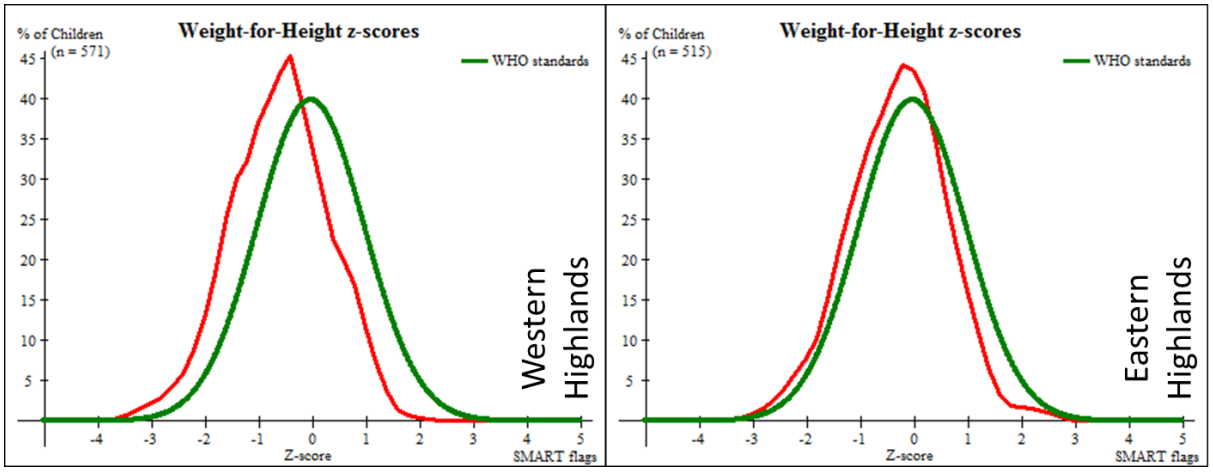
Child Nutrition

Acute malnutrition by WHZ

The survey showed a prevalence of global acute malnutrition (GAM) - as defined by WHZ - of 5.6% and 3.9% in Western Highlands and Eastern Highlands respectively with no significance difference between the two survey strata. Boys show higher GAM rates than girls in the two survey strata, but the difference is not statistically significant. Severe acute malnutrition (SAM) prevalence has been

found as 0.7% and 0.6% in Western Highlands and Eastern Highlands respectively (tables 10a and 10b). No single oedema case was reported in Western Highlands while only 2 cases were reported in Eastern Highlands. Graphs in figure 2 show slight shift to the left of the survey population when compared to the reference population, which is implying a presence of malnutrition slightly above the reference one. The current GAM level of 5.6% of the Western Highlands is classified as 'poor' according to the WHO categorization of public health significance of wasting, while GAM level of 3.9% of the Eastern Highlands is classified as 'acceptable'.

Figure 2. The survey children WHZ scores distribution vs the reference population in the two survey strata



Levels of GAM and SAM in both survey strata of Ibb found by this SMART survey (conducted in March/April 2017) are lower than levels found by EFSNA conducted in November 2016 (8% GAM and 1.7 SAM). For Western Highlands, the current levels of GAM and SAM are lower than those of SMART conducted in November 2012 in same stratum (8.6% GAM and 0.9% SAM). Similarly, the current levels of GAM and SAM in Eastern Highlands are lower than those of SMART conducted in December 2012 in same stratum (7.6% GAM and 1.2% SAM). More discussion is presented later in this report

Table 10a. Prevalence of acute malnutrition based on weight-for-height z-scores (and/or oedema) and by sex in Western Highlands

	All **n = 571**	**Boys** **n = 301**	**Girls** **n = 270**
Prevalence of global malnutrition	(32) 5.6 % (3.4 - 9.0 95% C.I.)	(20) 6.6 % (3.7 - 11.7 95% C.I.)	(12) 4.4 % (2.6 - 7.4 95% C.I.)
Prevalence of moderate malnutrition	(28) 4.9 % (2.9 - 8.1 95% C.I.)	(19) 6.3 % (3.7 - 10.7 95% C.I.)	(9) 3.3 % (1.7 - 6.4 95% C.I.)
Prevalence of severe malnutrition	(4) 0.7 % (0.3 - 1.8 95% C.I.)	(1) 0.3 % (0.0 - 2.5 95% C.I.)	(3) 1.1 % (0.4 - 3.4 95% C.I.)

The prevalence of oedema is 0.0 %

Table 10b. Prevalence of acute malnutrition based on weight-for-height z-scores (and/or oedema) and by sex in Eastern Highlands

	All **n = 517**	**Boys** **n = 251**	**Girls** **n = 266**
Prevalence of global malnutrition	(20) 3.9 % (2.3 - 6.4 95% C.I.)	(14) 5.6 % (3.3 - 9.2 95% C.I.)	(6) 2.3 % (0.9 - 5.4 95% C.I.)

Prevalence of moderate malnutrition	(17) 3.3 % (1.9 - 5.8 95% C.I.)	(12) 4.8 % (2.7 - 8.4 95% C.I.)	(5) 1.9 % (0.7 - 5.1 95% C.I.)
Prevalence of severe malnutrition	(3) 0.6 % (0.1 - 2.6 95% C.I.)	(2) 0.8 % (0.2 - 3.4 95% C.I.)	(1) 0.4 % (0.0 - 2.9 95% C.I.)

The prevalence of oedema is 0.4 %

Tables 11a and 11b show that GAM (by WHZ-score criteria) in the two survey zones is higher in younger children (6– 23 months) than in older group aged 24 to 59 months. The difference was not statistically significant.

Table 11a. Prevalence of acute malnutrition by age, based on weight-for-height z-scores and/or oedema in Western Highlands

Age (mo)	Total no.	Severe wasting		Moderate wasting		Wasting	
		No.	%	No.	%	No.	%
6-23	204	3	1.5	13	6.4	16	7.8
24-59	367	1	0.3	15	4.1	16	4.4
Total	571	4	0.7	28	4.9	32	5.6
Statistical test		X^2=1.257*, df=1, P=0.262				X^2=3.008, df=1, P=0.083	

* Corrected (Yates)

Table 11b. Prevalence of acute malnutrition by age, based on weight-for-height z-scores and/or oedema in Eastern Highlands

Age (mo)	Total no.	Severe wasting		Moderate wasting		Wasting	
		No.	%	No.	%	No.	%
6-23	188	1	0.5	6	3.2	7	3.7
24-59	329	2	0.6	11	3.3	13	4.0
Total	517	3	0.6	17	3.3	20	3.9
Statistical test		X^2=0.243*, df=1, P=0.622				X^2=0.017, df=1, P=0.897	

* Corrected (Yates)

Acute malnutrition by MUAC

Similar to the WHZ defined acute malnutrition, tables 12a and 12b show that prevalence of MUAC below 12.5 cm (GAM by MUAC) is higher in Western Highlands than in Western Highlands. However, GAM (by MUAC) of 6.3% in Western Highlands in not significantly higher than 4.2% of Eastern Highlands. Prevalence of MUAC below 11.5 cm (SAM by MUAC) was found as 1% in the two survey strata. GAM by MUAC was found higher in girls than in boys in both survey strata, however the difference was found significant only in the Western Highlands (X^2=11.911, P<0.001)

GAM and SAM by MUAC found by this SMART survey (conducted in March/April 2017) is lower than levels found by EFSNA November 2016 (7.8% and 1.9% SAM). For Western Highlands, the current levels of GAM and SAM by MUAC are slightly lower than those of SMART conducted in November 2012 in same stratum (7.1% GAM and 1.5% SAM). For Eastern Highlands, the current level of GAM is widely lower than those of SMART conducted in December 2012 in same stratum (10.4% GAM) and slightly power in case of SAM (1.6%). More discussion is presented later in this report

Tables 13a and 13b show that GAM prevalence by MUAC were higher in young children (6 – 23 months) (14.7% and 9.5% in Western Highlands and Eastern Highlands respectively) than in older children aged 24 to 59 months (1.6% and 1.2% in Western Highlands and Eastern Highlands respectively. Differences were significance with P<0.001 in both survey strata.

Table 12a. Prevalence of acute malnutrition based on MUAC cut off's (and/or oedema) and by sex in Western Highlands

	All **n = 572**	**Boys** **n = 302**	**Girls** **n = 270**
Prevalence of global malnutrition	(36) 6.3 % (4.3 - 9.1 95% C.I.)	(9) 3.0 % (1.4 - 6.4 95% C.I.)	(27) 10.0 % (7.0 - 14.1 95% C.I.)
Prevalence of moderate malnutrition	(30) 5.2 % (3.4 - 8.0 95% C.I.)	(7) 2.3 % (0.9 - 5.6 95% C.I.)	(23) 8.5 % (5.9 - 12.2 95% C.I.)
Prevalence of severe malnutrition	(6) 1.0 % (0.5 - 2.2 95% C.I.)	(2) 0.7 % (0.2 - 2.6 95% C.I.)	(4) 1.5 % (0.6 - 3.8 95% C.I.)

The prevalence of oedema is 0.0 %

Table 12b. Prevalence of acute malnutrition based on MUAC cut off's (and/or oedema) and by sex in Eastern Highlands

	All **n = 518**	**Boys** **n = 252**	**Girls** **n = 266**
Prevalence of global malnutrition	(22) 4.2 % (2.5 - 7.1 95% C.I.)	(8) 3.2 % (1.5 - 6.5 95% C.I.)	(14) 5.3 % (2.7 - 10.0 95% C.I.)
Prevalence of moderate malnutrition	(17) 3.3 % (2.0 - 5.4 95% C.I.)	(5) 2.0 % (0.9 - 4.6 95% C.I.)	(12) 4.5 % (2.3 - 8.5 95% C.I.)
Prevalence of severe malnutrition	(5) 1.0 % (0.3 - 2.7 95% C.I.)	(3) 1.2 % (0.4 - 3.7 95% C.I.)	(2) 0.8 % (0.2 - 3.0 95% C.I.)

The prevalence of oedema is 0.4 %

Table 13a. Prevalence of acute malnutrition by age, based on MUAC cut off's and/or oedema in Western Highlands

Age (mo)	**Total no.**	**Severe wasting**		**Moderate wasting**		**Wasting**	
		No.	**%**	**No.**	**%**	**No.**	**%**
6-23	204	4	2.0	26	12.7	30	14.7
24-59	368	2	0.5	4	1.1	6	1.6
Total	572	6	1.0	30	5.2	36	6.3
Statistical test		X^2=1.1358*, df=1, P=0.244				X^2=38.047, df=1, P=0.000	

* Corrected (Yates)

Table 13b. Prevalence of acute malnutrition by age, based on MUAC cut off's and/or oedema in Eastern Highlands

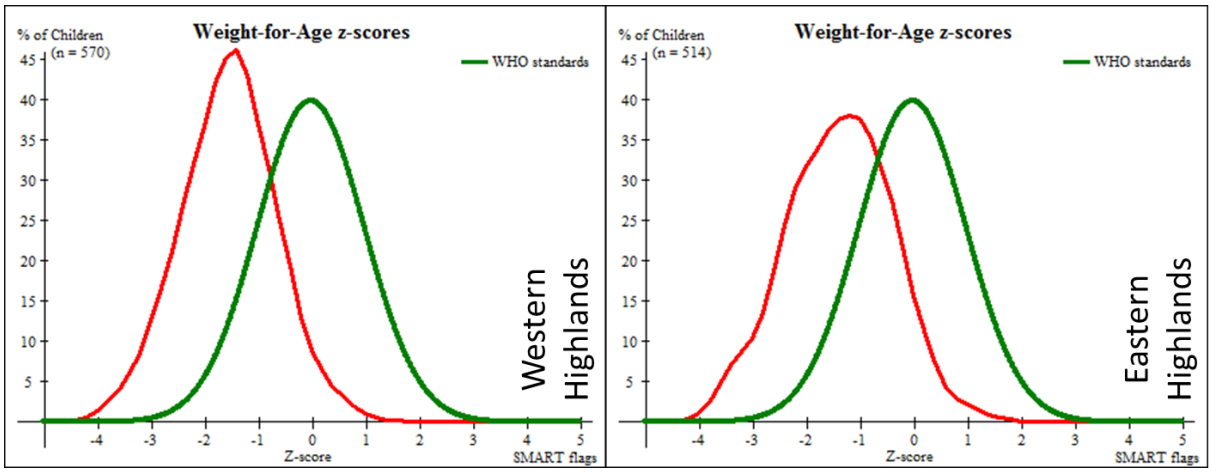
Age (mo)	Total no.	Severe wasting		Moderate wasting		Wasting	
		No.	%	No.	%	No.	%
6-23	189	4	2.1	14	7.4	18	9.5
24-59	329	1	0.3	3	0.9	4	1.2
Total	518	5	1.0	17	3.3	22	4.2
Statistical test		X^2=5.447*, df=1, P=0.118				X^2=20.374, df=1, P=0.000	

* Corrected (Yates)

Underweight

The survey has shown an underweight prevalence of 29.5% in Western Highlands and 28.0% in Eastern Highlands, while severe underweight was found as 5.3% in in Western Highlands and 6.2% in Eastern Highlands (Tables 14a and 14b). Underweight was found significantly higher in boys than in girls in Western Highlands (X^2=5.976, P<0.05) while difference in Eastern Highlands is not statistically significant. Severe underweight levels were found higher in boys than in girls, however, differences are statistically insignificant. With these levels of underweight that exceed 20% but below 30%, Ibb is classified as a governorate with 'high prevalence' underweight according to the WHO categorization of public health significance of underweight.

Figure 3. The survey children WAZ scores distribution vs the reference population in the two survey strata



Levels of underweight and severe underweight in both survey strata of Ibb found by this SMART survey (conducted in March/April 2017) are lower than levels reported by EFSNA conducted in November 2016 (33.3% underweight and 7.7% severe underweight). For Western Highlands, the current levels of underweight and severe underweight are lower than those of SMART conducted in November 2012 in same stratum (33.2% underweight and 7.9% severe underweight). Similarly, the current levels of underweight and severe underweight in Eastern Highlands are lower than that of SMART conducted in December 2012 in same stratum (35.6% underweight and 9.7% severe underweight). More discussion is presented later in this report

Table 14a. Prevalence of underweight based on weight-for-age z-scores by sex in Western Highlands

	All n = 570	Boys n = 301	Girls n = 269

Prevalence of underweight	(168) 29.5 % (24.8 - 34.7 95% C.I.)	(102) 33.9 % (27.5 - 40.9 95% C.I.)	(66) 24.5 % (20.4 - 29.2 95% C.I.)
Prevalence of moderate underweight	(138) 24.2 % (20.9 - 27.9 95% C.I.)	(84) 27.9 % (23.6 - 32.7 95% C.I.)	(54) 20.1 % (16.6 - 24.1 95% C.I.)
Prevalence of severe underweight	(30) 5.3 % (3.2 - 8.6 95% C.I.)	(18) 6.0 % (3.2 - 10.9 95% C.I.)	(12) 4.5 % (2.4 - 8.3 95% C.I.)

Table 14b. Prevalence of underweight based on weight-for-age z-scores by sex in Eastern Highlands

	All **n = 514**	**Boys** **n = 249**	**Girls** **n = 265**
Prevalence of underweight	(144) 28.0 % (21.9 - 35.0 95% C.I.)	(73) 29.3 % (22.4 - 37.4 95% C.I.)	(71) 26.8 % (19.9 - 35.1 95% C.I.)
Prevalence of moderate underweight	(112) 21.8 % (17.0 - 27.5 95% C.I.)	(53) 21.3 % (15.7 - 28.1 95% C.I.)	(59) 22.3 % (16.0 - 30.1 95% C.I.)
Prevalence of severe underweight	(32) 6.2 % (4.3 - 8.9 95% C.I.)	(20) 8.0 % (4.6 - 13.5 95% C.I.)	(12) 4.5 % (2.7 - 7.4 95% C.I.)

In both survey strata, table 15a and 15b show that underweight is higher in children aged 24 to 59 months (30.9% and 31.6% in Western Highlands and Eastern highlands respectively) than in children aged 6 to 23 months (27% and 21.6% in Western Highlands and Eastern highlands respectively). However the difference was only found significant in Eastern Highlands. Severe underweight was found insignificantly higher in older children in Eastern Highlands, while it was almost same in the two age groups in Western Highlands.

Table 15a. Prevalence of underweight by age, based on weight-for-age z-scores in Western Highlands

Age (mo)	**Total no.**	**Severe underweight**		**Moderate underweight**		**Underweight**	
		No.	**%**	**No.**	**%**	**No.**	**%**
6-23	204	11	5.4	44	21.6	55	27.0
24-59	366	19	5.2	94	25.7	113	30.9
Total	570	30	5.3	138	24.2	168	29.5
Statistical test		X^2=0.011, df=1, P=0.918				X^2=0.965, df=1, P=0.326	

Table 15b. Prevalence of underweight by age, based on weight-for-age z-scores in Eastern Highlands

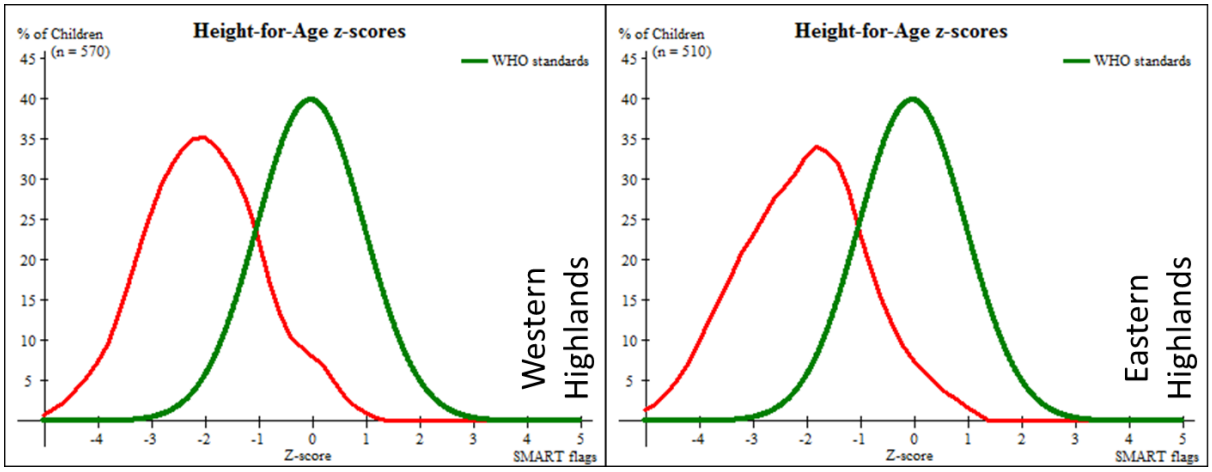
Age (mo)	**Total no.**	**Severe underweight**		**Moderate underweight**		**Underweight**	
		No.	**%**	**No.**	**%**	**No.**	**%**
6-23	185	9	4.9	31	16.8	40	21.6
24-59	329	23	7.0	81	24.6	104	31.6
Total	514	32	6.2	112	21.8	144	28.0
Statistical test		X^2=0.917, df=1, P=0.338				X^2=5.859, df=1, P=0.015	

Stunting

The stunting prevalence was found as of 51.9% in Western Highlands and 49.2% in Eastern highlands. Severe stunting levels were found as 19.3% and 21% in Western Highlands and Eastern highlands

respectively (Tables 16a and 16b). No significance differences was found between survey strata in both stunting and severe stunting. Boyes show higher levels than girls in the two survey strata, however the difference was not significant in Eastern Highlands and was almost significant (X^2=4.203, P=0.049) in Western Highlands. Differences between boys and girls for severe stunting were not significant in the two survey strata. With these levels of stunting that exceed 40%, Ibb is classified as a governorate with 'high prevalence' stunting according to the WHO categorization of public health significance of stunting.

Figure 4. The survey children HAZ scores distribution vs the reference population in the two survey zones



Levels of stunting and severe stunting in both survey strata of Ibb found by this SMART survey (conducted in March/April 2017) are close to levels reported by EFSNA conducted in November 2016 (52.9% stunting and 20% severe stunting). For Western Highlands, the current levels of stunting and severe stunting are close to those of SMART conducted in November 2012 in same stratum (52.2% stunting and 21.5% severe stunting). Similarly, the current levels of stunting and severe stunting in Eastern Highlands are slightly lower than those of SMART conducted in December 2012 in same stratum (55.7% stunting and 24.2% severe stunting). More discussion is presented later in this report

Table 16a. Prevalence of stunting based on height-for-age z-scores and by sex in Western Highlands

	All **n = 570**	**Boys** **n = 300**	**Girls** **n = 270**
Prevalence of stunting	(296) 51.9 % (45.2 - 58.6 95% C.I.)	(168) 56.0 % (47.7 - 64.0 95% C.I.)	(128) 47.4 % (40.3 - 54.6 95% C.I.)
Prevalence of moderate stunting	(186) 32.6 % (28.3 - 37.2 95% C.I.)	(102) 34.0 % (28.0 - 40.5 95% C.I.)	(84) 31.1 % (25.8 - 36.9 95% C.I.)
Prevalence of severe stunting	(110) 19.3 % (14.9 - 24.6 95% C.I.)	(66) 22.0 % (17.1 - 27.9 95% C.I.)	(44) 16.3 % (11.2 - 23.1 95% C.I.)

Table 16b. Prevalence of stunting based on height-for-age z-scores and by sex in Eastern Highlands

	All **n = 510**	**Boys** **n = 246**	**Girls** **n = 264**
Prevalence of stunting	(251) 49.2 % (41.3 - 57.1 95% C.I.)	(128) 52.0 % (42.6 - 61.4 95% C.I.)	(123) 46.6 % (38.2 - 55.2 95% C.I.)
Prevalence of moderate stunting	(144) 28.2 % (24.3 - 32.5 95% C.I.)	(68) 27.6 % (22.6 - 33.4 95% C.I.)	(76) 28.8 % (23.4 - 34.9 95% C.I.)

	All n = 510	Boys n = 246	Girls n = 264
Prevalence of severe stunting	(107) 21.0 % (15.5 - 27.8 95% C.I.)	(60) 24.4 % (17.1 - 33.6 95% C.I.)	(47) 17.8 % (12.8 - 24.2 95% C.I.)

Tables 17a and 17b show higher stunting levels in children aged 24 to 59 months (55% and 51.9% in Western Highlands and Eastern Highlands respectively) than in children aged 6 to 23 months (46.3% and 44.6% in Western Highlands and Eastern Highlands respectively). Difference was only significant in Western Highlands.

Table 17a. Prevalence of stunting by age based on height-for-age z-scores in Western Highlands

Age (mo)	Total no.	Severe stunting		Moderate stunting		Stunting	
		No.	%	No.	%	No.	%
6-23	203	35	17.2	59	29.1	94	46.3
24-59	367	75	20.4	127	34.6	202	55.0
Total	570	110	19.3	186	32.6	296	51.9
Statistical test		X^2=0.120, df=1, P=0.729				X^2=3.995, df=1, P=0.046	

Table 17b. Prevalence of stunting by age based on height-for-age z-scores in Eastern Highlands

Age (mo)	Total no.	Severe stunting		Moderate stunting		Stunting	
		No.	%	No.	%	No.	%
6-23	186	32	17.2	51	27.4	83	44.6
24-59	324	75	23.1	93	28.7	168	51.9
Total	510	107	21.0	144	28.2	251	49.2
Statistical test		X^2=2.518, df=1, P=0.113				X^2=2.470, df=1, P=0.116	

Mean z scores, design effects and flags

Table 18 shows z scores of different anthropometry indices with SDs of below 1 except for stunting that crossed the 1. In general all SDs are between 0.89 and 1.15. Design effect was higher than 1.5 for WFH in Western Highlands which was below 1.5 in Eastern Highlands.

Table 18. Mean z-scores, Design Effects and excluded subjects

Indicator	Western Highlands					Eastern Highlands				
	n	Mean z-scores ± SD	Design Effect (z-score < -2)	z-scores not available	z-scores out of range	n	Mean z-scores ± SD	Design Effect (z-score < -2)	z-scores not available*	z-scores out of range
Weight-for-Height	571	-0.60±0.90	1.90	0	1	515	-0.29±0.90	1.30	7	1
Weight-for-Age	570	-1.55±0.89	1.62	0	2	514	-1.38±0.97	2.64	6	3
Height-for-Age	570	-2.02±1.09	2.49	0	2	510	-2.03±1.15	3.09	5	8

* contains for WHZ and WAZ the children with oedema.

Change in Nutrition status between 2012 and 2017

The previous SMART survey conducted in Ibb was in Nov-Dec 2012. As shown in figures 5a and 5b, levels of malnutrition decreased during the past five years. Since the two surveys were done in different seasons, the comparison for acute malnutrition levels is not valid. Statistically, differences between the two surveys are not significant, except for underweight (t=2.49, df=64, P<0.05) and severe underweight (t=2.34, df=64, P<0.05) in Western Highlands and GAM by WHZ (t=2.78, df=64, P<0.01) and GAM by MUAC (t=3.38, df=64, P<0.05) in Eastern Highlands. However, as previously mentioned, such comparison is not valid for acute malnutrition. For stunting, the trend shows a decrease of a percentage of 1.5% per year in both survey areas that if it continues in the same rate for the coming 3 years, then change will reach the significance level to be considered as an improvement in chronic malnutrition levels.

Figure 5a. Changes in malnutrition levels in Western Highlands between November 2012 and March 2017

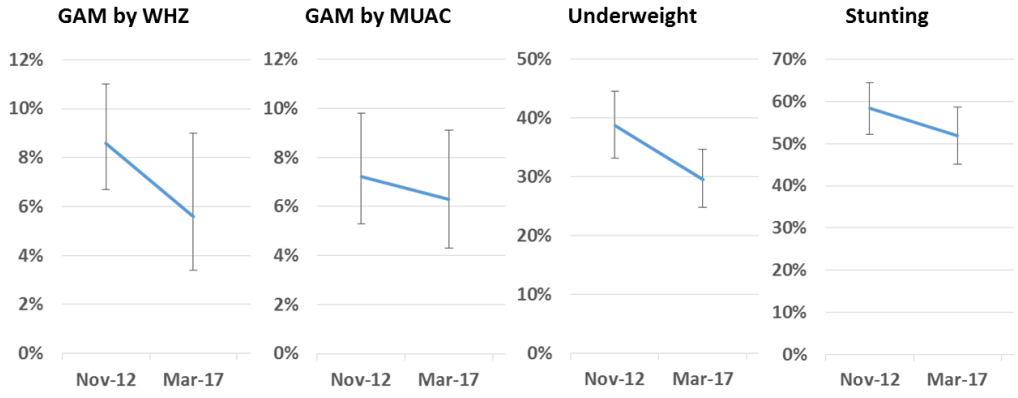
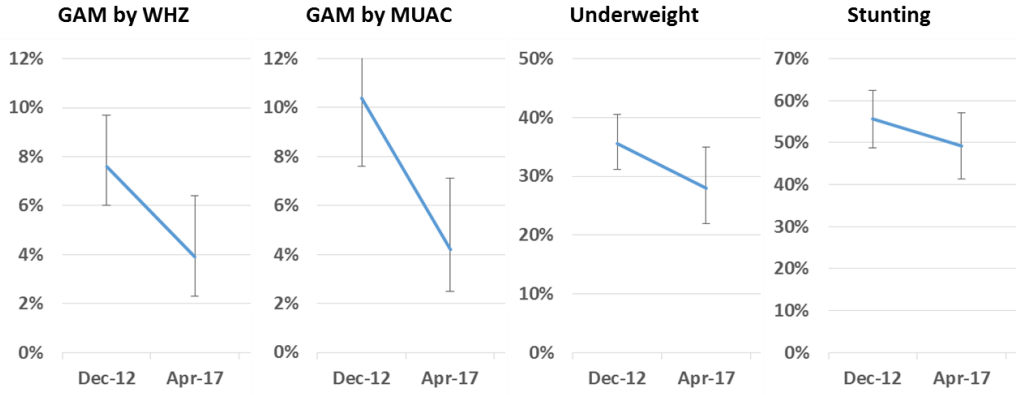


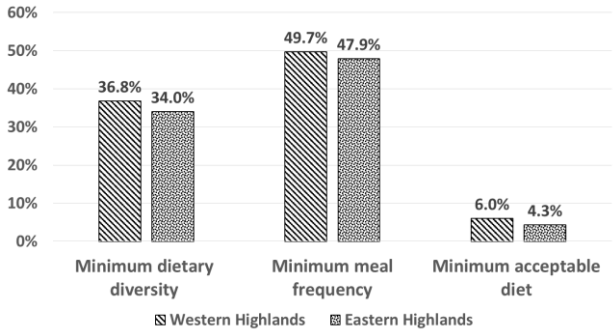
Figure 5b. Changes in malnutrition levels in Eastern Highlands between December 2012 and April 2017



IYCF practices

Among all children aged 0 to 23 months, almost 62% and 64% who have been breastfed either exclusively or partially in the previous day to the survey in Western Highlands and Eastern Highlands respectively. Exclusive breastfeeding levels in Ibb two survey strata are very close to the national average as shown in the table 19. One out of two children continue the breastfeeding at two years in Western Highlands in compare to two out of five children in Eastern Highlands.

Figure 6. Complementary feeding practice in children aged 6 to 23 months



Young child feeding practices have also been found as inappropriate. Although half of children both breastfed and on-breastfed aged 6 to 23 months in the two strata were found to receive the age appropriate number of meals, only 36.8% and 34% of children at this age group in the Western Highlands and Eastern highlands respectively are receiving the accepted diversified diets (composed of 4 food groups or more). Levels of minimum acceptable diet are too low as 6% and 4.3% in Western Highlands and Eastern Highlands respectively (figure 6 and table 19).

Table 19. IYCF indicators

	Western Highlands		Eastern Highlands	
Indicator	**N**	**% (95% CI)**	**N**	**% (95% CI)**
Breastfed yesterday	149	62.1 (55.6 – 68.2)	158	64.2 (57.9 – 70.2)
Exclusive breastfeeding	6	15.4 (5.9 – 30.5)	7	12.1 (5.0 – 23.3)
Continued breastfeeding at 1 year	26	68.4 (51.3 – 82.5)	8	42.1 (20.3 – 66.5)
Continued breastfeeding at 2 years	13	25.0 (14.0 – 38.9)	26	40.6 (28.5 – 53.6)
Minimum dietary diversity	74	36.8 (30.1 – 43.9)	64	34.0 (27.3 – 41.3)
Minimum meal frequency	99	49.7 (42.6 – 56.9)	90	47.9 (40.5 – 55.3)
Minimum acceptable diet	12	6.0 (3.2 – 10.3)	8	4.3 (1.9 – 8.2)

Child morbidity

Table 20 shows the prevalence of diarrhoea, ARI and fever within two weeks preceding the survey. Diarrhoea level was found high as 45% and 44% in the Western Highlands and Eastern Highlands respectively which is close to levels found in Hodeidah and Taiz in March and May 2013 but slightly higher than that reported by DHS 2013 for Ibb (37.1%) and lower than that shown by EFSNA 2016 (54.7%). ARI levels were found as 39.2% and 45.2% in Western Highlands and Eastern Highlands respectively that are higher than that reported by DHS 2013 (17.7%) and lower than that reported by EFSNA 2016 (70.1%). Higher levels of fever were found (52.5% and 50.2% respectively) that are higher than that shown by DHS 2013 for Ibb (36.1).

Table 20. Child morbidity within the last two weeks prior to the survey

	Western Highlands		Eastern Highlands	
Indicator	**N**	**% (95% CI)**	**N**	**% (95% CI)**
Diarrhoea	271	44.9 (40.9 – 49.0)	254	43.8 (39.7 – 47.9)
Acute respiratory infection	237	39.2 (35.3 – 43.3)	262	45.2 (41.1 – 49.3)

	Western Highlands		Eastern Highlands	
Indicator	**N**	**% (95% CI)**	**N**	**% (95% CI)**
Fever	317	52.5 (48.4 – 56.5)	291	50.2 (46 – 54.3)

Vitamin A supplementation and child vaccination

Although survey was conducted after a national polio campaign that included vitamin A supplementation to children aged 6 to 59 months, the coverage of vitamin A supplementation within the last 6 months was found below 90% as shown in table 21 which is lower than Sphere Standards. The routine polio vaccination (dose 3) was found above 80% in both survey strata that is higher than that shown by DHS 2013 for Ibb (60%), while lower levels of measles vaccination were found (77% and 80% in Western Highlands and Eastern Highlands respectively). There almost one child is still keeping the vaccination card out of two vaccinated for measles.

Table 21. Vitamin A supplementation and child vaccination

	Western Highlands		Eastern Highlands	
Indicator	**N**	**% (95% CI)**	**N**	**% (95% CI)**
Vitamin A supplementation within the last 6 months (for children aged 96 to 59 months)	446	78.9 (75.3 – 82.2)	458	88.2 (85.1 – 90.8)
Routine polio vaccination (by card) among children aged 3 months and above	282	50.3 (46.1 – 54.5)	217	41.8 (37.5 – 46.2)
Routine polio vaccination (by recall) among children aged 3 months and above	173	30.8 (27.1 – 34.9)	219	42.2 (37.9 – 46.6)
Routine polio vaccination (by card and recall) among children aged 3 months and above	455	81.1 (77.6 – 84.2)	436	84 (80.5 – 87)
Measles vaccination (by card) among children aged 9 months and above	244	46.3 (42 – 50.7)	188	38.3 (34 – 42.8)
Measles vaccination (by recall) among children aged 9 months and above	160	30.4 (26.5 – 34.5)	206	42 (37.6 – 46.5)
Measles vaccination (by card and recall) among children aged 9 months and above	404	76.7 (72.8 – 80.2)	394	80.1 (76.2 – 83.5)

Women nutrition

Using the WFP Yemen MUAC cutoffs for classifying acute malnutrition among women aged 15 to 49 years, table 22 shows that GAM and SAM level are 15.1% and 8.8% respectively in Western Highlands and 15% and 8.5% respectively in Eastern Highlands. While lactating mothers and pregnant women have same level of GAM in Western Highlands, pregnant women GAM in Eastern Highlands is almost three times of that of lactating mothers.

Table 22. Acute malnutrition among women at child bearing age

Indicator	Western Highlands	Eastern Highlands

	Global acute malnutrition N (%) (95% CI)	Severe acute malnutrition N (%) (95% CI)	Global acute malnutrition N (%) (95% CI)	Severe acute malnutrition N (%) (95% CI)
Women at child bearing age (15 – 49 years)	133 (15.1) (12.8 – 17.6)	78 (8.8) (7.1 – 10.9)	142 (15.0) (12.8 – 17.5)	80 (8.5) (6.8 – 10.5)
Lactating mothers	15 (11.2) (6.4 – 17.8)	9 (6.7) (3.1 – 12.4)	8 (5.5) (2.4 – 10.6)	5 (3.4) (1.1 – 7.9)
Pregnant women	14 (15.9) (9.0 – 25.2)	7 (8.0) (3.3 – 15.7)	21 (21.6) (13.9 – 31.2)	6 (6.2) (2.3 – 13.0)
Neither lactating nor pregnant	103 (15.7) (13.0 – 18.8)	61 (9.3) (7.2 – 11.8)	113 (16.2) (13.6 – 19.2)	69 (9.9) (7.8 – 12.4)

Mortality

Using a recall period of 98 days in Western Highlands and 105 days in Eastern Highlands , the crude death rates found are 0.48 (95% CI 0.30 – 0.77) and 0.17 (95% CI 0.09 – 0.33) per 10,000 per day in the Western Highlands and Eastern Highlands respectively. Underfive death rates were found as 0.70 (95% CI 0.27 – 1.81) per 10,000 per day in Western Highlands while no underfiive death were reported in Eastern Highlands. Details are in table 23.

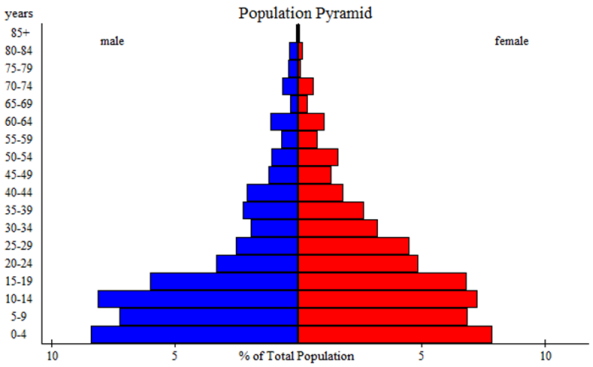
Table 23. Death rates in the two survey strata of Ibb Governorate

	Western Highlands		Eastern Highlands	
	Death Rate (95% CI)	Design Effect	Death Rate (95% CI)	Design Effect
Overall (CDR)	0.48 (0.30-0.77)	1	0.17 (0.09-0.33)	1
Sex				
Male	0.65 (0.33-1.28)	1.23	0.30 (0.14-0.63)	1
Female	0.32 (0.13-0.81)	1.2	0.05 (0.01-0.37)	1
Years				
0 – 4 yrs (U5DR)	0.70 (0.27-1.81)	1	0.00 (0.00-0.00)	1
5 – 11 yrs	0.00 (0.00-0.00)	1	0.13 (0.02-0.95)	1
12 – 17 yrs	0.34 (0.08-1.35)	1	0.00 (0.00-0.00)	1
18-49 yrs	0.15 (0.04-0.65)	1	0.12 (0.03-0.51)	1
50-64 yrs	1.33 (0.29-5.90)	1.67	1.07 (0.36-3.12)	1
65-120 yrs	5.30 (2.51-10.85)	1	0.80 (0.10-5.82)	1

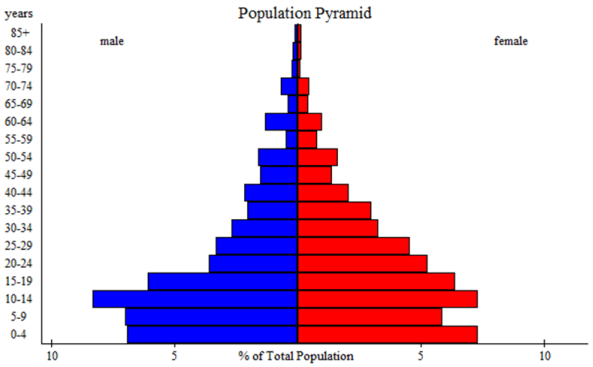
Population pyramids in figure 7 indicates similarities for age groups of females in the two survey strata, while it is not the case for males. Decay is seen for males in Western Highlands for age group of 20 to less than 35 years.

Figure 7. Population pyramids in the two survey strata of Ibb Governorate

Western Highlands



Eastern Highlands



Associations of the nutritional status

Acute malnutrition

In **Western Highlands**, acute malnutrition (when defined using WHZ) was found associated with existence of diarrhoea (P<0.05). Acute malnutrition (by WHZ) was found higher among children of caretakers who are not practising handwashing with water and soap (or soap alternatives) after toilet (P<0.05) as shown in table 24.

In **Eastern Highlands**, the acute malnutrition (as defined by MUAC cut offs) was found associated with diarrhoea among children two weeks prior to the survey (P<0.05) as shown in table 25.

Table 24. Associations of acute malnutrition (by WHZ)

Indicator	Acute malnutrition (by WHZ)		Statistical test
	N	%	
Western Highlands			
Diarrhoea (n=565) Yes (n=257) No (n=308)	 20 12	 7.8 3.9	X^2=3.96, df=1, P=0.047
Handwashing after toilet (n=571) Yes (n=271) No (n=300)	 9 23	 3.3 7.7	X^2=5.083, df=1, P=0.024

Table 25. Associations of acute malnutrition (by MUAC)

Indicator	Acute malnutrition (by MUAC)		Statistical test
	N	%	
Eastern Highlands			
Diarrhoea (n=518) Yes (n=236) No (n=282)	 15 7	 6.4 2.5	X^2=4.741, df=1, P=0.029

Underweight

In **Western Highlands**, underweight was significantly associated with WASH and monthly household total expenditures. Higher levels of underweight were found in children from households those use unimproved drinking water sources (P<0.05) and those use the unimproved latrines (P<0.05). Underweight was also found lower in children where household caretakers are practising handwashing with water and soap (or soap alternatives) after toilet (P<0.01) and before meal (P<0.01). Hand washing after toilet was also found associated with lower severe underweight levels (P<0.01) as presented in tables 26 and 27. Households at lowest, second and middle quintiles of monthly expenditures were found to have higher level of child underweight than those in households of fourth and highest quintile (P<0.05) as seen in table 26.

In **Eastern Highlands**, table 26 shows that underweight weight is mostly associated to diarrhoea and WASH indicators. Higher level of underweight were found in children who have suffered from diarrhoea in the past two weeks to the survey (P<0.05). Using of improved drinking water sources and improved latrines was found associated with lower levels of underweight (P<0.05). Children living in household with clean drinking water storage are with lower levels of underweight (P<0.01). The household caretaker practice of handwashing with water and soap (or soap alternatives) after toilet and/or before meal was also found associated with lower levels of underweight (P<0.01) as presented in table 26.

Table 26. Associations of underweight

Indicator	Underweight		Statistical test
	N	%	
Western Highlands			
Drinking water source type (n=570)			X^2=4.351, df=1, P=0.037
Improved (n=276)	70	25.4	
Unimproved (n=294)	98	33.3	
Latrine type (n=570)			X^2=5.576, df=1, P=0.018
Improved (n=194)	45	23.2	
Unimproved (n=376)	123	32.7	
Handwashing after toilet (n=570)			X^2=10.811, df=1, P=0.001
Yes (n=271)	62	22.9	
No (n=299)	106	35.5	
Handwashing before meal (n=570)			X^2=9.213, df=1, P=0.002
Yes (n=235)	53	22.6	
No (n=335)	115	34.3	
Expenditure quintile (n=567)			X^2=11.939, df=4, P=0.018
Lowest (n=108)	38	35.2	
Second (n=98)	32	32.7	
Middle (n=111)	39	35.1	
Fourth (n=118)	35	29.7	
Highest (n=132)	24	18.2	
Eastern Highlands			

Indicator	Underweight		Statistical test
	N	%	
Diarrhoea (n=514)			X^2=5.486, df=1, P=0.019
Yes (n=236)	78	33.1	
No (n=278)	66	23.7	
Drinking water source type (n=512)			X^2=11.863, df=1, P=0.001
Improved (n=403)	99	24.6	
Unimproved (n=109)	45	41.3	
Latrine type (n=514)			X^2=9.804, df=1, P=0.002
Improved (n=285)	64	22.5	
Unimproved (n=229)	80	34.9	
Cleanness of drinking water storage (n=514)			X^2=8.319, df=1, P=0.004
Yes (n=446)	115	25.8	
No (n=68)	29	42.6	
Handwashing after toilet (n=513)			X^2=6.867, df=1, P=0.009
Yes (n=182)	38	20.9	
No (n=331)	105	31.7	
Handwashing before meal (n=514)			X^2=8.316, df=1, P=0.004
Yes (n=186)	38	20.4	
No (n=328)	106	32.3	

Table 27. Associations of severe underweight

Indicator	Severe underweight		Statistical test
	N	%	
Western Highlands			
Handwashing after toilet (n=570)			X^2=9.633, df=1, P=0.002
Yes (n=271)	6	2.2	
No (n=299)	24	8.0	

Stunting

In **Western Highlands**, stunting was associated with WASH, income, monthly expenditures and food security. Lower stunting levels is associated with using of improved drinking water sources (P<0.05). Both stunting and severe stunting is also associated with the type of latrines that household is using (P<0.05 and P<0.01 respectively). Stunting and severe stunting levels were found lower among children living in households with clean drinking water storage (P<0.05 and P<0.05). Lower stunting levels are associated with household caretaker practice of handwashing before meal with water and soap (or soap alternatives) (P<0.01), while handwashing after toilet is associated with lower levels of stunting and severe stunting (P<0.05 and P<0.01 respectively). Children living in households with severe food insecurity (poor food consumption) have higher levels of stunting (P<0.05). Households at lowest, second and middle quintiles of monthly expenditures were found to have higher level of stunting and severe stunting than those in households of fourth and highest quintile (P<0.001 and

P<0.01 respectively). Severe stunting was also found associated with losing of income during the crisis period (P<0.01. Details are shown in tables 28 and 29.

In **Eastern Highlands**, higher stunting rate was found in households with illiterate caregivers (P<0.01). Higher stunting rates were associated with household using of unimproved drinking water sources (P<0.01) and unimproved latrines (p<0.01). Households those are doing drinking water treatment showed lower levels of stunting and severe stunting (P<0.05). Handwashing practice by household caregivers with water and soap (or soap alternatives) after toilet is associated with lower levels of stunting (P<0.01) and severe stunting (P<0.05). Handwashing before meals is also associated with lower rates of stunting and severe stunting (P<0.01). Details are presented in tables 28 and 29.

Table 28. Associations of stunting

Indicator	**Stunting**		**Statistical test**
	N	**%**	
Western Highlands			
Drinking water source type (n=570)			X^2=6.61, df=1, P=0.010
Improved (n=276)	128	46.4	
Unimproved (n=294)	168	57.1	
Latrine type (n=570)			X^2=4.696, df=1, P=0.030
Improved (n=195)	89	45.6	
Unimproved (n=375)	207	55.2	
Cleanness of drinking water storage (n=567)			X^2=7.131, df=1, P=0.008
Yes (n=423)	207	48.9	
No (n=144)	89	61.8	
Handwashing after toilet (n=570)			X^2=6.114, df=1, P=0.013
Yes (n=271)	126	46.5	
No (n=299)	170	56.9	
Handwashing before meal (n=570)			X^2=7.939, df=1, P=0.005
Yes (n=236)	106	44.9	
No (n=334)	190	56.9	
FCS category (n=570)			X^2=7.681, df=2, P=0.022
Acceptable (n=212)	100	47.2	
borderline (n=219)	110	50.2	
Poor (n=139)	86	61.9	
Expenditure quintile (n=567)			X^2=26.181, df=4, P=0
Lowest (n=108)	61	56.5	
Second (n=98)	58	59.2	
Middle (n=111)	73	65.8	
Fourth (n=118)	57	48.3	
Highest (n=132)	47	35.6	
Eastern Highlands			

Indicator	Stunting		Statistical test
	N	%	
Household caretaker education (n=510)			X^2=10.2281, df=1, P=0.001
Illiterate (n=318)	174	54.7	
Literate (n=192)	77	40.1	
Drinking water source type (n=508)			X^2=6.971, df=1, P=0.008
Improved (n=401)	186	46.4	
Unimproved (n=107)	65	60.7	
Latrine type (n=510)			X^2=8.419, df=1, P=0.004
Improved (n=283)	123	43.5	
Unimproved (n=227)	128	56.4	
Treatment of drinking water (n=505)			X^2=4.247, df=1, P=0.039
Yes (n=19)	5	26.3	
No (n=486)	245	50.4	
Handwashing after toilet (n=509)			X^2=11.575, df=1, P=0.001
Yes (n=182)	71	39.0	
No (n=327)	179	54.7	
Handwashing before meal (n=510)			X^2=7.159, df=1, P=0.007
Yes (n=186)	77	41.4	
No (n=324)	174	53.7	

Table 29. Associations of severe stunting

Indicator	Severe stunting		Statistical test
	N	%	
Western Highlands			
Cleanness of drinking water storage (n=567)			X^2=3.871, df=1, P=0.049
Yes (n=423)	74	17.5	
No (n=144)	36	25.0	
Latrine type (n=570)			X^2=7.986, df=1, P=0.005
Improved (n=195)	25	12.8	
Unimproved (n=375)	85	22.7	
Handwashing after toilet (n=570)			X^2=6.832, df=1, P=0.009
Yes (n=271)	40	14.8	
No (n=299)	70	23.4	
Losing of Income (n=568)			X^2=8.107, df=1, P=0.004
Yes (n=469)	101	21.5	
No (n=99)	9	9.1	
Expenditure quintile (n=567)			

Indicator	Severe stunting		Statistical test
	N	%	
Lowest (n=108)	24	22.2	X^2=17.283, df=4, P=0.002
Second (n=98)	23	23.5	
Middle (n=111)	31	27.9	
Fourth (n=118)	21	17.8	
Highest (n=132)	11	8.3	
Eastern Highlands			
Treatment of drinking water (n=505)			X^2=4.071*, df=1, P=0.044
Yes (n=19)	0	0.0	
No (n=486)	107	22.0	
Handwashing after toilet (n=509)			X^2=6.165, df=1, P=0.013
Yes (n=182)	27	14.8	
No (n=327)	79	24.2	
Handwashing before meal (n=510)			X^2=10.039, df=1, P=0.002
Yes (n=186)	25	13.4	
No (n=324)	82	25.3	

* Yates' chi-square

As a summary of all associations explained above, table 30 presents all determinants and background factors related to household, household caretaker and child and the type of association (if existed) either negative or positive.

Table 30. Summary of associations of different malnutrition forms with different determinants included in the survey

Determinants	GAM (by WHZ)	SAM (by WHZ)	GAM (by MUAC)	SAM (by MUAC)	Underweight	Severe underweight	Stunting	Severe stunting
Western Highlands								
Diarrhoea	+	○	○	○	○	○	○	○
Using improved drinking water source type	○	○	○	○	-	○	-	○
Using improved latrine type	-	○	○	○	-	○	-	-
Cleanness of drinking water storage	○	○	○	○	○	○	-	-
Washing hand after toilet	-	○	○	○	-	-	-	-
Washing hand before meal	○	○	○	○	-	○	-	○
Income losing	○	○	○	○	○	○	○	+

Determinants	GAM (by WHZ)	SAM (by WHZ)	GAM (by MUAC)	SAM (by MUAC)	Underweight	Severe underweight	Stunting	Severe stunting
Expenditure quintile	○	○	○	○	-	○	-	-
Food insecurity (using FCS)	○	○	○	○	○	○	+	○
Eastern Highlands								
Diarrhoea	○	○	+	○	+	○	○	○
Using improved drinking water source type	○	○	○	○	-	○	-	○
Using improved latrine type	○	○	○	○	-	○	-	○
Cleanness of drinking water storage	○	○	○	○	-	○	○	○
Treatment of drinking water	○	○	○	○	○	○	-	-
Washing hand after toilet	○	○	○	○	-	○	-	-
Washing hand before meal	○	○	○	○	-	○	-	-
Household caretaker education	○	○	○	○	○	○	-	○

Child nutrition in related to mother nutrition

In **Western Highlands**, higher GAM and SAM levels (as defined by WHZ) were found in children of wasted mothers (P<0.001). Waster mother were also found to have children with higher levels of underweight (P<0.001), severe underweight (P<0.001) and severe stunting (P<0.01). In **Eastern Highlands**, GAM and SAM (as defined by WHZ), underweight and severe underweight were found associated with wasting among mothers (P<0.001). Details are presented in table 31.

Table 31. Associations of mother and child malnutrition

Indicator	N	%	Statistical test
Western Highlands			
	Acute malnutrition (by WHZ)		
Wasting among mothers (n=557) Wasting (n=35) Normal MUAC (n=522)	 8 24	 22.9 4.6	X^2=16.965*, df=1, P=0.000
	Severe acute malnutrition (by WHZ)		
Wasting among mothers (n=557) Wasting (n=35)	 4	 11.4	X^2=45.128*, df=1, P=0.000

Indicator	N	%	Statistical test
Normal MUAC (n=522)	0	0.0	
	Underweight		
Wasting among mothers (n=556) Wasting (n=34) Normal MUAC (n=522)	 24 143	 70.6 27.4	X^2=28.34, df=1, P=0.000
	Severe underweight		
Wasting among mothers (n=556) Wasting (n=34) Normal MUAC (n=522)	 12 18	 35.3 3.4	X^2=57.334*, df=1, P=0.000
	Severe Stunting		
Wasting among mothers (n=556) Wasting (n=34) Normal MUAC (n=522)	 13 95	 38.2 18.2	X^2=8.187, df=1, P=0.004
Eastern Highlands			
	Acute malnutrition (by WHZ)		
Wasting among mothers (n=511) Wasting (n=21) Normal MUAC (n=490)	 7 12	 33.3 2.4	X^2=45.373*, df=1, P=0.000
	Severe acute malnutrition (by WHZ)		
Wasting among mothers (n=511) Wasting (n=21) Normal MUAC (n=490)	 2 1	 9.5 0.2	X^2=16.127*, df=1, P=0.000
	Underweight		
Wasting among mothers (n=508) Wasting (n=19) Normal MUAC (n=489)	 15 128	 78.9 26.2	X^2=25.182, df=1, P=0.000
	Severe underweight		
Wasting among mothers (n=508) Wasting (n=19) Normal MUAC (n=489)	 8 24	 42.1 4.9	X^2=36.803*, df=1, P=0.000

* Yates' chi-square

Recommendations

The survey reported a relatively low acute malnutrition levels (as defined by WHZ cutoff thresholds) in compare to levels in other nearby governorates such as Taiz and Hodeidah. These levels are 5.6% (poor) and 3.9% (acceptable) in Western Highlands and Eastern Highlands respectively. However, acute malnutrition levels of 6.3% and 4.2% (as defined by MAUC) in Western Highlands and Eastern Highlands respectively should be given an attention. High levels of underweight and very high levels of stunting have been found in Ibb with no differences between the two survey zones. Although, the comparison with data of 2012 shows some reduction trends in levels of malnutrition, another follow up survey is needed that should consider the seasonal factor.

Infant and young child feeding practices are poor with exclusive breastfeeding around 13% and minimum acceptable diet (MAD) around 5%, while vitamin A supplementation during the last 6 months is still below acceptable thresholds of Sphere Standards. On the other hands, high prevalence of diarrhoea and respiratory infections reported among underfive children.

Socioeconomic situation was found poor, with illiteracy rate of almost 70% of household caretakers (mostly women), with only 6.6% of them are with basic education. As more than 85% of households reported losing the income source either fully or partially, the household expenditure was found as less than US$ 3.5 per day for a house hold with average 7 members.

Although the rate of using improved drinking water sources is significantly higher in Eastern Highlands than in Western Highlands, there is still one out of three households uses unimproved sources in the whole governorate. Using of improved latrine facilities is available in almost half of the Governorate households, while defecation in open is still a practice of 8% of households. Only two out of five household caretakers were found practicing hand washing with water and soup after toilet and before meals.

Child nutrition status was found associated mainly with WASH factors in the two survey zone which include the type of drinking water source, latrine type and the practice of hand washing. Diarrhoea prevalence was also found a factor associate with acute malnutrition. Expenditure and food insecurity were found associated with underweight and/or stunting in Western Highlands, while education of household caretaker was associated with stunting in Eastern Highlands.

Acute malnutrition in women at child bearing age was found as 15% (using WFP Yemen MUAC categorisation). Although this is much lower than the national level, malnutrition among child mothers were found associated with acute malnutrition and underweight in children in the two survey zones.

Concerning these findings and the general situation of the country during the current crisis the following recommendations can be suggested to be translated to proper action points:

- WASH interventions including those made through C4D activities are required, to improve levels of utilization improved latrines, improved drinking water sources, and mobilise for hand washing to be a regular practice by household members. C4D activities should include prevention of child illnesses particularly diarrhoeal diseases
- The poor Infant and young child feeding practices should be addressed through intensive education campaigns targeted schools, women movements and other community platforms. Education of communities on using local available foods for feeding young child is critically required.
- Support is needed to assure supplement children with vitamin A every six months with the aim to achieving minimal levels stated by Sphere Standards.
- Planning for delivering of CMAM services should consider using the combined acute malnutrition levels as shown in table 31 below.

- If no change in the context, another survey after two year is recommended. It should be conducted either in March or in November.

Global, moderate and severe acute malnutrition prevalence used for caseload calculation

For CMAM programme planning purposes, the child is considered acutely malnourished in case at least one of the three criteria is existed, the first one is the WHZ below -2, the second is the existence of oedema, and the third is the child mid-upper arm circumference (MUAC) is below 125 mm. Similarly for severely acute malnutrition (SAM), the child is considered SAM if his WHZ is below -3, and/or the oedema is existed, and the third is the child MUAC is below 115 mm. Such analysis is crucial for calculation of caseload and for programme planning purposes. Table 32 shows combined acute malnutrition figures at the zone level as well the weighted ones for the governorate level.

Table 32. Combined acute malnutrition (based on WHZ and MUAC) for CMAM Planning purposes

		N	%	95% Conf Limits	
				Lower	Upper
Western Highlands (n = 572) (Unweighted)	Moderate	51	8.9%	6.8%	11.6%
	Severe	9	1.6%	0.8%	3.1%
	Moderate and Severe	60	10.5%	8.2%	13.4%
Eastern Highlands (n = 519) (Unweighted)	Moderate	29	5.6%	3.8%	8.0%
	Severe	6	1.2%	0.5%	2.6%
	Moderate and Severe	35	6.7%	4.8%	9.3%
Ibb (n = 1080) (Weighted)	Moderate	76	7.0%	5.6%	8.7%
	Severe	14	1.3%	0.8%	2.3%
	Moderate and Severe	90	8.3%	6.8%	10.2%

References

1. SMART, Action Against Hunger-Canada, and Technical Advisory Group. (2012) Sampling Methods and Sample Size Calculation for the SMART Methodology.
2. WHO (1995). Physical status: the use and interpretation of anthropometry. Report of a WHO Expert Committee. WHO Technical Report Series No.854. . Geneva, World Health Organisation.
3. WHO (2008). Indicators for assessing infant and young child feeding practices, World Health Organisation.
4. WHO. (2010). Nutrition Landscape Information System (NLIS) country profile indicators: interpretation guide. World Health Organisation, Geneva.
5. WHO. (2013). Guideline: Updates on the management of severe acute malnutrition in infants and children Geneva: World Health Organization, Geneva.
6. WHO Multicentre Growth Reference Study Group. (2006). WHO Child Growth Standards: Length/height-for-age, Weight-forage, Weight-for-length, Weight-for-height and Body mass index-for-age: Methods and Development. World Health Organization, Geneva.
7. WHO. Water Sanitation Health. http://www.who.int/water_sanitation_health/monitoring/jmp2012/key_terms/en/. Accessed on 28/5/2016.
8. WFP and Food Security Analysis Service. (2009). Comprehensive Food Security & Vulnerability Analysis Guidelines. United Nations World Food Programme, Rome, Italy.
9. Deniel Maxwell and Richard Caldwell. (2008). The Coping Strategies Index, Field Methods Manual, 2nd edition. CARE, Inc.

Annexes

Annex 1: Ibb March-April 2017 Nutrition Survey Questionnaire

استبيان رقم: .....

الجمهورية اليمنية
وزارة الصحة العامة والسكان
مكتب الصحة العامة والسكان بمحافظة .....

تقييم الحالة التغذوية والوفيات في محافظة .....، شهر 2017م

استبيان الأسرة (نموذج 1)

أولاً. يتم الشرح للساكنين في المسكن (البالغين منهم) عن التقييم والتعريف بالجهة القائمة عليه والأشخاص العاملين فيه (أعضاء الفريق)، ثم بعد ذلك الحصول على الموافقة الشفهية منهم.

الموافقة	1.	نعم	
	2.	لا	انتقل إلى الصفحة التالية

هل الأسرة مقيمة أم نازحة؟

1.	مقيمة.	
2.	نازحة	

في حال الأسرة المقيمة. هل تقيم معكم اسرة أو اسر نازحة؟

1.	نعم	في حال وجود اسرة نازحة تعيش مع اسرة مقيمة فينبغي تعبئة بيانات الاسرتين في استبيانين منفصلين عدا استمارة الوفيات فيجب ان تكون استمارة واحدة للأسرتين، وترفق مع استبيان الأسرة المقيمة.
2.	لا	

المديرية	العزلة	القرية/ الحارة

تاريخ المقابلة	يوم	شهر	سنة	رقم مسلسل الأسرة بحسب حصر العينة
		Ø	2 Ø 1 7	

اسم رب الأسرة:	

فريق التقييم رقم	الفريق	الاسم	التوقيع
	الباحثة 1		
	الباحثة 2 + 3		
	رئيس الفريق		
	المشرف الميداني		

تنقل البيانات التالية من س1 بيانات الأسرة والوفيات إلى استمارة تفريغ حصر العنقود .

عدد أفراد الأسرة	عدد الأطفال أقل من 5 سنوات	عدد الأطفال أقل من 6 أشهر	عدد النساء في سن الإنجاب 15-49 عام	عدد أفراد استمارة الوفيات

بين فيما إذا كان هناك:		
1.	غياب الأسرة عند الزيارة الأولى ويتطلب الأمر زيارة ثانية	
2.	غياب المرأة عند الزيارة الأولى ويتطلب الأمر زيارة ثانية	
3.	غياب طفل عند الزيارة الأولى ويتطلب الأمر زيارة ثانية*	

* عند غياب الطفل، تستكمل كل بياناته عدا القياسات الإنثروبومترية والأوديما حيث تستكمل عند حضوره.

ملاحظة: البيانات في الغلاف هي للاستخدام الميداني والإداري من قبل أعضاء الفريق.

استبيان رقم: .....

يملئ من قبل رئيس الفريق (تستخدم لإدخال البيانات)

تاريخ المقابلة	يوم		شهر		سنـــــة			
			Ø		2	Ø	1	7

رقم الفريق	

رمز القرية / الحارة			رمز العزلة		
رمز المديرية			رمز المحافظة		
رقم طبقة التقييم			رقم العنقود		

هل المنطقة حضرية (1) أم ريفية (2)	

غياب الأسرة حتى بعد الزيارة الثانية (1 نعم ، 2 لا)	
الموافقة (1 نعم ، 2 لا) إذا (لا) إنتقل إلى الأسرة التالية	

رقم استبيان الأسرة			
الاسرة مقيمة (1) أم نازحة (2)			
في حال الاسرة المقيمة، هل تأوي اسرة نازحة (1 نعم ، 2 لا)			
مسلسل الأسرة النازحة			

العمل المكتبي

	الاسم	اليوم		الشهر		السنة				التوقيع
مدخل البيانات										
مدخل البيانات										
المراجعة										

الملاحظات

.....

.....

.....

.....

.....

.....

.....

استبيان رقم: .....

س 001: بيانات عن الأسرة (الأحياء فقط والذين يعيشون حاليا في الأسرة)

H001a	عدد أفراد الأسرة (الأحياء فقط الذين يقيمون حاليا في الأسرة يوم الزيارة)	العدد	
H001b	عدد الأطفال أقل من 5 سنوات (الأحياء فقط الذين يقيمون حاليا في الأسرة يوم الزيارة)	العدد	
H001c	عدد الأطفال أقل من 6 أشهر (الأحياء فقط الذين يقيمون حاليا في الأسرة يوم الزيارة)	العدد	
H001d	عدد النساء بسن 15 – 49 عاما (المقيمات حاليا في الأسرة يوم الزيارة)	العدد	

س 002: بيانات عن جنس رب الأسرة (الشخص الذي يتكفل بالإنفاق على الأسرة)

H002	ما نوع رب الأسرة		
	1. ذكر		
	2. أنثى		

س 003 – س 005: بيانات عن راعي الأسرة (الشخص الذي يقوم برعاية الأسرة وخصوصا الأطفال)

H003	ما نوع راعي الأسرة		
	1. ذكر.		
	2. أنثى.		
H004	الحالة الاجتماعية لراعي الأسرة		
	1. متزوج .		
	2. أرمل.		
	3. مطلق.		
	4. حانق.		
	5. عازب.		
H005	المستوى التعليمي لراعي الأسرة		
	1. أمي.		
	2. يقرأ ويكتب.		
	3. تعليم أساسي.		
	4. تعليم ثانوي.		
	5. تعليم عالي (جامعة أو كلية أو معهد).		

استبيان رقم: .....

س 006 – س 007: بيانات عن دخل الأسرة وإنفاقها

H006	هل نقص دخل الأسرة خلال الـ12 إثنا عشر شهر الماضية ؟		
	1.	نعم.	
	2.	لا .	
	3.	لا أعرف .	

H007	كم متوسط (الإنفاق) المصروف للأسرة بالريال؟		قيمة الإنفاق (ريال)
	1.	الإنفاق اليومي	
	2.	الإنفاق الأسبوعي	
	3.	الإنفاق الشهري	
		الإجمالي	

س 008 – س 013: بيانات عن الماء والإصحاح البيئي والنظافة

				إنتقل إلى
H008	ما هو المصدر الرئيسي لمياه الشرب في منزلكم؟ (خيار واحد فقط)			
	1.	مشروع مياه موصل إلى المنازل (حكومية أو خاصة)		
	2.	حنفية عامة /نقطة مياه مجتمعية / مياه السبيل		
	3.	بئر ارتوازية		
	4.	بئر مغطاة		
	5.	بئر غير محمي		
	6.	عين مغطاة		
	7.	عين ماء غير محمية		
	8.	مياه معالجة (معدني أو كوثر)		H010 ←
	9.	مياه سطحية جدول/ غيل/ قنوات ري		
	10.	تجميع مياه الأمطار محمية		
	11.	تجميع مياه الأمطار غير محمية (صهاريج مياه / بركة/ ماجل)		
	12.	وايتات أو عربات نقل المياه		
	13.	أخرى: تذكر		

				انتقل إلى
H009a	هل تقومون بمعالجة الماء قبل الشرب؟			
	1.	نعم		
	2.	لا		H010 ←
	3.	لا أعرف		H010 ←

H009b	ماهي طريقة المعالجة الرئيسية المستخدمة لمياه الشرب (خيار واحد فقط)			
	1.	غلي الماء قبل الشرب		
	2.	استخدام الكلور		
	3.	الترشيح عبر قماش نظيف		
	4.	استخدام مرشح سيراميك أو رمل أو ما شابه (فلتر أو قطارة)		
	5.	ترك الماء ساكنا قبل الشرب لترسيب الشوائب.		
	6.	استخدام الشب (شب الفوّاد)		
	7.	أخرى: تذكر		

H010	للملاحظة: تحقق من توفر نقاط تخزين المياه لغرض الشرب: هل الوعاء الحاوي لمياه الشرب نظيف (خالي من الطحالب) ؟			
	1.	نعم. (عدم وجود طحالب)		
	2.	لا. (وجود طحالب)		

H011	اين تتم عملية قضاء الحاجة (التبرز)؟ (اختر فقرة من التالي)- تحقق من توفر المرافق والممارسات			
	1.	مرحاض - يتوفر فيه صب الماء للتنظيف الذاتي (سيفون أو دلو) إلى مجاري عمومية.		
	2.	مرحاض - يتوفر فيه صب الماء للتنظيف الذاتي (سيفون أو دلو) إلى بيارة.		
	3.	مرحاض - يتوفر فيه صب الماء للتنظيف الذاتي (سيفون أو دلو) إلى حفرة مرحاض.		
	4.	مرحاض - يتوفر فيه صب الماء للتنظيف الذاتي (سيفون أو دلو) إلى العراء.		
	5.	مرحاض - يتوفر فيه صب الماء للتنظيف الذاتي (سيفون أو دلو) إلى مكان غير معروف.		
	6.	حفرة مرحاض محسنة مهواه		
	7.	حفرة مرحاض بلوح		
	8.	حفرة مرحاض بدون لوح/ غير مغطاة		
	9.	مرحاض سماد		
	10.	دلو		
	11.	مرحاض معلق		
	12.	قضاء الحاجة في العراء (في الحقول مثلا، الخ.)		
	13.	أخرى: تذكر		

H012		H012a متى تقومين بغسل اليدين (سجل فقط في حالة ذكر إحدى الحالتين أو كلتيهما)؟		1. ذكرت ← إذا الإجابة 1. ذكرت في السؤال السابق 2. لم تذكر إذا لم تذكر إنتقل إلى السؤال H013	H012b بم تغسلين يديك ؟				
					a. الماء فقط	b. الماء مع الصابون (قطعة/ مسحوق/ سائل/ عجينة)	c. الماء مع الرماد/ التراب/ القضاض/ أوراق الشجر		
					1. نعم 2. لا	1. نعم 2. لا	1. نعم 2. لا		
	a.	بعد قضاء الحاجة.							
	b.	قبل الأكل.							

س 013 – س 015: الاستهلاك الغذائي وأليات التكيف

			H013a	H013b
		هل تناولت الأسرة أي من الأغذية أو المجموعات الغذائية أدناه. في العمود الأول تكون الإجابة بنعم أو لا (1 أو2) في العمود الثاني تكون الإجابة عدد الايام خلال السبعة ايام الماضية.	هل تناولت الاسرة خلال الـ 7 أيام الماضية 1. نعم 2. لا إذا لا إنتقل للخيار التالي	إذا الإجابة نعم في السؤال السابق كم عدد الأيام التي تناولتها الأسرة خلال الـ 7 أيام الماضية؟ (الإجابة هي من 1 إلى 7)
H013	a.	بر، خبز، عصيد، فتة، حبوب أخرى (ذرة، ذرة رفيعة، دخن، شعير)، معجنات، او اي منتجات مصنعة من الحبوب		
	b.	أرز أو مكرونة		
	c.	بطاط		
	d.	خضراوات (الخضراوات الورقية، الطماطم، الفلفل، جزر، دبا..... الخ)		
	e.	فواكه (مانجو، موز ، عنب، ..... الخ)		
	f.	لحم (بقري، غنمي)، كبدة، كلاوي ، دواجن		
	g.	الدواجن		
	h.	بيض		
	i.	أسماك (طازجة ومجففة ومعلبة)		
	j.	بقوليات (فاصوليا، عدس، بازيليا، فول، .....)		
	k.	مشتقات الحليب (لبن، جبن، زبادي، حقين، .....)		
	l.	زيوت/ دهون (سمن، زبدة، زيت نباتي، ....)		
	m.	سكر ، حلويات ، عسل، فواكه مجففة (تمر، زبيب)		
	n.	بهارات، شاي، بن		

				أنتقل إلى
H014a	خلال الـ7 ايام الماضية هل صادف أن الأسرة لم تكن تمتلك غذاءاً كافياً أو مالاً كافياً لشراء الغذاء اللازم لها؟			
	1.	نعم.		
	2.	لا.		H015 ←

			عدد الأيام (الإجابة هي من Ø إلى 7)	
H014b	كم عدد الأيام خلال الـ7 ايام الماضية التي لجأت فيها الأسرة إلى أيا من الإجراءات أدناه بسبب أنها لم تكن تمتلك غذاءاً كافياً أو مالاً كافياً لشراء الغذاء اللازم لها؟			
	a.	الاعتماد على طعام رديء أو أقل كلفة.		
	b.	اقتراض الطعام أو الاعتماد على مساعدات الأهل والأصدقاء.		
	c.	خفض كمية الطعام المقدم في الوجبات الرئيسية.		
	d.	تقليص وجبات البالغين في الأسرة من أجل توفير الطعام للأطفال		
	e.	خفض عدد الوجبات اليومية		
	f.	شراء الطعام بالدين أو الرهن		
	g.	جمع أطعمة من الأحراش أو حصاد مزروعات غير جاهزة للحصاد		
	h.	استهلاك بذور زراعة الموسم القادم		
	i.	إرسال أفراد الأسرة لتناول الطعام في مكان آخر		
	j.	إرسال أفراد الأسرة للتسول		
	k.	قضاء يوم كامل بدون طعام		

H015	هل قام أيا من أفراد الأسرة بالإجراءات التالية لمواجهة شحة الغذاء خلال الـ 30 يوم الماضية ؟. يرجى تعبئة كل الخانات كالتالي:- (0) مطلقا (1) نادراً (مرة أو مرتين خلال الـ 30 يوم الماضية). (2) أحيانا (من 3 – 10 مرات خلال الـ 30 يوم الماضية). (3) دائما (كثر من 10 مرات خلال الـ 30 يوم الماضية).		Ø . مطلقاً 1. نادراً 2. أحياناً 3. دائماً	
	a.	بيع أصول/ مقتنيات الأسرة (الأثاث والمجوهرات والملابس ..الخ).		
	b.	شراء الطعام بالدين أو الرهن نظراً لعدم امتلاك المال وقت الشراء.		
	c.	إنفاق المدخرات.		
	d.	اقتراض المال.		
	e.	بيع الأصول الإنتاجية أو وسائل النقل (ماكينة الخياطة أو السيارة أو الدراجة ... الخ).		
	f.	استهلاك مخزون البذور المحفوظ للموسم القادم)		
	g.	سحب الأطفال من المدارس.		
	h.	بيع المنزل أو الأرض.		
	i.	التسول.		
	j.	بيع آخر إناث الماشية التي لديها		
	k.	التقليل من الإنفاق على التعليم والصحة (بما في ذلك الأدوية)		

رقم إستبيان الأسرة: .....

س 016 – س20 : محيط منتصف الذراع للنساء في سن الإنجاب عمر (15 – 49 عاما)

		W016	W017	W018	W019	W020
رقم المرأة	الاسم الأول للمرأة	عمر المرأة (بالسنوات)	الحالة الاجتماعية:- 1 = متزوجة 2= أرمل 3= مطلق 4= حانق 5 = عازبة إذا كانت الإجابة (5 = عازبة) إنتقل إلىW019	وضع المرأة الآن:- 1 = حامل 2 = مرضع 3= لا حامل ولا مرضع	قياس محيط الذراع (سم) (الميواك) 88.8 = رافض 99.9 = غائب	كم الوقت الذي قضته المرأة خارج المنزل يوم أمس ؟ دقيقة . ساعة
.1					.	.
.2					.	.
.3					.	.
.4					.	.
.5					.	.
.6					.	.
.7					.	.
.8					.	.
.9					.	.
.10					.	.

رقم إستبيان الأسرة: .....

س 021 – س 023: سن الأطفال (يجب تدوين كل الأطفال من عمر 0 إلى أقل من 5 سنوات في الجدول أدناه ابتداء بالأكبر سنا)

		C021	C022	C023a	C023b	
رقم الطفل	الاسم الأول للطفل	نوع الطفل 1= ذكر 2 = أنثى	رقم المرأة (أم أو راعية الطفل يؤخذ من صفحة المرأة)	تاريخ الميلاد (بالهجري أو الميلادي) للأطفال من سن (0 إلى 59) شهر	عمر الطفل (بالأشهر)	ماذا قالت الأم عن سن الطفل ؟
.1				يوم شهر سنـــة		
.2				يوم شهر سنـــة		
.3				يوم شهر سنـــة		
.4				يوم شهر سنـــة		
.5				يوم شهر سنـــة		
.6				يوم شهر سنـــة		
.7				يوم شهر سنـــة		
.8				يوم شهر سنـــة		
.9				يوم شهر سنـــة		
.10				يوم شهر سنـــة		

رقم إستبيان الأسرة: .....

س 024 – س 026: القياسات الجسمانية للأطفال بين سن 6-59 شهر في الأسرة (يترك فارغاً للأطفال أقل من 6 أشهر)

			C024	C025	C026
رقم الطفل (ينقل من الصفحة السابقة)	الاسم الأول للطفل (من الصفحة السابقة)	عمر الطفل (بالأشهر) (من الصفحة السابقة)	الوزن (كجم.جم) 88.8 = رافض 99.9 = غائب	الطول (سم.مم) 888.8 = رافض 999.9 = غائب	قياس محيط الذراع (سم.مم) (الميواك) 88.8 = رافض 99.9 = غائب
			.	.	.
			.	.	.
			.	.	.
			.	.	.
			.	.	.
			.	.	.
			.	.	.
			.	.	.
			.	.	.
			.	.	.

رقم إستبيان الأسرة: .....

س 027 – س 033: التوذم والتحصين والمراضة الأطفال بين سن 0-59 شهر في الأسرة (كل الأطفال تحت سن 5 سنوات)

			C027	C028	C029	C030	C031	C032	C033
			لجميع الأطفال من عمر 0 – 59 شهر				*للأطفال بعمر 6 أشهر فأكثر*		*بعمر 9 أشهر فأكثر*
رقم الطفل (ينقل من الصفحة السابقة)	الاسم الأول للطفل (من الصفحة السابقة)	عمر الطفل (بالأشهر) (من الصفحة السابقة)	التوذم (أوديما) في كلا القدمين 1 = نعم 2 = لا 8 = رافض 9 = غائب	الإسهال * خلال الأسبوعين الماضيين 1 = نعم 2 = لا	سعال أو صعوبة في التنفس خلال الأسبوعين الماضيين 1 = نعم 2 = لا	الحمى خلال الأسبوعين الماضيين 1 = نعم 2 = لا	هل تم إعطاء فيتامين (أ) خلال الستة أشهر الماضية؟ (إظهار عينة) 1 = نعم 2 = لا 3 = لا أعرف	هل أخذ الطفل جرعة لقاح الخماسي3 (حقنة في الفخذ)؟ 1 = نعم من البطاقة 2 = نعم بالتذكر 3 = لا أعرف 4 = لم يطعم	للأطفال بعمر 9 أشهر فأكثر، هل تم تطعيم الطفل ضد الحصبة (حقنة في اليد اليسرى)؟ 1 = نعم من البطاقة 2 = نعم بالتذكر 3 = لا أعرف 4 = لم يطعم

*** الإسهال :- هو زيادة في عدد مرات الإسهال المائي عن الصورة المعتادة.**

رقم إستبيان الأسرة: .....

س 034– س 035: دون ممارسة الرضاعة للأطفال بين سن 0 إلى 24 شهر خلال الـ 24 ساعة الماضية (يترك فارغا للأطفال بعمر أكبر من 24 شهرا)

رقم الطفل (ينقل من الصفحة السابقة)	الاسم الأول للطفل (من الصفحة السابقة)	عمر الطفل (بالأشهر) (من الصفحة السابقة)	C034	C035				
			هل رضع الطفل من ثدي أمه (رضاعة / إعتصار) خلال الـ 24 ساعة الماضية؟ 1 = نعم 2 = لا إذا الإجابة لا إنتقل إلى السؤال C035b	سجل عدد المرات التي تناول فيها الطفل أمس (سجل 0 إذا لم يتناول الطفل)				
				C035a	C035b	C035c	C035d	C035e
				إذا كانت الإجابة نعم في السؤال السابق كم عدد المرات التي رضع فيها الطفل وعدد المرات التي أعطى فيها الطفل لبن الأم خلال الـ 24 ساعة الماضية؟	كم عدد المرات التي تناول فيها الطفل حليب رضع خلال الـ 24 ساعة الماضية؟	كم عدد المرات التي تناول فيها الطفل أي حليب آخر أو بودرة أو معلب أو حليب مواشي طازج خلال الـ 24 ساعة الماضية؟	كم عدد المرات التي تناول فيها الطفل الزبادي أو الحقين أو الثريب (الثرابة) خلال الـ 24 ساعة الماضية؟	كم عدد المرات التي تناول فيها الطفل الأغذية الأخرى بشرط ان تكون صلبة أو نصف صلبة أو لينة (كقوام الموز)

رقم إستبيان الأسرة: .....

س 036: دون ممارسة إطعام الأطفال بين سن 0(إلى 24 شهر) - خلال الـ 24 ساعة الماضية (يترك فارغا للأطفال بعمر أكبر من 24 شهرا)

رقم الطفل (ينقل من الصفحة السابقة)	لاسم الأول للطفل (من الصفحة السابقة)	عمر الطفل (بالأشهر) (من الصفحة السابقة)	C036							
			هل تناول الطفل أمس أيا من المجموعات الغذائية أدناه. (إبدائي بسؤال اليوم من الوقت الذي استيقظ فيه الطفل صباح أمس وحتى نومه في المساء). إتركي الأم تتذكر وعندما تنتهي قومي بذكر المواد أدناه 1 = نعم 2 = لا 3 = الأم لا تعرف							
			C036a	C036b	C036c	C036d	C036e	C036f	C036g	C036h	C036i
			ماء مع أو بدون سكر	**حبوب:** عصيدة أو شبيسة أو خبز أو أرز أو مكرونة أو اي غذاء مصنوع من الحبوب. **درنات:** بطاطا بيضاء أو أية أغذية درنية أخرى.	**بقوليات :** أي أغذية مصنوعة من الفول أو الفاصوليا أو البازيليا أو العدس أو الفول السوداني أو أي بقوليات أخرى.	الجبن أو الأيسكريم	**اللحوم :** كبد أو كلى أو قلب أو أحشاء أخرى. أي لحوم بقر أو غنم أو ماعز أو دواجن. اسماك طازجة أو مجففة أو معلبة.	بيض	**خضروات وفواكه:** دبا أو جزر أو بطاطا حلوة جوفها أصفر أو برتقالي. أي خضراوات ورقية داكنة الخضرة. مانجو أو باباي ناضجة.	أي فواكه أو خضراوات أخرى لم تذكر في الخانة السابقة.	أية مشروبات أو أغذية أخرى (عدا حليب الأطفال، وأي حليب اخر، والحقين والزبادي)

رقم إستبيان الأسرة: .....

تقييم الحالة التغذوية والوفيات في محافظة إب، شهر مارس - أبريل 2017م

استمارة الرصد الديموغرافي خلال الفترة منذ 19 ديسمبر 2016 (نموذج 2)

مديرية التقييم: _____ الحي/ القرية: _____ التاريخ: _____ رقم العنقود: _____

رقم الفريق: _____ رقم استبيان الأسرة: _____ طبقة التقييم: _____

م	الاسم	الجنس (ذكر أو أنثى)	العمر بالسنوات	التحق بالإسرة في أو بعد ذكرى المولد النبوي الشريف	غادر الأسرة في أو بعد ذكرى المولد النبوي الشريف	ولد في أو بعد ذكرى المولد النبوي الشريف	توفي في أو بعد ذكرى المولد النبوي الشريف	سبب الوفاة	موقع الوفاة
ضعي قائمة بأفراد الأسرة المتواجدين حاليا مع الأسرة، ثم وضحي باستخدام الإشارة (✓) الأفراد الذين التحقوا بالأسرة أو ولدوا في أو بعد ذكرى المولد النبوي									
1									
2									
3									
4									
5									
6									
7									
8									
9									
10									
11									
12									
13									
14									
15									
16									
17									
18									
19									
20									
21									
22									
23									
24									
25									

رقم إستبيان الأسرة: .....

م	الاسم	الجنس (ذكر أو أنثى)	العمر بالسنوات	التحق بالإسرة في أو بعد ذكرى المولد النبوي الشريف	غادر الأسرة في أو بعد ذكرى المولد النبوي الشريف	ولد في أو بعد ذكرى المولد النبوي الشريف	توفي في أو بعد ذكرى المولد النبوي الشريف	سبب الوفاة	موقع الوفاة
ضعي قائمة بالذين غادروا الأسرة قبل تاريخ الزيارة ابتداء من أو بعد ذكرى المولد النبوي الشريف، ثم وضحي باستخدام الإشارة (✓) من منهم كان قد التحق بالإسرة أو ولد في أو بعد ذكرى المولد النبوي الشريف									
1					✓				
2					✓				
3					✓				
4					✓				
5					✓				
6					✓				
7					✓				
8					✓				
9					✓				
10					✓				
11					✓				
12					✓				

م	الاسم	الجنس (ذكر أو أنثى)	العمر بالسنوات	التحق بالإسرة في أو بعد ذكرى المولد النبوي الشريف	غادر الأسرة في أو بعد ذكرى المولد النبوي الشريف	ولد في أو بعد ذكرى المولد النبوي الشريف	توفي في أو بعد ذكرى المولد النبوي الشريف	سبب الوفاة	موقع الوفاة
ضعي قائمة بالذين توفوا قبل تاريخ الزيارة ابتداء من أو بعد ذكرى المولد النبوي الشريف، ثم وضحي باستخدام الإشارة (✓) من منهم كان قد التحق بالإسرة أو ولد في أو بعد ذكرى المولد النبوي الشريف، ثم سجلي رموز سبب ومكان الوفاة									
1							✓		
2							✓		
3							✓		
4							✓		
5							✓		

هل كانت هناك امرأة حامل في الأسرة منذ ذكرى المولد النبوي الشريف؟	1. نعم 2. لا		إذا الإجابة نعم . كم عدد الحوامل؟

رموز أسباب الوفاة	
1 = غير معروف	5 = سوء التغذية
2 = حادث أو إصابة	6 = الحمى
3 = الاسهال	7= أخرى (حدد)
4 = مشاكل في التنفس	
رموز مواقع الوفاة	
1 = في الموقع الحالي	
2= أثناء الهجرة	
3= في آخر مكان سكن فيه	
4 = أخرى (حدد)	

Annex 2: Ibb March-April 2017 Nutrition August Survey Team

Team No	Name	Title
1	Abdulkareem Abdulraqeeb As Samawi	Team Heads
2	Nohammed Mohammed Al Adeeb	
3	Faisal Hamood Taher Al Taweel	
4	Waleed Rafie' Mohammed Abdullah	
5	Afeef Abdo Senan Derhem	
1	Najla Hamood Al Eryani	Enumerators
	Hanan Mohammed Omar Al Halqi	
	Eshraq Ahmed Al Absi	
2	Zainab Qaied Mohsen Mohammed	
	Samia Mohamed Hamood Shaie'	
	Sahar Faisal Badr Al Shawafi	
3	Fathia Abdulrahman Al Shojaa'	
	Arwa Ahmed Abdullah	
	Lamia Qasim Yehia Al Badani	
4	Ektiar Mohammed Hamood Al Harthi	
	Rabab Mohammed Ali Al Shami	
	Boshra Abdullah Mohammed Al Ghannam	
5	Lamia Hassan Ahmed Abdulrazzaq	
	Sameera Mabkhoot Saeed Da'aas	
	Hana Taha Mohammed Ali Hazabr	
		Title
Dr. Adel Abdulmahmood Al Absi		Field supervisors
Mohammed Taha Mohammed Al Saqqaf		
Abdullah Khadem Al Aqzal		
Hadhrami Hadi Al Hadhrami		
Omar Mohammed Al Qarhazi		
Hadhrami Hadi Al Hadhrami		Data entry
Hasan Ali Mohammed Al A'arami		
Foad Abdulkareem An Nozaili		
Zakaria Abdullateef Al Sabahi		
Nagib Abdulbaqi A. Ali		Data Analysis and Report Writing
Dr. Nabeel Abdulkareem An Nozaili		Survey Logistic Manager
Mansoor Abdo Mohammed Al Qadasi		Survey Technical Manager

Annex 3: Calendar of events

Event	Event Date
Hitting of Yareem Military camp and burning of missiles stock	2015/04/09
Airstrike of the stadium of Ibb City	2015/04/12
AQAP entry to Udain and looting the bank there	2014/10/14
Airstrike of the Ad Daleel bridge	2015/04/21
Airstrike of Brigadier Sanabani's house in Ibb	2015/08/28
Clashes of Houthis and resistance forces in Naqeel of Ba'adanl	2017/08/18
Handover the power to Abdrabbo Mansour Hadi	25 Feb 2012
Dignity Friday massacre	2012/03/18
Bombing of the military parade in AlSabeen Square	21 May 2012
the commencement of the National Dialogue Conference	18 Mar 2013
The attack on Al Urdi Medical Complex	5 Dec 2013
Bombing of Police Academy applicants	7 Jan 2015
The move of Abdrabbo Mansour Hadi to Aden	21 Feb 2015
The commencement of the Decisive Storm operation (Arab Coalition airstrikes)	26 Mar 2015
Chapala cyclone and flooding in the coast	5 Nov 2015
Anniversary of Isra and Me'raj	27 Rajab
Eid Al-Fitr	1 Shawwāl
Fasting month of Ramadhan	1 – 30 Ramadhan
Beginning of Hijrij Year (Hijra anniversary)	1 Muharram
A'ashora Day	10 Muharram
Eid Al-Adha	10 Dhū al-Ḥijjah
Unity anniversary	22 May
September Revolution anniversary	26 Sep
October Revolution anniversary	14 Oct
Independence Day	30 Nov

Annex 4: Age determination job aid

جدول مساعد للباحثات يحدد أعمار الأطفال أقل من خمس سنوات بالأشهر الميلادية وما يقابلها بالأشهر الهجرية التقريبية

السنوات الهجرية						السنوات الميلادية						العمر بالسنة والشهر		العمر بالشهر
1433	1434	1435	1436	1437	1438	2012	2013	2014	2015	2016	2017	سنة	شهر	
					6						3			0
					5						2		1	1
					4						1		2	2
					3					12			3	3
					2					11			4	4
					1					10			5	5
				12						9			6	6
				11						8			7	7
				10						7			8	8
				9						6			9	9
				8						5			10	10
				7						4			11	11
				6						3		1		12
				5						2		1	1	13
				4						1		1	2	14
				3					12			1	3	15
				2					11			1	4	16
				1					10			1	5	17
			12						9			1	6	18
			11						8			1	7	19
			10						7			1	8	20
			9						6			1	9	21
			8						5			1	10	22
			7						4			1	11	23
			6						3			2		24
			5						2			2	1	25
			4						1			2	2	26
			3					12				2	3	27
			2					11				2	4	28
			1					10				2	5	29
		11+12						9				2	6	30
		10						8				2	7	31
		9						7				2	8	32
		8						6				2	9	33
		7						5				2	10	34
		6						4				2	11	35
		5						3				3		36
		4						2				3	1	37
		3						1				3	2	38
		2					12					3	3	39
		1					11					3	4	40
	12						10					3	5	41
	11						9					3	6	42
	10						8					3	7	43
	9						7					3	8	44
	8						6					3	9	45
	7						5					3	10	46
	6						4					3	11	47
	5		هجرى	الشهر			3		ميلادى	الشهر		4		48
	4		محرم	1			2		يناير	1		4	1	49
	3		صفر	2			1		فبراير	2		4	2	50
	2		ربيع الاول	3		12			مارس	3		4	3	51
	1		ربيع الثاني	4		11			أبريل	4		4	4	52
12			جمادى الاولى	5		10			مايو	5		4	5	53
11			جمادى الثانية	6		9			يونيو	6		4	6	54
10			رجب	7		8			يوليو	7		4	7	55
9			شعبان	8		7			أغسطس	8		4	8	56
8			رمضان	9		6			سبتمبر	9		4	9	57
7			شوال	10		5			أكتوبر	10		4	10	58
6			ذو القعدة	11		4			نوفمبر	11		4	11	59
5			ذو الحجة	12		3			ديسمبر	12		5		60

تاريخ الإسناد - يوم السبت - 25/ 3/ 2017م الموافق 27/ 6/ 1438هـ

Annex 5: Ibb March-April 2017 Survey Plausibility Check

Plausibility check for: Ibb Nutrition and Mortality Survey Mar 2017 - Western Highlands.as

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

Overall data quality

Criteria	Flags*	Unit	Excel.	Good	Accept	Problematic	Score
Flagged data (% of out of range subjects)	Incl	%	0-2.5 0	>2.5-5.0 5	>5.0-7.5 10	>7.5 20	0 (0.2 %)
Overall Sex ratio (Significant chi square)	Incl	p	>0.1 0	>0.05 2	>0.001 4	<=0.001 10	0 (p=0.181)
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=0.282)
Dig pref score - weight	Incl	#	0-7 0	8-12 2	13-20 4	> 20 10	0 (3)
Dig pref score - height	Incl	#	0-7 0	8-12 2	13-20 4	> 20 10	2 (8)
Dig pref score - MUAC	Incl	#	0-7 0	8-12 2	13-20 4	> 20 10	0 (5)
Standard Dev WHZ	Excl	SD	<1.1 and	<1.15 and	<1.20 and	>=1.20 or	
.	Excl	SD	>0.9 0	>0.85 5	>0.80 10	<=0.80 20	5 (0.90)
Skewness WHZ	Excl	#	<±0.2 0	<±0.4 1	<±0.6 3	>=±0.6 5	0 (-0.15)
Kurtosis WHZ	Excl	#	<±0.2 0	<±0.4 1	<±0.6 3	>=±0.6 5	0 (-0.10)
Poisson dist WHZ-2	Excl	p	>0.05 0	>0.01 1	>0.001 3	<=0.001 5	3 (p=0.002)
OVERALL SCORE WHZ =			0-9	10-14	15-24	>25	10 %

The overall score of this survey is |10 %, this is good.

Plausibility check for: Ibb Nutrition and Mortality Survey Apr 2017 - Eastern Highlands.as

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

Overall data quality

Criteria	Flags*	Unit	Excel.	Good	Accept	Problematic	Score
Flagged data (% of out of range subjects)	Incl	%	0-2.5 0	>2.5-5.0 5	>5.0-7.5 10	>7.5 20	0 (0.2 %)
Overall Sex ratio (Significant chi square)	Incl	p	>0.1 0	>0.05 2	>0.001 4	<=0.001 10	0 (p=0.457)
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=0.642)
Dig pref score - weight	Incl	#	0-7 0	8-12 2	13-20 4	> 20 10	0 (3)
Dig pref score - height	Incl	#	0-7 0	8-12 2	13-20 4	> 20 10	2 (12)
Dig pref score - MUAC	Incl	#	0-7 0	8-12 2	13-20 4	> 20 10	0 (6)
Standard Dev WHZ	Excl	SD	<1.1 and	<1.15 and	<1.20 and	>=1.20 or	
.	Excl	SD	>0.9 0	>0.85 5	>0.80 10	<=0.80 20	5 (0.90)
Skewness WHZ	Excl	#	<±0.2 0	<±0.4 1	<±0.6 3	>=±0.6 5	0 (-0.07)
Kurtosis WHZ	Excl	#	<±0.2 0	<±0.4 1	<±0.6 3	>=±0.6 5	1 (0.22)
Poisson dist WHZ-2	Excl	p	>0.05 0	>0.01 1	>0.001 3	<=0.001 5	0 (p=0.194)
OVERALL SCORE WHZ =			0-9	10-14	15-24	>25	8 %

The overall score of this survey is 8 %, this is excellent.

Annex 6: Ibb Nutrition Survey Standardization Test Report for Evaluation of Teams

						Precision			Accuracy		OUTCOME		
Weight		subjects	mean	SD	max	Technical error	TEM/mean	Coef of reliability	Bias from superv	Bias from median	result		
		#	kg	kg	kg	TEM (kg)	TEM (%)	R (%)	Bias (kg)	Bias (kg)			
	Supervisor	10	17.4	1.7	0.5	0.16	0.9	99.1	-	0.69	TEM poor	R value good	Bias reject
	Team 1	10	17.5	1.7	0.4	0.12	0.7	99.5	0.07	0.76	TEM poor	R value good	Bias reject
	Team 2	10	17.2	1.7	0.64	0.24	1.4	98.1	-0.19	0.5	TEM reject	R value acceptable	Bias reject
	Team 3	10	17.5	1.9	2.3	0.52	3	92.4	0.11	0.8	TEM reject	R value poor	Bias reject
	Team 4	10	17.4	1.7	0.5	0.16	0.9	99.1	0.02	0.71	TEM poor	R value good	Bias reject
	Team 5	10	17.3	1.7	3.4	1.06	6.1	61.5	-0.05	0.64	TEM reject	R value reject	Bias reject
	Team inter 1st	5x10	17.4	1.7	-	0.67	3.9	85	-	-	TEM reject	R value reject	
	Team inter 2nd	5x10	17.4	1.7	-	0.41	2.4	94.2	-	-	TEM reject	R value poor	
	inter Team + sup	6x10	17.4	1.7	-	0.5	2.9	91.3	-	-	TEM reject	R value poor	
	TOTAL intra+inter	5x10	-	-	-	0.78	4.5	79.4	-0.01	0.68	TEM reject	R value reject	Bias reject
	TOTAL+ sup	6x10	-	-	-	0.72	4.1	82.5	-	-	TEM reject	R value reject	
Height		subjects	mean	SD	max	Technical error	TEM/mean	Coef of reliability	Bias from superv	Bias from median	result		
		#	cm	cm	cm	TEM (cm)	TEM (%)	R (%)	Bias (cm)	Bias (cm)			
	Supervisor	10	111.2	3.9	0.8	0.28	0.3	99.5	-	0.12	TEM good	R value good	
	Team 1	10	110.6	3.8	1	0.46	0.4	98.6	-0.59	-0.47	TEM acceptable	R value acceptable	Bias good
	Team 2	10	111.9	3.4	10.1	2.27	2	55.8	0.64	0.76	TEM reject	R value reject	Bias poor
	Team 3	10	111.3	3.9	2	0.66	0.6	97.1	0.12	0.24	TEM poor	R value acceptable	Bias good
	Team 4	10	110.9	3.8	1	0.36	0.3	99.1	-0.3	-0.18	TEM good	R value good	Bias good
	Team 5	10	111.1	4	1.6	0.56	0.5	98.1	-0.08	0.04	TEM acceptable	R value acceptable	Bias good
	Team inter 1st	5x10	111.2	3.8	-	0.59	0.5	97.5	-	-	TEM acceptable	R value acceptable	
	Team inter 2nd	5x10	111.2	3.7	-	1.7	1.5	79.5	-	-	TEM reject	R value reject	
	inter Team + sup	6x10	111.2	3.7	-	1.04	0.9	90.5	-	-	TEM poor	R value poor	
	TOTAL intra+inter	5x10	-	-	-	1.69	1.5	79.5	-0.04	0.08	TEM reject	R value reject	Bias good
	TOTAL+ sup	6x10	-	-	-	1.55	1.4	82.9	-	-	TEM reject	R value reject	
MUAC		subjects	mean	SD	max	Technical error	TEM/mean	Coef of reliability	Bias from superv	Bias from median	result		
		#	mm	mm	mm	TEM (mm)	TEM (%)	R (%)	Bias (mm)	Bias (mm)			
	Supervisor	10	157.1	9.9	5	1.99	1.3	96	-	1.05	TEM good	R value acceptable	Bias acceptable
	Team 1	10	159.3	8.3	9	3.36	2.1	83.8	2.25	3.3	TEM reject	R value reject	Bias reject
	Team 2	10	158.6	10.4	7	2.12	1.3	95.8	1.55	2.6	TEM acceptable	R value acceptable	Bias poor
	Team 3	10	156.6	9.9	5	2.01	1.3	95.9	-0.4	0.65	TEM acceptable	R value acceptable	Bias good
	Team 4	10	155.6	9.2	4	1.61	1	96.9	-1.45	-0.4	TEM good	R value acceptable	Bias good
	Team 5	10	154.4	9.7	5	1.76	1.1	96.7	-2.65	-1.6	TEM good	R value acceptable	Bias good
	Team inter 1st	5x10	156.7	9.4	-	2.59	1.7	92.5	-	-	TEM acceptable	R value poor	
	Team inter 2nd	5x10	157.1	9.7	-	3.53	2.2	86.8	-	-	TEM reject	R value reject	
	inter Team + sup	6x10	156.9	9.6	-	2.81	1.8	91.3	-	-	TEM poor	R value poor	
	TOTAL intra+inter	5x10	-	-	-	3.83	2.4	83.9	-0.14	0.93	TEM reject	R value reject	Bias good
	TOTAL+ sup	6x10	-	-	-	3.61	2.3	85.8	-	-	TEM reject	R value reject	

Notes:

During standardization test, trainers were moving around taking pictures and short videos that all was demonstrated so that participants were able to see the correct and incorrect things they have done.

All numbers written wrongly by participants during this exercise were presented to all to avoid repeating such errors in the field.

All numbers were entered to ENA-Training Part exactly as written by participants with no correction to those wrongly written numbers.

Annex 7: Clusters for Ibb March-April 2017 Nutrition Survey

Clusters of Western Highlands

Cluster	Site (sub-village or zone)	Ozla	District
1	Byt Al-Murady - Al-Mqatyr	Bany Syf Al-Safl	Al Qafr
2	Hayzan	Bany Mslm	Al Qafr
3	Al-Maazbh - Al-Harf	Bany Amr Al-Safl	Al Qafr
4	Bayt Al-Waday – Thabob	Hamyr	Al Qafr
5	Al-Mnqoudeh - Al-Mnqoudeh Al-Sofla	Al-Sahaoul	Al Makhader
6	Thayl Al-Abaar	Al-Shrf	Al Makhader
7	Asab - Al-Noubh	Al-Mharm	Al Makhader
8	Al-Madourh - Al-Souyda'a	Roba Thulmh	Hobaysh
9	Al-Ser – Waraj	Jbl Khadhra	Hobaysh
10	Al-Salouh - Al-Mouahyl	AlJjaafrh	Hobaysh
11	Jarabsh	Al-Sadr	Hobaysh
12	Bany Abdulslam - Al-Hajf	Hagyn	Hazm Al Udain
13	Al-Magrodh - Shab Al-Ghubab	Yarys	Hazm Al Udain
14	Rahadh - Al-Khthra'a	Bany Asad	Hazm Al Udain
15	Al-Sahlah - Al-Aouardh	Al-Mzahan	Fara' Al Udain
16	Hasyd - Al-Haymh	Al_Aaqbh	Fara' Al Udain
17	Al-Rahdh - Al-Senayeh	Al-Wazyrh	Fara' Al Udain
18	Haseh - Al-Habyeel	Al-Akhmas	Fara' Al Udain
19	Al-Odeen - Mashareh	Bany Hat	Al Udain
20	Al-Anb - Al-Qaryh Al-Sofla	Al-Wady	Al Udain
21	Al-Hamra'a - Al-Ghbd Al-Aala	Bany Abdallah	Al Udain
22	Al-Rias - Al-Alyt	Al-Sarh	Al Udain
23	Al-Dalo - Al-Mahajer	Al-Adany	Dhi As Sufal
24	Al-Muajlh - Shab Al-Dar	Al_Ansyeen	Dhi As Sufal
25	Al-Thahr - Al-Shoayb Al-Olia	Al_Sayf	Dhi As Sufal
26	Al-Qaadeh - Al-Sayarf	Khnouh	Dhi As Sufal
27	Wahyrat	Khnouh	Dhi As Sufal
28	Demnt Al-Jashaah	Wady Dhoba'a	Dhi As Sufal
29	Al_Shakhs - Al-Akhyraf	Al-Ashaoub	Mudhaykhirah
30	Kshran - Al-Najd	Al-Afyoush	Mudhaykhirah
Reserve cluster			
1	Rohysh	Bany Sarhah	Al Makhader
2	Aljrar - Thy Nasya	Shalf	Al Udain
3	Al-Zbour	Rydh Waryad	Dhi As Sufal
4	Thy Haafth Wajshman - Shab Adahm	Al-Joualh	Mudhaykhirah

Clusters of Eastern Highlands

Cluster	Site (sub-village or zone)	Ozla	District
1	Yareem - Darm Al-Mabry	Yareem	Yareem
2	Yareem - Harht Al-Zorajy	Yareem	Yareem
3	Alraady - Rayh	Khoudan	Yareem
4	Alozazy	Aryab	Yareem
5	Gably	Shayzer	Ar Radhmah
6	Al-Manzl	Al-Fajrh	An Nadirah
7	Qtham - Thras	Al-Meftah Al-Aala	An Nadirah
8	Thy Al-Shamh - Al-Shabh	Byt Al-Saidy	Ash Sha'ir
9	Thy Al-Rayd - Jarn Al-Aslab	Wady Al-Habaly	As Saddah
10	Shyaan - Jrab Al-Qtn	Bny Al-Athmanyeen	As Saddah
11	Al-Haythjah - Al-Harah Al-Sofla	Al-Mashar	Jiblah
12	Al-Sarouh - Haol Al-Arba	Al-Rabady	Jiblah
13	Al-Hamady	Al-Manar	Ba'dan
14	Byt Al-Hanesh	Dalal	Ba'dan
15	Byt Al-Badani - Sfal Al-Ngeel	Al-Doais	Ba'dan
16	Al-Sayany - Hart Al-Madrj	Nakhlan	As Sayyani
17	Al-Najeef - Al-Zahreh	Al-Damgh	As Sayyani
18	Al-Abrah - Al-Fajrah	Hadfan	As Sayyani
19	Shab Al-Gharyh	Al-Arbayeen	As Sayyani
20	Ibb - Al-Mjaarh	Al-Mashnah	Al Mashannah
21	Ibb - Al-Shaab	Al-Mashnah	Al Mashannah
22	Ibb - Jorafah	Althhar	Ad Dhihar
23	Ibb - Al-Sabal	Althhar	Ad Dhihar
24	Ibb - Al-Sabatd	Althhar	Ad Dhihar
25	Ibb - Joublah	Althhar	Ad Dhihar
26	Al-Shejaf	Thouab Aala	Ibb
27	Al-Haymh - Al-Hayfh	Ryman	Ibb
28	Al-Thnybah - Zahbr	Bany Moharm	Ibb
29	Manzl Ali	Mdhayh	As Sabrah
30	Thy Fery	Al-Msadah	As Sabrah
Reserve clusters			
1	Jabal Matyr - Al-Wasyh	Aras	Yareem
2	Al-Ajlab	Azal	Ar Radhmah
3	Shebl - Shebl Al-Sofla	Jabal Raween	Jiblah
4	Al-Jouz - Al-Wadi	Jabal Maoud	Ibb

Annex 8: Tables of Weighted Levels of Anthropometrical Indicators

Tables below shows levels of malnutrition in Ibb considering the sample weights in each survey zones.

1: Stunting among children distributed per zone, gender, and age category

Stunting		**N**	**%**	**95% Conf Limits**	
				Lower	**Upper**
Eastern Highlands (n = 612)	Moderate	173	28.2%	24.7%	32.0%
	Severe	128	21.0%	17.9%	24.5%
	Moderate and Severe	301	49.2%	45.2%	53.3%
Western Highlands (n = 456)	Moderate	149	32.6%	28.4%	37.2%
	Severe	88	19.3%	15.8%	23.3%
	Moderate and Severe	237	51.9%	47.2%	56.6%
Girls (n = 533)	Moderate	158	29.7%	25.9%	33.8%
	Severe	92	17.2%	14.1%	20.7%
	Moderate and Severe	250	46.9%	42.6%	51.3%
Boys (n = 535)	Moderate	163	30.5%	26.7%	34.6%
	Severe	125	23.3%	19.8%	27.2%
	Moderate and Severe	288	53.8%	49.5%	58.1%
6 - below 12 months (n = 118)	Moderate	26	22.1%	15.0%	30.7%
	Severe	12	10.5%	5.4%	17.2%
	Moderate and Severe	38	32.7%	24.1%	41.7%
12 - below 24 months (n = 268)	Moderate	82	30.7%	25.2%	36.5%
	Severe	54	20.1%	15.5%	25.5%
	Moderate and Severe	136	50.9%	44.7%	56.9%
24 - below 36 months (n = 231)	Moderate	65	28.2%	22.4%	34.4%
	Severe	56	24.2%	18.8%	30.3%
	Moderate and Severe	121	52.4%	45.8%	59.0%
36 - below 48 months (n = 227)	Moderate	84	37.2%	30.8%	43.8%
	Severe	44	19.6%	14.5%	25.2%
	Moderate and Severe	129	56.8%	50.1%	63.3%
48 - below 60 months (n = 224)	Moderate	64	28.3%	22.7%	34.8%
	Severe	50	22.1%	17.0%	28.2%
	Moderate and Severe	113	50.4%	43.8%	57.2%
Ibb (n = 1068)	*Moderate*	*322*	*30.1%*	*27.4%*	*33.0%*
	Severe	*216*	*20.3%*	*17.9%*	*22.8%*
	Moderate and Severe	*538*	*50.4%*	*47.3%*	*53.4%*

2: Underweight among children distributed per zone, gender, and age category

Underweight		**N**	**%**	**95% Conf Limits**	
				Lower	**Upper**
Eastern Highlands (n = 617)	Moderate	134	21.8%	18.6%	25.3%
	Severe	38	6.2%	4.5%	8.5%
	Moderate and Severe	173	28.0%	24.5%	31.8%
Western Highlands (n = 456)	Moderate	110	24.2%	20.4%	28.5%
	Severe	24	5.3%	3.5%	7.8%
	Moderate and Severe	134	29.5%	25.4%	33.9%
Girls (n = 533)	Moderate	114	21.4%	18.0%	25.2%
	Severe	24	4.5%	3.0%	6.7%
	Moderate and Severe	138	25.9%	22.3%	29.9%
Boys (n = 540)	Moderate	131	24.2%	20.7%	28.1%
	Severe	38	7.1%	5.2%	9.7%
	Moderate and Severe	169	31.4%	27.5%	35.5%

Underweight		N	%	95% Conf Limits	
				Lower	Upper
6 - below 12 months (n = 118)	Moderate	22	18.4%	12.1%	26.9%
	Severe	7	5.8%	2.4%	11.9%
	Moderate and Severe	28	24.1%	16.5%	32.6%
12 - below 24 months (n = 268)	Moderate	51	19.0%	14.5%	24.3%
	Severe	13	4.8%	2.6%	8.2%
	Moderate and Severe	64	23.8%	18.9%	29.4%
24 - below 36 months (n = 234)	Moderate	55	23.6%	18.2%	29.5%
	Severe	14	5.8%	3.3%	9.8%
	Moderate and Severe	69	29.4%	23.7%	35.7%
36 - below 48 months (n = 227)	Moderate	54	24.0%	18.5%	29.9%
	Severe	15	6.7%	3.8%	10.7%
	Moderate and Severe	70	30.7%	24.9%	37.3%
48 - below 60 months (n = 227)	Moderate	63	27.7%	22.0%	34.1%
	Severe	14	6.2%	3.4%	10.1%
	Moderate and Severe	77	33.9%	27.8%	40.5%
Ibb (n = 1073)	*Moderate*	*245*	*22.8%*	*20.4%*	*25.5%*
	Severe	*62*	*5.8%*	*4.5%*	*7.4%*
	Moderate and Severe	*307*	*28.6%*	*26.0%*	*31.5%*

3: Acute malnutrition (by WHZ) among children distributed per zone, gender, and age category

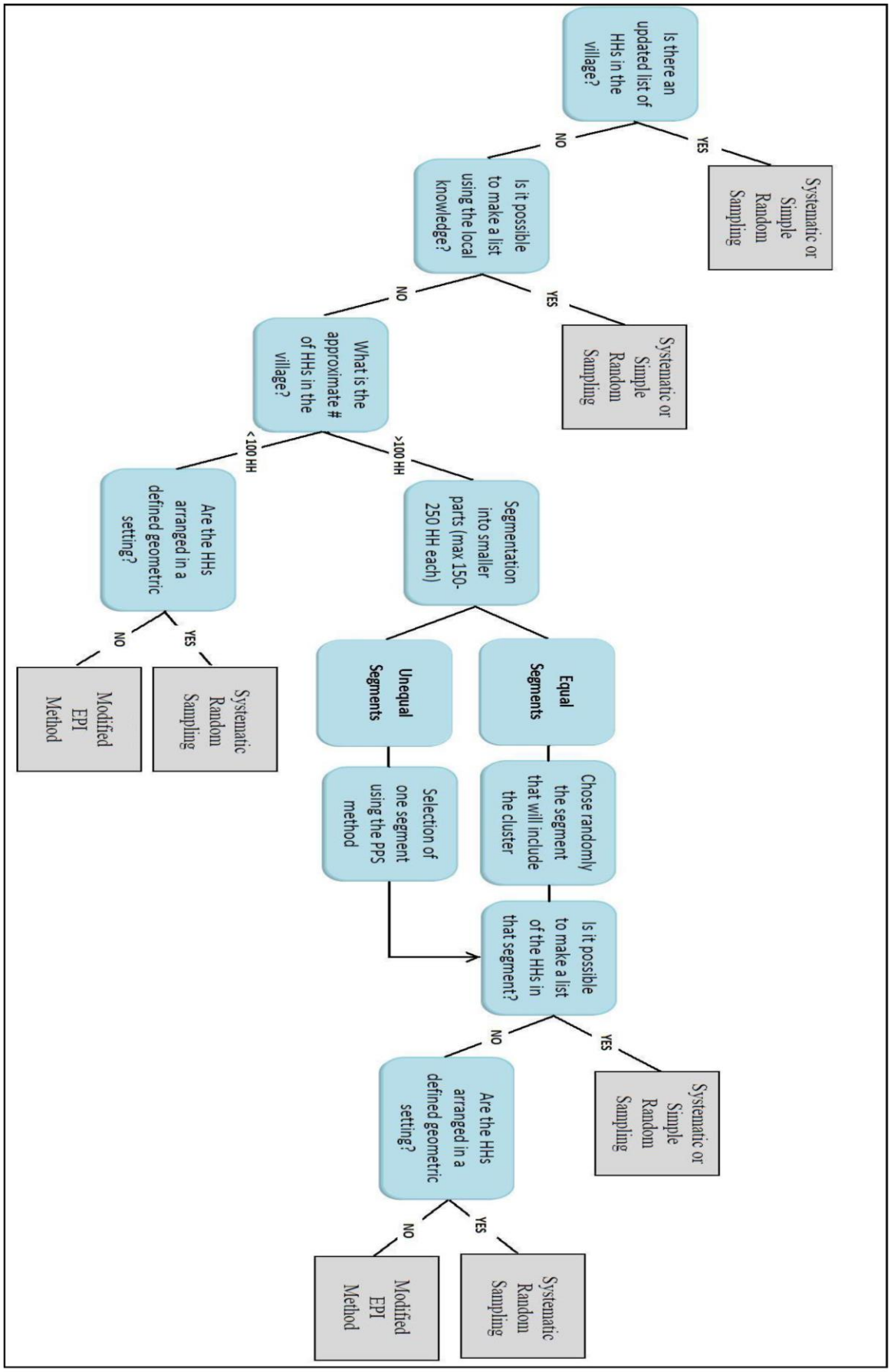
Acute malnutrition (by WHZ)		N	%	95% Conf Limits	
				Lower	Upper
Eastern Highlands (n = 620)	Moderate	20	3.3%	2.1%	5.1%
	Severe	4	0.6%	0.2%	1.7%
	Moderate and Severe	24	3.9%	2.5%	5.8%
Western Highlands (n = 457)	Moderate	22	4.9%	3.2%	7.4%
	Severe	3	0.7%	0.2%	2.1%
	Moderate and Severe	26	5.6%	3.8%	8.2%
Girls (n = 535)	Moderate	13	2.5%	1.4%	4.3%
	Severe	4	0.7%	0.2%	1.9%
	Moderate and Severe	17	3.1%	1.9%	5.1%
Boys (n = 542)	Moderate	30	5.5%	3.8%	7.8%
	Severe	3	0.6%	0.2%	1.8%
	Moderate and Severe	33	6.1%	4.3%	8.5%
6 - below 12 months (n = 118)	Moderate	8	6.5%	3.0%	12.9%
	Severe	2	1.4%	0.2%	6.0%
	Moderate and Severe	9	7.8%	3.6%	14.1%
12 - below 24 months (n = 271)	Moderate	10	3.7%	1.8%	6.7%
	Severe	2	0.7%	0.1%	2.6%
	Moderate and Severe	12	4.4%	2.3%	7.6%
24 - below 36 months (n = 235)	Moderate	9	3.7%	1.8%	7.1%
	Severe	1	0.3%	0.0%	2.3%
	Moderate and Severe	10	4.1%	2.1%	7.7%
36 - below 48 months (n = 227)	Moderate	5	2.3%	0.7%	5.1%
	Severe	1	0.5%	0.0%	2.4%
	Moderate and Severe	6	2.8%	1.0%	5.7%
48 - below 60 months (n = 227)	Moderate	11	4.9%	2.4%	8.5%
	Severe	1	0.5%	0.0%	2.4%
	Moderate and Severe	12	5.5%	2.8%	9.1%
Ibb (n = 1077)	*Moderate*	*43*	*4.0%*	*2.9%*	*5.4%*
	Severe	*7*	*0.6%*	*0.3%*	*1.4%*

Acute malnutrition (by WHZ)		N	%	95% Conf Limits	
				Lower	Upper
	Moderate and Severe	*50*	*4.6%*	*3.5%*	*6.1%*

4: Acute malnutrition (by MUAC) among children distributed per zone, gender, and age category

Acute malnutrition (by MUAC)		N	%	95% Conf Limits	
				Lower	Upper
Eastern Highlands (n = 622)	Moderate	20	3.3%	2.1%	5.1%
	Severe	6	1.0%	0.4%	2.2%
	Moderate and Severe	26	4.2%	2.9%	6.2%
Western Highlands (n = 458)	Moderate	24	5.2%	3.5%	7.8%
	Severe	5	1.0%	0.4%	2.6%
	Moderate and Severe	29	6.3%	4.3%	9.0%
Girls (n = 535)	Moderate	33	6.1%	4.3%	8.6%
	Severe	6	1.0%	0.4%	2.4%
	Moderate and Severe	38	7.2%	5.2%	9.8%
Boys (n = 544)	Moderate	12	2.1%	1.1%	3.8%
	Severe	5	1.0%	0.4%	2.3%
	Moderate and Severe	17	3.1%	1.9%	5.0%
6 - below 12 months (n = 119)	Moderate	21	17.8%	11.3%	25.8%
	Severe	5	4.0%	1.4%	9.5%
	Moderate and Severe	26	21.9%	14.8%	30.4%
12 - below 24 months (n = 271)	Moderate	16	6.0%	3.4%	9.4%
	Severe	3	1.2%	0.2%	3.2%
	Moderate and Severe	20	7.2%	4.6%	11.1%
24 - below 36 months (n = 235)	Moderate	4	1.9%	0.5%	4.3%
	Severe	1	0.3%	0.0%	2.3%
	Moderate and Severe	5	2.2%	0.7%	4.9%
36 - below 48 months (n = 227)	Moderate	2	1.1%	0.1%	3.2%
	Severe	1	0.5%	0.0%	2.4%
	Moderate and Severe	4	1.6%	0.5%	4.4%
48 - below 60 months (n = 228)	Moderate	0	0.0%	0.0%	1.6%
	Severe	1	0.4%	0.0%	2.4%
	Moderate and Severe	1	0.4%	0.0%	2.4%
Ibb (n = 1079)	*Moderate*	*44*	*4.1%*	*3.0%*	*5.5%*
	Severe	*11*	*1.0%*	*0.5%*	*1.9%*
	Moderate and Severe	*55*	*5.1%*	*3.9%*	*6.6%*

Annex 9: Decision Tree for Household Selection (SMART Sampling Guideline, June 2012)



Ministry of Public Health and Population
Ibb Governorate Health Office