NUTRITION SURVEY REPORT

RAYMA GOVERNORATE, YEMEN

26 to 31 May 2012

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EUROPEAN COMMISSION

Humanitarian Aid and Civil Protection

Ministry of Public Health and Population (MoPHP)
United Nations Children's Fund (UNICEF)

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The UNICEF Yemen Country Office provided technical support employing SMART methodology. A survey manager and supervisors were provided by the Taiz Governorate Health and Population Office, MoPHP, and Hodeidah Governorate Health and Population Office. The survey enumerators and team leaders came from governorates of Rayma, Taiz and Hodeidah. The data entry team from the Office of Hajja Governorate Public Health and Population and from the Ministry in Sana'a performed the data entry to enable daily data quality verification.

The Rayma Governorate Public Health and Population Office with support from Hodeidah Governorate Public Health and Population Office oversaw 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 European Commission for Humanitarian Aid and Civil Protection (ECHO); 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.

UNICEF and MoPHP also express their sincere appreciation to the entire assessment 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.

EXECUTIVE SUMMARY

Between 26 and 31 May 2012, MoPHP and Rayma Governorate Public Health and Population Office supported by UNICEF conducted nutrition and mortality survey in Rayma Governorate using the Standardized Monitoring and Assessment for Relief and Transition (SMART) methodology to establish and monitor the levels of acute malnutrition, stunting and underweight among children aged 6-59 months, identify some of the factors associated with malnutrition, estimate the underfive and crude death rates, and inform on the appropriate responses.

Using a two-stage Probability Proportionate to Population Size (PPS) sampling methodology, 30 clusters were randomly selected for both anthropometric and mortality assessments. A minimum of 18 households per cluster were randomly selected and assessed. However, one cluster was left for access difficulties. A total of 522 households were surveyed, covering a total of 640 children aged 6-59 months, respectively.

Results indicate that GAM rate using WHZ Scores is above the WHO 'serious' threshold with 10.8 per cent, however, proxy GAM using MUAC cutoff point of 125 mm is 13.1 per cent which is considered 'critical' as per the categorization of UNFAO/Food Security and Nutrition Analysis Unit (FSNAU. With high levels of proxy GAM, and stunting rates of 71.4 per cent and underweight of 50.4 per cent, it is highly probable that Rayma Governorate is suffering from chronic food insecurity. Beyond nutritional indicators above, high level of morbidity is also reported by this survey with levels of 48.1 per cent diarrhoea, 43.6 per cent ARI and 54.8 per cent fever.

The main sources of drinking water for about 70 per cent of households are protected springs, unprotected surface water, and unprotected open wells. Only 67 per cent of households seek health services from a public health facility when sick. Vitamin A coverage is lower than the Sphere Standards recommendation of 95 per cent coverage (83.1 per cent). About 80 per cent the children aged 6-24 months do not receive the recommend four meals a day.

There is effect on the nutritional status have been seen for breastfeeding continuity after the 6th month, diarrhoea and ARI prevalence, cleanness of drinking water storage, latrine type, handwashing after toilet and before and after meal, and the education level of household caretaker.

Crude death rate found is 0.17 per 10000 per day, while underfive death rate is 0.31 per 10000 per day.

Specific recommendations include:

Immediate Interventions

- The priority is cleaning the pockets from acute malnourished by mobilizing outreach clinics and to refer the complicated cases to nearest TFCs. Outreach clinics should also provide treatment services for child illnesses especially diarrhoea and ARI.

Medium and Long Term Interventions

- Rayma is in need of a programme that deals with underweight and chronic malnutrition. This should include utilization the approach of Growth Monitoring and

Promotion (GMP), maternal nutrition package, and promotion of hygienic. Pregnant women, lactating mothers, and underweight children should be supported by rations cereal: legume mix (locally known *Shabiza*) with sachets of micronutrients sprinkles in monthly basis.

- Food security enhancement projects are also required for Rayma, since this governorate is suffering from chronic food insecurity that can be seen from the high level of stunting, high levels of proxy GAM and from the high insecurity prevalence as mentioned earlier and average maternal MUAC as shown by the WFP – CFSS 2011. Rayma is the lowest governorate of average maternal MUAC with value of 24.2 cm.

Other Recommendations

- Rayma is the first governorate that was found to have higher proxy GAM and SAM by MUAC cutoffs than standard GAM and SAM by WH Z-scores. However, there could be other governorates with the same pattern that are suffering from chronic food insecurity, higher rates of stunting and underweight. For such cases, the international expertise is needed to setup intervention packages that are definitely beyond the idea of just having CMAM services.

Table 1. Summary of Nutrition Survey in Rayma Governorate, May 2012			
Indicator	**N**	**%**	**95% CI**
Child Malnutrition			
Total number of households assessed for children*	522	100	
Mean household size	6.9		
Total number of children assessed	638/640	99.7	
Child sex: Males (boys)	329	51.4	
Females (girls)	311	48.6	
Global Acute Malnutrition (WHZ<-2 z-score or oedema)	68	10.8	8.5 – 13.5
Severe Acute Malnutrition (WHZ<-3 z score or oedema)	9	1.4	0.7 – 2.8
Oedema	0	0	
Chronic Malnutrition (H/A<-2 z score)	439	71.4	67.6 – 74.9
Severe Chronic Malnutrition (H/A<-3 Z score)	254	41.3	37.4 – 45.3
Underweight prevalence (W/A<-2 Z score)	320	50.4	46.4 – 54.3
Severe Underweight (W/A<-3 z score)	120	18.9	16 – 22.2
Child Morbidity			
Children reported with suspected measles within one month prior to assessment	16	2.5	1.5 – 4.1
Children reported with diarrhoea in 2 weeks prior to assessment	308	48.1	44.2 – 52.1
Children reported with ARI within two weeks prior to assessment	279	43.6	39.7 – 47.5
Children reported with febrile illness in 2 weeks prior to assessment	351	54.8	50.9 – 58.7
Immunization and Supplementation Status			
Children aged 9 – 59 months immunised against measles	532	92.4	89.8 – 94.3
Children who have received 3 doses of polio vaccine (routine)	482	76.9	73.3 – 80.1
Children reported to have received vitamin A supplementation in last 6 months	520	83.1	79.8 – 85.9
Child Feeding			
Children (6-24 months) reported to be breastfeeding	136	62.7	55.9 – 69.1
Children (6-24 months) fed 4 times and above	44	20.3	15.1 – 26.2
Mortality			
0-5 Death Rate (U5DR) as deaths/10,000/ day	**0.31**		0.07 – 1.27
Crude Death Rate (CDR) as deaths/10,000/ day	**0.17**		0.08 – 0.37

1.0 INTRODUCTION / BACKGROUND

Rayma is the most newly created governorate in Yemen, which was part of Sana'a Governorate up to 2004. It is located 200 Km from Sana'a city, bordered by governorates of Hodeidah, Dhamar and Sana'a, with population size of about 500,000 that represents 3 per cent of the country population.

Figure (1): Map of Rayma Governorate

Administratively, Rayma is composed from 6 districts, AlJabeen (the Capital), AlJafaria, AlSalafia, Mazhar, Kusma, and Belad Al-Ta'am.

Rayma is characterized by rugged nature and high mountains, located amid a series western mountains between the degrees of 14.36 - 14.88 north and 43.50 - 44 east. Topographically, it contains a group of the highest Tihama highland chains, the western part of mountains of altitude ranged 1600 to 1800 metres above the sea level, the middle part of mountains of altitude ranged 1500 to 2950 metres above the sea level, and the eastern part with mountains of lower altitudes interspersed with valleys

The climate is characterized by coldness in winter and moderateness in the summer.

Agriculture in forms of cultivation of fruits, vegetables, cereals and coffee as well as breeding animals and honey production are the main activities practiced by people there.

Based on WFP-CFSS 2009, Rayma was at the top of governorates for the percentage of poor food consumption (24.3 per cent) and percentage of population with food in security (52.8 per cent).

Rayma is also the highest of having malnutrition among women aged 15 to 49 years with 26.8 per cent of women with MUAC below 21.4 cm and 39.8 per cent of women with MUAC below 22.2 cm.

The 2011 WFP-CFSS survey reported the moderate and severe food insecurity of 50.6 per cent that is close the one of 2009 estimating that 242,268 of the governorate population are food insecure. CFSS also report prevalence of acute malnutrition of 8.9 per cent with severe type of 2.8 per cent, chronic malnutrition of 68.4 per cent with severe type of 39.2, and underweight of 45.2 per cent with severe type of 16.8 per cent.

The CFSS survey shows that 35.1 per cent of household heads (mostly man) are illiterate and 21.9 per cent can read and write but had not enrolled in formal school education, while the 75.3 per cent of spouses (mostly woman) are illiterate and 9.8 per cent can read and write.

Health services are provided through 109 health facilities (2 hospitals, 35 health centres, and 72 health units). Nutrition CMAM services are provided by only 6 facilities. The routine coverage of vaccination is low with percentages of 25 per cent for pentavalent 3 and 23 per cent for measles.

2.0 ASSESSMENT OBJECTIVES

The overall objective of the survey was to establish the nutrition situation in Rayma Governorate, determine some of the factors influencing malnutrition, and identify some of the public health services accessible to the population.

Specific objectives:

1. To estimate the level of acute malnutrition (wasting), stunting and underweight among children aged 6-59 months in Rayma Governorate.
2. To identify factors influencing nutrition status of the children including disease prevalence and access to essential services in the governorate.
3. To estimate the prevalence of some common diseases (measles, diarrhoea, fever and ARI) in the governorate.
4. To estimate the measles and polio vaccination and Vitamin A supplementation coverage among children in the governorate.
5. To estimate the crude and under-five mortality/death rates in the governorate.

3.0 METHODOLOGY

3.1: Sampling Design and Sample Size Determination

A cross-sectional survey was conducted between 26 and 31 May 2012 in Rayma Governorate. Using a two-stage Probability Proportionate to Population Size (PPS) sampling methodology, 30 clusters were randomly selected for the survey. The cluster sampling methodology was selected in view of lack of an exhaustive updated list of household details. The total estimated population was 501166 (Ref: Annex 8: Sampling Frame: Source: CSO Projection of 2004 Census).

A sample size of 517 households was calculated using ENA for SMART software based on the estimated parameters shown in Table 2. The calculated sample size for mortality was about 487 households, hence the sample calculated for anthropometry was considered for mortality as well.

Table 2: Parameters used in the Sample Size Determination	
Parameters	
Estimated Acute Malnutrition Prevalence (%)[1]	20.1
Desired Precision (%)	5
Design Effect[2]	2
Average Household Size[3]	7
Under 5 year old (%)[4]	17
Non response household (%)[5]	3
Sample Size (N)	**517**

A minimum of 18 households per cluster were recommended for assessing the anthropometry and mortality. A total of 522 households were surveyed in 29 clusters while one cluster could not be reached, reaching a total number of 640 children aged 6-59 months, respectively.

3.2: Sampling Procedure

The ENA for SMART software was used in the random selection of the 30 clusters from the sampling frame, including identification of the reserve clusters. The sampling frame consisted of an exhaustive list of villages and the estimated population size for each. In this case, all villages were accessible and were included in the sampling frame, thus giving them an equal chance of being selected.

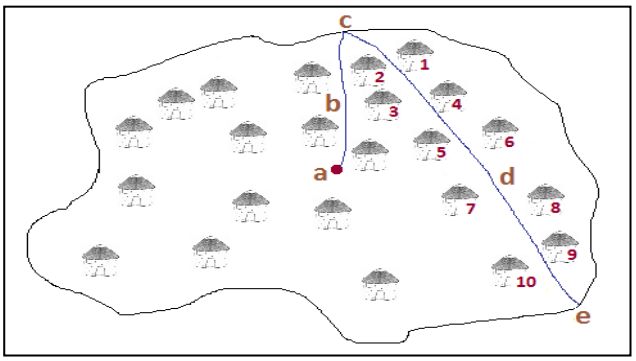
Only 29 out of the 30 clusters randomly selected were accessible and assessed. One cluster was unreached for geographically difficulties after more than 18 hours of traveling by car and walking. The reserve clusters were not assessed in the survey since the lost is less than 10 per cent of the total clusters. Upon reaching the cluster, the survey teams, with the help of an elder or the guide, requested the residents' permission to assess the areas. The purpose of the survey was explained and the

[1] International Food Policy Research Institute/Ministry of Planning and International Cooperation: National Food Security Paper, Feb 2010: Page 105 for GAM in Rayma.
[2] Minor heterogeneity within clusters in the study population explored based on presence of "marginalized groups"/ non-integrated groups, differences in infrastructural network hence access to services and information, rain dependence vs irrigation farming, livelihood (*Qat* growers vs *Qat* sellers, and farming, etc)
[3] Calculated on basis of Central Statistics office data of population versus households
[4] Estimated on basis of MoH reports and immunization statistics
[5] Non-response rate of 3% was estimated in case the teams encounter refusal, security-related inaccessibility or absence.

process of random selection of a representative sample from the cluster was also elaborated.

Once granted permission to continue with the survey, the survey team used the Modified EPI methodology to randomly pick the household to be interviewed. This involved identifying the centre of the cluster, where they had to spin a pen to randomly select the direction to take to the edge of the settlement. The team walked to the edge of the cluster. From the edge, the team had to spin the pen again aiming to randomly get a direction to follow to the other extreme edge of the settlement. In case the pen pointed towards outside of the settlement, the teams were to spin the pen multiple times till the pen pointed to any of the directions towards the settlement. Once a new direction was obtained, the team counted all the households along the randomly selected direction, gave each household a number, and then randomly selected the first household to be interviewed from the numbered households (for example, household number 7 in the households numbered 1 to 10, in the figure (2)).

Figure (2): The modified EPI method used for selection of households



Same direction was followed to select the subsequent household for interview, going for next nearest household on the right side and following the selected direction, until the required minimum number of households and children had been assessed (Ref: Figure (2) indicating the household selection process- Figure adopted from the SMART Methodology Guideline). Anthropometric data alongside other child data were collected from all children aged 6-59 months found in the randomly selected household. However for villages of relatively low counted numbers of households, every household is given a number, then the total number of the requested sample is drawn randomly.

In case the team assessed all households to the edge of the cluster and did not reach the required number of households, the team would repeat the process again i.e. start from the cluster/ village centre to randomly select another direction, then walk to the edge, then spin the pen again and count the households to the edge of the cluster. Then randomly pick the first household for interview, and then go the next nearest household, to the right hand side, till the required number of households were interviewed.

In case of absence of the children during the interview time or absence of the members of the randomly selected households, an appointment was made by the survey team to return back before leaving the cluster.

3.3: Study Population and Data Collection Process

As defined in the sampling frame, the study population was the entire population of Rayma Governorate as found form different resources.

The activities undertaken in the entire survey period are summarised in Table 3, below. Data collection preparation commenced with a four-day training of enumerators, team leaders and supervisors (Ref: Annex 3: Rayma Nutrition Survey Team). The training

conducted covered interview techniques, sampling procedures, field procedures (random household selection, introduction and systematic data collection), inclusion and exclusion criteria, sources and reduction of errors, taking of measurements (height, weight and MUAC) focusing on achieving high precision and accuracy, data collection standardisation procedures to ensure data quality, diagnosis of oedema, measles, ARI, diarrhoea and collection of household details necessary to establish household members movement and/or death in order to compute mortality rates, handling of equipment and the general courtesy during the assessment. Six survey teams were involved in the data collection process.

Quantitative data were collected by means of a household questionnaire for nutrition survey and a mortality survey question, adopted from the SMART Methodology guidelines (Ref: Annex 1: Rayma Nutrition Survey Questionnaire and Annex 2: Rayma Mortality Survey Questionnaire). Only children aged 6-59 month or with length/ height of 65 - 109.9 cm were included in the anthropometric assessment. The age estimation was based on birth or immunization card details and/or supported with events calendar and date conversion tables based on the Islamic Calendar (Ref: Annexes 5 and 6: Age Conversion Tables and Events Calendar).

Retrospective mortality data were collected from all randomly selected households, irrespective of presence or absence of children aged 6-59 months. A recall period of 90 days prior to the survey was used.

Table 3: Chronology of activities in the survey

Action	Period
Preparation: Contacting local authority, survey team identification, training material preparation	21 – 26 Apr
Training of survey teams and field test	28 Apr – 3 May
Data collection and data entry	26 May – 2 June
Data cleaning and analysis	11 – 13 June
Report drafting and releasing	14 – 22 June
Circulation of final report	30 June

3.4: Measurement Standardization and Quality Control

Six survey teams underwent rigorous standardisation test procedures using 10 children aged 6 - 59 months. This exercise was conducted at the training place in Women Union place in Hodeidah City and it aimed at assessing the accuracy and precision of the survey teams for purposes of enhancing the survey data quality. The weak team members were identified and the common mistakes made were identified and addressed (Ref: Annex 4: Rayma Nutrition Survey Standardization Test Report, showing team performance and how errors were rectified/ addressed). Further field testing of survey tools and exercise on data collection, including household selection and interview steps and familiarization of questions was conducted, and field level challenges and common mistakes identified and discussed. The field testing was conducted in Tabbat Al-Shawesh village in AlJabeen District. This village was not one of the randomly selected clusters.

Each team was composed from 3 female surveyors and one male team head. Two out of

the three female surveyors are recruited from those have participated in surveys conducted in Hodeidah and Taiz while the third member is from Rayma Governorate.

Beside training, which also included role playing and field testing, data quality was also ensured through (i) Monitoring of fieldwork by coordination team; (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, continuous data cleaning and plausibility checks, plus ensuring each team was given feedback on the quality of previous day's data before the start of a new day; (v) Equipment calibration/ monitoring accuracy of equipment (weighing scales) by regularly measuring objects of known weights to check for any differences, (vi) Additional check was done at the data entry level to enable entry only of relevant possible responses and measurements; (vii) Continuous reinforcement of good practices. During the field data collection, all measurements were loudly called by both the enumerators reading and recording them, to reduce errors during recording.

Clear job descriptions were provided to the teams as part of the training, to ensure appropriate guidance in delivering the assigned tasks (Annex 9: Survey Team Job Description). The supervisor had to review the questionnaire and verify the accuracy of the details before the teams leave a household, thus minimizing possibility of incomplete data (missing variables) and outliers.

3.5: Data Entry and Analysis

The anthropometric data were entered and analysed using ENA for SMART software, while the remaining household variables and child-related variables (feeding practices and morbidity) were entered and analysed using Epi info version 3.5.3. Running and tabulation of all variable frequencies was carried out as part of data cleaning. The nutrition 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).

The classification used for wasting levels was a follows:

W/H < -3 Z-Scores or oedema = Severe acute malnutrition
W/H ≥ -3 Z-Scores < -2 Z-Scores = Moderate acute malnutrition
W/H < -2 Z-score or oedema = Global/total acute malnutrition
W/H ≥ -2Z-Scores = Normal

The classification used for proxy wasting levels using MUAC was a follows:

MUAC < 115 mm or oedema = Proxy severe acute malnutrition
MUAC ≥ 115 mm < 125 mm = Proxy moderate acute malnutrition
MUAC < 125 mm or oedema = Proxy global/total acute malnutrition
MUAC ≥ 125 mm = Normal

The classification used for Stunting levels was a follows:

H/A < -3 Z-Scores = Severe stunting
H/A ≥ -3 Z-Scores < -2 Z-Scores = Moderate stunting
H/A < -2 Z-score = Stunting Prevalence rates
H/A ≥ -2Z-Scores = Normal

The classification used for Underweight levels was a follows:

W/A < -3 Z-Scores = Severe Underweight
W/A ≥ -3 Z-Scores < -2 Z-Scores = Moderate underweight
W/A < -2 Z-score = Underweight Prevalence Rates
W/A ≥ -2Z-Scores = Normal

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.

Mortality data were entered and analysed using the ENA for SMART software.

3.6: Data Entry Verification and Cleaning

Team of Two members shared the work of data entry, and then each member would review the work done by another colleague before merging the data on a daily basis.

About 10 per cent of the entered questionnaires were randomly drawn using the Random Number Table of ENA software. These drawn questionnaires were revised for accuracy of entry in the electronic database. The quality of data entry was accepted if accuracy was not less than 95 per cent.

The uniqueness of IDs of both household questionnaire and mortality sheet was also reviewed for any repeating during data entry.

For anthropometry data, all flagged records were also reviewed by means of revisiting original questionnaires.

4.0 ASSESSMENT RESULTS

4.1: Household Characteristics of Study Population

As shown in Table 4 below, the gender of household head in more than 90 per cent of households is male. 81 per cent of household heads are married and living with partner. About two thirds of household caretakers in the survey area are illiterate while the proportion of household caretakers with basic, secondary and higher education is collectively 7.4 per cent.

The three main income sources for households are temporary work (casual labour)[6], fixed monthly waged work and remittance with total percentage of about 69.3 per cent as shown in Table 4.

Regarding drinking water, the main three sources for about 70 per cent of households are protected springs, unprotected surface water, and unprotected open wells. Only 3.6 per cent of households do treatment for drinking water mainly by filtration. About 54 per cent of the households store drinking water in clean containers (algae growth is not seen).

As shown in Table 4, only 29.5 per cent use flush or pour flush latrine system while 45.5 per cent use either open pit latrine or simple covered pit latrine in their human waste disposal. About one quarter of households defecate in open.

Table 4: Household Characteristics

	N	*%*
Total Households	522	100
Household size (Mean):	6.9	
Mean No of Under-fives	1.37	
Mean No of 6 – 59 months	1.23	
Sex of Household Head:		
Male	476	91.2
Female	46	8.8
Marital status of household head		
1. Married and living with spouse	423	81
2. Married but living far from spouse for ≥ 6 months	63	12.1
3. Widowed	27	5.2
4. Single	5	1.0
5. Recalcitrant	3	0.6
6. Divorced	1	0.2
Education level of household caretaker		
1. Illiterate	316	60.5
2. Read and write	112	21.5
3. Basic education	48	9.2
4. Secondary education	23	4.4
5. Higher education	23	4.4
Main Source of Income:		
1. Temporary work/ Casual labour	191	36.7
2. Fixed monthly waged work	109	20.9
3. Remittance	61	11.7
4. *Qat* cultivation and trade	47	9.0
5. Donations from friends and relatives	32	6.1
6. Trade	22	4.2
7. Crops other than *Qat*	20	3.8
8. craftsmanship	17	3.3
9. Animals and animal products	12	2.3

[6] Temporary work is daily wage based work such as work in construction, on others' farms, etc.

Table 4: Household Characteristics		
	N	*%*
10. Social assurance	6	1.2
11. Other	4	0.8
Main water source for drinking		
1. Water from protected spring	199	38.1
2. Unprotected surface water (wadi, springs, etc)	99	19.0
3. Water from unprotected open well	67	12.8
4. Water from covered rainwater harvesting tank	55	10.5
5. Water from protected open well	53	10.2
6. Water from uncovered rainwater harvesting tank	25	4.8
7. House-connected yard piped water	15	2.9
8. Water tanker	8	1.5
9. House-connected piped water	1	0.2
Household latrine type		
1. Flush/pour flush latrine	154	29.5
2. Open pit latrine	137	26.2
3. Simple covered pit latrine	101	19.3
4. Defecation in open (in fields, etc.)	129	24.7
5. Other	1	0.2

4.2: Morbidity, Immunization Status and Health Seeking Behaviour

High prevalence of common diseases was recorded as reflected in Table 5 below. During the two weeks prior to the survey, recorded prevalence of diarrhoea among children was 48.2 per cent, the prevalence of ARI as described by coughing or breathing difficulty was 43.6 per cent and the prevalence of fever two weeks prior to the survey was 45.8 per cent. Suspected measles[7] during the last month was 2.5 per cent.

As shown in Table 5, the coverage for routine polio vaccination is low with proportion of 76.9 per cent that is also joins the three doses of pentavalent vaccination, while it is 92.4 per cent for measles immunization coverage mostly through outreach campaigns. During the previous 6 months, 83.1 per cent of the children had received vitamin A supplements. The above immunization coverage and vitamin A supplementation coverage are lower than the Sphere Standards recommended 95 per cent coverage.

Only 8.6 per cent of surveyed children slept under a mosquito net the night before the survey.

Table 5: Health Seeking Behaviour		
	N	*%*
Where health service is sought		
Public health facility	347	66.5
Private clinic	64	12.3
Pharmacy	23	4.4
Personal medication	64	12.3
Traditional medication	4	0.8
Do not seek medical assistance	20	3.8
Morbidity		
Proportion of children with diarrhoea within 2 weeks prior to assessment	308	48.2
Proportion of children with ARI within two weeks prior to assessment	279	43.6
Proportion of children with fever within two weeks prior to assessment	351	54.8

[7] The suspected measles is defined as having rash and fever in addition to at least one of: cough, sore throat, or conjunctivitis.

Table 5: Health Seeking Behaviour		
	N	*%*
Suspected measles within one month prior to assessment	16	2.5
Immunization		
Children (9-59 months) immunised against measles	532	92.4
Children who have received the routine polio vaccine	482	76.9
Supplementation		
Children who received vitamin A supplementation in last 6 months	520	83.1
Sleeping under mosquito net		
Children slept under mosquito net last night	55	8.6

As shown in Table 5, only 66.5 per cent of households seek health services from public health facilities, while 16.9 per cent are either practice personal or traditional medication or do not seek medical assistance. Far distant and high cost of the service is the main two reasons said by those whore not seeking the service.

4.3: Feeding Practices

Table 6: Feeding practices		
	N	*%*
Still breastfeeding	136	62.7
Number of feeds (other than breastfeeds)		
No feed	20	9.2
One feed	20	9.2
Two feeds	34	15.7
Three feeds	99	45.6
Feeding 4 times and above	44	20.3
Number of milk feeds (other than breastmilk)		
No milk feed	58	27.8
One milk feed	24	11.5
More than one milk feed	127	60.8

As shown in Table 6, only 62.7 per cent of children aged 6 to 24 months are continuing breastfeeding. Additionally, only 20.3 per cent of this category of children had 4 and above feeds other than breastfeeding in the previous day. Inappropriate infant and young child feeding practice of giving milk (other than breastmilk) to children over 6 months of age was recorded as common in Rayma with percentages of 72.3 per cent of children in the previous day to the survey.

4.4: Characteristics of the children assessed

Table 7: Distribution of Age and Sex of the sample							
	Boys		*Girls*		*Total*		*Ratio*
AGE (mo)	*no.*	*%*	*no.*	*%*	*no.*	*%*	*Boy:girl*
6-17	74	50.0	74	50.0	148	23.1	1.0
18-29	67	47.9	73	52.1	140	21.9	0.9
30-41	85	48.9	89	51.1	174	27.2	1.0
42-53	78	57.4	58	42.6	136	21.3	1.3
54-59	25	59.5	17	40.5	42	6.6	1.5
Total	329	51.4	311	48.6	640	100.0	1.1

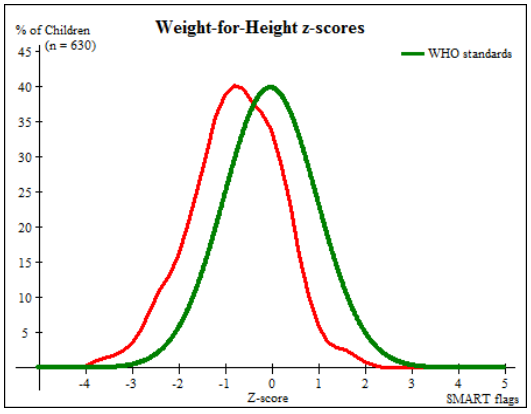
Generally there were more boys than girls assessed in this survey, as shown in table 7, however, the difference is not statistically high (p=0.477) as found by the plausibility check of the survey date (Annex 11: Assessment Quality Check)

4.5: Nutrition Status

Below is a summary of the anthropometric results of the nutrition survey. Data quality was validated using the Plausibility check function of the SMART for ENA software. The overall scoring of the plausibility check of the survey data is 11 which is categorised as

acceptable (Ref: Annex 11 for the Assessment Quality Check)

4.5.1: Acute Malnutrition Rates



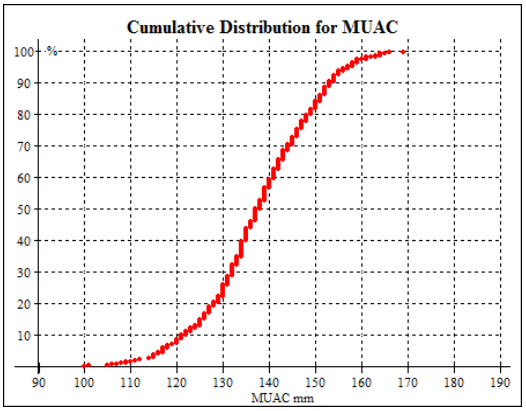
Though there is an overall shift to the left of the study population when compared with the reference population, as per the graphs shown (implying presence of malnutrition). The interpretation was made based on the 2006 WHO Growth Standards.

The level of wasting with oedema – also known as global acute malnutrition (GAM) – found is **10.8 per cent,** which classifies as 'serious' as per the WHO categorization of the severity as shown in Tables 8 (including the confidence intervals). Pockets of high nutritional vulnerability in some clusters were noted and reported (P=0.000). Levels of severe acute malnutrition (SAM) of 1.4 per cent and moderate acute malnutrition (MAM) of 9.4 per cent are lower than the national levels as well as rates estimated by IFPRI for Rayma based on HBS 2005-06 data (12.6 per cent MAM and 7.5 per cent SAM), however these levels are close to those found by WFP-CFSS 2011 that are 8.9 per cent GAM and 2.8 per cent SAM. There was no oedema case identified by the survey.

Table 8 : Acute Malnutrition (Wasting) Rate

	All *n = 630*	*Boys* *n = 325*	*Girls* *n = 305*
Prevalence of global malnutrition (<-2 z-score and/or oedema)	(68) 10.8 % (8.5 - 13.5 95% CI)	(40) 12.3 % (9.0 - 16.5 95% CI)	(28) 9.2 % (6.3 - 13.1 95% CI)
Prevalence of moderate malnutrition (<-2 z-score and >=-3 z-score	(59) 9.4 % (7.3 - 12.0 95% CI)	(36) 11.1 % (8.0 - 15.1 95% CI)	(23) 7.5 % (4.2 - 13.3 95% CI)
Prevalence of severe malnutrition (<-3 z-score and/or oedema)	(9) 1.4 % (0.7 - 2.8 95% CI)	(4) 1.2 % (0.4 - 3.3 95% CI)	(5) 1.6 % (0.6 - 4.5 95% CI)

The prevalence of oedema is 0.0 per cent



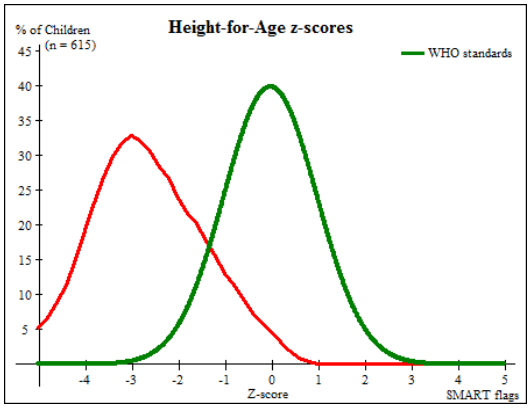
However, the image for Rayma is different when MUAC cut offs of 115 mm and 125 mm are used to estimate proxy GAM and proxy SAM. The table 9 below indicate that proxy GAM is high as 13.1 per cent and proxy SAM is high as 3 per cent which classifies as 'critical' as per FAO categorization when MUAC is used.

The prevalence of acute malnutrition based on the NCHS reference is reflected the summary of Table 12, below.

Table 9 : Proxy Acute Malnutrition based on MUAC cut offs			
	All *n = 639*	*Boys* *n = 329*	*Girls* *n = 310*
Prevalence of global malnutrition (< 125 mm and/or oedema)	(84) 13.1 % (9.8 - 17.5 95% CI)	(37) 11.2 % (7.5 - 16.6 95% CI)	(47) 15.2 % (10.6 - 21.1 95% CI)
Prevalence of moderate malnutrition (< 125 mm and >= 115 mm, no oedema)	(65) 10.2 % (7.6 - 13.5 95% CI)	(28) 8.5 % (6.0 - 12.0 95% CI)	(37) 11.9 % (8.1 - 17.3 95% CI)
Prevalence of severe malnutrition (< 115 mm and/or oedema)	(19) 3.0 % (1.8 - 4.9 95% CI)	(9) 2.7 % (1.2 - 6.3 95% CI)	(10) 3.2 % (1.7 - 5.9 95% CI)

4.5.2: Chronic Malnutrition Rates

As mentioned above, stunting prevalence is Rayma is the highest that has not ever seen in other governorates with level of 71.4 per cent as shown in Table 10. There is overall shift to the left of the study population deviating from the reference population. The prevalence of severe stunting is also high with rates of 41.3 per cent. The statistical details of the stunting rates are as shown in the table 10 below.

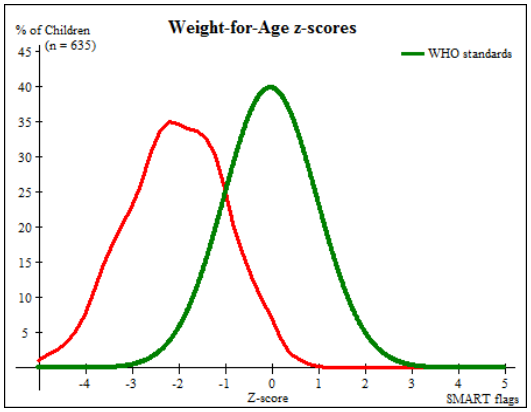


This stunting level exceed the 40 per cent threshold for critical levels according to WHO (2000), hence the situation is of great concern. It is higher than the estimated by IFPRI (overall stunting of 60.1 per cent and severe stunting of 41.5 per cent), but close to findings of the WFP-CFSS 2011 (overall stunting of 68.4 per cent and severe stunting of 39.2 per cent).

Table 10: Chronic Malnutrition (Stunting) Rate			
	All *n = 615*	*Boys* *n = 321*	*Girls* *n = 294*
Prevalence of stunting (H/A<-2 z-score)	(439) 71.4 % (67.6 - 74.9 95% CI)	(236) 73.5 % (68.3 - 78.3 95% CI)	(203) 69.0 % (63.4 - 74.3 95% CI)
Prevalence of moderate stunting (<-2 z-score and >=-3 z-score)	(185) 30.1 % (26.5 - 33.9 95% CI)	(99) 30.8 % (25.9 - 36.3 95% CI)	(86) 29.3 % (24.1 - 34.8 95% CI)
Prevalence of severe stunting (H/A<-3 z-score)	(254) 41.3 % (37.4 - 45.3 95% CI)	(137) 42.7 % (37.2 - 48.3 95% CI)	(117) 39.8 % (34.2 - 45.6 95% CI)

4.5.3: Underweight Rates

Underweight prevalence as per child gender is shown in Tables 11. The rate is 50.4 per cent which is one of the highest in Yemen with severe underweight of 18.9 per cent. An overall shift of the study population is shown in the graphs, reflecting the overall deviation of the study population from the reference population, implying presence of widespread malnutrition. The statistical details of the underweight



prevalence are shown in the tables 11 below.

The above underweight rate exceeds the WHO (2000) critical levels of 30 per cent and above. It is worth noting that underweight is a composite variable for Global Acute Malnutrition and Chronic Malnutrition levels in a population.

Table 11: Underweight Rate			
	All *n = 635*	*Boys* *n = 327*	*Girls* *n = 308*
Prevalence of underweight (<-2 z-score)	(320) 50.4 % (46.4 - 54.3 95% CI)	(167) 51.1 % (45.5 - 56.6 95% CI)	(153) 49.7 % (44.0 - 55.4 95% CI)
Prevalence of moderate underweight (<-2 z-score and >=-3 z-score)	(200) 31.5 % (27.9 - 35.3 95% CI)	(105) 32.1 % (27.1 - 37.5 95% CI)	(95) 30.8 % (25.8 - 36.4 95% CI)
Prevalence of severe underweight (<-3 z-score)	(120) 18.9 % (16.0 - 22.2 95% CI)	(62) 19.0 % (14.9 - 23.7 95% CI)	(58) 18.8 % (14.7 - 23.7 95% CI)

Table 12: Summary of Malnutrition Rates

	Mountainous		
	n	***%***	***95% CI***
Global Acute Malnutrition (WHZ<-2 or oedema)	68	10.8	8.5 – 13.5
Severe Acute Malnutrition (WHZ<-3 or oedema)	9	1.4	0.7 – 2.8
Oedema	0	0	-
Global Acute Malnutrition (WHM<80% or oedema)*	38	6.0	4.3 – 8.2
Severe Acute Malnutrition (WHM<70% or oedema)*	6	0.9	0.4 – 2.1
Stunting rate (HAZ<-2 z score)	439	71.4	67.6 – 74.9
Severe stunting rate (HAZ <3 z score)	254	41.3	37.4 – 45.3
Underweight Rates (WAZ<-2 z score)	320	50.4	46.4 – 54.3
Underweight rate (WAZ_-3 z score)	120	18.9	16.0 – 22.2

* NCHS reference is used.

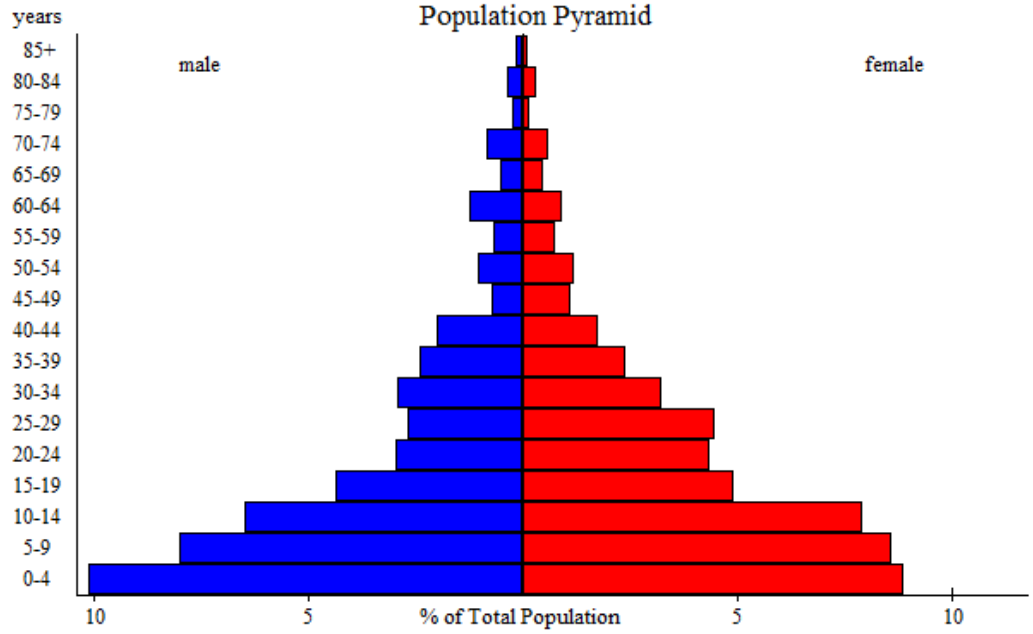
4.6: Mortality

The crude death rate is 0.13 per 10,000 per day. The rate is higher among males than females (0.16 and 0.09 respectively). The under-five death rate is 0.33 per 10,000 per day, respectively. These rates are low and within acceptable levels according to WHO categorisation, hence not raising concern. No death is caused by violence

Table 13: Mortality data		
	U5	*Total*
Total HHs surveyed	522	522
Total Population assessed in HHs	740	3895
Number who joined the HHs	27	178
Number who left the HHs	25	280
Number of births	29	29
Number of deaths	2	6
Mortality rate (per 10,000 per day)		
Under-five	**0.31**	
Crude	**0.17**	

4.6.1: Population Pyramid

Information about household members during the previous 90 days was collected. The resulting population pyramid for each zone is shown here.



5.0 DISCUSSION AND VARIABLE ASSOCIATION

Levels of malnutrition in Rayme are somehow different than those reported by SMART surveys in Taiz and Hajja. GAM rate was found close to that of Taiz Mountains and Hajja Mountains but lower than those of Taiz Lowland and Hajja Lowland. SAM also was found lower than those seen in Hajja Lowland, Taiz Lowland and all Hodeidah zones. However, it is paradoxical issue since proxy GAM and proxy SAM as found by using MUAC cutoff points of 125 mm and 115 mm were higher than GAM and SAM found by WHZ Scores. This is the first time to report such pattern in Yemen[8]. The reason behind finding this pattern is rates of underweight and stunting as mentioned below.

High levels of underweight and stunting found in Rayma. Unless it may be existed in another governorate, Rayma is unique in having level of stunting exceeded 70 per cent with long interval of about 20 per cent between stunting and underweight. Table 14 below shows the differences between Rayma, Hajja and Taiz in underweight and stunting.

Table 14: comparison the underweight and stunting of Rayma with those of Taiz and Hajja

Survey	Underweight%		Stunting%	
	WAZ < 2	WAZ < 3	HAZ < 2	HAZ < 3
Taiz Mountains - Feb 2012	35	9.1	51.5	17.1
Taiz Plain and Coastal - Feb 2012	44.3	13.4	49.1	19.1
Hajja Mountains - May 2012	45.5	13.7	61.3	29.8
Hajja Lowland - May 2012	47	15.9	48.8	17.7
Rayma - May 2012	***50.4***	***18.9***	***71.4***	***41.3***

There is no doubt that having MUAC below 125 mm or below 115 mm means depletion or extremely depletion of muscles. It was found that most of those are wasted by MUAC who are severely stunted but moderately underweight were found of normal WHZ Scores. This is the reason of having higher proxy GAM and proxy SAM using MUAC cutoffs than GAM and SAM using WHZ Scores.

Having this proxy GAM and proxy SAM in Rayma with high prevalence of chronic malnutrition and low mortality rates indicates a chronic suffering from acute malnutrition and the possible reason of this is not sudden deterioration in WASH situation or disease outbreak but chronic food insecurity. Rayma was in the top food insecure governorates in the WFP-CFSS 2009 with proportion of food insecured population of 52.8 per cent. This rate was not significantly changed in 2011 CFSS (50.6 per cent)

Levels of stunting and underweight found in this survey are above the WHO 'critical' levels thresholds of 40 per cent and 30 per cent respectively. Level of GAM is found above the WHO 'serious' threshold of 10 per cent. However for deciding the proper GAM severity categorization level, proxy GAM or proxy SAM should be used guided by the categorization of UNFAO/Food Security and Nutrition Analysis Unit (FSNAU) which describe proxy GAM between 10 per cent and 14.9 per cent or proxy SAM above 1 per cent as 'critical'. Stunting rate in Rayma is extremely high and needs integrated response that should start now to reduce the prevalence and the resultant longer-term

[8] Usually, it is known that prevalence of acute malnutrition reported by using MUAC cutoffs in Yemen is underestimated.

effect of stunting (children in Rayma will not reach their full potential in productivity and this is threatening the future of the development in this governorate). Findings of this surveys is are close to that found by the WFP-CFSS 2011 which are 8.9 per cent wasting, 45.2 per cent underweight and 68.4 per cent stunting.

As found by surveys done in other governorates no differences between girls and boys in the prevalence of underweight and stunting were found, however, unlike other surveys, there statistical difference in GAM was found between girls and boys in Rayma.

5.1: Child Feeding, Vitamin A Supplementation and Malnutrition Levels

Among children aged 6 to 24 months, there is statistically significant difference in stunting and underweight between those still breastfed and those have ceased breastfeeding. Absence of stunting was noted higher among those still breastfed (X^2: 4.1, P<0.05, df 1) while underweight was noted higher among those have ceased breastfeeding (X^2: 3.5, P<0.05, df 1). The number of feeds (other than breastfeeds) and milk feeds (other than breastmilk) show no effect on levels of stunting, underweight and wasting.

It is notable that the vitamin A coverage (supplementation 6 months prior to the survey) was lower than the recommended 95 per cent coverage (Sphere Standards, 2011). It was not found any positive effect of vitamin A supplementation on levels of either stunting, underweight or wasting.

5.2: Morbidity and Malnutrition Levels

The disease prevalence was recorded as being high in Rayma Governorate with levels of 48.1 per cent diarrhoea, 43.6 per cent ARI and 54.8 per cent fever. There is statistical significant effect was observed for diarrhoea two weeks prior to the survey on the prevalence of GAM (X^2: 6.1, P<0.01, df 1) and SAM (X^2: 6.2, P<0.05, df 1). There is effect was also seen for fever on SAM prevalence (X^2: 4.2, P<0.05, df 1). High morbidity levels among stunted and muscle depleted children is increasing the disease severity and will reduce the chance for these children to gain height and build muscles and put them at the edge of death risk.

5.3: Household Caretaker Education and Nutrition Situation

The association between mother education and child nutritional status is well reported. In this survey, levels of underweight were found inversely proportional with the education level of household caretaker (X2: 10.7, P<0.05, df 4). No association was reported between wasting or stunting and education level.

5.4: WASH and Nutrition Situation

GAM was found statistically higher among those with unclean storage containers of drinking water (X^2: 4.5, P<0.05, df 1). Latrine type was also seen to have some effect. Flush or pour flush latrines were found to have association with lower rates of stunting (X^2: 8.7, P<0.05, df 3).

The household caretaker hand washing with water and soap practice showed some correlation with malnutrition levels. Although those with underweight were equally distributed among those mentioned and not mentioned washing hand with soup after toilet, non-underweight level were seen higher among the group mentioned washing hand after toilet than those have not mentioned (X2: 3.5, P<0.05, df 1). However, hand washing with soup after toiled was noted with lower levels of severe underweight (X2: 12.3, P<0.001, df 1). Low proportion of GAM were noted among children in households where caretakers reported practicing hand-washing after using latrine (X2: 5.0, P<0.05, df 1). Practicing the hand washing before meal by household caretaker was found associated with lower levels of severe stunting (X2: 4.7, P<0.05, df 1), lower levels of underweight (X2: 7.6, P<0.01, df 1), severe underweight (X2: 16.5, P<0.0001, df 1), and lower levels of GAM (X2: 8.4, P<0.01, df 1). The caretaker hand washing after meal was also noted to have association with malnutrition levels. It was found associated with lower levels of severe stunting (X2: 3.6, P<0.05, df 1), lower levels of underweight (X2: 8.5, P<0.01, df 1), severe underweight (X2: 5.4, P<0.05, df 1), and lower levels of GAM (X2: 4.1, P<0.05, df 1). Household hand washing with before cooking was found associated with lower levels of underweight (X2: 13.1, P<0.001, df 1), lower levels of severe underweight (X2: 8.9, P<0.01, df 1), and lower levels of GAM (X2: 10.5, P<0.001, df 1). It seems that existence of appropriate community based WASH facilities and practices can help to reduce the high levels of chronic malnutrition in Rayma Governorate.

6.0 RECOMMENDATIONS

Although the prevalence of acute malnutrition looks better than that in many other areas in the coastal areas of Yemen, the proxy indicators of the acute malnutrition indicated serious problem in this governorate.

However with high rates of stunting and underweight, it is likely to have high incidence rates if the intervention approach focuses on acute malnutrition only. In such situation intervention package should focus underweight installing the growth monitoring and promotion approach and using the growth monitoring chart. Children with SAM should be treated first at the facility that provides the CMAM service. It is also important to note that there are pockets of vulnerability that can be compared to the level found in many lowland areas in Yemen.

The presence of multiple aggravating factors including poor feeding practices, diseases, insufficient coverage of essential services such as immunization and micronutrient supplementation, and low education for the majority of caretakers, indicate a need for delivery of a package of interventions that not only address the critical wasting but mainly to address underweight and chronic malnutrition. Delivery of intervention services catering for both mothers and children, especially during the window of opportunity (from conception till the child is 2 years and beyond). WASH interventions especially promoting of the handwashing is essential to essential to have sustained improvement in nutritional and health status.

Some of the immediate and medium-term interventions proposed include:

Immediate Interventions

- The priority is cleaning the pockets from acute malnourished by mobilizing outreach clinics and to refer the complicated cases to nearest TFCs. Outreach clinics should also provide treatment services for child illnesses especially diarrhoea and ARI.

Medium and Long Term Interventions

- Rayma is in need of a programme that deals with underweight and chronic malnutrition. This should include utilization the approach of Growth Monitoring and Promotion (GMP), maternal nutrition package, and promotion of hygienic. Pregnant women, lactating mothers, and underweight children should be supported by rations cereal: legume mix (locally known *Shabiza*) with sachets of micronutrients sprinkles in monthly basis.
- Food security enhancement projects are also required for Rayma, since this governorate is suffering from chronic food insecurity that can be seen from the high level of stunting, high levels of proxy GAM and from the high insecurity prevalence as mentioned earlier and average maternal MUAC as shown by the WFP – CFSS 2011. Rayma is the lowest governorate of average maternal MUAC with value of 24.2 cm.

Other Recommendations

- Rayma is the first governorate that was found to have higher proxy GAM and SAM by MUAC cutoffs than standard GAM and SAM by WH Z-scores. However, there could be

other governorates with the same pattern that are suffering from chronic food insecurity, higher rates of stunting and underweight. For such cases, the international expertise is needed to setup intervention packages that are definitely beyond the idea of just having CMAM services.

Annexes

Annex 1: Rayma Nutrition Survey Questionnaire

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

مسح الحالة التغذوية والوفيات في محافظة ريمة – مايو 2012

استبيان الأسرة (نموذج 1)

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

الموافقة	.1	نعم		
	.2	لا		انتقل إلى النهاية

تاريخ المقابلة	يوم		شهر		سنـــــة			
			5	Ø	2	1	Ø	2

المديرية	العزلة	القرية أو الحي
الاسم	الاسم	الاسم

اسم رب الأسرة:	

فريق المسح رقم		الاسم	التوقيع
	الاسرة والأنثروبومتري		
	الوفيات		
	رئيس الفريق		

بين فيما إذا كان هناك:		
.1	غياب الأسرة عند الزيارة الأولى ويتطلب الأمر زيارة ثانية	
.2	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)

غياب الأسرة حتى بعد الزيارة الثانية (1 نعم ، 2 لا)	
الموافقة (1 نعم ، 2 لا)	

رقم الفريق		

رقم استبيان الأسرة				

تاريخ المقابلة	ي	ي		ش	ش		س	س	س	س
				0	5		2	1	0	2

هل المنطقة حضرية (1) أم ريفية (2)	

رمز القرية أو الحي			رمز العزلة		
رمز المديرية			رمز المحافظة	1	3
رقم طبقة المسح			رقم العنقود		

العمل المكتبي

	الاسم	اليوم		الشهر		السنة				التوقيع
إدخال البيانات										
المراجعة										
ترميز أخرى										

الملاحظات

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استبيان رقم: .....

س 001: بيانات عن الأسرة (الأحياء فقط والذين يعيشون بشكل دائم معا)

H001a	عدد أفراد الأسرة (الأحياء فقط الذين يعيشون مع الأسرة تاريخ المسح)	**العدد**	
H001b	عدد الأطفال أقل من 5 سنوات (الأحياء فقط الذين يعيشون مع الأسرة تاريخ المسح)	**العدد**	
H001c	عدد الأطفال أقل من 6 أشهر (الأحياء فقط الذين يعيشون مع الأسرة تاريخ المسح)	**العدد**	

س 002 – س 003: بيانات رب الأسرة

H002	مانوع رب الأسرة		
	.1	ذكر	
	.2	أنثى	
H003	الحالة الاجتماعية لرب الأسرة		
	.1	متزوج ويعيش مع شريكه.	
	.2	متزوج لكنه لا يعيش مع الشريك منذ ستة أشهر أو أكثر.	
	.3	أرمل.	
	.4	مطلق.	
	.5	حانق	
	.6	عازب.	

س 004: بيانات راعي الأسرة

H004	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 005: مصدر دخل الأسرة

H005	ماهو مصدر الدخل **الرئيسي** للأسرة؟		
	.1	بيع منتجات زراعية غير القات.	
	.2	بيع حيوانات والمنتجات الحيوانية.	
	.3	بيع اسماك.	
	.4	التجارة.	
	.5	عمل مؤقت.	
	.6	وظيفة دائمة براتب شهري.	
	.7	حوالات (من المغتربين).	
	.8	أعمال حرفية.	
	.9	زراعة/ بيع/ نقل القات.	
	.10	هبات (من الأهل أو الأصدقاء).	
	.11	ضمان إجتماعي	
	.12	أخرى: تذكر	

س 006 – س 012: بيانات عن الماء والإصحاح البيئي والنظافة

H006	ماهو المصدر الرئيسي **لمياه الشرب** في منزلكم؟ (خيار واحد فقط)		
	.1	أنابيب مياه موصلة إلى البيت.	
	.2	أنابيب مياه موصلة إلى فناء البيت.	
	.3	بئر مفتوحة غير محمية.	
	.4	بئر مفتوحة محمية.	
	.5	خزان مغطى لحصاد مياه الأمطار.	
	.6	خزان مفتوح لحصاد مياه الأمطار.	
	.7	سيارة نقل المياه (وايت ماء)	
	.8	مياه صحية معبأة (حدة، شملان، كوثر الخ)	
	.9	مياه سطحية غير محمية (وادي، عين ماء جاري، الخ)	
	.10	عين ماء محمية	
	.11	أخرى: تذكر	

			إنتقل إلى
H007a	هل تقومون بمعالجة الماء قبل **الشرب**؟		
	.1	نعم	
	.2	لا	H008 ←
	.3	لا أعرف	H008 ←

H007b	ماهي طريقة المعالجة **الرئيسية** المستخدمة **لمياه الشرب** (خيار واحد فقط)			
	1.	غلي الماء قبل الشرب		
	2.	استخدام الكلور أو الكلوركس		
	3.	الترشيح عبر قماش نظيف		
	4.	استخدام مرشح سيراميك أو رمل أو ماشابه (فلتر أو قطارة)		
	5.	ترقيد الماء قبل الشرب		
	6.	استخدام الشب (شب الفؤاد)		
	7.	أخرى		
H008	**للملاحظة**: **تحقق** من توفر نقاط تخزين المياه **لغرض الشرب**: هل الوعاء الحاوي لمياه الشرب نظيف؟ (عدم وجود طحالب)			
	1.	نعم.		
	2.	لا.		
H009	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).		
	2.	مرحاض - حفرة دون غطاء.		
	3.	مرحاض - حفرة مغطاة بطريقة بسيطة (الجاف).		
	4.	قضاء الحاجة في العراء (في الحقول مثلا، الخ.)		
	5.	أخرى: تذكر		

H010	متى تقومين بغسل اليدين باستخدام الصابون أو الرماد أو التراب أو أوراق الشجر أو ي مادة اخرى؟ (ضع علامة أمام أكثر من فقرة إذا قام الشخص بذكرها. لا تعطي الشخص الخيارات قبل الإجابة				
	a. بعد قضاء الحاجة	1.	نعم		
		2.	لا		
	b. قبل الأكل	1.	نعم		
		2.	لا		
	c. بعد الأكل	1.	نعم		
		2.	لا		
	d. قبل الطبخ	1.	نعم		
		2.	لا		
	e. قبل إطعام الطفل	1.	نعم		
		2.	لا		
	f. بعد التخلص من براز الطفل	1.	نعم		
		2.	لا		
	g. بعد التنظيف لمكان المواشي والدواجن	1.	نعم		
		2.	لا		
	h. اية إجابات أخرى: تذكر:				

H011	**للملاحظة**: في نقطة غسل اليدين، تحقق من وجود التالي				
	a. الماء	1.	نعم		
		2.	لا		
	b. الصابون	1.	نعم		
		2.	لا		
	c. الرماد/ التراب/ القضاض/ أوراق الشجر.	1.	نعم		
		2.	لا		

H012a	أين تحصلون على الرعاية الصحية عندما يمرض أحد أفراد الأسرة؟		**إنتقل إلى**
	1.	لا أطلب مساعدة طبية	
	2.	أدوية شخصية	
	3.	معالج تقليدي	
	4.	شيخ	
	5.	صيدلية	
	6.	عيادة خاصة	C013 ←
	7.	مرفق صحي عام	C013 ←

H012b	لماذا لاتسعون للحصول على الخدمة الصحية في مرفق صحي أو عيادة عند المرض؟		
	.1	الكلفة عالية	
	.2	المرفق بعيد ولا تتوفر مواصلات	
	.3	لايوجد وقت كافي	
	.4	لا نثق في خدمات المرافق القريبة	
	.5	أخرى: تذكر	

س 013 – س 019: حالة الإطعام والتحصين للأطفال في سن 6-59 شهراً في الأسرة

رقم الطفل	الاسم الأول للطفل	C013 نوع الطفل 1= ذكر 2 = أنثى	C014a تاريخ الميلاد (إذا دونت تاريخ الميلاد فعليك تجاوز السؤال C014b)	C014b عمر الطفل (بالأشهر) (إذا كان الطفل أكبر من 24 شهر انتقل إلى السؤال C017)	C015 للطفل الذي عمره 24 شهر أو أقل. هل مازال الطفل يرضع (رضع خلال الـ 12 ساعة الماضية)؟ 1= نعم 2 = لا	C016a للطفل الذي عمره 24 شهر أو أقل. كم مرة قمتي بإطعام الطفل خلال 24 ساعة الماضية؟ (يرجى عدم حساب مرات الرضاعة الطبيعية)
.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			

			C016b		C017	C018	C019
رقم الطفل (كما سبق أعلاه)	نوع الطفل 1= ذكر 2 = أنثى	عمر الطفل (بالأشهر)	للطفل الذي عمره 24 شهر أو أقل. كم مرة قمتي بإعطاء الطفل حليب خلال 24 ساعة الماضية؟ (يرجى عدم حساب مرات الرضاعة الطبيعية)		هل تم إعطاء الطفل فيتامين أ خلال الستة أشهر الماضية؟ (إظهار عينة) 1 = نعم 2 = لا 3= لا أعرف	هل أخذ الطفل جرعة لقاح الخماسي3/ الشلل3؟ 1 = نعم 2 = لا	للأطفال بعمر تسعة أشهر فأكبر. هل تم تطعيم الطفل ضد الحصبة. (حقنة في اليد اليسرى)؟ 1 = نعم من البطاقة. 2 = نعم بالتذكر. 3 = لا أعرف 4 = لم يطعم
.1							
.2							
.3							
.4							
.5							
.6							
.7							

س 020 – س 029: القياسات الجسمانية ومراضة الأطفال بين سن 6-59 شهر في الأسرة

			C020	C021	C022	C023
رقم الطفل (كما سبق أعلاه)	نوع الطفل 1= ذكر 2 = أنثى	عمر الطفل (بالأشهر)	الوزن (كيلو جرام) 88.8 = رافض 99.9 = غائب	الطول (سم) 888.8 = رافض 999.9 = غائب	التوذم (أوديما) في كلا القدمين. 1 = نعم 2 = لا 8 = رافض 9 = غائب	قياس محيط الذراع (سم) (الميواك) 88.8 = رافض 99.9 = غائب
.1			___.___	___.___		___.___
.2			___.___	___.___		___.___
.3			___.___	___.___		___.___
.4			___.___	___.___		___.___
.5			___.___	___.___		___.___
.6			___.___	___.___		___.___
.7			___.___	___.___		___.___

			C024	C025	C026	C027	C028	C029
رقم الطفل (كما سبق أعلاه)	نوع الطفل 1= ذكر 2 = أنثى	عمر الطفل (بالأشهر)	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	الاشتباه بالحصبة خلال الشهر الماضي (طفح جلدي + حمى + (سعال أو إلتهاب حلق أو إلتهاب الملتحمة) 1 = نعم 2 = لا	هل نام الطفل تحت شبك الناموس الليلة الماضية؟ 1 = نعم 2 = لا	هل الطفل مسجل حالياً في أي مركز تغذية SFP =1 TFC/SC =2 OTP =3 4= أخرى 5 = غير مسجل
.1								
.2								
.3								
.4								
.5								
.6								
.7								

Questionnaire Number: .....

Republic of Yemen
Ministry of Public Health and Population
Office of Public Health and Population, Rayma Governorate

Nutritional Status and Mortality Survey – Rayma Governorate – May 2012

Household Questionnaire (Form 1)

First: Explain to the residents of the household (adults) about the survey and inform them of the agency conducting the survey and survey staff (team members). Then request their verbal agreement to participate in the survey.

Consent	1.	Yes.		
	2.	No.		Go to the end.

Date of interview	Day		month		year				
			Ø	5	2	Ø	1	2	

District	Ozla (Sub-district)	Village or neighborhood
name	Name	name

Name of head of household	

Survey team number		Name	Signature
	Household and anthropometric data		
	Mortality data		
	Team leader		

Indicate which situation applies:		
1.	Absence of household upon first visit which necessitated a second visit	
2.	Absence of child upon first visit which necessitated a second visit *	

* If the child is not present, all data should be filled in except anthropometric measurements and edema which should be completed only if the child is present.

Note: The data inside the cover is for field and administrative use by the team members.

Questionnaire Number: .....

To be filled by the Team Leader (for data input purposes)

Repeated absence of the household even after the second visit (1=yes, 2=no)	
Consent (1=yes, 2=no)	

Team Number		

Household Questionnaire Number				

Date of Interview	day		Month			year			
			Ø	2		2	Ø	1	2

Is the region urban (1) or rural (2)?	

Village or neighborhood code number			Sub-district code number		
District code			Governorate code number	3	1
Survey zone (stratum) number			Cluster number		

.....

Desk work

	Name	day		month		Year				Signature
Data entry										
Review										
Other encoding										

Remarks:

.....

.....

.....

.....

.....

.....

Questionnaire Number: .....

Q001: Household data (only those who are alive and living together continuously)

H001a	Number of household members (only those who are alive and living with the household on the date of the survey)	Quantity	

H001b	Number of children under five (only those who are alive and living with the household on the date of the survey)	Quantity	

H001c	Number of children under six months (only those who are alive and living with the household on the date of the survey)	Quantity	

Q002 – Q003: Head of household data

H002	Gender of the head of household			
	1.	Male		
	2.	Female		

H003	Social status of the head of household			
	1.	Married and living with partner		
	2.	Married and not living with partner for at least six months or more.		
	3.	Widow/widower		
	4.	Divorced		
	5.	Angered and separated		
	6.	Single		

Q004: Household caretaker data

H004	Education level of household caretaker			
	1.	Illiterate.		
	2.	Can read and write (literate).		
	3.	Basic education.		
	4.	Secondary education.		
	5.	Tertiary education (university, college, or institute).		

Questionnaire Number: .....

Q005: Household income source

H005	What is the **primary** source of income for the household?		
	1.	Sale of non-qat agricultural products	
	2.	Sale of livestock and livestock products	
	3.	Sale of seafood	
	4.	Trading	
	5.	Temporary work (Causal work)	
	6.	Job with fixed monthly salary	
	7.	Remittance (from emigrants)	
	8.	Craftsmanship	
	9.	Farming/sale/transport of qat	
	1Ø.	Donation (from friends and relatives)	
	11.	Social insurance	
	12.	Other: specify -	

Q006 – Q012: Water, environmental sanitation, and hygiene data

H006	What is the main source of **drinking water** in your home? (choose one only)		
	1.	Piped water connected to home.	
	2.	Piped water connected to yard.	
	3.	Open, unprotected well.	
	4.	Open, protected well.	
	5.	Covered rainwater collection tank.	
	6.	Open rainwater collection tank.	
	7.	Water delivery truck. (water tanker)	
	8.	Bottled water (Hadda, Shamlan, Kawthar, etc.)	
	9.	Unprotected surface water (valley, running spring, etc.)	
	1Ø.	Protected spring water.	
	11.	Other: specify -	

H007a	Do you treat the water before drinking?			Go to
	1.	Yes		
	2.	No		→ H008
	3.	Don't know.		→ H008

Questionnaire Number: .....

H007b	What is the **main** method used to treat **drinking water**? Choose only one.			
	1.	Boil water before drinking.		
	2.	Use chlorine or Clorox.		
	3.	Filter through clean cloth.		
	4.	Use ceramic or sand filter or similar filter method.		
	5.	Let water settle before drinking.		
	6.	Use of alum crystal to disinfect.		
	7.	Other.		

H008	**Note**: **Investigate** availability of storage for **drinking water**. Is the water container clean (no algae seen)?			
	1.	Yes.		
	2.	No.		

H009	What is used for defecation? Choose one of the following. **Verify** existence of facilities and practices.			
	1.	Toilet – equipped with flush mechanism to wash water down.		
	2.	Toilet – uncovered pit.		
	3.	Toilet – simple dry covered pit.		
	4.	Outdoors in the open air (in fields, for example).		
	5.	Other: specify -		

Questionnaire Number: .....

H010	When do you clean your hands with soap, ashes, dust, tree leaves, or any other material? Place a check mark in more than one answer if the respondent mentions them. Do not give the person any choices before the answer.					
	a.	After using the toilet.	1.	Yes		
			2.	No		
	b.	Before eating.	1.	Yes		
			2.	No		
	c.	After eating.	1.	Yes		
			2.	No		
	d.	Before cooking.	1.	Yes		
			2.	No		
	e.	Before feeding the child.	1.	Yes		
			2.	No		
	f.	After disposing of child's waste.	1.	Yes		
			2.	No		
	g.	After cleaning the livestock or poultry areas.	1.	Yes		
			2.	No		
	h.	Any other answers: Specify -				

H011	Note: With regard to hand-washing, confirm the use of the following:				
	a.	Water.	1.	Yes	
			2.	No	
	b.	Soap.	1.	Yes	
			2.	No	
	c.	Ashes, dust, limestone powder, tree leaves.	1.	Yes	
			2.	No	

H012a	Where do you obtain health care if someone in the household gets sick?			Go to
	1.	No medical help is sought.		
	2.	Personal medicines.		
	3.	Traditional healer.		
	4.	Shaykh.		
	5.	Pharmacy.		
	6.	Private clinic.		→ C013
	7.	Public health facility.		→ C013

Questionnaire Number: .....

H012b	Why don't you seek health services at a health facility or clinic when someone gets sick?			
	1.	High cost.		
	2.	Facility is distant and transportation is not available.		
	3.	Not enough time.		
	4.	We do not have confidence in the nearby services.		
	5.	Other: specify -		

Questionnaire Number: .....

Q013 – Q019: Nutritional and Immunization Status of Children ages 6-59 months within the household

		C013	C014a	C014b	C015	C016a
Child no.	Child's first name	Child's gender 1 = male 2 = female	Date of birth. If the date is recorded, skip C014b)	Age of child in months. If the child is older than 24 months, go to question C017.	For children 24 months or less. Is the child still breastfeeding? 1 = yes 2 = no	For children 24 months or less. How many times have you fed the child in the past 24 hours? Do not include number of times breastfed.
1.			day mo. Year			
2.			day mo. Year			
3.			day mo. Year			
4.			day mo. Year			
5.			day mo. year			
6.			day mo. year			
7.			day mo. year			

Questionnaire Number: .....

			C016b	C017	C018	C019
Child no. (as above)	Child's gender 1 = male 2 = female	Child's age (in months)	For children 24 months or less. How many times have you fed the child milk in the last 24 hours? Do not include number of times breastfed.	Has the child been given Vitamin A in the past six months? (Show sample.) 1 = yes 2 = no 3 = don't know	Has the child been given vaccinations for Pentavalent 3 and Polio 3? 1 = yes 2 = no	For children nine months and older. Has the child been immunized against measles (shot in left arm)? 1 = yes, shown on card 2 = yes, from memory 3 = don't know 4 = has not been immunized
1.						
2.						
3.						
4.						
5.						
6.						
7.						

Questionnaire Number: .....

Q020 – Q029: Anthropometric measurements and childhood diseases of children aged 6 – 59 years in the household

			C020	C021	C022	C023
Child no. (as above)	Child's gender 1 = male 2 = female	Child's age (in months)	Weight (kg) 88.8 = refused 99.9 = not present	Height (cm) 888.8 = refused 999.9 = not present	Bilateral edema (in both legs). 1 = yes 2 = no 8 = refused 9 = not present	Middle upper arm circumference (cm) 88.8 = refused 99.9 = not present
1.						
2.						
3.						
4.						
5.						
6.						
7.						

Questionnaire Number: .....

			C024	C025	C026	C027	C028	C029
Child no. (as above)	Child's gender 1 = male 2 = female	Child's age (in months)	Diarrhea within the past two weeks 1 = yes 2 = no	Cough or difficulty breathing in the past two weeks 1 = yes 2 = no	Fever in the past two weeks 1 = yes 2 = no	Symptoms similar to measles in past month (skin rash + fever + cough or throat infection or conjunctivitis) 1 = yes 2 = no	Did the child sleep under mosquito net last night? 1 = yes 2 = no	Is the child currently registered at a nutrition center? 1 = SFP 2 = TFC/SC 3 = OTP 4 = other 5 = not registered
1.								
2.								
3.								
4.								
5.								
6.								
7.								

Annex 2: Rayma Mortality Survey Questionnaire

رقم إستبيان الأسرة: .....

مسح الحالة التغذوية والوفيات في محافظة ريمة – مايو 2012

استمارة رصد أفراد الأسرة خلال فترة 90 يوم من تاريخ المسح (نموذج 2)

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

رقم الفريق: _____ رقم إستبيان الأسرة: _____ طبقة المسح: _____

م	الاسم (اختياري)	الجنس (ذكر أو أنثى)	العمر بالسنوات	التحق أثناء فترة 90 يوم	غادر أثناء فترة 90 يوم	ولد أثناء فترة 90 يوم	توفي أثناء فترة 90 يوم	سبب الوفاة	موقع الوفاة
1									
2									
3									
4									
5									
6									
7									
8									
9									
10									
11									
12									
13									
14									
15									
16									
17									
18									
19									
20									

هام: يتم تسجيل كل الأفراد الموجودين حاليا و كل من التحق بالأسرة أو غادرها أو توفى أو ولد خلال 90 يوم من تاريخ المسح

رموز أسباب الوفاة	
1 = الاسهال	5 = سوء التغذية
2 = الحمى	6= العنف / بسبب الصراعات
3= الحصبة	7= أخرى (حدد)
4 = مشاكل في التنفس	
رموز مواقع الوفاة	
1 = في الموقع الحال	
2= أثناء الهجرة	
3= في آخر مكان سكن فيه	
4 = أخرى (حدد)	

Family Reference Number: .....

Nutritional Status and Mortality – Rayma Governorate, May 2012

Individual household members monitoring form for the 90 days following survey commencement date (Form 2)

District surveyed: _____ Village/neighborhood: _____ Date: _____ Cluster number: _____

Team number: _____ Household questionnaire number: _____ Survey zone (stratum): _____

No.	Name (optional)	Sex (M, F)	Age in years or date of birth	Joined within the 90 day period	Left within the 90 day period	Born within the 90 day period	Died within the 90 day period	Cause of death	Place of death
1									
2									
3									
4									
5									
6									
7									
8									
9									
10									
11									
12									
13									
14									
15									
16									
17									
18									
19									
20									

Important: All individuals present in the household should be recorded, whether joining or leaving the household, and whether born or died within the 90 day period from commencement of the survey.

Symbols for causes of death	
1 = diarrheal disease	5 = malnutrition
2 = fever	6 = violence / impacts of conflicts
3 = measles	7 = other (specify)
4 = respiration disorders	

Symbols for places of death
1 = at the current location
2 = during emigration
3 = at a different residence
4 = other (specify)

Annex 3: Rayma Nutrition Survey Team, 26 – 31 May 2012

Team No	Survey Team	Duty Station
1	Mansour Yousef Shamsan **(Team Leader)**	Rayma
	Entidhar Abdo Mohammed Farhan	Taiz
	Zaina Salem Salman Rahban	Hodeidah
	Hamama Ali Hasan	Rayma
2	Abdulaziz Mahmood Ghalen **(Team Leader)**	Rayma
	Kafa Saeed Qahtan Mohammed	Taiz
	Amina Hasan Ahmed Saleh	Hodeidah
	Hind Mohammed Qasem	Rayma
3	Mahdi Abdullah Ali Al-Showaie **(Team Leader)**	Rayma
	Tahani Mohammed Abdulwahab Naji	Taiz
	Ne`ma Ahmed Ahmed Mahdi	Hodeidah
	Hanan Ali Awadh Al-Zabidi	Rayma
4	Ali Ali Ahmed Al-Maswari **(Team Leader)**	Rayma
	Zohoor Mohmmed Naji Khalid	Taiz
	Itimad Abdo Salem Al-Omairi	Hodeidah
	Fatima Mojahid Ali Al-Bateena	Rayma
5	Mohammed Hussain Ali Mohammed **(Team Leader)**	Rayma
	Asmhan saeed Mohammed Qaied	Taiz
	Amina Ali Hasan Ahmed	Hodeidah
	Faiza Mohammed Ahmed Al-Montaser	Rayma
6	Mohammed Mohammed Mohammed Ali **(Team Leader)**	Rayma
	Aswan Hasan Ahmed Al-Humaiqani	Taiz
	Nabeela Mohammed Ali Mohammed	Hodeidah
	Samah Ahmed Mohammed Yehia	Rayma
	Data Entry team	
	Hadhrami Hadi Al-Hadhrami	GHO - Hajja
	Sadeq Al-Ashwal	MoPHP – Sana'a
	Logistics	
	Mansour Abdo Abdullah	Hajja City
	Survey Technical Supervisors	
	Faisal Ali Qamhan	MoPHP – Sana'a
	Waleed Abdulmalek Al-Madhaji	MoPHP – Sana'a
	Nassar Hamood Al-Ashwal	MoPHP – Sana'a
	Abdullah Khadem Al-Aqzal	GHO - Hodeidah
	Survey Manager	

	Dr. Abdulbaset Mahyoub Al-Dobaee`	GHO - Taiz
	Data Analysis and Report Writing	
	Nagib Abdulbaqi Ali	UNICEF – Sana'a

Annex 4: Rayma Nutrition Survey Standardization Test Report for Evaluation of Enumerators

Weight:

	Precision: Sum of Square [W2-W1]	Accuracy: Sum of Square [Superv.(W1+W2)-Enum.(W1+W2]	No. +/- Precision	No. +/- Accuracy
Supervisor	0.03		1/2	
Enumerator 1	0.02 OK	0.13 POOR	2/0	0/7
Enumerator 2[9]	97.92 POOR	97.77 POOR	3/3	1/5
Enumerator 3[10]	8.83 POOR	9.66 POOR	3/2	1/4
Enumerator 4	0.15 POOR	0.12 POOR	4/5	2/4
Enumerator 5	0.17 POOR	0.10 POOR	6/3	2/5
Enumerator 6	0.40 POOR	0.65 POOR	6/1	5/3

Height:

	Precision: Sum of Square [H2-H1]	Accuracy: Sum of Square [Superv.(H1+H2)-Enum.(H1+H2]	No. +/- Precision	No. +/- Accuracy
Supervisor	0.45		3/6	
Enumerator 1	0.96 POOR	0.71 OK	0/6	3/6
Enumerator 2	3.10 POOR	2.87 POOR	1/7	5/5
Enumerator 3	3.25 POOR	4.20 POOR	8/1	6/3
Enumerator 4[11]	20.59 POOR	24.02 POOR	6/2	9/0
Enumerator 5	2.90 POOR	4.57 POOR	5/4	1/9
Enumerator 6	4.80 POOR	2.93 POOR	5/4	4/6

MUAC:

	Precision: Sum of Square [MUAC2-MUAC1]	Accuracy: Sum of Square [Superv.(MUAC1+MUAC2)-Enum.(MUAC1+MUAC2]	No. +/- Precision	No. +/- Accuracy
Supervisor	9.00		3/3	
Enumerator 1	270.00 POOR	427.00 POOR	4/0	5/5
Enumerator 2[12]	Error	Error	6/2	2/8
Enumerator 3	156.00 POOR	259.00 POOR	3/7	6/4

[9] Mistakes in reading/writing weights of three children.
[10] Mistakes in writing weight readings of two children.'9' waswritten as '4', and '5' was written as '2'
[11] One child was measured as 104 cm in the first height reading and 99.4 cm in the second reading.
[12] MUAC of one child was written 14.3 cm in the first reading and 70.8 cm in the second reading

Enumerator 4	138.00 POOR	337.00 POOR	3/4	0/10
Enumerator 5	46.00 POOR	123.00 POOR	6/3	5/3
Enumerator 6	124.00 POOR	167.00 POOR	6/2	5/3

For evaluating the enumerators the precision and the accuracy of their measurements is calculated.
For precision the sum of the square of the differences for the double measurements is calculated. This value should be less than two times the precision value of the supervisor.
For the accuracy the sum of the square of the differences between the enumerator values (weight1+weight2) and the supervisor values (weight1+weight2) is calculated. This value should be less than three times the precision value of the supervisor.
To check for systematic errors of the enumerators the number of positive and negative deviations can be used.
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Annex 5: Reference Table for Age Estimation

Nutrition Survey - Rayma Governoarte May 2012

الطريقة التقريبية لحساب العمر بالاشهر مبني على اليوم الأول من المسح

يجب حساب يوم إضافية عن كل يوم من المسح بدء من اليوم الثاني

مواليد العام 2007

العمر بالاشهر	حتى تاريخ			من تاريخ		
	سنة	شهر	يوم	سنة	شهر	يوم
59	2007	6	4	2007	5	5
58	2007	7	4	2007	6	5
57	2007	8	4	2007	7	5
56	2007	9	4	2007	8	5
55	2007	10	4	2007	9	5
54	2007	11	4	2007	10	5
53	2007	12	4	2007	11	5
52	2008	1	4	2007	12	5

مواليد العام 2008

العمر بالاشهر	حتى تاريخ			من تاريخ		
	سنة	شهر	يوم	سنة	شهر	يوم
51	2008	2	4	2008	1	5
50	2008	3	4	2008	2	5
49	2008	4	4	2008	3	5
48	2008	5	4	2008	4	5
47	2008	6	4	2008	5	5
46	2008	7	4	2008	6	5
45	2008	8	4	2008	7	5
44	2008	9	4	2008	8	5
43	2008	10	4	2008	9	5
42	2008	11	4	2008	10	5
41	2008	12	4	2008	11	5

مواليد العام 2009

العمر بالاشهر	حتى تاريخ			من تاريخ		
	سنة	شهر	يوم	سنة	شهر	يوم
40	2009	1	4	2008	12	5
39	2009	2	4	2009	1	5
38	2009	3	4	2009	2	5
37	2009	4	4	2009	3	5
36	2009	5	4	2009	4	5
35	2009	6	4	2009	5	5
34	2009	7	4	2009	6	5
33	2009	8	4	2009	7	5
32	2009	9	4	2009	8	5
31	2009	10	4	2009	9	5
30	2009	11	4	2009	10	5
29	2009	12	4	2009	11	5
28	2010	1	4	2009	12	5

مواليد العام 2010

العمر بالاشهر	حتى تاريخ			من تاريخ		
	سنة	شهر	يوم	سنة	شهر	يوم
27	2010	2	4	2010	1	5
26	2010	3	4	2010	2	5
25	2010	4	4	2010	3	5
24	2010	5	4	2010	4	5
23	2010	6	4	2010	5	5
22	2010	7	4	2010	6	5
21	2010	8	4	2010	7	5
20	2010	9	4	2010	8	5
19	2010	10	4	2010	9	5
18	2010	11	4	2010	10	5
17	2010	12	4	2010	11	5
16	2011	1	4	2010	12	5

مواليد العام 2011

العمر بالاشهر	حتى تاريخ			من تاريخ		
	سنة	شهر	يوم	سنة	شهر	يوم
15	2011	2	4	2011	1	5
14	2011	3	4	2011	2	5
13	2011	4	4	2011	3	5
12	2011	5	4	2011	4	5
11	2011	6	4	2011	5	5
10	2011	7	4	2011	6	5
9	2011	8	4	2011	7	5
8	2011	9	4	2011	8	5
7	2011	10	4	2011	9	5
6	2011	11	4	2011	10	5
5	2011	12	4	2011	11	5

مواليد العام 2012

العمر بالاشهر	حتى تاريخ			من تاريخ		
	سنة	شهر	يوم	سنة	شهر	يوم
4	2012	1	4	2011	12	5
3	2012	2	4	2012	1	5
2	2012	3	4	2012	2	5
1	2012	4	4	2012	3	5
اقل من شهر	2012	5	4	2012	4	5

Annex 6: Calendar of Events for Rayma for Reference in Age Estimation

تواريخ المناسبات والأحداث

المناسبة	تاريخ المناسبة
ثورة فبراير	11 فبراير 2011
إنتخاب عبدربه منصور	21 فيراير 2012
ذكرى الوحدة	22 مايو من كل عام
ذكرى الثورة ضد الإمامة	26 سبتمبر من كل عام
ذكرى الثورة ضد الاستعمار البريطاني	14 أكتوبر من كل عام
ذكرى جلاء المستعمر البريطاني	30 نوفمبر من كل عام
رأس السنة الهجرية	1 محرم
عاشوراء	9 و 10 محرم
مولد النبي (ص)	12 ربيع أول
الإسراء والمعراج	27 رجب
شهر الصوم	شهر رمضان
عيد الفطر المبارك	1 شوال
العشر	العشر الأوائل من ذي الحجة
وقفة عرفة	9 ذي الحجة
عيد الأضحى المبارك	10 ذي الحجة

ملاحظة: في حالة التواريخ الهجرية يرجى العودة إلى جدويل التحويل إلى الميلادي

Dates of events

Event	Event date
February revoluation	11 Feb 2011
Election of Abdurabbo Mansour	21 Feb 2012
Unity anniversary	22 May every year
Anniversary of revolution against Imam	26 Sep every year
Anniversary of revolution against British colonialism	14 Oct every year
Anniversary of independence	30 Nov every year
Beginning of Hijrij Year	1 Muharram
A'ashora	9 and 19 Muharram
Anniversary of the birth of the Prophet (PUH)	12 Rabie Awal
Anniversary of Isra and Me'raj	27 Rajab
Fasting month	Ramadan
Eid Al-Fitr	1 Shawal
Al-Ashr (The ten days)	The first 10 days of Dhul-Hijjah
Day of Arafat	9 Dhul-Hijjah
Eid Al-Adha	10 Dhul-Hijjah

Note: in case of Hijri dates, please refer to the forms given to you to convert to gregorian

Annex 7: Cluster Sampling for Rayma Governorate

City/ Village	Ozla	District	Cluster No
AlDemnah	AlQablia	AlJabeen	1
AlAkama - AlHansa	Bani AlDhubaibi	AlJabeen	2
Anfa	Bani AlDhubaibi	AlJabeen	3
Wadi Sair	Bani AlDhubaibi	AlJabeen	4
AlOnaiqeb	Hawra	AlJabeen	5
Hazza	Shaboon	AlJabeen	6
AlBelad	AlYamania	AlJafaria	7
Awali Samed	AlYamania	AlJafaria	8
Omq	Bani Ahmed	AlJafaria	9
Qariat Bani AlGhazi	Bani AlGhazi	AlJafaria	10
Madhnai AlSareer	Bani Saeed	AlJafaria	11
Mashrafa	Bani Waqed	AlJafaria	12
Ja'r	AlJubahi	AlSalafia	13
Eyal AlAsad	AlNawba	AlSalafia	14
Wadi AlRadhah	Bani AlA'bdi	AlSalafia	15
AlAqeen	Bani AlWahdi Sa'di	AlSalafia	16
AlMusool	Bani Nafee'	AlSalafia	17
Adhamoon	Kahla	AlSalafia	18
AlHesn	Bani Khawli	Belad lTa'am	19
Gadboon	AlJaboob	Kusma	20
Bani Masrooq	AlDhabara	Kusma	21
Bani AlAmri - Mala AlSufla	AlMagharem	Kusma	22
Dhi Saeed	Bani Abdulaziz	Kusma	23
Sha'f	Sha'f	Kusma	24
AlEr	AlReem	Mazhar	25
AlMeqdam	AlMekhlaf	Mazhar	26
AlQusaie	Bakal	Mazhar	27
Maheedh	Bakal	Mazhar	28
Nasad	Bani Ya'for	Mazhar	29
Haqeeba	Maswar	Mazhar	30
AlGabeen (AlZaila)	AlGabeen	AlJabeen	RC
AlMutaradh	AlA'r	Belad lTa'am	RC
AlMurool	Dharhan	Belad lTa'am	RC
Hajroon	Yamen	Kusma	RC

Annex 8: Sampling Frame of Rayma Governorate

Geographical unit	Population size	Geographical unit	Population size	Geographical unit	Population size
الذياب	457	فحوه	333	المدوره	124
الرماد	1192	مود	650	المراغه	316
العارض	1029	القود	336	المصبحي	2601
الميسر	1298	الكدحه	434	المصرع	1050
الاحقل	508	المرحله	339	المغربه	450
(الزيلة)الجبين	2081	بني حدود	111	المقصاب	469
الجدهنه	136	ذو الرجم	238	المهامل	1064
الجورة	340	الجورة	113	الميسره	384
الجيبل	272	الدمنه	152	النفور	140
الحصن	283	الاقرعة	337	الوجرات	210
الحقل	229	الاكمه - الجبجبة	258	انفه	686
الحيت	119	الاكمه - الحرازية	116	بني الحتيتي	547
الرباط	445	الاكمه - الاجناد	189	بني الحداد	582
السلوم	146	الاكمه - المحجر	73	بني رضوان	1223
الغربي	170	الاكمه - المشر	50	بني عبدالواسع	1402
اللكمه	80	الاكمه - المرجة	112	بني عليان	780
بيت الجعماني	455	الاكمه - الطلحة	219	بني هتار	579
بيت الشاوش	42	الاكمه - الجعير	241	تنمل	365
دنمه	147	الاكمه - الصلواح	387	جده	250
رحب	390	الاكمه - الملعاب	294	جنان	358
عسوب	368	الاكمه - المشقبة	165	دنوه	597
ارته	572	الاكمه - القرضة	103	رحبون	123
الافقول	466	الاكمه - الكدحة	122	رهن	620
الجبل	210	الاكمه - المنقل	167	صرو	206
حضور	391	الاكمه - بيت بكير	199	عجين	91
محفرة	511	الاكمه - الحنسة	116	عصليه	85
الحدق	1171	الاكمه - العرصة	260	عوله	1838
السفلى	1052	الاكمه - تلمدر	52	قاع الكبار	111
الكبه	1604	الاكمه - رحبان	164	قيطح	1475
الوطن	1039	الاكمه - العدن	49	محلاه	595
ذا محقد	545	الاكمه - الركته	94	مقابل	133
قحزمه	588	الاكمه - النقيل	85	ملل	77
السلم	364	الاكمه - القرانع	117	مهد	1287
الكريف	331	الاكمه - التراحة	36	وادي حلمه	392
الوادي	278	الاكمه - الجرفي	16	وادي سير	1213
جوارث	368	الاكمه - النمس	90	الاركه	519
نبع	33	الاكمه - معنيه العليا	19	الشعف	668
الجرنه	447	الاكمه - الحسن	9	العوارض	589
الجننه	416	البقعه	377	الموسطه	751
الدمنه	350	البيضاء	216	ريم	951
المطلس	574	الجحار	252	صياح	472
عضل	270	الجحره	86	الجبل	399
كحله	502	الجله	468	الحجر	534
مكحل	524	الحريوه	108	المحجر	164
البرح	259	الحيدم	295	المخراطه	510
البرحه	583	الرباط السافل	176	سوق الرباط	1651
السرقه	433	الرباط العالى	103	الحرث	286
الشرف	343	الزمح	385	ذرون	89
القضية	488	التيز	139	عثمه	885
القطن	290	الصعفان	209	الجنن	169
المصلى	451	الصوبه	495	الجوره	206
المعلم	306	الضبه	137	الرحامي السافل	329
جحب	161	الطحاطح	218	الرحامي العالى	233
ذو عياله	341	الظهره	1506	العدنه	106
سنيه	488	القحنب	411	المدينه	140
ال العرب	394	القشبة	228	الهولب العالي	142
العبره	177	اللوج	53	صله	191
العره	1404	المحالا	152	ضهيا	327
المشارقه	330	المحداد	241	عبو	262
اورمه	513	المدقه	126	غرافه السفلى	129

Geographical unit	Population size	Geographical unit	Population size	Geographical unit	Population size
مدر	219	زهير	163	العنم	477
الحجر	945	الظهره	281	المحله	760
الجدفة	329	المكدى	133	المربض	331
الجمعة	488	دبيان	206	المشباب	498
الشرقي السافل	239	صنيف المهدي	475	المصبحي العالي	573
الضبابة	492	محوى السيف	698	عقب عالي	377
العذر	620	البرحه	380	عقب سافل	675
العنيقب	344	البلاد	2343	التلل	287
المنهز	702	الجند	2048	الجبه	246
ذي الحمر	269	الحقيب	718	الصبه	137
سعد	594	السلفه	353	المرخام	395
طرورة	618	القبله	932	المضناي	498
طنب	593	القرض	488	ذي حق	382
متور	278	المصبحي المختاري	195	قرية بني الغزي	377
مسلم	1724	برحة العوبلي	1964	البقعه	821
نمول	479	بني العامري	1913	سرول	493
المصبحي	516	ذي حضير	928	شاكمه	510
المغربه	627	شخظه	343	الجبل السافل	622
البرعي	542	عمرانه	453	الجميمه	1001
الجلمي	419	عوالي بن وليد	540	المجبان	395
السلف	1122	عوالي سامد	2288	سفاكه	444
الموظمه	1507	مصبحي بني وليد	789	السلم	375
جبل شجاع	207	مضربه	1004	الحقيب	715
حمره	585	مغربة بني مختار	559	البرحة	290
خضم	339	العوارض	397	التبباليه	330
دياح	553	الصافيه	288	الصرد	350
شزهب	400	الصحف	667	المدافن	423
وادي الرباط	1115	سنفه العاليه	197	المشارق	211
الجديه	477	سنيامه	224	ذي عمران	807
السهلة	327	البرح	808	سطيح	298
المشاخض	475	الشرف	739	مشرعه	230
حزه	225	طنب	428	السهول	576
حير	342	حمره	300	الشرفه	1847
شهات	260	الصافيه	722	اللمهيل	1106
الامحال	373	الجدر	657	جبل اسود	346
طبع	121	العوش	143	عبثاء	803
عدن (المغربه	1042	العوش العالي	699	علوجه	645
الجبل	837	الغبير	851	كمز	703
الذارعي	1004	المساب	460	مضناى السرير	773
المشرافه	650	المضناى	515	مضناي الحيم	1632
المعصره	337	جبل ريم	1185	مكيم	755
ريمه	916	جحرور	586	منضحه	376
شعف	423	ذاري القطو	417	البرحه	377
الجبل	276	شاحوط	820	المصبحي	347
السافيه	524	شرعان	594	المغربه	306
المرواح	253	عمق	477	عنتوره	484
المعبور	270	عنتوره	215	الربيض	1289
حزز	466	كعان	670	الزنم	900
دعوانس	413	وادي السيد	229	السريد	779
ذا النشم	810	المضناى	410	الشريف	615
رباط النهاري	851	الحديه	1179	الصفاء	530
شعاب	156	القزعه	323	القمير العالي	999
الجرجره	378	المصبحي العالي	370	المقطار	882
الراحه	140	المصبحي سافل	535	حرقه	332
الضاحي	303	جبل شعيب	2625	سحمه	777
اللكيمات	213	ذي حسان	596	طياش	1687
باب سلم	127	عدف	405	قمره	906
باب هيفان	26	نعمه	285	مشرفة	698
حاميه	140	يفوز	335	الحبيل	640
خديشه	262	الصرادحة	515	الحويه	204

Geographical unit	Population size	Geographical unit	Population size	Geographical unit	Population size
الذنيبه	324	وادي الرضيه	919	الجبجب	877
الربوع	210	الرباط	397	الضلاع	1093
الطاهريه	66	الحمراء	147	المحافظه	982
الطور	474	المحل	280	المعذب	947
العقيده	756	المصول	540	المعرض	970
عرسمه	1041	جابره	575	بني الجابري	798
الرباط	683	قبلة	789	حاوه	390
اللكمه	392	قريت	1066	قاعه	760
البرار	654	الغربي	175	نيله	460
الرزمه	589	الشرف	284	ادقر	514
الشعب	1426	المحله السفلى	765	الصلب	199
الشوب	984	المحله العليا	887	الغراب	1289
العراميه	821	الميفعه	489	عرسان	382
الغره	917	ذرحيون	554	عصام	699
القله	627	سقم	425	الجبل	334
علاود	898	سنوم	284	الجيه	250
نمر	674	هدوه	98	السخي	338
الجبل	443	الرباط	689	النقيل	1696
العارضه	1364	العدن	574	الشرقي	531
جعر	537	ابيون	227	الفوز	649
حبابل	667	الاقحر	415	عضيهمون	982
مزهر	402	التعيه	154	الحقل	1177
التاشيش	537	المجعاره	435	الرباط	633
الحبوس	121	المصنعه	1333	المغربه	764
الخربه	567	دجمه	243	الجبل	215
الصيحانيه	1484	رخمان	290	المقطار	63
المجارين	2245	ريعه	816	الحمراء	437
باب الاحد	993	مدوره	1561	الشعيبه	720
قرية الرباط	334	المغربه	87	الكديد	731
الجله	280	الجوره	55	المعزبه	98
البرار	503	الاقين	267	المعفاده	986
الخربه	854	الاملاح	178	كردي	436
الاكمه السوداء	458	التولقي	600	الكدحه	769
الصلفاح	347	الجبور	139	المطيب	815
الضبير	1049	الجو	778	الظهار	1318
العدن	411	العماد	672	المحربه	443
النقيل	440	القصيبه	103	المشماط	879
الهجره	1216	سباء	288	جشمان	669
حقيبه	151	ظعابر	558	الشرف	370
زهيره	834	عقده السفلى	86	المرخام	283
عيال الاسد	755	عقده العليا	61	الجرب	489
قديس	1182	مجرد	140	الجربه	713
قرضه	213	الجوره	632	الدار	130
مقرمه	497	العقيبه	1771	الشوع	197
السوداء	389	الوسق	414	القدم	115
المخنقه	458	صيود	136	غصان	195
المنوهه	255	نسب	698	الحيرة	280
طنجل	608	الجحره	851	الحر	120
عبر الوادي	347	المحله	345	المحترض	597
الجزر	1260	الحمراء	461	بني سبيان	241
السوره	1002	المحل	429	خضاضيه	143
الظهر	770	الحواز	519	القزعه	1241
العدين	687	جرمه	452	الرقيه	1322
مضبعه	1022	دغفل	597	الصياتة	1173
الجبل	1578	ركبة الضوه	62	المعشور	535
الحزه	377	سوق السبت	516	الغربي	338
العمق	799	كزومه	231	الجلة	159
تمصنعه	186	الاكمه	985	الكداري	927
قاع الميدان	132	البقعه	1480	المخلاف	605
منقعه	1867	المصول	426	المطيب	737

Geographical unit	Population size	Geographical unit	Population size	Geographical unit	Population size
مهدد	390	ذاري عنم	980	بني العمري - المضرعه	24
الشرف	292	ذى المدر	581	بني العمري - الجفنه	11
الدنقة	729	محليه	614	بني العمري - المربد	44
الرواكز	476	مصبح	290	بني العمري - الصلو	15
طاهر	234	معر	636	بني حكم - المحوليه	386
الاملاح	190	هكر	1635	بني حكم - الصودم السافل	172
الشرقي	388	المصبحي	643	بني حكم - رشون	141
القريه	517	الموسطه	267	بني حكم - كوريا	75
المرحلة	444	بني الشماخ	1704	بني حكم - الادفون	53
المغارب	466	الاعصور	1883	بني حكم - جعاره	32
الموجار	217	الطرف	212	بني حكم - بني زريق	329
الوسط	261	العوالي	1565	بني حكم - محلل	378
جعفر	377	المحل العالي	169	بني حكم - بعرون	52
حجام	181	بني الجوحي	2060	بني حكم - اريمه	241
غرفات	546	بني مسروق	2558	بني حكم - العتم	149
الحصن	1775	سحلبون	1664	بني حكم - عتكله	204
القرتوب	787	قرية ليون	132	بني حكم - رقيه	215
جرش	1052	الساقيه	492	بني حكم - شرعب	110
قطير	467	العموقي	1017	بني حكم - مدير	79
الدفان	91	حوده	918	بني حكم - المطلح	46
الركنه	615	موسم	714	بني حكم - حيمه	91
بيانه	474	العوالي	671	بني حكم - النشم	32
الميراك	1099	الراحة	784	بني حكم - بيت الفله	16
المغربه	93	حصبه	723	بني حكم - العجوره	9
المرواح	738	شيبوب	841	بني حكم - الخوب	4
الماجل	532	بني الاشقري	1253	بني حكم - الكدكده	9
المركز	598	بني العمري - منضيبه	29	بني حكم - المشرعه	10
براصليح	655	بني العمري - نونمه	50	بني حكم - الكريف	20
اسملان	148	بني العمري - سحوه	153	بني حكم - الكدحه	247
السواد	225	بني العمري - العره	65	بني حكم - درح	7
المرخامي	380	بني العمري - الشعيبه	24	بني حكم - الحلله	8
المقفليه	132	بني العمري - المضرام	40	بني حكم - بيت تيسعه	2
شيح	237	بني العمري - الوادي	413	بني حكم - مصبح	35
عرضه	175	بني العمري - سوق الروضه	132	بني حكم - الجبيب	23
الجبل	501	بني العمري - ذي زبران	64	بني حكم - المبرع	13
البطاح	1579	بني العمري - الظهابير	158	بني حكم - المقطع	64
الصرم	134	بني العمري - قصوه	332	بني حكم - بيت الوادي	32
المكتوب	657	بني العمري - الحصبه	23	بني حكم - بيت الولي	23
الجبل	449	بني العمري - حبل	19	بني حكم - نياح الطنب	27
الحضن	976	بني العمري - حضض	54	بني حكم - المعطان	33
الخواله	602	بني العمري - معله العليا	148	بني سهيل	1735
المرول	806	بني العمري - الضبر	167	جبل الطلح - بني حفص	178
بني صبره	195	بني العمري - لزبر	296	جبل الطلح - الكمه	160
حمر	334	بني العمري - حلبه	51	جبل الطلح - الزبره	90
سمع	502	بني العمري - مديو العالي	242	جبل الطلح - السهل	273
صرع	550	بني العمري - ذي سود	26	جبل الطلح - ذوغانم	330
عبرحب	516	بني العمري - بيت الحمامي	158	جبل الطلح - الحطم	199
الحجره	687	بني العمري - المراجح	29	جبل الطلح - ذرخم	197
جرهن	1772	بني العمري - السفله	77	جبل الطلح - جليوت	140
جنبذه	957	بني العمري - حقل المنى	65	جبل الطلح - الصومعه	122
مظهوره	703	بني العمري - معله الوسطى	123	جبل الطلح - مريحب	22
الحرف	1267	بني العمري - معله السفلى	129	جبل الطلح - حده	91
اللفلف	1761	بني العمري - البرته	29	جبل الطلح - عتمه	34
الموسطة	443	بني العمري - الحفز	38	جبل الطلح - سهل الولي	41
الناحيه	924	بني العمري - زيك الابره	15	جبل الطلح - كوريه	44
بني الشماخ	1127	بني العمري - المحجر	131	جبل الطلح - المنفاع	56
بني الكدار	896	بني العمري - المحلى	90	جبل الطلح - القرحد	38
جبل صالح سعيد	1539	بني العمري - ذبري	26	جبل الطلح - عرصم	132
جدبون	1137	بني العمري - الكريف	4	جبل الطلح - الصاليه	90
ذاري البريد	868	بني العمري - الكدحه	24	جبل الطلح - ضوطه	47

Geographical unit	Population size	Geographical unit	Population size	Geographical unit	Population size
جبل الطلح - اعوش	61	اده	569	بني حسن - بيت الاثره	28
جبل الطلح - المزعه	97	الاعكوب	974	بني حسن - بيت العيلة	33
جبل الطلح - المطاحن	50	بني شبيل	656	بني حسن - بيت الجدف	36
جبل الطلح - ضباره	81	المحجر	1897	بني حسن - بيت المغربه	60
جبل الطلح - العصمه	42	ذي جودان	320	بني حسن - بيت كزم	72
جبل الطلح - المربا	26	مركز كسمه	1487	بني حسن - بيت عبر الماء	54
جبل الطلح - جحره العقاب	19	منهوره	440	بني محمد	1420
جبل الطلح - الشتيت	30	شعف	2274	جلب	1351
جبل الطلح - الحداد	42	البرح	1161	حجرون	1455
جبل الطلح - المحفد	31	راس الجبل	924	رهيفة	1028
جبل الطلح - القوز	65	الحقل	2297	السوداء	1215
جبل الطلح - بيت الدرويش	18	البقعة	1215	المصنعه	2476
جبل الطلح - الجابه	33	الهيجه	590	الشرقي	724
جبل الطلح - البرح	69	بني حسن - المدحه	89	الذيوب	1168
جبل الطلح - المغراسه	75	بني حسن - صيونه	64	سين	1138
جبل الطلح - الشيطه	20	بني حسن - يعنوس	33	عيال اسد	770
جبل الطلح - السنف	18	بني حسن - يعلون	90	السلف	829
جبل الطلح - العشق	13	بني حسن - وادي الحشر السافل	46	الدار	1075
جبل الطلح - المدافن	13	بني حسن - البرح	256	الاريد	715
جبل الطلح - المقسم	34	بني حسن - الصروف	224	السوق	12
جبل الطلح - المصيحي	16	بني حسن - شرفله	209	صحمه	1190
جبل الطلح - المترس	10	بني حسن - ايله	152	مزهر	513
حمير - الزهاء	370	بني حسن - مركوز	77	العر	817
حمير - المشرعه	65	بني حسن - ضوره	99	المغارب	783
حمير - الضبره	37	بني حسن - بيت المحراق	94	الغربي	649
حمير - الترم	36	بني حسن - المنطقي	39	المحروم	1168
حمير - الاسمل	39	بني حسن - بيت الجاب	62	المسوعة	1282
حمير - المجبان	282	بني حسن - بيت الريسي	27	الهجرة	1019
حمير - الابرح	62	بني حسن - بيت المدحجي	125	جبل الريم	947
حمير - ناده	91	بني حسن - مقطره	127	لكمة	235
حمير - ديرمه	154	بني حسن - المحروم	145	وادي الريم	1238
حمير - الشرف	16	بني حسن - اللكمة	122	الشرف	413
حمير - عطط	45	بني حسن - قرضون	87	الاكمه	499
حمير - الذبني	41	بني حسن - رهن	112	الجند	666
حمير - دريم	94	بني حسن - العكد	156	المسارب	225
حمير - مدها	165	بني حسن - سنينه	102	خمص	422
حمير - السبطه	62	بني حسن - مشونن	164	شيف	199
حمير - جبل مدها	119	بني حسن - المسواد	71	المضناى	1409
حمير - المدهف	56	بني حسن - الجديد	74	الاصحوب	1826
حمير - يعوان	338	بني حسن - الجنزيره	187	الحلو	1016
حمير - الخدعه	200	بني حسن - بيت السهله	62	المقدام	640
حمير - الضودم العالي	83	بني حسن - الديوس	297	بني عياش	743
حمير - برون	459	بني حسن - شهره	92	جزز	1364
حمير - جوانه	8	بني حسن - الجحار	90	موتره	649
حمير - بيت الشعيبه	18	بني حسن - التجه	150	الغربي	765
حمير - بيت الجرحره	9	بني حسن - مشقون	433	الجبل	896
حمير - المحله	9	بني حسن - مشرعه	35	الشرف	598
حمير - الغرض	61	بني حسن - وادي الحشر الاعلى	101	العارضه	538
حمير - الجوره	28	بني حسن - الشرف	22	بني شيبان	505
حمير - القطيه	69	بني حسن - الاحروز	37	الماجل	133
حمير - العنيه	8	بني حسن - بيت القعب	21	الطرف	875
حمير - الشعيب	209	بني حسن - بيت عيتمه	14	الاجبور	439
حمير - الحقل	23	بني حسن - بيت اليمني	15	الاحد	264
الشعير	2397	بني حسن - بيت الجويب	7	الجندي	730
ذي سعيد	1877	بني حسن - بيت المشخوص	10	الحسل	905
الموسطة	985	بني حسن - بيت برعه	32	الحنب	914
البلول	448	بني حسن - بيت الحرف	102	الحيير	390
بني يعقوب	2036	بني حسن - محرسه	34	الدرجة	2010
خنع	1106	بني حسن - السفلي	125	الشرقي	346
ذي شديد	632	بني حسن - بيت العصم	18	القيل	999

Geographical unit	Population size	Geographical unit	Population size	Geographical unit	Population size
القصيع	1609	محفل - البرار	148		
القمر	710	محفل - القلت	39		
المياسي	1503	محفل - الحجرة	31		
بسر	197	محفل - عبرسيع	27		
بني المرفدى	384	محفل - السهلة	17		
بني حفص	2115	محفل - التلوت	88		
بني عقيل	2225	محفل - الحنا السافل	61		
بني مطر	1277	محفل - القرون العالى	35		
حواز الشرف	412	محفل - الحبيل العالي	98		
خجه	276	محفل - الحبيل السافل	72		
زبل	1203	محفل - الجربه	23		
عرزه	932	محفل - المسريه	139		
عمد	271	محفل - المجعاره	20		
غنن	1373	محفل - العروض	10		
لوظ	269	محفل - التارده	12		
محيض	1335	محفل - اللكام	48		
الاحضور	1449	محفل - شعب دعاس	20		
السادة	1539	محفل - القرون السافل	9		
المثلوث	473	نسد	1025		
زعمه	1267	الهجرة	697		
سافع	2372	البعور	337		
ضروه	889	الحوز	597		
محفل - البرته	277	العلى	257		
محفل - شرادي	167	كنده	403		
محفل - الدورة	32	المصبحي	426		
محفل - المقلع	64	المحريه	200		
محفل - الخرف العالي	175	الحرف	380		
محفل - الخرف السافل	287	ارضه	423		
محفل - الحافه	98	اقروض	446		
محفل - القرية	210	الجرادمه	643		
محفل - الحقل	115	الجلال	718		
محفل - المحل	429	الدنع	190		
محفل - المحله	234	الذاري السافل	725		
محفل - قرن واصب	30	الذاري العالي	1294		
محفل - تل مقابر	105	الزيله	388		
محفل - حقه	110	السلفة	282		
محفل - المرازيم	39	الشرف بالول	346		
محفل - نظر	67	الشرق	885		
محفل - القبل	118	العقد	451		
محفل - قزيع	62	العيون	402		
محفل - حطرومه	210	القبول	991		
محفل - الثجه	59	المشارعة	1215		
محفل - سودان	111	المشاعر	333		
محفل - جبر عشر	32	المعقاب	197		
محفل - قفعه	112	جبل مدري	276		
محفل - الحنا العالي	87	حقيبة	2350		
محفل - المحش	41	حودون	776		
محفل - العسق	223	سائلة الهادى	703		
محفل - اللتبه	30	سوق التلوت	16		
محفل - مخيمر	96	صحلف	991		
محفل - المبرك	40	عيومه	219		
محفل - الظهر	143	عسلب	1031		
محفل - المناخ	47	مدري	1938		
محفل - السلفه	35	وادي مزهر	1352		
محفل - الكبيدة	88	وادي نعوم	276		
محفل - حمامية	70				
محفل - الهيجة	49				
محفل - الشهته	83				
محفل - جدهنية	111				
محفل - وادي البير	62				

Annex 9: Job Descriptions for Survey Teams (Extracted from SMART Training Materials

Each survey team should be composed of at least 3 people. Including women in survey teams is highly recommended since they are usually more comfortable interacting with children. Generally, two surveyors are involved in anthropometric measurements while another one, the team leader, records the data on the forms. However, it is strongly suggested that each team member knows how to accomplish the tasks of his teammates, because unexpected events can happen and a change in the staff may be required.

All team members must have the following qualifications:

- They should be able to write and read English or French (depending on the country where the survey takes place) and speak the local languages of the areas where the survey will be conducted.
- They should have sufficient level of education, as they will need to read and write fluently and count accurately.
- They should be physically fit to walk long distances and carry the measuring equipment.
- They do not (necessarily) have to be health professionals. In fact, anyone from the community can be selected and trained as long as he meets the above criteria.

1. Survey Manager (or supervisor)
The manager guarantees the respect of the survey methodology; he has the responsibility for:

1- Gathering available information on the context and survey planning,

2- Selecting team members,

3- Training team members,

4- Supervision of the survey: Taking necessary actions to enhance the accuracy of data collected:

4.1 Visiting teams in the field and making sure that before leaving the field, each team leader reviews and signs all forms to ensure that no pieces of data have been left out; making sure that the team returns to visit the absent people in the household at least once before leaving the area.

4.2 It is particularly important to check cases of oedema, as there are often no cases of oedema seen during the training and some team members may therefore be prone to mistaking a fat child for one with oedema (particularly with younger children). The supervisor should note teams that report a lot of oedema, confirm measles and death cases, and visit some of these children to verify their status.

4.3 Ensuring that households are selected properly and, that the equipment is checked and calibrated each morning during the survey, and that measurements are taken and recorded accurately.

4.4 Deciding on how to overcome the problems encountered during the survey. Each problem encountered and decision made must be promptly recorded and included in the final report, if this has caused a change in the planned methodology.

4.5 Organizing data entry into ENA and checking any suspect data every evening, by using the appropriate sections of the plausibility report.

4.6 Organizing an evening "wrap up" session with all the teams together to discuss any problems that have arisen during the day[13].

4.7 Ensuring that the teams have enough time to take appropriate rest periods and has refreshments with them. It is very important not to overwork survey teams since there is a lot of walking involved in carrying out a survey, and when people are tired, they may make mistakes or fail to include more distant houses selected for the survey.

5- Analyse and write the report.

2. Team Leader

Skills and required abilities:

To be able to read, write and count; know the area to survey; be reliable and friendly.

Tasks:

1. Ensures all forms and questionnaires are ready at start of day;
2. Ensures all equipment is ready at start of day;
3. Calibrates measurement instruments on daily basis;
4. Ensures all food/refreshments are ready at start of day;
5. Organises briefing meeting with his team before departure in morning;
6. Speaks with chief of village to explain the survey and its objectives,
7. Draws a map of the area to survey and use a random table;
8. Manages the households selection procedure;
9. Uses a local events calendar to estimate the age;
10. Calculates the Weight-for-Height ratio after taking anthropometric measurements;
11. Checks if the child is malnourished (checks for the presence of oedema);
12. Fills the anthropometric form;
13. Fills survey questionnaires when needed;

[13] This may not be possible if the survey area is large since the teams might be widely separated and remain in the field for several days. In that case, communication with teams in the field might often be very difficult; hence, each team leader must be sufficiently trained to be able to take decisions independently.

14. Fills the referral form if necessary;
15. Ensures that houses with missing data are revisited before leaving the field the same day;
16. Checks that all forms are properly filled out before leaving the field.
17. Ensures that all the equipment is maintained in a good state;
18. Manages time allocated to measurements, breaks and lunch,
19. Ensures security of team members,
20. Note and report the problems encountered.

3. Measurers

Skills and required abilities:

To be able to read, write and count; know the area to survey; be reliable and friendly.

Tasks:

1. Measures the height, weight and arm circumference (if included in the survey);
2. Assesses the presence of edema;
3. Uses a local events calendar to estimate the age;
4. Respects the time required for measurements, breaks and meals;
5. Takes care of the equipment;
6. Follows security measures.

The measurers must acquire some special skills and knowledge although they don't have the primary responsibility for tasks that are related:

1. Know how to calculate the weight-for-height ratio;
2. Know how to select households for the survey;
3. Know how to check if a child is malnourished;
4. Learn how to make a reference for a malnourished child.

Annex 10: Referral Form for the Malnourished Children

مسح الحالة التغذوية للأطفال تحت سن الخامسة في محافظة ريمة، مايو 2012

استمارة إحالة طفل مصاب بسوء تغذية حاد وخيم

الأخوة/ المرفق الصحي : .....

نود إحاطتكم أن الطفل/ الطفلة : ..... كان/ كانت
ضمن عينة المسح المشار إليه أعلاه ووجد أنه مصاب بسوء تغذية حاد من خلال القياسات التالية:

	سنتيمتر .	محيط ذراع الطفل بالسنتيمتر (ØØ. Ø)

	سنتيمتر .	طول / ارتفاع الطفل بالسنتيمتر (ØØØ. Ø)

وجود التوذم: (نعم / لا)

تاريخ القياس	يوم	شهر	سنـــــة
			2 Ø 1 1

يرجى تعاونكم معه/ معها

وتقبلوا تحيات فريق المسح

اسم المشرف الميداني .....

توقيعه

Annex 11: Assessments Quality Checks

Plausibility check for: Rayma May 2012

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
Missing/Flagged data (% of in-range subjects)	Incl	%	0-2.5 0	>2.5-5.0 5	>5.0-10 10	>10 20	0 (1.3 %)
Overall Sex ratio (Significant chi square)	Incl	p	>0.1 0	>0.05 2	>0.001 4	<0.000 10	0 (p=0.477)
Overall Age distrib (Significant chi square)	Incl	p	>0.1 0	>0.05 2	>0.001 4	<0.000 10	4 (p=0.001)
Dig pref score - weight	Incl	#	0-5 0	5-10 2	10-20 4	> 20 10	0 (3)
Dig pref score - height	Incl	#	0-5 0	5-10 2	10-20 4	> 20 10	2 (8)
Standard Dev WHZ	Excl	SD	<1.1 0	<1.15 2	<1.20 6	>1.20 20	0 (0.97)
Skewness WHZ	Excl	#	<±1.0 0	<±2.0 1	<±3.0 3	>±3.0 5	0 (-0.20)
Kurtosis WHZ	Excl	#	<±1.0 0	<±2.0 1	<±3.0 3	>±3.0 5	0 (0.07)
Poisson dist WHZ-2	Excl	p	>0.05 0	>0.01 1	>0.001 3	<0.000 5	5 (p=0.000)
Timing	Excl	Not determined yet					
			0	1	3	5	
OVERALL SCORE WHZ =			0-5	5-10	10-15	>15	11 %

At the moment the overall score of this survey is 11 %, this is acceptable.

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5- MoPHP and UNICEF. Nutrition Survey among U5 Children and Women of Childbearing Age in Three Districts in Hajjah Governorate, Yemen. July, 2011

6- UNICEF, Nutrition Survey among U5 Children in Hodeidah Governorate, Yemen. October, 2011

7- World Health Organization. The management of nutrition in major emergencies. Geneva: World Health Organization; 2000.

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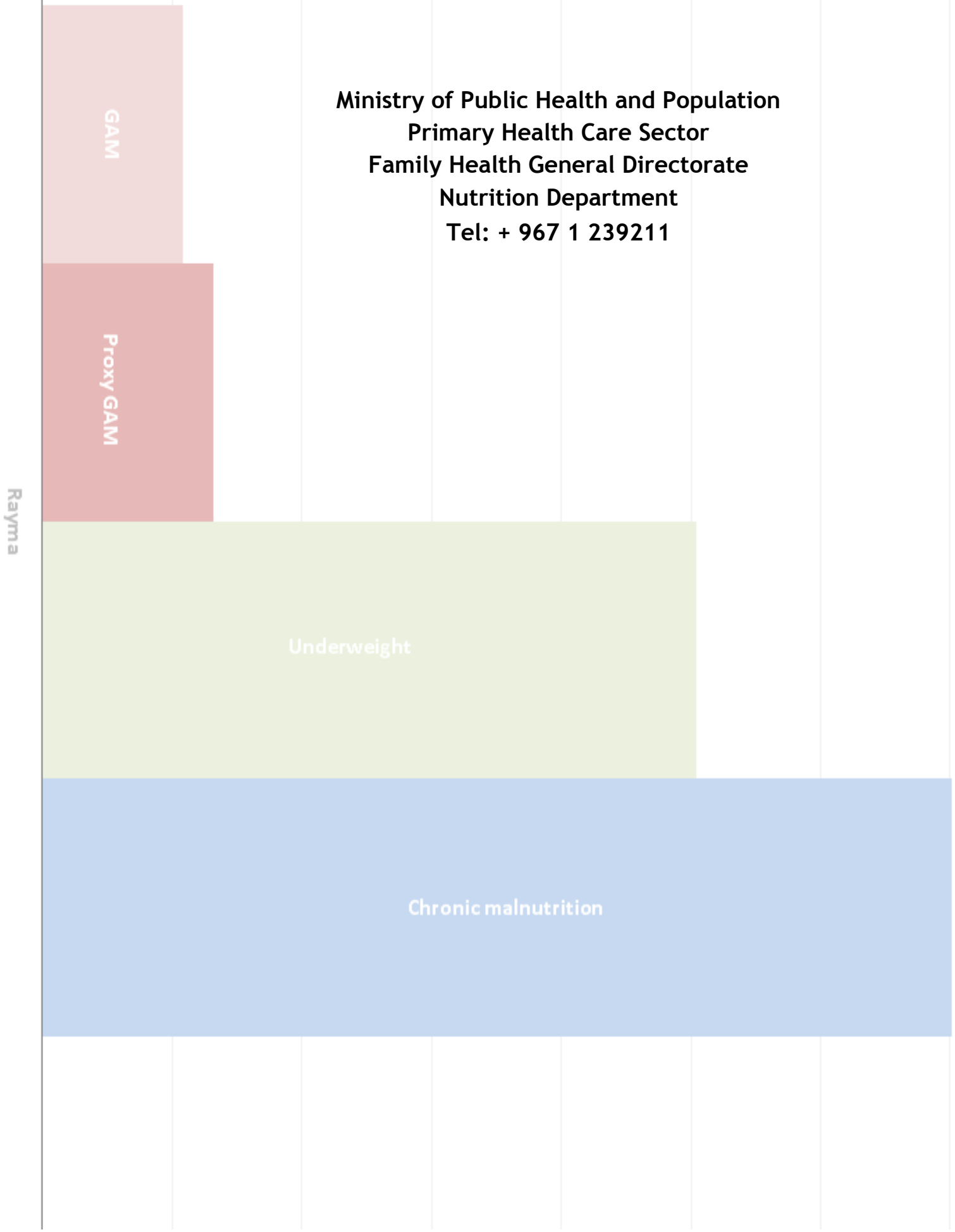
9- MoPHP, UNICEF, ECHO. Nutrition Survey in the Lowland and Mountainous Ecological Zones of Hajja Governorate – May 2012. Hajja Governorate Public Health and Population Office

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