NUTRITION SURVEY REPORT

DHAMAR GOVERNORATE, YEMEN: EASTERN AND WESTERN Districts

23 March, 2013
to
3 April 2013

unicef

EUROPEAN COMMISSION
Humanitarian Aid and Civil Protection

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

NUTRITION SURVEY REPORT

DHAMAR GOVERNORATE, YEMEN:

EASTERN AND WESTERN Districts

Conducted: 23 March,2013 to 3 April 2013

unicef

TABLE of CONTENTS

TABLE of CONTENTS 3
Abbreviation and Acronms 5
ACKNOWLEDGEMENTS 6
EXECUTIVE SUMMARY 7
1.0 INTRODUCTION / BACKGROUND 14
2.0 ASSESSMENT OBJECTIVES 16
3.0 METHODOLOGY 17
3.1: Sampling Design and Sample Size Determination 17
3.2: Sampling Procedure 18
3.3: Study Population and Data Collection Process 19
3.4: Measurement Standardization and Quality Control 20
3.5: Data Entry and Analysis 21
3.6: Data Entry Verification and Cleaning 21
4.0 ASSESSMENT RESULTS 22
4.1: Household Characteristics of Study Population 22
4.2: Morbidity, Immunization Status and Health Seeking Behaviour 24
4.3: Feeding Practices 25
4.4 WASH 25
4.5: Food security 26
4.6: Characteristics of the children assessed 28
4.7: Nutrition Status 29
4.8: Mortality 32
4.9: Population Pyramid 32
5.0 DISCUSSION 33
5.1 Malnutrition 33
5.2 Child Feeding 34
5.3 Vitamin A Supplementation 35
5.4 Vaccination coverage 35
5.5 Salt iodization 36
5.6 Morbidity 36
5.7 WASH and Morbidities and Nutrition Situation 38
5.8 Food Insecurity 39
5.9 Nutrition Status and Household Caretaker Education 39

6.0 RECOMMENDATIONS 40
3 Annexes 42
Annex 1: Dhamar Arabic Nutrition/Mortality Survey Questionnaire 43
6 Annex 2: Dhamar English Nutrtion/Mortality Survey Questionnaire 55
Annex 3: Dhamar Nutrition Survey Team, 10 – 21 May 2012 69
Annex 4: Dhamar Nutrition Survey Standardization Test Report for Evaluation of Enumerators 70
Annex 5: Reference Table for Age Estimation 71
Annex 6: Calendar of Events for Dhamar for Reference in Age Estimation 72
Annex 7: Cluster Sampling for the Eastern Dhamar 73
Annex 8: Cluster Sampling for the Western Dhamar 74
Annex 9: Sampling Frame of the Eastern Dhamar 75
Annex 10: Sampling Frame of the Western Dhamar 76
Annex 11: Job Descriptions for Survey Teams (Extracted from SMART Training Materials 77
Annex 12: Referral Form for the Malnourished Children 80
Annex 13: Assessments Quality Checks 81

ABBREVIATIONS AND ACRONYMS

ARI	Acute Respiratory Infection
CBO	Community Based Organization
CI	Confidence Interval
CMAM	Community Management of Acute Malnutrition
CMR	Crude Mortality Rate
ENA	Emergency Nutrition Assessment
EPI	Expanded Programme on Immunization
GAM	Global Acute Malnutrition
HAZ	Height-for-Age z-score
HH	Household
IDP	Internally Displaced People
ITN	Insecticide Treated Net
MCH	Maternal and Child Health
MOPHP	Ministry of Public Health and Population
MUAC	Middle Upper Arm Circumference
N	Number
NGO	Non-governmental Organization
OTP	Outpatient Therapeutic Programme
PHC	Primary Health Care
PPS	Population Proportional to Size
RUTF	Ready-To-Use Therapeutic Food
SAM	Severe Acute Malnutrition
SD	Standard Deviation
SFP	Supplementary Feeding Programme
SMART	Standardized Monitoring and Assessment of Relief and Transition
TFC	Therapeutic Feeding Centre
TFP	Therapeutic Feeding Programme
TSFP	Targeted Supplementary Feeding Programme
U5MR	Under five Mortality Rate
UNICEF	United Nation Children's Fund
WAZ	Weight-for-Age z-score
WFP-CFSS	World Food Programme-Comprehensive Food Security Survey
WHO	World Health Organization
WHZ	Weight-for-Height z-score

ACKNOWLEDGEMENTS

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

The UNICEF Yemen Country Office provided technical support employing SMART methodology. A survey manager and supervisors were provided by the Dhamar Governorate Health and Population Office and the MoPHP. The survey enumerators and team leaders came from Dhamar Governorate. The data entry team from the Office of Dhamar Governorate Public Health and Population performed the data entry to enable daily data quality verification.

The Dhamar Governorate Public Health and Population 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.

Many thanks to James Kingori, the UNICEF Regional Nutrition Advisor for his worth contribution in revising and commenting on the draft report.

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

Dhamar governorate is located to the south and southeast of Sana'a Governorate, to the north of Ibb Governorate, to the east of Hodeidah Governorate and to the northwest of Al Bayda Governorate in the central highlands, with an area of 7,586 square kilometers and a population of 1,329,229 people. The governorate contains of two main ecological zones the Eastern (mainly urban) and the Western (purely rural) regions.

Poverty and unemployment in Dhamar and elsewhere in Yemen, exacerbated by the recent political unrest and by rapid population growth. It is anticipated that by 2034, Dhamar governorate's population will increase to around four million people if the current fertility rate doesn't shift, translating to an increase of more than two million people when compared to numbers from the 2004 census. The health sector would also require significant economic resources in 2034. It would be extremely difficult to improve the current service level with continued population growth at the current fertility rate. Costs for the health sector are projected to be over $43 million, an increase of $25 million compared with 2009.

The 2012 WFP-CFSS reported that 24.1, 22.0, 46.1 per cents are severely, moderately, and "severe and moderate" food insecure in Dhamar governorate respectively. Regarding malnutrition, the 2010 IFPRI National Food Security Paper estimated GAM rate based on HBS 2005-06 data in Dhamar to be 11.2 per cent, with SAM at 3.3 per cent, underweight 46.7 per cent, and stunting 70.1 per cent. The 2012 WFP-CFSS, reported the following prevalence: GAM: 9.8 per cent, SAM: 1.8 per cent, underweight: 36.1per per cent, and stunting: 59.2 per cent. According to Nutrition cluster strategy 2012/Yemen, Dhamar fall within the poor zone (GAM from 5 – 9.9%).

Between 23rd March to 3rd April, 2013, MoPHP and UNICEF conducted two inter-agency nutrition surveys using the Standardized Monitoring and Assessment for Relief and Transition (SMART) methodology covering the Eastern and Western districts in Dhamar Governorate. This was a Yemen Nutrition Cluster initiative to establish and monitor the levels of acute malnutrition, stunting and underweight among children aged 6-59 months in the different livelihood/ ecological zones, identify some of the factors associated with malnutrition, and inform on the appropriate responses.

Using a two-stage Probability Proportionate to Population Size (PPS) sampling methodology, 36 clusters in each of the Eastern and Western Dhamar were randomly selected for both anthropometric and mortality assessments. The calculated sample sizes in the Eastern district and Western Dhamar using ENA for SMART software were 681 and 835 households respectively for assessing both the anthropometry and mortality.

In the Western Dhamar the Global Acute Malnutrition (GAM) rate was **9.2 per cent** (95% **CI:** 6.8 - 12.4**),** with Severe Acute Malnutrition (SAM) **1.0 per cent** (95% CI: 0.6 - 1.8). GAM and SAM rates in the Eastern Dhamar were **4.9 per cent** (95% CI: 3.7 - 6.5) and **0.5 per cent** (95% CI: 0.2 – 1.5) respectively. ***According to WHO categorization, these***

rates indicate that the nutrition situation in Western Dhamar fits with the upper limit of cut-off values for "poor" ***(which equal to GAM rates*** 5-9.9 ***per cent) and in the*** Eastern ***Dhamar*** fits with the upper limit of cut-off values for "acceptable" ***(which equal to GAM rates <5 per cent).***

Stunting rates in the Western and Eastern Dhamar are **69.5 per cent** (95% CI: 65.7 – 73.1) and **62.8 per cent** (95% CI: 57.4 – 67.8) respectively with severe stunting of **31.8 per cent** (95% CI: 28.1 - 35.8) and **29.8 per cent** (95% CI: 24.2 - 36.1) respectively. ***These rates are much beyond the critical levels of 40 per cent; thus the stunting rates are of great concern.***

Underweight rate in the Western Dhamar is **45.5 per cent** (95% CI: 41.1 - 50.0), with severe underweight of **12.5 per cent** (95% CI: 10.0 - 15.5) while the underweight and severe underweight rates in the Eastern Dhamar are **35.1 per cent** (95% CI: 29.7 - 40.9) and **8.9 per cent** (95% CI: 6.3– 12.2), respectively. ***These rates are much more than the critical levels of 30 per cent, as per WHO categorization.***

Such pattern of malnutrition–especially in the Western districts- is somewhat similar to the pattern that found in neighbouring Ibb that shows more predominant chronic malnutrition (as reflected by extremely high stunting rates) but less severe acute malnutrition (especially in the Eastern Dhamar). This should be in interpreted as an indication of poor environmental conditions or long-term restriction of a child's growth potential together with chronic food insecurity and poverty.

Both stunting and underweight significantly differ between the rural and urban areas and significantly higher among children aged 36 and above than younger age group. Comparable to the findings from previous nutritional surveys (e.g. Hodeidah, Hajjah), all types of malnutrition found to be higher among males than females, however such difference is only statistically significant for underweight.

The two main sources of drinking water in the Eastern Dhamar were house-connected piped water (41 per cent) and water from protected open well (32 per cent) while in the Western Dhamar they were water from protected open well (31 per cent) and unprotected surface water (17 per cent). The majority of Eastern Dhamar (88%) population are having flush/pour flush latrine compared to only 58% in the Western Dhamar. The main two sources of income for Eastern Dhamar are fixed monthly waged work and casual labour (29% each) compared to casual labour (45%) and fixed monthly waged work (14%) for Western Dhamar. More than 80% of the Eastern and Western districts' population seeks health services from a public health facility when sick.

There was high prevalence of common disease, as recorded during the survey: diarrhea, Acute Respiratory Infection (ARI) and fever prevalence are the reported cases 2 weeks before the survey while measles was one month before the survey, as shown in table 1 below and all are significantly higher in the Western than Eastern Dhamar. Of these morbidities only diarrhea prevalence is significantly higher among children aged less

than 36 compared to those who are 36 and above (39% vs. 25%, X2 42.1, P<0.0001, df 1). Among children aged 6 to 24 months although morbidities prevalence does not differ by breastfeeding status or feeding 4 times and above (other than breastfeeds), however diarrhea was higher among children who were given more than one milk feed (other than breast milk) in the previous day to the survey (50% vs. 37%, X^2 11.3, P<0.01, df 1) which may be related to unhygienic preparation or administration of artificial milk. Having diarrhea also found to be significantly associated with GAM: 9% vs. 6%, X^2 5.0, P<0.05, df 1, and fever significantly associated with underweight: 50 % vs. 45%, X^2 5.7, P<0.05, df 1. However, morbidities does not differ by urban/rural residence, gender, vitamin A supplementation, or vaccination except for measles that is significantly higher among non-vaccinated children to measles (5.2% vs. 1.5%, X^2 19.0, P<0.0001, df 1).

It is notable that the vitamin A supplementation 6 months prior to the survey in the Dhamar which is 81% is still lower than the recommended 95 per cent coverage Sphere Standards, 2011. Such coverage significantly higher in Eastern than Western Dhamar (89.0% vs. 79.0%, X^2 21.8, P < 0.0001, df 1), and urban than rural residence (93.0% vs. 83.0%, X^2 6.5, P < 0.05, df 1). Vitamin A supplementation found to be highly significantly associated with lower prevalence of measles (1.8% vs. 6.4%, X^2 23.2, P < 0.0001, df 1) but neither with other types of morbidities nor with gender or malnutrition.

Regarding vaccination, the percentage of children who have been vaccinated with the third dose of polio vaccination and measles found to be significantly higher in the Eastern than in Western Dhamar (76.0% vs. 63.0%, X^2 36.4, P<0.0001, df 1) and (79.0% vs. 71.0%, X^2 17.4, P<0.0001, df 1) respectively. Both vaccines are also higher in urban than rural residence: 84.0% vs. 71.0%, X^2 7.1, P<0.01, df 1 and 87.0% vs. 77.0%, X^2 4.5, P<0.05, df 1 respectively. However, no association was found between vaccination and gender, malnutrition and morbidities except for higher measles prevalence with not receiving polio vaccine (5.0% vs. 1.5%, X^2 19.2, P< 0.0001, df 1) and higher ARI, fever and measles prevalence with not receiving measles vaccine.

Only 3.0 per cent of households in Western compared to 21.0% in Eastern Dhamar are using adequately iodized salt (X^2 122.0, P< 0.0001, df 1) which is also significantly lower in rural than urban residence (29.0% vs. 10.0%, X^2 50.0, P< 0.0001, df 1).

Among children aged 6 to 24 months in Dhamar, only 61 per cent still breastfeed. This found to be significantly higher in Western than Eastern Dhamar (57 % vs. 65%, X^2 4.0, P<0.05, df 1) but does not differ by urban/rural residence. Breastfed also found to be significantly higher among males than females (65 % vs. 57%, X^2 5.2, P<0.05, df 1). Regarding malnutrition and still breastfed, there is only significantly higher prevalence of underweight among those who are still breastfed compared to those who have ceased breastfeeding (41 % vs. 31%, X^2 7.7, P<0.01, df 1) may be due overreliance on breastfeeding with poor complementary feeding. One of four children does not receive the recommended number of meals (4 meals and above), as per UN-FAO recommendations. However, this does not differ between the Eastern and Western Dhamar, urban/rural residence, or by gender. Furthermore, the recommended number of meals shows no effect on levels of wasting, stunting, and underweight. Among

children aged 6 to 24 months, less than half received more than one milk feed in the last 24 hours. The number of feeds (other than breastfeeds) does not differ between Eastern and Western Dhamar, urban and rural, or gender. Although the children who have received more than one milk feed in the last 24 hours shows lower prevalence of wasting, stunting, and underweight, the difference was not statistically significant.

Regarding WASH, overall 29% of Dhamar households drink water from unclean water container (i.e. algae seen) that found to be significantly higher in the Western than Eastern Dhamar (41% vs. 17%, X^2 109.2, P<0.0001, df 1), and in rural than urban residence (53% vs. 4%, X^2 32, P<0.0001, df 1). Diarrhea prevalence found to be significantly higher among households using unclean water container (40% vs. 27%, X^2 16.0, P<0.0001, df 1). Although wasting, stunting, and underweight are higher among those who are drinking from unclean water container, this was only statistically significant for underweight (46% vs. 35%, X^2 11.2, P<0.01, df 1) and SAM (1.6% vs. 0.1%, Fisher exact test X^2 8.1, P<0.05, df 1). Whether these are direct effects or due to other confounding e.g. diarrhea or socioeconomic status is not certain. Around three quarters of households in Dhamar are having flush or pour flush latrine. This was significantly higher in Eastern than Western Dhamar (88% vs. 58%, X^2 174.1, P<0.0001, df 1) and in Urban than rural Dhamar (99% vs. 70%, X^2 62.1, P<0.0001, df 1). However, having no flush/pour latrine found not to be significantly associated with diarrhea or malnutrition except for stunting (73% vs. 64%, X^2 8.4, P<0.01, df 1). Whether this is a direct effect or due to other confounding (e.g. poorer socio economic status etc.) is behind the scope of this survey. Overall, the Western Dhamar have significantly poorer handwashing practices than eastern Dhamar e.g. for washing hand after toilet (47% vs. 62%, X^2 38.1, P<0.0001, df 1), washing hand before meal (33% vs. 41%, X^2 9.6, P<0.01, df 1), washing hand before cooking (25% vs. 35%, X^2 19.3, P<0.0001, df 1). Similarly, overall household caretaker handwashing practices are significantly poorer in rural than urban areas. The availability of soap at handwashing facility was also significantly higher at Eastern than Western Dhamar (94% vs. 75%, X^2 109.4, P<0.0001, df 1) and urban than rural Dhamar (97% vs. 83%, X^2 21.6, P<0.0001, df 1) however it does not significantly associated with diarrhea. Of those practices only not handwashing after disposal of child faces and not handwashing before cooking were significantly associated with diarrhea: 33% vs. 26%, X^2 5.0, P<0.05, df 1and 33% vs. 27%, X^2 3.8, P=0.05, df 1 respectively. Furthermore, only not washing hand before cooking (41% vs. 32%, X^2 6.9, P<0.01, df 1) shows significant association with underweight and not washing hand before child feeding and not washing hand after child faces disposal were significantly associated with stunting: 68% vs. 58%, X^2 5.3, P<0.05, df 1 and 69% vs. 60%, X^2 6.5, P<0.05, df 1. Whether such associations are direct associations or confounded by other factors e.g. diarrhea, socio economic status is not ascertained.

Regarding food insecurity, all indicators found to be significantly much higher in Western than Eastern Dhamar e.g. reduced meal size (20% vs. 4%, X^2 88.2, P<0.0001, df 1), or reduced meal number (18% vs. 3%, X^2 89.8, P<0.0001, df 1), and member go the bed hungry because of not enough food (17% vs. 4%, X^2 69.8, P<0.0001, df 1). Coping strategies are also more predominant at Western than Eastern Dhamar e.g. borrowing food/money to purchase food or purchase food in credit or mortgage if the reason that HH has not money (36% vs. 17%, X^2 71.2, P<0.0001, df 1) and reduced expenditure on health/education (24% vs. 7%, X^2 87.2, P<0.0001, df 1). This confirms the finding of

2012 WFP-CFSS that food insecurity is a problem among Dhamar population. Similarly, food insecurity indicators also much severer in rural than urban Dhamar e.g. reduced meal number (11% vs. 4%, X^2 7.4, P<0.01, df 1), and member go the bed hungry because of not enough food (11% vs. 4%, X^2 4.2, P<0.01, df 1). This support previous findings that rural-urban inequalities are high in Yemen and the number of food insecure people living in rural areas is more than five times higher than in urban areas.

Although the prevalence of some types of malnutrition (e.g. underweight) found to be slightly higher among food insecure households, such difference was not statistically significant. This may indicates that the malnutrition in Dhamar is a health related problem (e.g. associated with diarrhea) or a practice problem (e.g. IYCF) rather being a purely food insecurity in origin.

Finally, about 80% of the caretakers in Dhamar have no formal education. Although, the prevalence of underweight and stunting was higher among illiterate mothers' children: 40% vs. 33% and 68% vs. 61% respectively such differences were not statistically significant. Similarly some morbidities e.g. diarrhea is higher among illiterate mothers' children (32% vs. 27%) however, such difference was not statistically significant. Nevertheless, illiterate mothers' children have significantly lower polio vaccination (70% vs. 81%, X^2 9.5, P<0.01, df 1) and lower measles vaccination (76% vs. 86%, X^2 8.7, P<0.01, df 1).

Finally, overall mortality rates are low and within the acceptable levels according to WHO categorisation, hence not raising major concern.

Recommendations

In a view of very high chronic malnutrition found in this survey with less severer acute malnutrition –especially in Eastern Dhamar-, but with the risks to health may be similar to many acute emergencies, short-term emergency responses alone are not enough to address such long-term problems and there is a need to concentrate on both immediate as well as medium term Interventions. Therefore, there is a need to deliver an integrated package of services to mothers and their children not only to address the acute malnutrition but also to address the high level of stunting and underweight as well as other development indicators.

Immediate Interventions

- Develop detailed integrated response micro-plan articulating district level humanitarian needs, delivering response package, coverage and gaps to document the progress, advocacy and lessons learnt.
- Priority should be given to pockets of vulnerability in both zones through mobilizing outreach services to rapidly address the high GAM/SAM rates.
- Development of CMAM protocol, strengthen and expanding CMAM services to reach all the existed health facilities and outreach services.
- CMAM services should adhere to the CMAM protocol (ensuring systematic treatment and full consideration of moderate acute malnutrition management) that should be integrated with infant feeding, hygiene promotion and food security interventions.

- to promote appropriate IYCF practices (early initiation of breastfeeding, exclusive and sustained breastfeeding for 2 years and promotion of appropriate complementary feeding practices for children aged 6 to 24 months) along with micronutrient supplementations and deworming.
- Accelerate the integration of IYCF counseling into all CMAM services delivered by both fixed and mobile clinics.
- Intensive social mobilisation campaigns on IYCF feeding and caring practices through behavior change / communication interventions mainly in the following areas; timely introduction of complementary food and continue breastfeeding up to two years, along with Vit. A supplementation, micronutrient supplements, and promotion of safe sanitation and hygienic practices including hand washing with soap as well as safe disposal of children's excreta, diarrhoea prevention measures and appropriate management of ARI among young children

Medium Term Interventions

- From the development point of view, there is an essential need for Yemen to be an active member in the global SUN movement.
- High level advocacy with the GOY and politicians to mobilise their commitment to fight undernutrition among U5 Yemeni children.
- Scaling up implementation of the national nutrition strategy and related action to address the high level of malnutrition in line with the lifecycle approach along with promotion of maternal nutrition.
- Continued support for longer term water development and sanitation programmes throughout the governorate, with community mobilization activities to promote safe sanitation and hygienic practices.
- Follow up SMART nutrition survey and coverage survey in 2014 to track the progress on implementation of the response plan.
- Exploring new initiatives to promote small scale income generating projects, draw lessons learnt and replicate the successful projects.
- Promote improved latrine use and other hygiene services like Community Led Total Sanitation (CLTS) strategy.

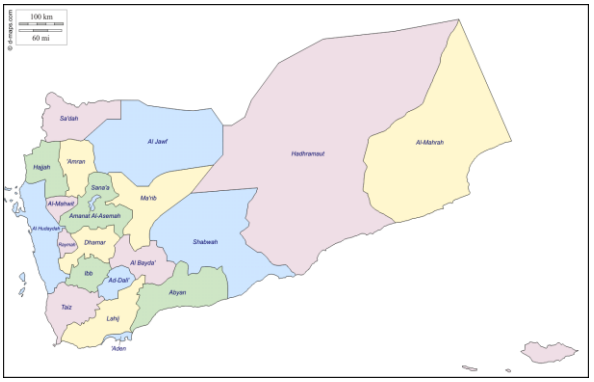
Other Recommendations

- Further investigation is needed to understand the causality tree behind high level of acute malnutrition among boys compared to girls found earlier surveys conducted in Hodeidah, Taiz, Hajja governorates as well as in this survey (especially for underweight).
- Undertaking full scale national nutrition and mortality survey.
- In a view of high malnutrition among illiterate mothers' children as well as poor child feeding practices and health indicators (e.g. vaccination, Vitamin A supplementation) found in this survey as well as previous surveys in Yemen, a focus on girls' education is necessary in the long term battle against malnutrition as well as for broader development.

Table 1. Summary of Dhamar Governorate Nutrition Survey Findings, March/April 2013

Indicator	*Eastern Dhamar (N=759)*			*Western Dhamar (N=766)*		
	N	*%*	*95% CI*	*N*	*%*	*95% CI*
I- Child Malnutrition						
Total number of households assessed for children	756	99.6		762	99.5	
Mean household size	7.8			7.3		
Total number of children assessed	943			974		
Child sex: Males (boys)	467	49		480	49	
Females (girls)	476	51		494	51	
Global Acute Malnutrition (WHZ<-2 z-score or oedema)	46	4.9	3.7-6.5	89	9.2	6.8-12.4
Severe Acute Malnutrition (WHZ<-3 z score or oedema)	5	0.5	0.2-1.5	10	1.0	0.6-1.8
Oedema	0	0		0	0	
Chronic Malnutrition (H/A<-2 z score)	583	62.8	57.4-67.8	673	69.5	65.7-73.1
Severe Chronic Malnutrition (H/A<-3 Z score)	277	29.8	24.2-36.1	308	31.8	28.1-35.8
Underweight prevalence (W/A<-2 Z score)	329	35.1	29.7-40.9	441	45.5	41.1-50.0
Severe Underweight (W/A<-3 z score)	83	8.9	6.3-12.2	121	12.5	10.0-15.5
II- Child Morbidity						
Children reported with suspected measles within one month prior to assessment	17	1.8	1.0-2.8	32	3.3	2.2-4.5
Children reported with diarrhoea in 2 weeks prior to assessment	295	31.0	28.0-34.0	343	36.0	32.0-39.0
Children reported with ARI within two weeks prior to assessment	301	32.0	29.0-35.0	369	38.0	35.0-41.0
Children reported with febrile illness in 2 weeks prior to assessment	377	40.0	37.0-43.0	518	53.0	50.0-57.0
III- Immunization and Supplementation Status						
Children aged 9 – 59 months immunised against measles	695	79.0	77.0-82.0	620	71.0	67.0-74.0
Children who have received 3 doses of polio vaccine	712	76.0	73.0-78.0	607	63.0	60.0-66.0
Children reported to have received vitamin A supplementation in last 6 months	799	87.0	85.0-89.0	721	76.0	73.0-79.0
IV- Child Feeding						
Children (6-24 months) reported to be still breastfed	187	57.0	52.0-63.0	205	65.0	60.0-70.0
Children (6-24 months) fed 4 times and above	84	24.0	20.0-28.0	75	24.0	19.0-29.0
V- Salt iodization						
Households consumes adequately iodized salt	160	21.0	18.0-24.0	19	2.6	1.5-3.8
VI- Mortality						
0-5 Death Rate (U5DR) as deaths/10,000/ day	0.0			0.0		
Crude Death Rate (CDR) as deaths/10,000/ day	0.27		0.15-0.48	0.19		0.10-0.35

1.0 INTRODUCTION / BACKGROUND



Dhamar , also spelt Thamar, is a governorate of Yemen located to the south and southeast of Sana'a Governorate, to the north of Ibb Governorate, to the east of Al Hodeida Governorate and to the northwest of Al Bayda Governorate in the central highlands. It has a total areas of 7,586 km^2 (2,929 sq mi). The center of the is about 100 km (62 mi) from Sana'a, of the Republic.

Dhamar is divided among 12 administrative districts (mudiriyyah) and further divided into 314 sub-districts ('uzlah). According to the 2004 census, the governorate contains 1,329,229 people, most of whom live in the governorate's 3,262 villages.

The city of Dhamar is the capital of the governorate and is situated on the main road, which connects Sana'a with a number of other governorates. This city was one of the famous Arabic and Islamic culture and scientific centers in Yemen.

Topography and Climate

The governorate in general lies 1,600–3,200 m (5,200–10,500 ft) above the sea level, with a topographic relief that varies from high mountains to deep valleys, upland plains and plateaus. The most mountain peaks include Isbil, al-Lisi, Duran, the two Wusab mountain ranges, and the 'Utamah mountains. Jahran, in the north central part of the governorate, is its most extensive plain.

The governorate's climate is temperate, although the central and eastern sections of the governorate tend to be cold during the winter, while the valleys and western slopes are warmer. The average temperatures range from 10 to 19 °C (50 to 66 °F) in summer, and from 8 to -1 °C (46 to 30 °F) in winter.

Although no reliable rain gauge exists within the governorate, it is estimates that annual rainfall would range between 400 and 500 millimetres (16 and 20 in) concentrated exclusively in the summer months, especially in July and August but also in March and April. Occasionally, floods can prove disastrous though causing extensive erosion, notably in early April 2006.

Taking advantage of the governorate's topographic diversity – plains, high plateaus, mountain slope valleys – farmers have introduced a diversity of crops, and agriculture became the governorate's principle economic activity. The governorate contains about 28,000 square kilometers of arable land, of which 12,000 square kilometers is currently in cash crops such as corn, wheat and horticultural crops. The governorate also holds about 3,000 square kilometers devoted to growing vegetables and fruits that are marketed to other governorates of Yemen and to neighboring countries.

Dhamar governorate is also well-known of its coffee, in western districts such as Anis, Maghrab 'Ans and 'Utamah which provide the suitable climate for coffee production in commercial quantities however, qat nowadays is competing for such land. Another of the governorate's important activities is herding of sheep and goats; the governorate is famous for Arabian horse breeding.

Socio-political situation

Dhamar Governorate is the important seat for the Zaydi religious sect which has long had a major influence in Yemen. The pre-Islamic kingdoms of Saba', Qataban and Himyar had their capitals within the present area of Dhamar, and the Himyarite kingdom had its capital at Yarim one of the major city at Dhamar. Dhamar city is still famous in Yemen for its numerous historical mosques and schools, which are distinguished by their beautiful characteristic architecture in harmony with the colors of its volcano land.

Poverty and unemployment in Dhamar and elsewhere in Yemen, exacerbated by the current political unrest and by rapid population growth. It is anticipated that by 2034, Dhamar governorate's population will increase to around four million people if the current fertility rate doesn't shift, translating to an increase of more than two million people when compared to numbers from the 2004 census. The health sector would also require significant economic resources in 2034. It would be extremely difficult to improve the current service level with continued population growth at the current fertility rate. Costs for the health sector are projected to be over $43 million, an increase of $25 million compared with 2009[1].

Food insecurity and nutritional status

The 2012 WFP-CFSS[2] reported that 24.1, 22.0, 46.1 per cents are severely, moderately, and "severe and moderate" food insecure in Dhamar governorate respectively. Regarding malnutrition, the 2010 IFPRI National Food Security Paper estimated GAM rate based on HBS 2005-06 data in Dhamar to be 11.2 per cent, with SAM at 3.3 per

[1] Dutch Government. Population, Development and Future Challenges in Dhamar. 2011
[2] WFP. Comprehensive Food Security Survey, Yemen. March 2012 WFP (2012). The State of Food Security and Nutrition in Yemen. Summary and Overview

cent, underweight 46.7 per cent , and stunting 70.1 per cent[3]. The 2012 WFP-CFSS, reported the following prevalence: GAM: 9.8 per cent, SAM: 1.8 per cent, underweight: 36.1per per cent, and stunting: 59.2 per cent. According to Nutrition cluster strategy 2012/Yemen[4], Dhamar fall within the poor zone (GAM from 5 – 9.9%).

Health services and health situation

In Dhamar, public health services are provided through a public network of two governorate hospitals, 10 district hospitals, 53 Health Centres, and 205 Health Units which staffed with 175 doctors and 380 nurses, and 156 midwives. Regarding the private health services, it is mainly concentrated in the main cities where there are five private hospitals and 20 health centres that mainly provide curative services.

The main reported diseases in 2009 are ARI (61,409) , diarrhea/dysentery (37,339) and malaria (22,834). Schistosomiasis, hepatitis, TB, and Non communicable diseases also important health problems. During 2009, 4299 cases of malnutrition were reported.

2.0 ASSESSMENT OBJECTIVES

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

Specific objectives were:

To estimate the level of acute malnutrition (wasting), stunting and underweight among children aged 6-59 months in the Eastern and Western districts of Dhamar Governorate.

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

[3] MoPIC and IFPRI. National Food Security Strategy Paper (NFSSP). Final Draft, February 2010
[4] Nutrition cluster strategy 2012/ Yemen

3.0 METHODOLOGY

3.1: Sampling Design and Sample Size Determination

Two cross-sectional surveys were conducted between 23rd March to 3rd April, 2013 in the Dhamar Governorate's Eastern and Western districts. Using a two-stage Probability Proportionate to Population Size (PPS) sampling methodology, 36 clusters in each of the Eastern and Western Dhamar were randomly selected for both anthropometric and mortality assessments. The cluster sampling methodology was selected in view of lack of an exhaustive updated list of household details and accurate demographic characteristic by village; only population estimate at village level was available. The total estimated population in the Eastern Dhamar was 1,025,131 while the total estimated population in the Western Dhamar was 661,415 (Ref: Annexes 9 and 10: Sampling Frame: Source: CSO Projection, 2012).

Table 2: Parameters used in the Sample Size Determination

Parameters	Eastern Dhamar	Western Dhamar
Estimated Acute Malnutrition Prevalence (%)	**14.7**	**14.7**
Desired Precision (%)	**3.0**	**3.0**
Design Effect[5]	**1.5**	**1.5**
Average Household Size[6]	**7.5**	**6.5**
Under 5 year old (%)[7]	**22.1**	**22.1**
Non response household (%)[8]	**3**	**3**
Sample Size (N)	**604**	**697**

From the 12 Dhamar's districts, eight districts were put in the Eastern stratum; they are: Al Hada, Al Manar, Anns, Jaharn, Dahmar city, Maghirib Ans, Mayfa'at Anss, and Dawran districts. The remaining four districts were put in the Western stratum: Wusab Al Ali, Wusab As Safil, Jabal Ash sharq, Utmah districts.

The calculated sample sizes in the Eastern and Western Dhamar using ENA for SMART software were 604 and 697 households respectively. The calculated sample for death estimation purpose using parameters of estimated death of 0.16 per 10000 per day and desired precision of 0.15 per 10000 per day in a recall period of 90 days resulted in a sample size of 681 and 835 households in each Eastern and Western Dhamar respectively.

Based on this, it was decided that 17 per cluster per day could be visited in the Eastern Dhamar for assessing the anthropometry and 20 per cluster per day mortality; while considering the time needed to travel daily due to the challenging terrain in the Western Dhamar, it was estimated that a team could visit a maximum of 19 households per cluster per day for anthropometry but continue to complete 24 households for mortality.

[6] Calculated on basis of Central Statistics office data of population versus households
[7] Estimated on basis of MoH reports and immunization statistics
[8] Non-response rate of 3% was estimated in case the teams encounter refusal, security-related inaccessibility or absence.

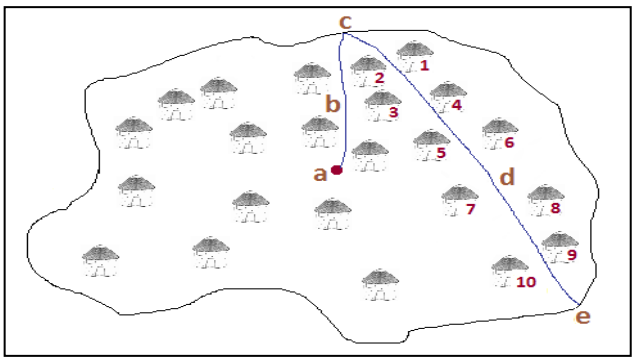
3.2: Sampling Procedure

The ENA for SMART software was used in the random selection of the 36 clusters from the sampling frame, including identification of the reserve clusters. The sampling frame consisted of an exhaustive list of villages or urban area sections known to be accessible within Dhamar Governorate and the estimated population size for each of the villages. Independent sampling frames for Eastern and Western Dhamar were used in this selection process (Ref: Sampling frames in Annexes 9 and 10). In this case, all villages in Dhamar Governorate were accessible and were included in the sampling frame, thus giving them an equal chance of being selected.

All the 36 clusters randomly selected from the sampling frames for the Eastern and Western Dhamar were accessible and were assessed, hence the reserve clusters were not assessed in the two surveys. Upon reaching the cluster/ villages, the survey teams, with the help of an elder or a village guide, requested the village residents' permission to assess the areas. The purpose of the survey was explained and the 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/ village, where they had to spin a pen to randomly select the direction to take to the edge/periphery of the village. The team walked to the edge of the cluster/ village. From the edge of the village, the team had to spin the pen again aiming to randomly get a direction to follow to the other extreme edge of the village. In case the pen pointed towards outside of the village, the teams were to spin the pen multiple times till the pen pointed to any of the directions towards the village. 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.

In case the team assessed all households to the edge of the village 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 Dhamar Governorate as defined based on the two types of districts– the Eastern and Western districts.

The activities undertaken in the entire survey period are summarised. Data collection preparation commenced with a four-day training of enumerators, team leaders and supervisors (Ref: Annex 3: Dhamar 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. Seven 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: Dhamar Nutrition Survey Questionnaire and Annex 2: Dhamar Mortality Survey Questionnaire). Only children aged 6-59 month were included in the measurement of height, weight and MUAC. 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: Annex 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.

3.4: Measurement Standardization and Quality Control

Seven survey teams (one team as a reserve) underwent rigorous standardisation test procedures using 10 children aged 6 - 59 months. This exercise was conducted at training place in the in Dhamar 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: Dhamar 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 Khurba Afik village

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 11: 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 ENA 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 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 into the individual level sheet of ENA software and analysed immediately.

3.6: Data Entry Verification and Cleaning

Four team 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 3 below, the gender of household head in Dhamar is largely male (97 per cent). The majority (93 per cent and 89 per cent) of household heads are married and living with partner in the Eastern and the Western Dhamar respectively. Those who are married but living far from spouse for ≥ 6 months is higher in the Western Dhamar than the Eastern Dhamar: 7% and 3% respectively, which may indicate more internal and external immigration in the Western Dhamar. Illiteracy is very high among caretakers in both zones but much higher in the Western (87%) compared to the Eastern (74%) Dhamar. Similarly, the percentage of highly educated caretakers is much lower in the Western than the Eastern Dhamar: 0.3% vs. 2.0% respectively.

The main two sources of income in the Eastern Dhamar is the fixed monthly wage and casual labour[9] (29% each), compared to casual labor (45%) and fixed monthly wage (14%) in the Western Dhamar. Qat cultivation and trade is important source of income in the Eastern compared to the Western Dhamar (20% vs. 8% respectively) while crops other than Qat is not an important source of income in both parts of Dhamar (around 6%).

Regarding drinking water (see Table 3), while the main source for households in the Eastern Dhamar is house-connected piped water (41%) compared to only 2% in the Western Dhamar. Instead, water from protected open well is the main source in Western Dhamar as well as the second source in Eastern Dhamar (31% and 32% respectively). Furthermore, while water from unprotected open well and from protected spring is important sources in Western Dhamar is 11% and 9%, it is only 1% and 0.5% in Eastern Dhamar respectively.

As shown in Table 3, 88% of households in the Eastern Dhamar is having flush or pour flush latrine compared to only 58% in the Western Dhamar. Similarly, more households in the Western Dhamar reported defecation in open compared to the Eastern Dhamar (26% vs. 8%) which is also reflecting the urban predominance in the Eastern districts compared to purely rural residence in the Western Dhamar.

Only 3.0 per cent of households in Western compared to 21.0% in Eastern Dhamar are using adequately iodized salt. Another 28% and 34% respectively are using iodized salt but not adequately iodized.

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

Table 3: Household Characteristics

Indicator	*Eastern Dhamar*		*Western Dhamar*	
	N	*%*	*N*	*%*
Household members				
Total Households	756		762	
Mean household size	7.8		7.3	
Mean No of Under-five	1.4		1.4	
Sex of Household Head:				
Male	730	97.0	739	97.0
Female	26	3.0	23	3.0
Marital status of household head:				
1. Married and living with spouse	700	93.0	675	89.0
2. Married but living far from spouse for ≥ 6 months	21	3.0	52	7.0
3. Widowed	21	3.0	23	3.0
4. Single	8	1.0	9	1.0
5. Recalcitrant	4	0.5	2	0.3
6. Divorced	2	0.3	1	0.1
Education level of household caretaker:				
1. Illiterate	563	74.0	660	87.0
2. Read and write	134	18.0	70	9.0
3. Basic education	24	3.0	22	3.0
4. Secondary education	21	3.0	8	1.0
5. Higher education	13	2.0	2	0.3
Main Source of Income:				
1. Fixed monthly waged work	222	29.0	110	14.0
2. Temporary work/ Casual labour	221	29.0	340	45.0
3. Remittance	51	7.0	69	9.0
4. *Qat* cultivation and trade	150	20.0	62	8.0
5. Crops other than *Qat*	43	6.0	53	7.0
6. Handmade work	23	3.0	51	7.0
7. Trade	20	3.0	37	5
8. Donations	10	1.0	21	3.0
9.Social insurance	4	0.5	9	1.0
10. Animal and Animal products	9	1.0	8	1.0
11. Others	3	0.5	2	0.3
Main water source for drinking:				
1. House-connected piped water	308	41.0	14	2.0
2. House-connected yard piped water	56	7.0	58	8.0
3. Water from protected open well	244	32.0	233	31.0
4. Unprotected surface water (wadi, springs, etc.)	75	10.0	127	17.0
5. Water tanker	57	8.0	25	3.0
6. Water from unprotected open well	10	1.0	84	11.0
7. Water from protected spring	4	0.5	72	9.0
8. Water from covered rainwater harvesting tank	1	0.1	107	14.0
9. Water from uncovered rainwater harvesting tank	0	0.0	39	5.0
10. Other	1	0.1	3	0.4
Household latrine type:				
1. Flush/pour flush latrine	664	88.0	438	58.0
2. Open pit latrine	6	1.0	90	12.0
3. Simple covered pit latrine	26	3.0	32	4.0
4. Defecation in open (in fields, etc.)	60	8.0	198	26.0
Salt type used				
1. Non iodized salt	335	45.0	509	69.0
2. Inadequately iodized salt (below 15 ppm)	257	34.0	206	28.0
3. Adequately iodized salt (15 ppm and above)	160	21.0	19	3.0

4.2: Morbidity, Immunization Status and Health Seeking Behaviour

Overall, although high prevalence of common diseases was recorded in both the Eastern and the Western Dhamar, the prevalence of all morbidities is much higher in the Western Dhamar (Table 4). For example, the prevalence of diarrhoea during the two weeks prior to the survey recorded among children is 31% and 36% in the Eastern and the Western Dhamar respectively. Similarly, 40% of children were having fever during the two weeks prior to the survey compared to 53% respectively.

Suspected measles[10] during the last month was also higher in the Western Dhamar (3.3%) compared to only 1.8 % in the Eastern Dhamar.

As shown in Table 4, only 63.0% of children have been vaccinated with the third dose of polio in the Western Dhamar compared to 76.0 % in the Eastern Dhamar. Also, higher measles vaccination coverage (79.0 %) was found among children aged 9 months to below 60 months in the Eastern Dhamar compared to only 71.0 % in the Western Dhamar.

Vitamin A supplementation during the previous 6 months was also higher in the Eastern than the Western Dhamar (87.0% vs. 76.0%) respectively.

Very few children slept under a mosquito net the night before the survey however, the percentage is higher in the Western (15%) than the Eastern (3%) Dhamar which may goes with the malaria endemicity.

As shown in Table 4, the majority of households in the Eastern and the Western Dhamar are using public health services (85% and 82% respectively), compared to only 11% and 13% respectively are using private services. Only one per cent does not seek medical assistance during illness in both Eastern and Western Dhamar. Only one per cent seek traditional medication in the Western Dhamar compared to none in the Eastern Dhamar. While the main reason for not seeking medical care in the Western Dhamar is the far distance (64%) followed by high cost (29%), the main reason at the Eastern Dhamar is the high cost (48%) followed by far distance (38%). The rest mainly due to poor service quality or lack of time.

Table 4: Health Seeking Behaviour

Indicator	*Eastern Dhamar*		*Western Dhamar*	
	N	*%*	*N*	*%*
Morbidity				
Children with diarrhoea within 2 weeks prior to assessment	295	31.0	343	36.0
Children with ARI within two weeks prior to assessment	301	32.0	369	38.0
Children with fever within two weeks prior to assessment	377	40.0	518	53.0
Suspected measles within one month prior to assessment	17	1.8	32	3.3

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

Indicator	*Eastern Dhamar*		*Western Dhamar*	
	N	*%*	*N*	*%*
Immunization				
Children (9-59 months) immunised against measles	695	79.0	620	71.0
Children who have received 3 doses of polio vaccine	712	76.0	607	63.0
Vitamin ***A Supplementation***				
Children who received vitamin A supplementation in last 6 months	799	87.0	721	76.0
Sleeping under mosquito net				
Children slept under mosquito net last night	28	3.0	147	15.0
Where health service is sought				
Public health facility	644	85.0	622	82.0
Private clinic	86	11.0	95	13.0
Pharmacy	15	2.0	18	2.0
Personal medication	5	1.0	9	1.0
Do not seek medical assistance	5	1.0	10	1.0
Traditional medication	0	0.0	8	1.0

4.3: Feeding Practices

Table 5: Feeding practices for of children aged 6 to 24 months

Indicator	*Eastern Dhamar*		*Western Dhamar*	
	N	*%*	*N*	*%*
Still breastfed	187	57.0	205	65.0
Number of feeds (other than breastfeeds)				
No feed	5	1.0	15	5.0
One feed	11	3.0	8	3.0
Two feeds	39	11.0	37	12.0
Three feeds	206	60.0	178	57.0
Feeding 4 times and above	84	25.0	75	24.0
Number of milk feeds (other than breast milk)				
No milk feed	158	46.0	121	41.0
One milk feed	27	8.0	22	8.0
More than one milk feed	156	46.0	149	51.0

Inappropriate infant and young child feeding practice was recorded in Dhamar. As shown in Table 5, only slightly more than half of children aged 6 to 24 months are continuing breast-feeding in the Eastern Dhamar compared to around two thirds In the Western Dhamar.

Only around one out of four children in the Eastern and Western Dhamar had four and above feeds other than breastfeeding in the previous day. Furthermore, only around half of children over 6 months of age was given more than one milk feed (other than breast milk) in the previous day to the survey.

4.4: WASH

Households' caretakers WASH practices were assessed where both the Eastern and Western Dhamar found to be having poor WASH practices (Table 6) but generally poorer in Western areas. For example 62%, 41% and 35% of caretakers are washing hands with soap after toilet, before meal, and before cooking in the Eastern Dhamar compared to only 47%, 33% and 25% in the Western Dhamar. Likewise, 10% and 20% are washing hands before feeding child and after disposal of child's faces in the Eastern compared to 11% and 17% in the Western Dhamar.

Furthermore, on observation, the availability of soap at hand washing facility was much higher in the Eastern than the Western Dhamar (94% vs.75%) respectively. Similarly, clean water container (no algae seen) is higher in the Eastern than the Western Dhamar (83% vs. 59%) respectively.

Table 6: WASH practices

Indicator	*Eastern Dhamar*		*Western Dhamar*	
	N	*%*	*N*	*%*
1. Hand washing after toilet	472	62.0	355	47.0
2. Hand washing before meal	310	41.0	254	33.0
3. Hand washing After meal	445	59.0	339	45.0
4. Hand washing before cooking	264	35.0	188	25.0
5. Hand washing before feeding child	78	10.0	87	11.0
6. Hand washing after disposal of child's faces	148	20.0	126	17.0
7. Hand washing after cleaning livestock's place	99	13.0	189	25.0
8. Availability of water at hand Washing facility	755	100	748	98.0
9. Availability of soap at hand Washing facility	711	94.0	569	75.0
10. Availability of ash/leaves/sand at hand Washing facility	4	1.0	9	1.0
11. Water container clean (no algae seen)	622	83.0	446	59.0

4.5: Food insecurity

Three parameters to assess food accessibility and two parameters to assess coping strategies were used in this survey in which all were measuring the practice 30 days prior to the survey. The Western Dhamar households are having much more difficulty in accessing food than the Eastern Dhamar. While 20 per cent and 18 per cent of the households in the Western Dhamar reported reducing meals' size and meals' number respectively only 4 per cent and 3 per cent in the Eastern Dhamar were. Similarly in the Western Dhamar 17 per cent of households have members experienced to go to the bed hungry compared to only 4.0 per cent in the Eastern Dhamar. Regarding coping strategies, in the Western Dhamar 36 per cent of the households borrow food/ money to purchase food or purchase food in credit and 24 per cent reduced expenditures of education and/or health compared to 17 per cent for both indicators in the Eastern Dhamar.

In the Eastern Dhamar 80 per cent of households mentioned none of the above parameters (compared to only 57% in Western Dhamar), 12 per cent mentioned one parameter (compared to 15 per cent in the Western Dhamar), 6 per cent mentioned two parameters (compared to 9 per cent in the Western Dhamar), one per cent mentioned three parameters (compared to 4 per cent in the Western Dhamar), one per cent mentioned four parameters (compared to 3 per cent in the Western Dhamar), and one per cent mentioned all of the five parameters (compared to 11 per cent in the Western Dhamar).

A composite score for the five food insecurity indicators was developed and shows higher mean in the Western than the Eastern Dhamar (1.2 vs. 0.4) respectively.

Table 7: Food insecurity

Indicator (Over the past 30 days)	*Eastern Dhamar*		*Western Dhamar*	
	N	*%*	*N*	*%*
1. reduce the size of meals because of the scarcity of resources	32	4.0	152	20.0
2. reduce the number of meals because of the scarcity of resources?	23	3.0	137	18.0
3. did you or any HH member go the bed in night hungry because of not enough food?	29	4.0	129	17.0
4. did the HH borrow food, borrow money to purchase food or purchase food in credit or mortgage only if the reason that HH has not money?	129	17.0	276	36.0
5. did the HH reduce the expenditure on education or health to save money to purchase food?	51	17.0	183	24.0

4.6: Characteristics of the children assessed

Table 8: Eastern Dhamar: Age and Sex distribution

Indicator	*Boys*		*Girls*		*Total*		*Ratio*
AGE (months)	*no.*	*%*	*no.*	*%*	*no.*	*%*	*Boy: girl*
6-17	122	53.3	107	46.7	229	24.3	1.1
18-29	111	48.9	116	51.1	227	24.1	1.0
30-41	109	49.3	112	50.7	221	23.4	1.0
42-53	88	46.6	101	53.4	189	20.0	0.9
54-59	37	48.1	40	51.9	77	8.2	0.9
Total	467	49.5	476	50.5	943	100.0	1.0

Table 9: Western Dhamar: Age and Sex distribution

Indicator	*Boys*		*Girls*		*Total*		*Ratio*
AGE (months)	*no.*	*%*	*no.*	*%*	*no.*	*%*	*Boy: girl*
6-17	102	47.7	112	52.3	214	22.0	0.9
18-29	127	48.8	133	51.2	260	26.7	1.0
30-41	101	47.0	114	53.0	215	22.1	0.9
42-53	116	56.0	91	44.0	207	21.3	1.3
54-59	34	43.6	44	56.4	78	8.0	0.8
Total	480	49.3	494	50.7	974	100.0	1.0

Generally there were nearly equal numbers of boys and girls assessed in the Eastern and the Western Dhamar (overall ratio of 1), implying representativeness of the sample collected during the survey, as shown in Tables 9 & 10.

Regarding the age ratio of 6-29 months to 30-59 months (that should be around 1.0), it was found to be 0.94 and 0.95 in the Eastern and the Western Dhamar respectively.

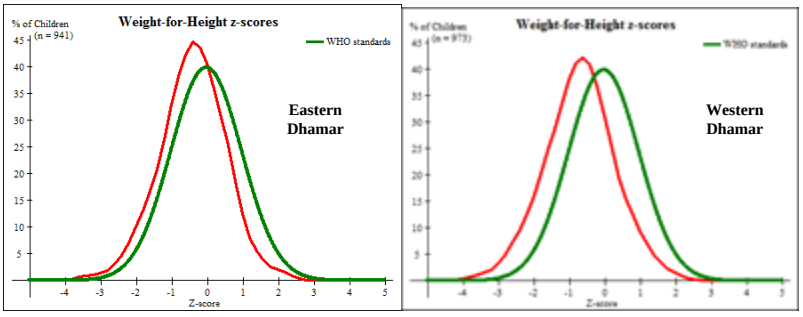
However, the overall sex/age distribution in both Eastern and Western Dhamar significantly differ ($p < 0.05$) which means that the boys and girls are not equally represented according to age groups.

4.7: Nutrition Status

Below is a summary of the anthropometric results for both the Eastern and the Western Dhamar. Data quality was validated using the plausibility check function of the SMART for ENA software. For the Eastern Dhamar the data quality was excellent (plausibility data quality scores of 4) and for the Western Dhamar it was acceptable (plausibility data quality score of 11) (see Annex 13). The interpretation was made based on the 2006 WHO Growth Standards.

4.6.1: Acute Malnutrition Rates

The graph shows that there is an overall shift of the study population to the left (especially for the Western Dhamar) when compared with the reference population, which is implying presence of malnutrition.



The level of wasting – also known as (GAM) – found in the Western Dhamar is **9.2 per cent,** compared to only **4.9 per cent** in the Eastern Dhamar as shown in Tables 11 & 12 (including the confidence intervals).

Furthermore, the SAM prevalence found to be 0.5 and 1.0 in the Eastern and Western Dhamar respectively.

Table 10: Eastern Dhamar: Prevalence of acute malnutrition based on weight-for-height z-scores (and/or oedema) and by sex

Indicator	*All n = 938*			*Boys n = 462*			*Girls n = 476*		
	N	*%*	*95% CI*	*N*	*%*	*95% CI*	*N*	*%*	*95% CI*
Prevalence of global acute malnutrition (<-2 z-score and/or oedema*)	46	4.9	3.7 - 6.5	23	5.0	3.2 - 7.7	23	4.8	2.9 - 8.0
Prevalence of moderate acute malnutrition (<-2 z-score and >=-3 z-score	41	4.4	3.2 - 6.0	20	4.3	2.7 - 7.0	21	4.4	2.6 - 7.5
Prevalence of severe acute malnutrition (<-3 z-score and/or oedema*)	5	0.5	0.2 - 1.5	3	0.6	0.1 - 2.8	2	0.4	0.1 - 1.7

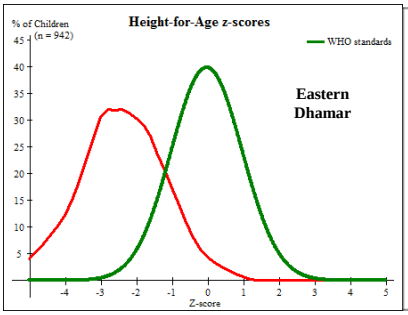
Table 11: Western Dhamar : Prevalence of acute malnutrition based on weight-for-height z-scores (and/or oedema) and by sex

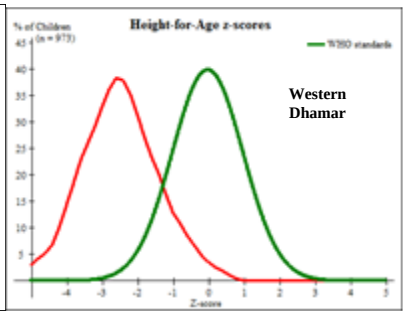
Indicator	*All n = 967*			*Boys n = 476*			*Girls n = 491*		
	N	*%*	*95% CI*	*N*	*%*	*95% CI*	*N*	*%*	*95% CI*
Prevalence of global Acute malnutrition (<-2 z-score and/or oedema*)	89	9.2	6.8 - 12.4	53	11.1	7.5 - 16.1	36	7.3	5.2 - 10.3
Prevalence of moderate malnutrition (<-2 z-score and >=-3 z-score	79	8.2	5.7 - 11.5	48	10.1	6.5 - 15.4	31	6.3	4.2 - 9.3
Prevalence of severe malnutrition (<-3 z-score and/or oedema*)	10	1.0	0.6 - 1.8	5	1.1	0.5 - 2.4	5	1.0	0.4 - 2.4

*The prevalence of oedema is 0.0 per cent

The prevalence of acute malnutrition based on the NCHS reference is reflected in the summary Table 16 below.

4.6.2: Chronic Malnutrition Rates





There is also an overall shift to the left of the study population deviating from the reference population as the graphs shown (implying presence of chronic malnutrition). Global stunting is higher in the Western than Eastern Dhamar (69.5 vs. 62.8 per cent). The prevalence of severe stunting is only slightly higher in the Western Dhamar (31.8 vs. 29.8 per cent). The details of the stunting rates are as shown in the tables 13 & 14 below.

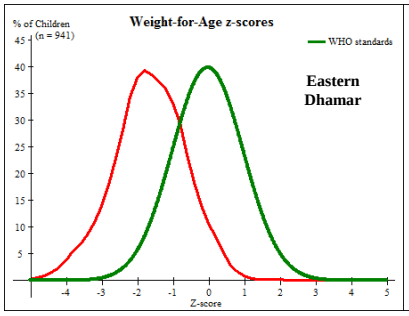
Table 12: Eastern Dhamar: Prevalence of stunting based on height-for-age z-scores and by sex

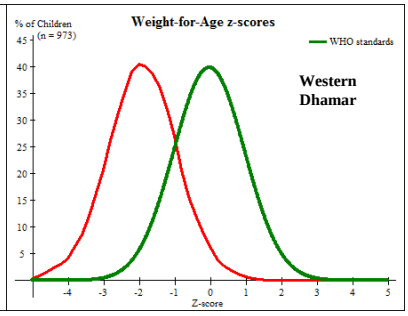
Indicator	*All n =929*			*Boys n =457*			*Girls n =472*		
	N	*%*	*95% CI*	*N*	*%*	*95% CI*	*N*	*%*	*95% CI*
Prevalence of stunting (H/A<-2 z-score)	583	62.8	57.4 - 67.8	294	64.3	58.2 - 70.0	289	61.2	54.8 - 67.3
Prevalence of moderate stunting (<-2 z-score and >=-3 z-score)	306	32.9	29.8 - 36.3	140	30.6	26.0 - 35.7	166	35.2	31.4 - 39.2
Prevalence of severe stunting (H/A<-3 z-score)	277	29.8	24.2 - 36.1	154	33.7	26.4 - 41.9	123	26.1	20.9 - 31.9

Table 13: Western Dhamar : Prevalence of stunting based on height-for-age z-scores and by sex

Indicator	*All n = 968*			*Boys n = 477*			*Girls n = 491*		
	N	*%*	*95% CI*	*N*	*%*	*95% CI*	*N*	*%*	*95% CI*
Prevalence of stunting (H/A<-2 z-score)	673	69.5	65.7 - 73.1	340	71.3	66.2 - 75.9	333	67.8	62.6 - 72.6
Prevalence of moderate stunting (<-2 z-score and >=-3 z-score)	365	37.7	35.3 - 40.1	178	37.3	33.1 - 41.7	187	38.1	34.7 - 41.6
Prevalence of severe stunting (H/A<-3 z-score)	308	31.8	28.1 - 35.8	162	34.0	30.1 - 38.1	146	29.2	25.2 - 34.7

4.6.3: Underweight Rates





Regarding underweight, an overall shift of the study population from the reference is shown in the graphs, implying presence of underweight.

Underweight and severe underweight prevalence are higher in Western than Eastern Dhamar: 45.5 &12.5 vs. 35.1 & 8.9 per cent respectively. The details of the underweight rates are as shown in the tables 15 & 16 below.

Table 14: Eastern Dhamar: Prevalence of underweight based on weight-for-age z-scores by sex

Indicator	*All n =937*			*Boys n = 461*			*Girls n =476*		
	N	*%*	*95% CI*	*N*	*%*	*95% CI*	*N*	*%*	*95% CI*
Prevalence of underweight (<-2 z-score)	329	35.1	29.7 - 40.9	174	37.7	30.3 - 45.8	155	32.6	26.5 - 39.3
Prevalence of moderate underweight (<-2 z-score and >=-3 z-score)	246	26.3	22.8 - 30.1	128	27.8	22.7 - 33.4	118	24.8	20.4 - 29.8
Prevalence of severe underweight (<-3 z-score)	83	8.9	6.3 - 12.2	46	10.0	6.7 - 14.7	37	7.8	5.0 - 11.9

Table 15: Western Dhamar: Prevalence of underweight based on weight-for-age z-scores by sex

Indicator	*All n =969*			*Boys n = 478*			*Girls n =491*		
	N	*%*	*95% CI*	*N*	*%*	*95% CI*	*N*	*%*	*95% CI*
Prevalence of underweight (<-2 z-score)	441	45.5	41.1 - 50.0	235	49.2	43.7 - 54.7	206	42.0	36.9 - 47.1
Prevalence of moderate underweight (<-2 z-score and >=-3 z-score)	320	33.0	29.2 - 37.1	169	35.4	30.6 - 40.4	151	30.8	26.1 - 35.8
Prevalence of severe underweight (<-3 z-score)	121	12.5	10.0 - 15.5	66	13.8	10.6 - 17.8	55	11.2	8.0 - 15.4

The following table (Table 16) summarizes the Malnutrition rates in both the Eastern and Western Dhamar. It also gives the prevalence of acute malnutrition based on the NCHS reference.

Table 16: Summary of Malnutrition Rates by type of districts

Indicator	*Eastern Dhamar*			*Western Dhamar*		
	N	*%*	*95% CI*	*n*	*%*	*95% CI*
Global Acute Malnutrition (WHZ<-2 or oedema)	46	4.9	3.7-6.5	89	9.2	6.8-12.4
Severe Acute Malnutrition (WHZ<-3 or oedema)	5	0.5	0.2-1.5	10	1.0	0.6-1.8
Oedema						
Global Acute Malnutrition (WHM<80% or oedema)*	21	2.2	1.3 - 3.7	50	5.1	3.9 - 6.8
Severe Acute Malnutrition (WHM<70% or oedema)*	0	0.0		0	0.0	
Stunting rate (HAZ<-2 z score)	583	62.8	57.4-67.8	673	69.5	65.7-73.1
Severe stunting rate (HAZ <3 z score)	277	29.8	24.2-36.1	308	31.8	28.1-35.8
Underweight Rates (WAZ<-2 z score)	329	35.1	29.7-40.9	441	45.5	41.1-50.0
Underweight rate (WAZ_-3 z score)	83	8.9	6.3-12.2	121	12.5	10.0-15.5

* NCHS reference is used.

4.8: Mortality

Table 17: Mortality data

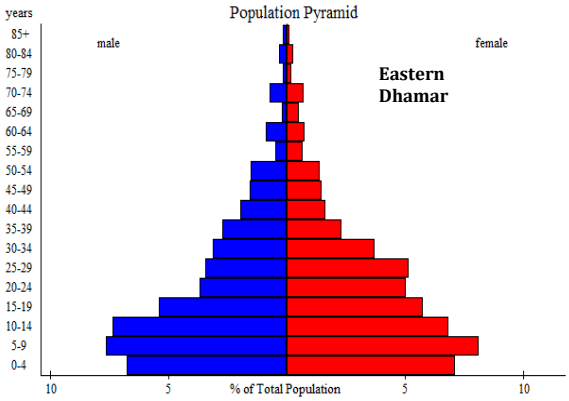
Indicator	*Eastern Dhamar*		*Western Dhamar*	
	U5	*Total*	*U5*	*Total*
Total HHs surveyed	-	759	-	766
Total Population assessed in HHs	881	6442	966	6916
Number who joined the HHs	53	545	25	336
Number who left the HHs	57	722	50	762
Number of births	-	0	-	0
Number of deaths	0	14	0	9
Mortality rate (per 10,000 per day)				
Under-five	0		0	
Crude	0.27		0.19	

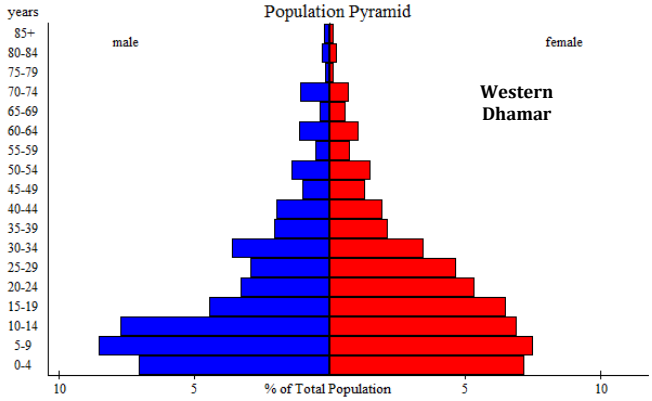
Table 17 shows that there is no under-five mortality in both the Eastern and Western Dhamar. The crude death rate is slightly higher in the Eastern than Western Dhamar (0.27 and 0.19 respectively). While in Eastern Dhamar, the crude death rate is higher among females than males (0.33 vs. 0.21), in the Western Dhamar it is higher among males (0.25 vs. 0.12) respectively.

Overall these rates are low and within the acceptable levels according to WHO categorisation, hence not raising major concern.

4.9: Population Pyramid

Information about household members during the previous 90 days was collected. The resulting population pyramid for each zone is shown below. The pyramid is a stage one (expanding) population pyramid where there is high birth rate; high death rate, and short life expectancy. The population distribution shows almost equal number of the men and women (0.9 : 1) both in the eastern and Western Dhamar.





5. Discussion

5.1 Malnutrition

The levels of acute malnutrition in Dhamar were found to be less than predicted based on data collected from Hodeidah and Taiz. However, it is similar to the pattern that found in neighbouring Ibb that shows more predominant chronic malnutrition (as reflected by extremely high stunting rates) but less severe acute malnutrition (especially in Eastern Dhamar). This may interpreted as an indication of poor environmental conditions or long-term restriction of a child's growth potential together with chronic food insecurity and poverty.

According to the WHO categorization of the malnutrition severity, current GAM rate from Western Dhamar (which is 9.2%) fits with the upper limit of cut-off values for "poor" i.e. 5-9.9%' while the current GAM rate for Eastern Dhamar (which is 4.9%) fits with the upper limit of cut-off values for "acceptable" i.e.<5%.

The Western Dhamar shows higher prevalence of GAM and SAM than Eastern Dhamar, but the difference in GAM rates is only statistically significantly (9.2 vs. 4.9, X^2: 13.4, P: <0.0001, df 1). Compared to the national figures, the Eastern and Western Dhamar GAM rates are less than the 12.3 per cent national level of the 2003 Family Health Survey, the 2010 IFPRI estimation based on the 2005-06 HBS of 15.7, and the recent 2012 WFP-CFSS estimates of 13.0. Nevertheless, the higher current GAM rate in the Western Dhamar (9.2%) is still lower than the Dhamar 2010 IFPRI estimation of 11.2 but nearly similar to the 2012 WFP Dhamar GAM rate of 9.8 per cent.

Regarding SAM rates, even the highest current SAM figures of 1.0 for the Western Dhamar is much less than the 3.0 per cent national level of the 2003 Family Health Survey and the 3.3% Dhamar 2010 IFPRI estimation based on the 2005-06 HBS but slightly lower than the 2012 WFP-CFSS recent estimates for Dhamar governorate of 1.8 per cent.

The stunting rate is significantly higher in the Western than Eastern Dhamar: 69.5 vs. 62.8, X^2 9.7, P value <0.01, df 1. Such stunting prevalence is much higher than the estimated national stunting levels of 58 per cent (as per 2003 PAPFAM survey), the 2010 IFPRI estimation based on the 2005-06 HBS of 55.7, and the recent WFP-CFSS estimates of 46.6 per cent as well as the recent WFP-CFSS stunting rate of 59.2 for Dhamar. However, it is lower than the 2010 IFPRI stunting estimates for Dhamar Governorate of 70.1 per cent. The current stunting rates in both the Eastern and the Western Dhamar are beyond the critical levels of 40 per cent; thus the Dhamar stunting rates are of great concern. Regarding severe stunting, the current prevalence of 31.8 and 29.8 per cent for Western and Eastern Dhamar respectively is higher than the national figures of 21.7 per cent but similar to the 2102 WFP-CFSS rate for Dhamar which 31.3 per cent.

Regarding underweight, which is a composite variable for acute and chronic malnutrition levels in a population, it is significantly higher in the Western than the Eastern Dhamar: 45.5 vs. 35.1, X^2 21.4, P value <0.0001, df 1. While the Eastern Dhamar current rates are similar to the recent WFP-CFSS estimated national figure of 35.5 and the 2012 WFP-CFSS Dhamar Governorate figure of 36.1, the Western Dhamar current underweight rate of 45.5 is much higher than both national and Dhamar recent WFP-CFSS figures. The current underweight rates in both Eastern and Western Dhamar are beyond the critical levels of 30 per cent; thus the Dhamar underweight rates are of great concern. Regarding the severe underweight, the current Western Dhamar prevalence of 12.5 per cent (which is higher than Eastern Dhamar prevalence of 8.9 per cent) is similar to the 2102 WFP-CFSS national figure of 12.6 but lower than the 2010 IFPRI estimates for Dhamar of 16.1 and the 2102 WFP-CFSS Dhamar underweight rate of 13.6 per cent.

In a view of such very high chronic malnutrition found in this survey with less severer acute malnutrition –especially in Eastern Dhamar- but with the risks to health may be similar to many acute emergencies, short-term emergency responses alone are not enough to address such long-term problems. Such trends reflects the cumulative effects of undernutrition and infections since and even before birth and should be interpreted as an indication of poor environmental conditions or long-term restriction of a child's growth potential as well as chronic food insecurity and poverty.

Although both GAM and SAM are higher in rural than urban areas (6.7% vs. 3.9% and 0.6 vs. 0.0 respectively) the differences are not statically significant may due to small numbers. However, stunting and underweight differ significantly between the rural and urban areas: 68.1% vs. 50.5%, X^2 12.3, P <0.0001, df 1, and 40.1% vs. 21.4%, X^2 13.8, P <0.0001, df 1 respectively. Such significant differences may signifies chronic food insecurity in the rural areas and confirms pervious findings that the food insecurity is a rural phenomenon which is also found in this survey (see 5.7 food security).

Comparable to the findings from previous nutritional surveys (e.g. Hodeidah, Hajjah), all types of malnutrition found to be higher among males than females, however such difference is only statistically significant for underweight (43.6% vs. 37.3%, X^2 7.7, P<0.01, df 1).

Wasting, stunting and underweight (but not GAM or SAM) found also to be higher among children aged 36 months and above than younger group however, this is only statistically significant with stunting (70.3% vs. 63.5%, X^2 9.3, P<0.01, df 1) and underweight (43.8% vs. 38.2%, X^2 5.9, P<0.05). Such trend (that was observed in previous surveys) may be related to some child rearing practices e.g. weaning.

5.2 Child Feeding

Among children aged 6 to 24 months in Dhamar, only 61 per cent still breastfed. This found to be significantly higher in the Western than Eastern Dhamar (57 % vs. 65%, X^2 4.0, P<0.05, df 1) but does not differ by urban/rural residence. Breastfeeding also

found to be significantly higher among males than females (65 % vs. 57%, X^2 5.2, P<0.05, df 1). Regarding malnutrition and still breastfed, there is only significantly higher prevalence of underweight among those who are still breastfed compared to those who have ceased breastfeeding (41 % vs. 31%, X^2 7.7, P<0.01, df 1) which may be due overreliance on breastfeeding with poor complementary feeding.

A significant proportion of children (76 per cent) do not receive the recommended number of meals (4 meals and above), as per UN-FAO recommendations. However, this does not differ between the Eastern and the Western Dhamar, urban/rural residence, or by gender. Furthermore, the recommended number of meals shows no effect on levels of wasting, stunting, and underweight.

Among children aged 6 to 24 months, less than half received more than one milk feed in the last 24 hours. The number of feeds (other than breastfeeds) does not differ between the Eastern and the Western Dhamar, urban and rural, or gender. Although the children who have received more than one milk feed in the last 24 hours shows lower prevalence of wasting, stunting, and underweight, the difference was not statistically significant.

5.3 Vitamin A Supplementation

It is notable that the vitamin A supplementation 6 months prior to the survey in the Dhamar, which is 81%, is still lower than the recommended 95 per cent coverage Sphere Standards, 2011. Such coverage significantly higher in the Eastern than the Western Dhamar (87.0% vs. 76.0%, X^2 21.8, P < 0.0001, df 1), and in urban than rural residence (93.0% vs. 83.0%, X^2 6.5, P < 0.05, df 1). No association was found between vitamin A supplementation and gender, and malnutrition.

Vitamin A supplementation found to be highly significantly associated with lower prevalence of measles (1.8% vs. 6.4%, X^2 23.2, P < 0.0001, df 1) but not with other types of morbidities. Therefore, in the view of this finding and vitamin A proven protective effects for children against infection, more efforts are needed to increase vitamin A supplementation especially in the Western Dhamar .

5.4 Vaccination coverage

Regarding vaccination, the percentage of children who have been vaccinated with the third dose of polio vaccination found to be significantly higher in the Eastern than in the Western Dhamar (76.0% vs. 63.0%, X^2 36.4, P<0.0001, df 1) and in urban than rural residence (84.0% vs. 71.0%, X^2 7.1, P<0.01, df 1). Even in the Eastern Dhamar that have higher coverage, such coverage is still much lower than the recommended 95 per cent coverage Sphere Standards.

No association was found between third dose of polio vaccination and gender, wasting, and underweight but higher stunting prevalence was found with not receiving polio vaccine (69.0% vs. 65.0%, X^2 3.8, P≤ 0.05, df 1). Also no association was found between

third dose of polio vaccination and diarrhea, fever, or ARI but higher measles prevalence was found with not receiving polio vaccine (5.0% vs. 1.5%, X^2 19.2, P< 0.0001, df 1).

Similarly, the measles vaccination coverage of children aged 9 months to below 60 months, is higher in the Eastern than the Western Dhamar (79.0% vs. 71.0%, X^2 17.4, P<0.0001, df 1). This may indicates poor health services in the Western Dhamar. However, even in these Eastern districts that have higher coverage, such coverage is still far less than the recommended 95 per cent Sphere Standards.

Measles vaccination coverage was also higher in urban than rural residence (87.0% vs. 77.0%, X^2 4.5, P<0.05, df 1). However, no association was found with gender or malnutrition. However, not receiving measles vaccine higher was associated with higher ARI prevalence (40.0% vs. 33.0%, X^2 5.6, P< 0.05, df 1), higher fever prevalence (51.0% vs. 44.0%, X^2 6.0, P< 0.05, df 1) and higher measles prevalence (5.2% vs. 1.5%, X^2 19.0, P< 0.0001, df 1).

5.5 Salt iodization

Iodized salt is important because it prevents iodine deficiency commonly leads to thyroid gland problems, specifically endemic goitre. Around 2 billion people worldwide are deficient in iodine - and this is one of the leading preventable causes of mental retardation[11]. Only 3.0 per cent of households in the Western compared to 21.0% in the Eastern Dhamar are using adequately iodized salt (X^2 122.0, P< 0.0001, df 1). Although another 34.0% and 28.0% at the Eastern and Western Dhamar respectively are using iodized salt, the amount of iodide found to be inadequate. This indicates that in spite of the household tendency to use iodized salt, there is weakness in the food inspection system on salt monitoring at the market level that need to be strengthened.

Salt iodization also significantly lower in rural than urban residence (29.0% vs. 10.0%, X^2 50.0, P< 0.0001, df 1).

5.6 Morbidity

The morbidities during the last two weeks prior to the survey was recorded and where it was found that 34% of children reported to have diarrhoea (compared to national figure of 30[12]), 35% to have ARI (compared to national figure of 42%[13]) and 47% to have fever (compared to national figure of 40%[14]). Such high prevalence of different morbidities may indicates inappropriate living condition, predisposing the population to illness. Furthermore, low herd immunity, inadequate health services and low vaccination coverage could be attributing factors. Such high morbidities is calling for improving living condition and an appropriate and adequate health service provision in order to address negative health outcomes including malnutrition.

---

[11] Basil S Hetzel The Nature and Magnitude of the. Iodine Deficiency Disorders (IDD). http://www.ceecis.org/iodine /01_global/02_oxfd/SECTION_01.pdf

12 Multiple Indicator Cluster Surveys (MICS), 2006

13 Family Health Survey, 2003

14 Family Health Survey, 2003

The diarrhea prevalence in last two weeks prior to the survey is significantly much higher in the Western than Eastern Dhamar (36% vs. 31%, X^2 3.9, P<0.05, df 1) but does not significantly differs by urban/rural areas. Diarrhea prevalence is also much higher among children aged less than 36 compared to those who are 36 and above (39% vs. 25%, X^2 42.1, P<0.0001, df 1). Although diarrhea prevalence does not differ by breastfeeding status or feeding 4 times and above (other than breastfeeds), it was higher among children who were given more than one milk feed (other than breast milk) in the previous day to the survey (50% vs. 37%, X^2 11.3, P<0.01, df 1). This may be related to unhygienic preparation or administration of artificial milk. Diarrhea also does not differ by gender, vitamin A supplementation, or polio or measles vaccination.

The association between diarrhea and malnutrition has been found in similar previous surveys. In this survey having diarrhea also found to be significantly associated with GAM (9% vs. 6%, X^2 5.0, P<0.05, df 1). Repeated attacks of diarrhoea – that may be associated to poor environmental sanitation- found to be associated with tropical enteropathy with resultant poor nutrient absorption and considerable nutrient losses[15]. The resulting nutritional deficiency causes impaired immunity and increased vulnerability to more infection resulting in a vicious cycle of infection and malnutrition. In spite of higher prevalence of SAM, underweight or stunting among those have diarrhea, such differences do not reach statistical significance.

Regarding the ARI, it was found to be significantly higher in the Western than the Eastern Dhamar (38% vs. 32%, X^2 7.8, P<0. 01, df 1), but does not significantly differ by rural/ urban residence, gender, and age less than 36 months. Also, ARI does neither significantly associated with malnutrition nor with breastfeeding, feeding ≥4 times, and having more than one milk feed.

Fever two weeks prior to the survey was significantly higher in the Western than the Eastern Dhamar (53 % vs. 40%, X^2 34.4, P<0.0001, df 1) but no significant difference was found with rural and urban residence, gender, and age less than 36 months. Fever also significantly associated with underweight (50% vs. 45%, X^2 5.7, P<0.05, df 1) but neither with wasting or stunting, nor with breastfeeding, feeding ≥4 times, and having more than one milk feed.

Suspected measles[16] during the last month was significantly higher in the Western than the Eastern Dhamar(3.3% vs. 1.8%, X^2 4.3, P<0.05, df 1). Although it is also higher in rural than urban residence (3.2% vs. 0.0%) this does not reach statistical significance probably due to small number of measles cases. Similarly, measles prevalence does not differ by gender, but it significantly higher among non-vaccinated children to measles (5.2% vs. 1.5%, X^2 19.0, P<0.0001, df 1). Measles prevalence also does not associated with nutritional status, feeding practices, or aged less than 36 month.

15 Jean H Humphrey. Child undernutrition, tropical enteropathy, toilets, and Handwashing. Lancet.com Vol 374 September 19, 2009:1032-35

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

5.7 WASH and Morbidities and Nutrition Situation

WASH known to be an important factor in relation to morbidities as well malnutrition. Overall 29% of Dhamar households drink water from unclean container. Unclean water container (i.e. algae seen) found to be significantly higher in the Western than the Eastern Dhamar (41% vs. 17%, X^2 109.2, P<0.0001, df 1), and in rural than urban residence (53% vs. 4%, X^2 32, P<0.0001, df 1). Diarrhea prevalence found to be significantly higher among households using unclean water container (40% vs. 27%, X^2 16.0, P<0.0001, df 1). Although wasting, stunting, and underweight are higher among those who are drinking from unclean water container, this was only statistically significant for underweight (46% vs. 35%, X^2 11.2, P<0.01, df 1) and SAM (1.6% vs. 0.1%, Fisher exact test X^2 8.1, P<0.05, df 1). Whether these are direct effects (e.g. through causing diarrhea) or due to other confounding (e.g. socioeconomic status etc.) is not certain.

Around three quarters of households in Dhamar are having flush or pour flush latrine. This was significantly higher in the Easter than the Western Dhamar (88% vs. 58%, X^2 174.1, P<0.0001, df 1) and in urban than rural Dhamar (99% vs. 70%, X^2 62.1, P<0.0001, df 1). However, having no flush/pour latrine found not to be significantly associated with diarrhea or malnutrition except for stunting (73% vs. 64%, X^2 8.4, P<0.01, df 1). Similarly, whether this is a direct effect or due to other confounding e.g. poorer socio economic status is behind the scope of this survey.

Overall, the Western Dhamar have significantly poorer handwashing practices than the Eastern Dhamar e.g. for washing hand after toilet (47% vs. 62%, X^2 38.1, P<0.0001, df 1), washing hand before meal (33% vs. 41%, X^2 9.6, P<0.01, df 1), washing hand before cooking (25% vs. 35%, X^2 19.3, P<0.0001, df 1).

Similarly, most household caretaker handwashing practices (except for handwashing after cleaning livestock place) are significantly poorer in rural than urban areas. Of those practices only not handwashing after disposal of child faces and not handwashing before cooking were significantly associated with diarrhea: 33% vs. 26%, X^2 5.0, P<0.05, df 1and 33% vs. 27%, X^2 3.8, P=0.05, df 1 respectively.

The availability of soap at handwashing facility was also significantly higher at the Eastern than the Western Dhamar (94% vs. 75%, X^2 109.4, P<0.0001, df 1) and at urban than rural Dhamar (97% vs. 83%, X^2 21.6, P<0.0001, df 1), however it does not significantly associated with diarrhea.

Of the household caretaker handwashing practice only not washing hand before cooking (41% vs. 32%, X^2 6.9, P<0.01, df 1) shows significant association with underweight and not washing hand before child feeding and not washing hand after child faces disposal significantly associated with stunting: 68% vs. 58%, X^2 5.3, P<0.05, df 1 and 69% vs. 60%, X^2 6.5, P<0.05, df 1. Whether such associations are direct associations or confounded by other factors e.g. diarrhea, socio economic status is not ascertained. Nevertheless, hygiene promotion should be a key intervention contributing reducing morbidities and eventually better nutrition and well-being of the population.

5.8 Food insecurity

All food insecurity indicators found to be significantly much higher in the Western than the Eastern Dhamar e.g. reduced meal size (20% vs. 4%, X^2 88.2, P<0.0001, df 1), reduced meal number (18% vs. 3%, X^2 89.8, P<0.0001, df 1), and household member go bed hungry because of not having enough food (17% vs. 4%, X^2 69.8, P<0.0001, df 1). Coping strategies are also more predominant at the Western than the Eastern Dhamar e.g. borrowing food/money to purchase food or purchase food in credit or mortgage if the reason that HH has not money (36% vs. 17%, X^2 71.2, P<0.0001, df 1) and reduced expenditure on health/education (24% vs. 7%, X^2 87.2, P<0.0001, df 1). This confirms the finding of 2012 WFP-CFSS that 46 per cent of the Dhamar population is food insecure[17]. The mean of the composite score for the five food insecurity indicators was also significantly higher in the Western than the Eastern Dhamar by one way Anova test (1.2 vs. 0.4, F 135.2, P <0.0001, df 1).

Food insecurity indicators also much severer in rural than urban Dhamar e.g. reduced meal number (11% vs. 4%, X^2 7.4, P<0.01, df 1), and member go the bed hungry because of not enough food (11% vs. 4%, X^2 4.2, P<0.01, df 1). Coping strategies are also more predominant at the Western than the Eastern Dhamar e.g. borrowing food/money to purchase food or purchase food in credit or mortgage if the reason that HH has not money (29% vs. 11%, X^2 22.5, P<0.0001, df 1) and reduced expenditure on health/education (16% vs. 9%, X^2 6.4, P<0.05, df 1). The mean of the composite score for the five food insecurity indicators was also significantly higher in rural than urban Dhamar by one way Anova test (0.8 vs. 0.4, F 14.4, P <0.0001, df 1). This support previous findings that rural-urban inequalities are high in Yemen and the number of food insecure people living in rural areas is more than five times higher than in urban areas[18].

Although the prevalence of some types of malnutrition (e.g. underweight) found to be slightly higher among food insecure households, such difference was not statistically significant. This may indicates that the malnutrition in Dhamar is a health related problem (e.g. associated with diarrhea) or a practice problem (e.g. IYCF) rather being a purely food insecurity in origin.

5.9 Nutrition Status and Household Caretaker Education

The association between education level of mothers and the child nutritional status is well reported by nutritional survey done in Yemen since 1991. Care taker Illiteracy is significantly higher in Western than Eastern Dhamar (87% vs. 74%, X^2 35.2, P<0.01, df 1) and in rural than urban areas (85% vs. 47%, X^2 128.7, P<0.01, df 1). Although, the prevalence of underweight and stunting was higher among illiterate mothers' children: 40% vs. 33% and 68% vs. 61% respectively such differences were not statistically significant.

Similarly some morbidities e.g. diarrhea is higher among illiterate mothers' children (32% vs. 27%) however, such difference was not statistically significant. Nevertheless, illiterate mothers' children have significantly lower polio vaccination (70% vs. 81%, X^2 9.5, P<0.01, df 1) and lower measles vaccination (76% vs. 86%, X^2 8.7, P<0.01, df 1). Therefore, a focus on girls' education should be a priority for its clear and well documented profits on children and community health.

[17] WFP. Comprehensive Food Security Survey, Yemen. March 2010
[18] WFP. YEMEN: Secondary Data Analysis on Food Security and Vulnerability, 2009

6.0 RECOMMENDATIONS

The levels of acute malnutrition in Dhamar were found to be less than predicted based on data collected from Hodeidah and Taiz but similar to the pattern that found in neighbouring Ibb that shows more predominant chronic malnutrition (as reflected by extremely high stunting rates) but less severe acute malnutrition (especially in Eastern Dhamar) which should be interpreted as an indication of poor environmental conditions or long-term restriction of a child's growth potential together with chronic food insecurity and poverty.

Although mortality is still low, the critical levels of stunting and underweight in both zones that are above the critical levels as per WHO categorization as well as the GAM rates in the Western Dhamar that are equal to the "poor" according to WHO classification i.e. between 5 - 9.9 per cent which require an urgent intervention to address the situation a cross the governorate. It is also important to note that there are pockets of vulnerability in the two zones with high levels of acute and chronic malnutrition, comparable to the prevalence seen in neighbouring Ibb and Hodeidah Governorate.

The existence of multi-sectoral aggravating factors like poor feeding practices, high prevalence of communicable diseases, insufficient coverage of essential health services like immunization and micronutrient supplementation in addition to high level of illiteracy among the majority of caretakers are appealing and calling for an integrated multi-sectoral action. The need to deliver an integrated package of services to mothers and their children not only to address the acute malnutrition but also to address the high level of stunting and underweight as well as other development indicators.

Politicians and decision makers along with development partners need to keep the fighting undernutrition among U5 children on top of their political and development agenda. Since early 1970s; stunting among U5 children was and continue to be one of the highest levels in the world. Through simple analysis utilizing the data collected from Hodeidah, Taiz, Hajja, Ibb and finally Dhamar governorates which are dwelled by more than 40 per cent of Yemenis, it simply can be identified that more than one million of U5 children in this five governorates are stunted; threatening the development future of Yemen.

Below are the main immediate and medium-term recommendations:

Immediate Interventions

- Develop detailed integrated response micro-plan articulating district level humanitarian needs, delivering response package, coverage and gaps to document the progress, advocacy and lessons learnt.
- Priority should be given to pockets of vulnerability in both zones through mobilizing outreach services to rapidly address the high GAM/SAM rates.
- Development of CMAM protocol, strengthen and expanding CMAM services to reach all the existed health facilities and outreach services.

- CMAM services should adhere to the CMAM protocol (ensuring systematic treatment and full consideration of moderate acute malnutrition management) that should be integrated with infant feeding, hygiene promotion and food security interventions.
- to promote appropriate IYCF practices (early initiation of breastfeeding, exclusive and sustained breastfeeding for 2 years and promotion of appropriate complementary feeding practices for children aged 6 to 24 months) along with micronutrient supplementations and deworming.
- Accelerate the integration of IYCF counseling into all CMAM services delivered by both fixed and mobile clinics.
- Intensive social mobilisation campaigns on IYCF feeding and caring practices through behavior change / communication interventions mainly in the following areas; timely introduction of complementary food and continue breastfeeding up to two years, along with Vit. A supplementation, micronutrient supplements, and promotion of safe sanitation and hygienic practices including hand washing with soap as well as safe disposal of children's excreta, diarrhoea prevention measures and appropriate management of ARI among young children

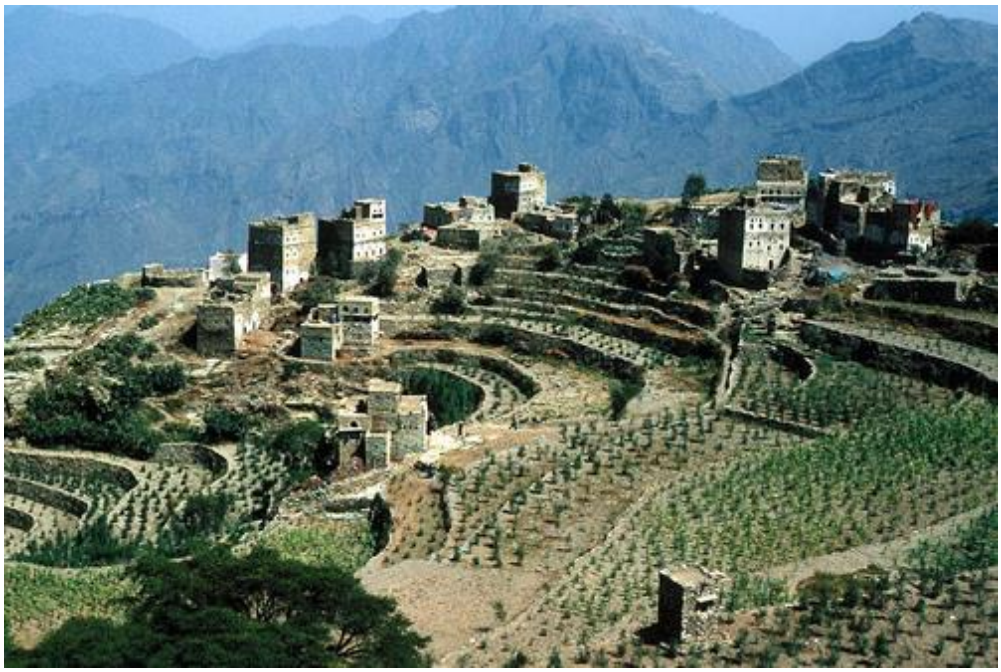
Medium Term Interventions

- From the development point of view, there is an essential need for Yemen to be an active member in the global SUN movement.
- High level advocacy with the GOY and politicians to mobilise their commitment to fight undernutrition among U5 Yemeni children.
- Scaling up implementation of the national nutrition strategy and related action to address the high level of malnutrition in line with the lifecycle approach along with promotion of maternal nutrition.
- Continued support for longer term water development and sanitation programmes throughout the governorate, with community mobilization activities to promote safe sanitation and hygienic practices.
- Follow up SMART nutrition survey and coverage survey in 2014 to track the progress on implementation of the response plan.
- Exploring new initiatives to promote small scale income generating projects, draw lessons learnt and replicate the successful projects.
- Promote improved latrine use and other hygiene services like Community Led Total Sanitation (CLTS) strategy.

Other Recommendations

- Further investigation is needed to understand the causality tree behind high level of acute malnutrition among boys compared to girls found in this survey (especially for underweight) as well as earlier surveys conducted in Hodeidah, Taiz, Hajja governorates.
- Undertaking full scale national nutrition and mortality survey.
- In a view of high malnutrition among illiterate mothers' children found in this as well as previous surveys in Yemen, a focus on girls' education is necessary in the long term battle against malnutrition.

7. Annexes



استبيان رقم: .....

Annex 1: Dhamar Nutrition Survey Questionnaire

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

مسح الحالة التغذوية والوفيات في محافظة ذمار
مارس - ابريل 2013م

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			
					2	Ø	1	2

المديرية	العزلة	القرية/ الحارة
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
							2	1	Ø	2

هل المنطقة حضرية (1) أم ريفية (2)	

رمز القرية / الحارة			رمز العزلة	
رمز المديرية			رمز المحافظة	1 1
رقم **طبقة** المسح			رقم العنقود	

العمل المكتبي

	الاسم	اليوم		الشهر		السنة				التوقيع
إدخال البيانات										
المراجعة										
ترميز أخرى										

الملاحظات

.....

.....

.....

.....

.....

.....

.....

.

استبيان رقم: .....

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

H001a	عدد أفراد الأسرة (الأحياء فقط الذين يعيشون حاليا في الأسرة تاريخ المسح)	**العدد**	

H001b	عدد الأطفال أقل من 5 سنوات (الأحياء فقط الذين يعيشون حاليا في الأسرة تاريخ المسح)	**العدد**	

H001c	عدد الأطفال أقل من 6 أشهر (الأحياء فقط الذين يعيشون حاليا في 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	منتجات زراعية غير القات.		
	.2	حيوانات ومنتجات الحيوانية.		
	.3	اسماك.		
	.4	تجارة.		
	.5	عمل مؤقت.		
	.6	وظيفة دائمة براتب شهري.		
	.7	حوالات (من المغتربين).		
	.8	أعمال حرفية.		
	.9	زراعة/ بيع/ نقل القات.		
	.1Ø	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)		
	.1Ø	عين ماء محمية		
	.11	أخرى: تذكر		

إنتقل إلى				
	H007a	هل تقومون بمعالجة الماء قبل **الشرب؟**		
H~~008~~		.1	نعم	
H~~008~~		.2	لا	
		.3	لا أعرف	

H007b	ماهي طريقة المعالجة **الرئيسية** المستخدمة **لمياه الشرب** (خيار واحد فقط)			
	1.	غلي الماء قبل الشرب		
	2.	استخدام الكلور		
	3.	الترشيح عبر قماش نظيف		
	4.	استخدام مرشح سيراميك أو رمل أو ماشابه (فلتر أو قطارة)		
	5.	ترك الماء ساكنا قبل الشرب لترسيب الشوائب.		
	6.	استخدام الشب (شب الفؤاد)		
	7.	أخرى: تذكر		

H008	**للملاحظة**: **تحقق** من توفر نقاط تخزين المياه **لغرض الشرب**: هل الوعاء الحاوي لمياه الشرب نظيف؟ (عدم وجود طحالب يعني رقم 1 ووجود الطحالب يعني رقم 2)			
	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. **يرجى عدم طرح خيارات الإجابة على المستجيب**					
	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 بصورة رئيسية على الرعاية الصحية عندما يمرض أحد أفراد الأسرة؟			**إنتقل إلى**
	.1	لا أطلب مساعدة طبية		
	.2	تداوي شخصي		
	.3	معالج تقليدي/ شعبي		
	.4	شيخ/ القرآن		
	.5	صيدلية		
	.6	عيادة خاصة		C~~013~~
	.7	مرفق صحي عام		C~~013~~

H012b	في حالة عدم الحصول على الخدمة الصحية، ماهو السبب الذي يجعلكم لاتسعون للحصول على الخدمة في مرفق صحي أو عيادة عند المرض؟			
	.1	الكلفة عالية		
	.2	المرفق بعيد ولا تتوفر مواصلات		

	3.	لايوجد وقت كافي		
	4.	لا نثق في خدما ت المرافق القريبة		
	5.	أخرى: تذكر		

س 013 – س 017: خاص بحالة الأمن الغذائي (الإجابة على هذه الإسئلة يجب أن تكون وفقا للحالة خلال الـ 30 يوم الماضية)

H013	خلال الثلاثين اليوم الماضية، هل حدث أن لجأ (الاسم) أو أحد أفراد الأسرة إلى تصغير حجم الوجبات في اليوم بسبب شحة الموارد؟			
	.1	نعم		
	.2	لا		

H014	خلال الثلاثين اليوم الماضية، هل حدث أن لجأ (الاسم) أو أحد أفراد الأسرة إلى تقليل عدد الوجبات في اليوم بسبب شحة الموارد؟			
	.1	نعم		
	.2	لا		

H015	خلال الثلاثين اليوم الماضية، هل حدث أن ذهب (الاسم) أو أحد أفراد الأسرة إلى النوم في الليل وهو جائع بسبب عدم كفاية الغذاء؟			
	.1	نعم		
	.2	لا		

H016	خلال الثلاثين اليوم الماضية، هل حدث وأن قامت الأسرة باستلاف الغذاء، أو أقترضت نقودا من أجل شراء الغذاء أو قامت بشراء الغذاء بالآجل (الدين) أو الرهن **بسبب عدم توفر النقود**؟			
	.1	نعم		
	.2	لا		

H017	خلال الثلاثين اليوم الماضية، هل حدث أن قللت الأسرة الإنفاق على التعليم والصحة لشراء مواد غذائية؟			
	.1	نعم		
	.2	لا		

س 018: حالة تيويد ملح الأسرة

H018	قم بفحص الملح الذي استخدمته الأسرة يوم أمس بواسطة كاشف اليود السريع؟			
	.1	لايوجد اليود.		
	.2	يود أقل من 15 جزء في المليون		
	.3	يود بنسبة 15 جزء في المليون أو أكثر		
	.4	لم يعمل الفحص		

س 019 – س 025: حالة الإطعام والتحصين للأطفال في سن 6-59 شهراً في الأسرة

		C019	C020a	C020b	C021	C022a
رقم الطفل	الاسم الأول للطفل	نوع الطفل 1= ذكر 2 = أنثى	تاريخ الميلاد (بالهجري أو الميلادي)	عمر الطفل (بالأشهر) (إذا كان الطفل أكبر من 24 شهر انتقل إلى السؤال C023)	للطفل الذي عمره 24 شهر أو أقل. هل مازال الطفل يرضع (رضع خلال الـ 12 ساعة الماضية)؟ 1= نعم 2 = لا	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			

استبيان رقم: .....

			C022b	C023	C024	C025
رقم الطفل (كما سبق أعلاه)	الاسم الأول للطفل	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						

استبيان رقم: .....

س 026 – س 035: القياسات الجسمانية ومراضة الأطفال بين سن 6-59 شهر في الأسرة

			C026	C027	C028	C029
رقم الطفل (كما سبق أعلاه)	الاسم الأول للطفل	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			.	.		.

استبيان رقم: .....

			C030	C031	C032	C033	C034	C035
رقم الطفل (كما سبق أعلاه)		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 1= SFP (تغذية تكميلية) 2= TFC (معالجة سوء التغذية في القسم الداخلي في المستشفى) 3= OTP (معالجة سوء التغذية في العيادة خارجية) 4= أخرى 5 = غير مسجل
.1								
.2								
.3								
.4								
.5								
.6								
.7								

مسح الحالة التغذوية والوفيات في محافظة أبين ، ديسمبر 2012- يناير 2013

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

مديرية المسح: _____ 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 وكل 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)	

Questionnaire Number: ……

Annex 2: Dhamar Nutrition Survey English Questionnaire

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

Nutritional Status and Mortality Survey – Dhamar Governorate, March – April 2013

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.

	day		month		year			
Date of interview					2	Ø	1	2

District	**Ozla (Sub-district)**	**Village/ Hara**
Name	Name	Name

Name of head of household	

		Name	**Signature**
Survey team number ……	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.

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

Questionnaire Number: ……

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				
					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	1	1
Survey zone (stratum) number			Cluster number		

Stratum number is (1) Eastern districts (2) Western districts

……
……

Desk work

	Name	**day**		**month**		**Year**				**Signature**
Data entry										
Review										
Other encoding										

Remarks:

……
……

……
……

……
……

……
……

……
……

……

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/ Recalcitrant		
	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).		

Q005: Household income source

H005	What is the **primary** source of income for the household?			
	1.	Non-qat agricultural products		
	2.	Livestock and livestock products		
	3.	Fishery		
	4.	Trading		
	5.	Temporary work (Casual work)		
	6.	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.		
	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		~~H9~~08
	3.	Don't know.		~~H9~~08

H007b	What is the **main** method used to treat **drinking water**? Choose only one.			
	1.	Boil water before drinking.		
	2.	Use chlorine substance.		
	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 -		

H010	When do you clean your hands with soap, ashes, dust, tree leaves, or any other material? Place a check mark for each answer said by the respondent. **Do not give the respondent any choices for 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

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 -		

Q013 – Q017: The food security situation part (to be answered for the situation in the past 30 days)

H013	Over the past 30 days, did you or any HH member use to reduce the size of meals because of the scarcity of resources?			
	1.	Yes		
	2.	No		

H014	Over the past 30 days, did you or any HH member use to reduce the number of meals because of the scarcity of resources?			
	1.	Yes		
	2.	No		

H015	Over the past 30 days, did you or any HH member go the bed in night hungry because of not enough food?			
	1.	Yes		
	2.	No		

H016	Over the past 30 days, did the HH borrow food, borrow money to purchase food or purchase food in credit or mortgage **only if the reason that HH has not money**?			
	1.	Yes		
	2.	No		

H017	Over the past 30 days, did the HH reduce the expenditure on education or food to save money to purchase food?			
	1.	Yes		
	2.	No		

Q018: Situation of salt iodisation

H018	Use the rapid test reagent to check the iodisation status of the salt HH was used yesterday?			
	1.	Not iodised.		
	2.	Below 15 ppm.		
	3.	15 ppm and above.		
	4.	The test was not made.		

Q019 – Q025: Nutritional and Immunization Status of Children ages 6-59 months within the household

		C019	**C020a**	**C020b**	**C021**	**C022a**
Child no.	Child's first name	Child's gender 1 = male 2 = female	Date of birth. If the date is recorded, skip C020b)	Age of child in months. If the child is older than 24 months, go to question C023.	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			

			C022b	**C023**	**C024**	**C025**
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.						

Q026 – Q035: Anthropometric measurements and childhood diseases of children aged 6 – 59 years in the household

			C026	**C027**	**C028**	**C029**
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.			☐☐.☐	☐☐☐.☐		☐☐.☐

			C030	C031	C032	C033	C034	C035
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.								

Nutritional Status and Mortality – Dhamar Governorate, Nov – Dec 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	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: Dhamar Nutrition Survey Team, 23 March to 3 April 2013

م	الاسم	الصفة	رقم الجوال	مكان العمل
1	نصار حمود ناجي الاشول	مدير المسح	771125201	وزارة الصحة
2	محمد يحيى العنسي	مسئول لوجيستي	777050088	مكتب الصحة (ذمار)
3	نبراس صالح زعبل	مشرف ميداني	777002439	مكتب الصحة (عدن)
4	محمد حسن الفراص	مشرف ميداني	771686226	مكتب الصحة (حجة)
5	مطيع علي البغدادي	مشرف ميداني	777817704	مكتب الصحة (اب)
6	عبدالله الخادم الاقزل	مشرف ميداني	777558717	مكتب الصحة (الحديدة)
	حضرمي هادي الحضرمي	إدخال بيانات	777475007	مكتب الصحة (حجة)
	الفريق 1			
1	لطف زيد اليمني	رئيس فريق	777069753	مكتب الصحة (ذمار)
2	روسيا محمد صالح احمد	باحثة	772015161	مركز التالبي (عنس)
3	غدير صالح حمادي	باحثة	773593900	مركز الصيح (ضوران)
4	فاطمة علي عايض	باحثة	773986524	مركز البردون (الحدا)
	الفريق 2			
1	نبيل حمود زياد	رئيس فريق	777225088	مكتب الصحة (ذمار)
2	انتظار فرحان	باحثة	714205647	مستشفى السلام شرعب
3	خلود حسين احمد الهمام	باحثة	771669878	مستشفى زراجة(الحدا)
4	فوزية عباس اسماعيل	باحثة	737089932	مركز التعاون (وصاب العالي)
	الفريق 3			
1	خالد علي يحيى العفيري	رئيس فريق	777770897	مركز بني يعفر
2	اماني حسين الفقيه	باحثة	770710184	مركز افق(جهران)
3	فتحية محمد عبدالله الجبري	باحثة	772267153	مركز الحميات (ذمار)
4	بشرى محمد مصلح الزيادي	باحثة	771189631	مستشفى زراجة(الحدا)
	الفريق 4			
1	علي علي الغيل	رئيس فريق	770318531	مكتب الصحة (ذمار)
2	اسمهان سعيد محمد	باحثة	770457288	
3	ايمان احمد العسودي	باحثة	777752293	مركز حدقة (ضوران)
4	سرور علي حجر	باحثة	771211878	مركز معبر (جهران)
	الفريق 5			
1	عبداللطيف محمد احمد	رئيس فريق	777042313	مكتب الصحة (ذمار)
2	رحمة احمد عبدالرب	باحثة	777807989	وحدة هران (ذمار)
3	هند احمد الرشيدي	باحثة	772561356	مركز الجمعة (جبل الشرق)
4	هناء علي الذاهبي	باحثة	771526683	مركز 26سبتمبر (عتمة)
	الفريق 6			
1	زيد علي الموشكي	رئيس فريق	777706552	مكتب الصحة (ذمار)
2	كفاء سعيد	باحثة	714049721	مستشفى السلام شرعب
3	فوزية شجين علي	باحثة	771351517	مركز شهداء الوحدة (المنار)
4	زينب علي محمد الفراصي	باحثة	773119134	مستشفى البردون (الحدا)
	اسماء سائقي السيارات			
1	حضرمي هادي الحضرمي	إدخال بيانات	777475007	مكتب الصحة (حجة)
2	بشير احمد العواضي	إدخال بيانات	777554368	مكتب الصحة (ذمار)
3	عادل احمد النماري	إدخال بيانات	773678117	مكتب الصحة (ذمار)
4	سلطان محمد التالبي	إدخال بيانات	773900593	مكتب الصحة (ذمار)

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

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	0.02		0/2	
Enumerator 1	0.00 OK	0.22 POOR	0/0	3/4
Enumerator 2	0.06 POOR	0.16 POOR	1/2	7/0
Enumerator 3	0.44 POOR	0.48 POOR	4/2	5/2
Enumerator 4	0.26 POOR	0.30 POOR	2/3	3/2
Enumerator 5	0.33 POOR	0.35 POOR	1/6	5/4
Enumerator 6	8.65 POOR	9.55 POOR	6/4	4/6
Enumerator 7	0.93 POOR	0.77 POOR	0/8	4/4

Height:

	Precision: Sum of Square [H2-H1]	Accuracy: Sum of Square [Superv.(H1+H2)-Enum.(H1+H2]	No. +/- Precision	No. +/- Accuracy
Supervisor	2.16		3/6	
Enumerator 1	0.00 OK	32.64 POOR	0/0	9/1
Enumerator 2	3.09 OK	8.85 POOR	3/7	8/1
Enumerator 3	Error	Error	4/6	7/3
Enumerator 4	22.62 POOR	25.66 POOR	5/4	2/8
Enumerator 5	5.46 POOR	7.30 POOR	1/9	4/6
Enumerator 6	5.47 POOR	24.15 POOR	4/6	4/6
Enumerator 7	6.77 POOR	11.19 POOR	6/4	5/4

MUAC:

	Precision: Sum of Square [MUAC2-MUAC1]	Accuracy: Sum of Square [Superv.(MUAC1+MUAC2)-Enum.(MUAC1+MUAC2]	No. +/- Precision	No. +/- Accuracy
Supervisor	122.00		5/5	
Enumerator 1	0.00 OK	370.00 POOR	0/0	3/6
Enumerator 2	125.00 OK	179.00 OK	5/3	7/0
Enumerator 3	296.00 POOR	118.00 OK	4/5	3/6
Enumerator 4	193.00 OK	159.00 OK	2/7	3/4
Enumerator 5	409.00 POOR	335.00 OK	4/6	7/3
Enumerator 6	195.00 OK	257.00 OK	6/4	4/5
Enumerator 7	142.00 OK	1058.00 POOR	5/5	0/10

Annex 5: Reference Table for Age Estimation

اليوم: ..... التاريخ: ...../ ...../ 2013م
رقم الفريق: .....

رقم العنقود: .....

اسم القرية/الحارة: .....

رقم الاستبيان	رقم الطفل	اسم الطفل	كلام الام او راعي الطفل عند استجوابها عن تاريخ ميلاد الطفل

توقيع اعضاء الفريق 1 ..... 2 ..... 3 ..... رئيس الفريق:

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

	2007		2008		2009		2010		2011		2012	
Jan		69	New Year's day	57	New Year's day	45	New Year's day	33	New Year's day	21	New Year's day	9
Feb		68		56		44		32		20		8
Mar		67		55		43		31	7th Oct burn event	19		7
Apr		66		54		42		30		18		6
May		65	National Day	53	National Day	41	National Day	29	Zengebar crisis National day	17	National Day	5
Jun		64		52		40		28		16		4
Jul		63		51	Tarq Alfadly event	39		27		15	Ramadan	3
Aug		62		50	Ramadan	38	Ramadan	26	Ramadan Alfater Aid	14		2
Sep		61	revolution Day Ramadan	49	revolution Day Alfater Aid	37	revolution Day Alfater Aid	25	revolution Day	13	revolution Day	1
Oct		60	revolution Day Alfeter Aid	48	revolution Day	36	revolution Day	24	revolution Day	12	revolution Day	0-1
Nov		59	dependence day	47	dependence day Aladah Aid	35	dependence day Aladah Aid Gulf 20	23	dependence day Aladah Aid	11	dependence day	
Dec		58	Aladah Aid	46	ALmagalah event	34		22		10		

Annex 7: Cluster Sampling for the Western Dhamar

CLUSTER	POPULATION SIZE	المدينة/القرية	رمز القرية	العزلة	رمز العزلة	المديرية	رمز المديرية
1	1042	بيت الجبر	42	مخلاف الحداء	31	جبل الشرق	9
2	954	جمعة العامري	43	الظهرة بن قشيب	32	جبل الشرق	9
3	951	زاحة	44	الحميطة	33	جبل الشرق	9
4	586	شابم	45	شرقي جبل الشرق	34	جبل الشرق	9
5	432	اريمه	46	على الغربى	35	عتمه	10
6	170	الجوجبه	47	العقدالعالى	36	عتمه	10
7	920	الصولة	48	المقرانه	37	عتمه	10
8	448	العتره	49	الثلث	38	عتمه	10
9	34	القابل	50	الهادله	39	عتمه	10
10	252	المحيوض	51	حمير ابزار	40	عتمه	10
11	223	الزهوه	52	القبل	41	عتمه	10
12	50	الجدمي	54	الغربى والفجرة	43	عتمه	10
13	171	سلفحي العالى	55	المقتزعه	44	عتمه	10
14	1678	راس كبيره	56	كبيره	45	عتمه	10
15	98	عرومه	57	الاجبار	46	وصاب العالي	11
16	308	عقبه السافله	58	بني حفص	47	وصاب العالي	11
17	703	اريمات	59	السنه	48	وصاب العالي	11
18	333	وادي الهجر	60	الشوكاء	49	وصاب العالي	11
19	455	العمقه	61	ظفران	50	وصاب العالي	11
20	1113	العسادى	62	الغربي العالي	51	وصاب العالي	11
21	507	مدره	63	السيف	52	وصاب العالي	11
22	365	الحجر	64	الكلبين الجنوبي	53	وصاب العالي	11
23	249	العرشه	65	الجدله	54	وصاب العالي	11
24	257	البرحه	66	اجبار عوالي	55	وصاب العالي	11
25	99	دى عسنه	67	الموسطه	56	وصاب العالي	11
26	141	زراره	69	ذى حمد	58	وصاب	11

	العالي						
12	وصاب السافل	59	بني علي	70	المعان	651	27
12	وصاب السافل	60	بني معانس	71	شعب الجبه	194	28
12	وصاب السافل	61	باخش	72	المجاور	85	29
12	وصاب السافل	62	بني غليس	73	المقشع	275	30
12	وصاب السافل	63	الاجراف	74	الرقيباء	244	31
12	وصاب السافل	64	بني غشيم	75	بني غشيم	513	32
12	وصاب السافل	65	بني حطام	76	الصبه	248	33
12	وصاب السافل	67	المغارب	78	خزيجه	278	34
12	وصاب السافل	68	العارس	79	الغسلات	302	35
12	وصاب السافل	69	وادي الخشب	80	الجرات	278	36

Annex 8: Cluster Sampling for the Wastern Dhamar

رمز المديرية	المديرية	رمز العزلة	العزلة	رمز القرية /المدينة	القرية /المدينة	رمز المحلة/الحارة	المحلة /الحارة	متوقع عدد السكان	رقم العنقود
1	الحـــــداء	1	اعماس الجبل	1	الشواذب	1	الشواذب	1505	1
1	الحـــــداء	2	ثوبان	2	المشارم	2	المشارم	1911	2
1	الحـــــداء	3	زراجة	3	ساقتين	3	الحصن	564	3
1	الحـــــداء	4	الرشدة	4	قاعة الدار	4	قاعة الدار	358	4
1	الحـــــداء	5	العابسيه	5	كلبة العقر	5	العقر	455	5
1	الحـــــداء	7	عبيده السفلى	7	بني عكروت	7	المعمارى	531	6
2	جهران	8	علو جهران	8	بني سرحان	8	مراره	292	7
2	جهران	9	الموسطه	9	بيت راشد	9	بيت القعطبي	52	8
2	جهران	9	الموسطه	10	معبر	10	مصيبح	594	9
2	جهران	10	سفل جهران	11	رصابه	11	جبل صبيح	1064	10
3	ضوران انس	11	احلال	13	احلال	13	احلال	1251	11
3	ضوران انس	12	بيت العميسي	14	بيت العميسي	14	بيت العميسي	408	12
3	ضوران انس	13	خمس بني فضل	15	الحلة	15	العذار	140	13
3	ضوران انس	14	حمير	16	وينان	16	وينان	873	14
3	ضوران انس	15	الصيح	17	هجرةالصيح	17	هجرةالصيح	191	15
3	ضوران انس	16	شارح	18	بني خضير	18	الجامع	348	16
4	المنار	17	ذاهب	19	الولي	19	الولي	702	17
4	المنار	18	جبل اسحاق	20	جبل اسحاق	20	جبل اسحاق	1140	18
5	مدينة ذمار	19	ذمار	21	مدينة ذمار	21	الغبراء	254	19
5	مدينة ذمار	19	ذمار	21	مدينة ذمار	22	ابو بكر الصديق	628	20
5	مدينة ذمار	19	ذمار	21	مدينة ذمار	24	الاصلاحيه	430	21
5	مدينة ذمار	19	ذمار	21	مدينة ذمار	25	الاخضر	323	22
5	مدينة ذمار	19	ذمار	21	مدينة ذمار	26	حاره لقمان	322	23
5	مدينة ذمار	19	ذمار	21	مدينة ذمار	27	الربيدي	303	24
5	مدينة ذمار	19	ذمار	21	مدينة ذمار	28	المنزل	586	25
5	مدينة ذمار	19	ذمار	21	مدينة ذمار	29	الجرد البرطي	613	26
6	ميفعة عنس	21	عنس السلامة	23	سنبان	30	الحزه	824	27
6	ميفعة عنس	22	الجرشه	24	الجرشة العليا	31	جعار	811	28
6	ميفعة عنس	23	اسبيل	25	العساكره	32	الوادي	1097	29
7	عنس	24	وادي الحار	26	خربة ابو يابس	33	المعمار الاسفل	395	30
7	عنس	24	وادي الحار	27	قفل الصياد	34	حاره الشعب	412	31

7	عنس	25	جبل الدار	28	عمد	35	قاع الفجير	305	32
7	عنس	26	جبل زبيد	29	اضرعه	37	زراقه	717	33
7	عنس	27	وادي زبيد	30	بيت الضبياني	38	بيت الضبياني	372	34
8	مغرب عنس	28	نجاح	32	بيت الشتاء	39	بيت الشتاء	463	35
8	مغرب عنس	29	بيت نصر	33	العارضة	40	حجر الضبع	18	36
العناقيد الاحتياط للطبقة الاولى									
1	الحـــــداء	6	كومان سنامه	6	الجباحره	6	الجباحره	409	RC
2	جهران	10	سفل جهران	12	عيشان	12	عيشان	952	RC
5	مدينة ذمار	20	منقذه	22	هجرة منقذه	23	المعمار	881	RC
7	عنس	25	جبل الدار	31	الركيح	36	الحارة العليا	290	RC

Annex 11: 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[19].

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;

[19] 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 12: Referral Form for the Malnourished Children

مسح الحالة التغذوية للأطفال تحت سن الخامسة في محافظة المحويت، يونيو 2013

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:

محيط ذراع الطفل بالسنتيمتر (ØØ. Ø)	سنتيمتر .	

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

وزن الطفل بالكيلوجرام (ØØ. Ø)	كيلوجرام .	

نقطة الانحراف المعياري (Z)

وجود التوذم: (نعم / لا)
سبب الاحالة : المواك <11.5 ( ) نقطة الانحراف المعياري (z) ≤ -3 ( ) التوذم ( )

تاريخ القياس	يوم		شهر		سنـــــــة			
					3	1	Ø	2

يرجى تعاونكم معه/ معها

وتقبلوا تحيات فريق المسح

اسم المشرف الميداني

.....

توقيعه

Annex 13: Assessments Quality Checks

13. a. Plausibility check for: Yem_Eastern_Dhamar_April 2013.as

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

Criteria	Flags*	Unit	Excel.	Good	Accept	Problematic	**Score**
Missing/Flagged data	Incl	%	0-2.5	>2.5-5.0	>5.0-10	>10	
(% of in-range subjects)			0	5	10	20	**0** (0.3 %)
Overall Sex ratio	Incl	p	>0.1	>0.05	>0.001	<0.000	
(Significant chi square)			0	2	4	10	**0** (p=0.769)
Overall Age distrib	Incl	p	>0.1	>0.05	>0.001	<0.000	
(Significant chi square)			0	2	4	10	**2** (p=0.063)
Dig pref score - weight	Incl	#	0-5	5-10	10-20	> 20	
			0	2	4	10	**0** (3)
Dig pref score - height	Incl	#	0-5	5-10	10-20	> 20	
			0	2	4	10	**2** (8)
Standard Dev WHZ	Excl	SD	<1.1	<1.15	<1.20	>1.20	
			0	2	6	20	**0** (0.92)
Skewness WHZ	Excl	#	<±1.0	<±2.0	<±3.0	>±3.0	
			0	1	3	5	**0** (-0.11)
Kurtosis WHZ	Excl	#	<±1.0	<±2.0	<±3.0	>±3.0	
			0	1	3	5	**0** (0.29)
Poisson dist WHZ-2	Excl	p	>0.05	>0.01	>0.001	<0.000	
			0	1	3	5	**0** (p=0.525)
Timing	Excl	Not determined yet					
			0	1	3	5	
OVERALL SCORE WHZ =			0-5	5-10	10-15	>15	**4** %

At the moment the overall score of this survey is 4 %, this is excellent.

13. a. Plausibility check for: Yem_Western_Dhamar_April 2013.as

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

Criteria	Flags*	Unit	Excel.	Good	Accept	Problematic	**Score**
Missing/Flagged data	Incl	%	0-2.5	>2.5-5.0	>5.0-10	>10	
(% of in-range subjects)			0	5	10	20	**0** (0.6 %)
Overall Sex ratio	Incl	p	>0.1	>0.05	>0.001	<0.000	
(Significant chi square)			0	2	4	10	**0** (p=0.654)
Overall Age distrib	Incl	p	>0.1	>0.05	>0.001	<0.000	
(Significant chi square)			0	2	4	10	**4** (p=0.006)
Dig pref score - weight	Incl	#	0-5	5-10	10-20	> 20	
			0	2	4	10	**0** (4)
Dig pref score - height	Incl	#	0-5	5-10	10-20	> 20	
			0	2	4	10	**2** (10)
Standard Dev WHZ	Excl	SD	<1.1	<1.15	<1.20	>1.20	
			0	2	6	20	**0** (0.98)
Skewness WHZ	Excl	#	<±1.0	<±2.0	<±3.0	>±3.0	
			0	1	3	5	**0** (-0.03)
Kurtosis WHZ	Excl	#	<±1.0	<±2.0	<±3.0	>±3.0	
			0	1	3	5	**0** (-0.01)
Poisson dist WHZ-2	Excl	p	>0.05	>0.01	>0.001	<0.000	
			0	1	3	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.