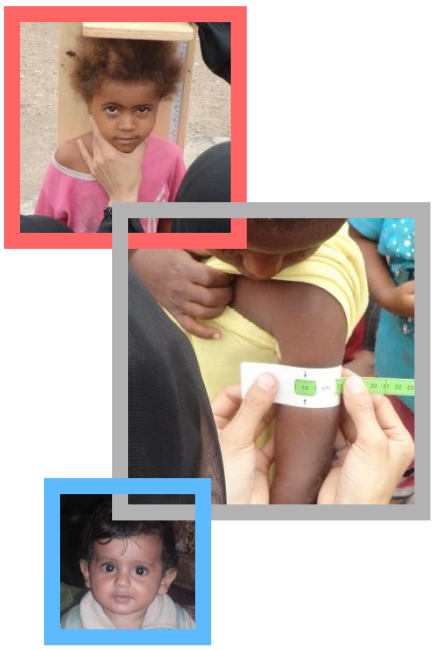
NUTRITION SURVEY REPORT

MOUNTAINOUS AND COASTAL PLAIN ECOLOGICAL ZONES

TAIZ GOVERNORATE, YEMEN



28 January to 23 February 2012

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UNICEF MENA Regional Office and the UNICEF Yemen Country Office supported the survey technically, employing SMART methodology and providing coordination support. Additional survey coordinators were provided by the Ministry of Public Health and Population and WHO. The survey enumerators and supervisors came from the Ministry of Public Health and Population at the central and governorate levels. The data entry team from the Office of Taiz Governorate Public Health and Population performed the data entry to enable daily data quality verification and swift availability of preliminary results. The Director General of the Office of Taiz Governorate Public Health and Population Taiz MoPHP and the Governorate Nutrition Coordinator oversaw the political and logistical arrangements for the survey, ensuring the smooth operation of the survey. 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.

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EXECUTIVE SUMMARY

Taiz Governorate is Yemen's most populous governorate, with an estimated 2,839,206 inhabitants. The governorate contains of two main ecological zones / livelihood groups: the mountainous zone, where agriculture (qat growing) is the main livelihood, and the lowland coastal plain close to the Red Sea, where cultivation of sorghum, millet, vegetables, and fruit in addition to fisheries are undertaken.

Taiz governorate has insufficient social services in areas including health; poor road infrastructure; as well as water shortages and high food prices. Further deterioration has taken place since May 2011, when Taiz experienced incidents of civil unrest and armed conflict. These security incidents have limited access for the humanitarian community.

The ongoing increase in the price of the main food commodities has reduced the purchasing power particularly of the poorest and most severely food insecure families in Yemen. According to CFSS WFP 2011, more than 45% of Taiz populations are food insecure.

In view of these circumstances, as well as high global food insecurity and water stress, in addition to the lack of baseline data on the nutrition situation and poor reporting/information system, it has been deemed crucial to obtain a better understanding of the nutrition situation of the Taiz population. Taiz was prioritized for the survey by all nutrition cluster partners to establish the current nutrition situation as base line and to help on determining the required response in this governorate. The preparation for the survey started on 28 January 2012 by training of enumeration teams, selecting of clusters and implementing the field test.

Between 7 and 23 February 2012, MoPHP, UNICEF, WHO and cluster partners conducted two inter-agency nutrition surveys using the Standardized Monitoring and Assessment for Relief and Transition (SMART) methodology covering the two main ecological zones in Taiz Governorate of Yemen. 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, 30 clusters in Mountainous and 30 clusters in Coastal Plain ecological zones were randomly selected for both anthropometric and mortality assessments. A minimum of 20 households per cluster in the Mountainous Ecological Zone and 19 households per cluster in the Coastal Plain Ecological Zone were randomly selected and assessed. A total of 612 households in Mountainous and 605 in Coastal Plain were surveyed, covering a total of 698 and 736 children aged 6-59 months, respectively.

Results indicate that the nutrition situation differs in the two zones as shown in table 1 below. The Global Acute Malnutrition (GAM) rate was **9.4%** (95% CI: 7.4 – 11.9), with Severe Acute Malnutrition (SAM) 1% (95% CI: 0.5 – 2.2) in Mountainous Ecological Zone. GAM and SAM rates in the Coastal Plain Ecological Zone were **15.1%** (95% CI: 12.6 – 18.0) and 3.1% (95% CI: 2 – 4.7), respectively. These rates indicate that the nutrition situation in the Mountainous zone is poor (<10%) while in the Coastal Plain it is critical, according to WHO categorization. ***The GAM rate in the Coastal Plain Zone (15.1%) exceeds the emergency threshold of 15%.*** Pockets of high vulnerability were identified in the Coastal Plain survey.

Stunting rates in the Mountainous Zone and Coastal Plain Zone are **51.5%** (95% CI: 48.1 – 54.9) and **49.1%** (95% CI: 44.6 – 53.6) respectively with severe stunting of 17.1% (95% CI: 14.7 – 19.8) and 19.1% (95% CI: 15.8 – 23.0) respectively. ***These rates are beyond the critical levels of 40%; thus the stunting rates are of great concern***.

Underweight rate in the Mountainous Zone is **35%** (95% CI: 31.9 – 38.3), with severe underweight of 9.1% (95% CI: 7.3 – 11.2) while the underweight and severe underweight rates in the Coastal Plain Zone are **44.3%** (95% CI: 39.9 – 48.8) and 13.4% (95% CI: 10.6 – 16.8), respectively. ***These rates are above the critical levels of 30%, as per WHO categorization***.

The two main sources of drinking water in the Mountainous Zone were bottled water (29.9%) and piped water (18.6%) while in the Coastal Plain Zone they were unprotected open wells (35.2%) and protected open wells (25.1%). Over 75% of the population in Taiz seek health services from a public health facility when sick (Mountainous Zone 76.6% and Coastal Plain 75.9%). There is 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 is one month before the survey*) – cf. table 1 below*. Vitamin A coverage is lower than the Sphere Standards recommendation of 95% coverage (Mountainous Zone – 83.6%; Coastal Plain – 76%), while over 72% of the children aged 6-24 months do not receive the recommend four meals a day.

There are statistically significant relationships between malnutrition and child feeding practices, Vitamin A supplementation, ARI and fever, the education level of household caretaker, the cleanliness of drinking water storage, handwashing practices, and human waste disposal practices (type of latrines in use). This implies that these factors may be contributing to the poor nutrition situation in Taiz, hence the need to address them in the intervention package. There was no statistically significant association between malnutrition and diarrhoea, or household main source of drinking water.

Specific recommendations include:

Immediate Interventions

- Expansion and strengthen of CMAM services in the Coastal Plain with particular focus on pockets of vulnerable *Ozlas (group of villages with same characteristics*) is urgently required. All CMAM services should adhere to CMAM protocol (ensuring systematic treatment and full consideration of moderate acute malnutrition management) that should be integrated with infant feeding in emergency services, hygiene promotion and food security intervention. Interventions need to be prioritized in districts with pockets of malnutrition and with high SAM rates (mostly in the Coastal Plain area).
- Accelerate Infant and Young Children Feeding (exclusive and sustained breastfeeding and complementary feeding practices for children aged 6 to 24 months) and micronutrient interventions (including deworming) for acute and chronic malnutrition mitigation.
- Promote intervention integration and expansion to address risk factors associated with disease, sub-optimal food frequency, household food security, knowledge of child care etc, delivered/coordinated under basic minimum package for child survival and targeting the crucial period of the window of opportunity (pregnancy till the child is 2 years).

- Establish partnerships among/ between the government, UN and NGOs to accelerate the response scale-up in Taiz.

Medium Term Interventions

- Develop detailed response plans articulating district level humanitarian needs, delivering response package, coverage and gaps for easier response progress analysis and advocacy.
- Integrate MUAC screening and referral, deworming, awareness raising on hygiene and water treatment/storage, as well as IYCF, in Child Health Day activities.
- Promote improved latrine use and other services enhancing hygiene services, for instance Community Led Total Sanitation (CLTS) strategy.
- Undertake periodic vitamin A supplementation as per WHO global recommendation, and facilitate provision of multiple micronutrients in addressing the high stunting levels.

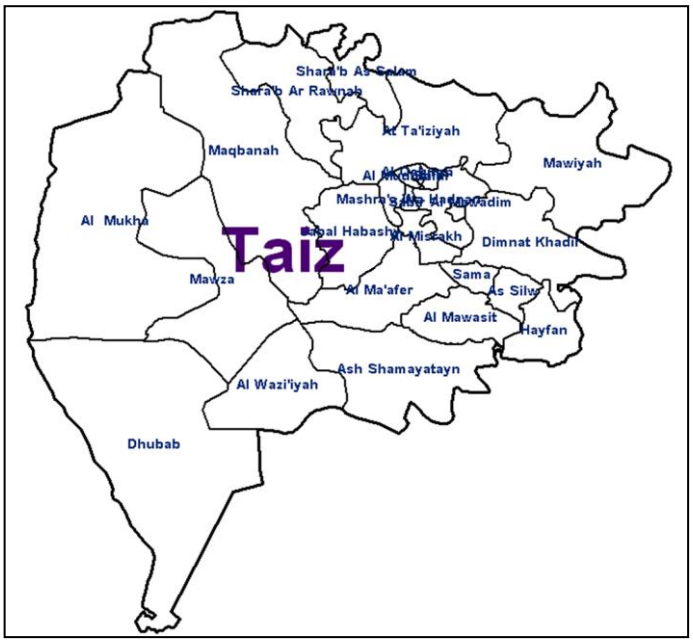
Table 1. Summary of Taiz Governorate Nutrition Survey Findings, Feb 2012						
	Mountainous (N=698)			**Coastal Plain (N= 736)**		
Indicator	**N**	**%**	**95% CI**	**N**	**%**	**95% CI**
Child Malnutrition						
Total number of households assessed for children*	427	69.8%	65.9 – 73.4	410	67.8	63.9 – 71.5
Mean household size	7.5			7		
Total number of children assessed						
Child sex: Males (boys)	355	50.9	47.1 – 54.6	410	55.7	52 – 59.3
Females (girls)	343	49.1	45.4 – 52.9	326	44.3	40.7 – 48
Global Acute Malnutrition (WHZ<-2 z-score or oedema)	64	9.4	7.4 – 11.9	108	15.1	12.6 – 18
Severe Acute Malnutrition (WHZ<-3 z score or oedema)	7	1	0.5 – 2.2	22	3.1	2 – 4.7
Oedema	2	0.3	0.1 – 1.2	0	0	
Chronic Malnutrition (H/A<-2 z score)	341	51.5	47.6 – 55.4	346	49.1	45.3 – 52.8
Severe Chronic Malnutrition (H/A<-3 Z score)	113	17.0	14.3 – 20.2	135	19.1	16.3 – 22.3)
Underweight prevalence (W/A<-2 Z score)	239	35.0	31.5 – 38.8	317	44.3	40.7 – 48.1
Severe Underweight (W/A<-3 z score)	62	9.0	7.1 – 11.6)	96	13.4	11.1 – 16.2)
Child Morbidity						
Children reported with suspected measles within one month prior to assessment	60	8.6	6.7 – 11	13	1.8	1 – 3.1
Children reported with diarrhoea in 2 weeks prior to assessment	235	33.9	30.4 – 37.6	218	29.7	26.5 – 33.2
Children reported with ARI within two weeks prior to assessment	323	46.7	42.9 – 50.5	372	50.6	46.9 – 54.3
Children reported with febrile illness in 2 weeks prior to assessment	322	46.3	42.5 – 50.1	366	49.9	46.2 – 53.5
Immunization and Supplementation Status						
Children aged 9 – 59 months immunised against measles	566	87.8	84.9 – 90.1	514	74.3	70.8 – 77.5
Children who have received 3 doses of polio vaccine	610	88.2	85.5 – 90.4	537	73.2	69.8 – 76.3
Children reported to have received vitamin A supplementation in last 6 months	577	83.6	80.6 – 86.3	550	76	72.7 – 79
Child Feeding						
Children (6-24 months) reported to be breastfeeding	169	68.4	62.2 – 74.2	175	71.4	65.3 – 77
Children (6-24 months) fed 4 times and above	66	27.5	22 – 33.6	42	17.8	13.1 – 23.3
Mortality						
0-5 Death Rate (U5DR) as deaths/10,000/ day	**0.71**		0.27 – 1.84	**0.69**		0.25 – 1.89
Crude Death Rate (CDR) as deaths/10,000/ day	**0.27**		0.14 – 0.51	**0.21**		0.1 – 0.43

- In Mountainous Zone, out of 615 households visited, 3 refused and 185 did not have children aged 6 – 59 months. In Coastal Plain Zone, out of 606 households visited, 1 refused and 195 did not have children aged 6 – 59 months.

1.0 INTRODUCTION / BACKGROUND

Historical Context

Figure (1): Taiz map



Taiz Governorate is located in the southwestern part of the Republic of Yemen, bordering the Red Sea to the west, Hodaidah and Ibb governorates to the north, Lahj to the south, and Al-Dhale governorate to the east. Its surface area is about 10 462 km^2. Taiz is Yemen's most populous governorate, with an estimated 2,839,206 people – 12.15% of the country's population (2011 population projection based on 2004 census). About 81% of the population is rural while 19% is urban; 48% is male and 52% is female. Taiz's population growth rate is 2.47%. Current population density is estimated at 26 inhabitants /km^2.

Administratively Taiz is divided into 23 districts, 3 urban (Muzaffar, Qahera and Salah), and 20 rural (Al Taziha, Saber Al Moadm, Mashra'a and Hdnan, Al Msrakh, Jabal Habashi, Mawasit, Al Maafr, Ashammaitin, Mauza'a, Al Wazeia, Al Makha, Dhubab, Maqbana, Sharhab Al Rawna, Sharhab Al Salam, Khadder, Same'a, Aselow, Hiffan and Mawiah), as shown in Figure 1. There are 1877 villages, within 329 Ozla.

Taiz governorate is made up two ecological zones/ livelihood groups, namely the Mountainous Zone and the Lowland Coastal Plain. Although the governorate is characterized by diverse economic activity, the population's characteristics and living conditions differ significantly between the two ecological zones.

People in the coastal area work mainly in fisheries, while those living in the mountainous area engage mostly in farming, cultivating crops such as grains, vegetables, qat and fruits as well as livestock and industry.

Climate: The climate differs between the mountainous and coastal plain areas. The mountainous areas have cold winters and temperate summers, while the coastal areas have temperate winters and warm/hot summers.

Precipitation: Summers are humid across Taiz governorate, due to the seasonal winds from the Indian Ocean. Average rainfall in Taiz is 737 mm, though little of it is received during winter. Annual rainfall may reach more than 1000 mm in certain locations, such as Jabal Sabir.

Socio-political situation: Since May 2011 armed conflict and civil unrest have caused a significant increase in humanitarian needs in Taiz, particularly with regard to food, access to basic health care, and water, sanitation and hygiene (WASH). Insecurity is one of the primary humanitarian challenges, hindering smooth delivery of humanitarian assistance. Basic public social services are also inadequate in some areas that may not have access challenges. Governorate health office statistics indicate that child vaccination rate dropped to 75% during 2011 in spite of three outreach rounds, as

compared to 91% reached during 2010 without outreach services. Statistics also indicate a drop in 2011 in the number of births that took place in the health facilities with professional health staff assistance.

The findings of a rapid inter-agency multi-sectorial assessment conducted in Taiz during December 2011 indicate that the main issues of concern for many of the affected communities surveyed include food shortage, an increase in food prices, limited economic means (loss of livelihoods during crisis), lack or inadequate quality of water and sanitation services, due to increased fuel prices (for water pumping) and overall water shortage. All these factors exacerbated the level of vulnerability for Taiz's population, especially its women and under-five year old girls and boys.

Thus far the only selective nutrition intervention available in the governorate is the therapeutic feeding programme for managing severe acute malnutrition. These services are provided through the functional 32 OTPs and one TFC, located across the 23 districts.

In 2010, the IFPRI National Food Security Paper estimated Global Acute Malnutrition rate in Taiz to be 20.9%, with Severe Acute Malnutrition at 4.4%. This entailed an emergency nutrition situation. However these figures were extrapolations based on 2005-06 data, and the methodology for data collection and consideration of any disparities in the population could not be confirmed.

2.0 ASSESSMENT OBJECTIVES

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

Specific objectives were:

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

3.0 METHODOLOGY

3.1: Sampling Design and Sample Size Determination

Two cross-sectional surveys were conducted between 7 and 23 February 2012 in the Taiz Governorate's Mountainous and Coastal Plain Ecological Zones. Using a two-stage Probability Proportionate to Population Size (PPS) sampling methodology, 30 clusters in the Mountainous Ecological Zone and 30 clusters in Coastal Plain Zone 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 Mountainous zone was 1,971,648 while the total estimated population in Coastal Plain was 937,426 (Ref: Annexes 9 and 10: Sampling Frame: Source: CSO Projection, 2012).

A sample size of 575 households in the Mountainous Zone and 552 in the Coastal Zone was calculated using ENA for SMART software based on the estimated parameters shown in Table 2. The calculated sample size for mortality in each of the ecological zone was about 300 households, hence close to the calculated sample for the nutrition survey.

Table 2: Parameters used in the Sample Size Determination

Parameters	Mountainous Zone Survey	Coastal Plain Survey
Estimated Acute Malnutrition Prevalence (%)[1]	21	21
Desired Precision (%)	5	5
Design Effect[2]	2	2
Average Household Size[3]	6.5	6.4
Under 5 year old (%)[4]	17	18
Non response household (%)[5]	3	3
Sample Size (N)	**575**	**552**

A minimum of 20 households per cluster and 19 households per cluster were recommended for assessing the anthropometry and mortality in Mountainous and Coastal Plain zone respectively. A total of 612 households in Mountainous and 605 in Coastal Plain were surveyed, reaching a total number of 698 and 736 children aged 6-59 months, respectively.

3.2: Sampling Procedure

The ENA for SMART software was used in the random selection of the 30 clusters from the sampling frame, including identification of the reserve clusters. The sampling frame consisted of an exhaustive list of villages or urban area sections known to be accessible within Taiz Governorate and the estimated population size for each of the

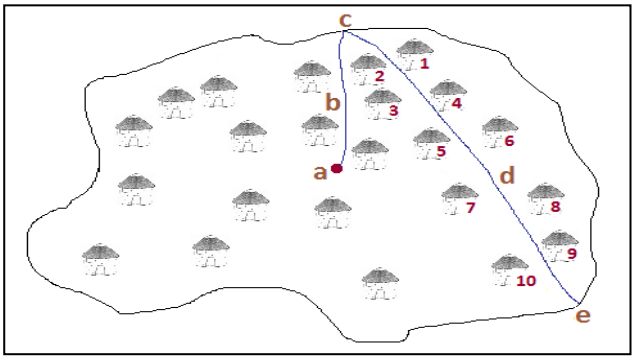
[1] International Food Policy Research Institute/Ministry of Planning and International Cooperation: National Food Security Paper, Feb 2010: Page 105 for GAM in Taiz .
[2] Minor heterogeneity within clusters in the study population explored based on presence of "marginalized groups"/ non–integrated groups,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

villages. Independent sampling frames for Mountainous and Coastal Plain zones were used in this selection process (Ref: Sampling frame in Annexes 9 and 10). In this case, all villages in Taiz Governorate were accessible and were included in the sampling frame, thus giving them an equal chance of being selected.

All the 30 clusters randomly selected from the sampling frames for the Mountainous and Coastal Plain Ecological Zones 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 Taiz Governorate as defined based on the two ecological zones – Mountainous and Coastal Plain.

The activities undertaken in the entire survey period are summarised in Table 3, below. Data collection preparation commenced with a four-day training of enumerators, team leaders and supervisors (Ref: Annex 3: Taiz Nutrition Survey Team). The training conducted covered interview techniques, sampling procedures, field procedures (random household selection, introduction and systematic data collection), inclusion and exclusion criteria, sources and reduction of errors, taking of measurements (height, weight and MUAC) focusing on achieving high precision and accuracy, data collection standardisation procedures to ensure data quality, diagnosis of oedema, measles, ARI, diarrhoea and collection of household details necessary to establish household members movement and/or death in order to compute mortality rates, handling of equipment and the general courtesy during the assessment. Six survey teams were involved in the data collection process.

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

Table 3: Chronology of Activities in the Taiz Governorate Survey

Action	Period
Preparation: Contacting local authority, survey team identification, training material preparation	2 – 5 Feb
Training of survey teams and pre-testing of questionnaire	7 – 10 Feb
Taiz Mountainous Zone survey: Data collection and data entry	11 – 17 Feb
Taiz Mountainous Zone: Data cleaning and analysis	18 – 20 Feb
Taiz Coastal Plain Zone: Data collection and data entry	18 – 23 Feb
Taiz Coastal Plain Zone: Data cleaning and analysis	24 – 26 Feb
Taiz Nutrition Survey report drafting and releasing	27 – 29 Feb
Circulation of final report	14 March

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 the Taiz Governorate Public Health Office 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: Taiz 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 Jabal Jarrah village in the periphery of Taiz town. This village was not one of the randomly selected villages/clusters.

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

-3 Z-Scores $\leq$W/H< -2 Z-Scores = Moderate acute malnutrition

W/H <-2 Z-score or oedema = Global/total acute malnutrition

W/H $\geq$ -2Z-Scores = Normal

The classification used for Stunting levels was a follows:

H/A < -3 Z-Scores = Severe Stunting

-3 Z-Scores $\leq$H/A< -2 Z-Scores = Moderate Stunting

H/A <-2 Z-score = Stunting Rates

H/A ≥ -2Z-Scores = Normal

The classification used for Underweight levels was a follows:

W/A < -3 Z-Scores = Severe Underweight

-3 Z-Scores ≤W/A< -2 Z-Scores = Moderate Underweight

W/A <-2 Z-score = Underweight Prevalence Rates

W/A ≥ -2Z-Scores = Normal

Frequencies and cross-tabulations were used to give percentages, means and standard deviations in the descriptive analysis and presentation of general household and child characteristics.

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

3.6: Data Entry Verification and Cleaning

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% 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%.

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

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

4.0 ASSESSMENT RESULTS

4.1: Household Characteristics of Study Population

As shown in Table 4 below, the gender of household head is largely male (over 90%). More than 80% of household heads are married and living with partner in the two survey zones. More than 25% of household caretakers in the governorate are illiterate, with higher percentage in Coastal Plain Zone (43.6%) than Mountainous districts (25.7%). The proportion of household caretakers with secondary or higher education is higher in Mountainous Zone (33.7%) than in the Coastal Plain Zone (18.7%).

The three main income sources for households in Mountainous Zone are temporary work (casual labour)[6], fixed monthly waged work and qat cultivation and trade, while the three main sources of household income in the Coastal Plain Zone are temporary work (casual labour), fixed monthly waged work, and remittances, as shown in Table 4.

Regarding drinking water, the three main sources in Mountainous Zone are bottled water (29.9%), piped water (18.6%) and unprotected open wells (14.2), while the main three main sources for households in Coastal Plain Zone are unprotected open wells (35.2%), protected open wells (25.1) and dependence on water tankers (14.5%). Only 26 households (21 in Mountainous Zone and 5 in Coastal Plain Zone) do water treatment, mainly by boiling water before drinking. About 80.2% (Mountainous Zone) and 60.6% (Coastal Plain Zone) of the households store drinking water in clean containers (algae growth is not seen).

As shown in Table 4, about 45.5% of the households in Mountainous Zone use flush or pour flush latrine system in their human waste disposal, compared to 15% of the household in the Coastal Plain Zone. Defecation in open places is more practiced in the Coastal Plain Zone (22.6% of households) than in Mountainous Zone (3.9% of households).

Table 4: Household Characteristics

	Mountainous		*Coastal Plain*	
	N	*%*	*N*	*%*
Total Households	612/615	99.5	605/606	99.8
Household size (Mean):	7.5		7	
Mean No of Under-fives	1.3		1.3	
Sex of Household Head:				
Male	556	90.8	563	93.2
Female	56	9.2	41	6.8
Marital status of household head				
1. Married and living with spouse	504	82.4	512	84.6
2. Married but living far from spouse for ≥ 6 months	68	11.1	47	7.8
3. Widowed	26	4.2	33	5.5
4. Single	4	0.7	10	1.7
5. Recalcitrant	5	0.8	0	0
6. Divorced	5	0.8	3	0.5
Education level of household caretaker				
1. Illiterate	157	25.7	264	43.6
2. Read and write	147	24	142	23.5
3. Basic education	102	16.7	86	14.2
4. Secondary education	83	13.6	59	9.8
5. Higher education	123	20.1	54	8.9
Main Source of Income:				

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

Table 4: Household Characteristics				
	Mountainous		*Coastal Plain*	
	N	*%*	*N*	*%*
1. Temporary work/ Casual labour	188	31.2	136	26.7
2. Fixed monthly waged work	127	21.1	186	30.5
3. Qat cultivation and trade	75	12.4	56	9.2
4. Remittance	46	7.6	65	10.7
5. craftsmanship	44	7.3	52	8.5
6. Donations	29	4.8	27	4.4
7. Crops other than qat	24	4	8	1.3
8. Trade	24	4	43	7
9. Other	46	7.7	10	1.6
Main water source for drinking				
1. Bottled water	183	29.9	18	3
2. House-connected piped water	114	18.6	47	7.8
3. Water from unprotected open well	87	14.2	213	35.2
4. Water from protected open well	73	11.9	152	25.1
5. Water from covered rainwater harvesting tank	53	8.7	32	5.3
6. Unprotected surface water (wadi, springs, etc)	45	7.4	2	0.3
7. Water from protected spring	40	6.5	0	0
8. House-connected yard piped water	8	1.3	52	8.6
9. Water tanker	6	1	88	14.5
10. Water from uncovered rainwater harvesting tank	2	0.3	1	0.2
11. Other	1	0.2	0	0
Household latrine type				
1. Flush/pour flush latrine	278	45.5	91	15
2. Open pit latrine	212	34.7	220	36.4
3. Simple covered pit latrine	96	15.7	157	26
4. Defecation in open (in fields, etc.)	24	3.9	137	22.6
5. Other	1	0.2	0	0

4.2: Morbidity, Immunization Status and Health Seeking Behaviour

High prevalence of common diseases was recorded in both the Mountainous and Coastal Plain Ecological Zones, as reflected in Table 5, below. During the two weeks prior to the survey, recorded prevalence of diarrhoea among children was 33.9% and 29.7% in the Mountainous Zone and Coastal Plain Zone, respectively. The prevalence of ARI as described by coughing or breathing difficulty and the prevalence of fever two weeks prior to the survey were 46.7% and 46.3% respectively in Mountainous Zone and 50.6% and 49.9% in Coastal Plain Zone.

Suspected measles[7] during the last month was higher in Mountainous Zone (8.6%) than in Coastal Plain Zone (1.8%).

As shown in Table 5, the coverage for polio vaccination was higher in Mountainous Zone (88.2%) than in Coastal Plain Zone (73.2%). A similar trend was found in the measles immunization coverage, with 87.8% of the children aged 9 months to below 60 months being vaccinated in the Mountainous Zone (87.8%) compared to 74.3% in the Coastal Plain districts. During the previous 6 months, 83.6% of the children in the Mountainous Zone and 76% of the children in the Coastal Plain Zone had received vitamin A supplements. The above immunization coverage and vitamin A supplementation coverage are lower than the Sphere Standards recommended 95% coverage.

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

Only 11.1% of children slept under a mosquito net the night before the survey. The percentage is higher in Mountainous districts (13.5%) than Coastal Plain districts (6.8%).

As shown in Table 5, more than three quarters of households seek health services from public health facilities, with no significant differences between the two zones. The main reasons for seeking medical assistance outside either public facilities or private clinics are the high cost of the service, the physical distance to these services, and transportation difficulties.

Table 5: Health Seeking Behaviour

	Mountainous		*Coastal Plain*	
	N	*%*	*N*	*%*
Where health service is sought				
Public health facility	468	76.6	459	75.9
Pharmacy	51	8.3	46	7.6
Private clinic	43	7	65	10.7
Personal medication	30	4.9	20	3.3
Do not seek medical assistance	11	1.8	6	1
Traditional medication	7	1.1	9	1.5
Sheikh	1	0.2	0	0
Morbidity				
Proportion of children with diarrhoea within 2 weeks prior to assessment	235	33.9	218	29.7
Proportion of children with ARI within two weeks prior to assessment	323	46.7	372	50.6
Proportion of children with fever within two weeks prior to assessment	322	46.3	366	49.9
Suspected measles within one month prior to assessment	60	8.6	13	1.8
Immunization				
Children (9-59 months) immunised against measles	566	87.8	514	74.3
Children who have ever received polio vaccine	610	88.2	537	73.2
Supplementation				
Children who received vitamin A supplementation in last 6 months	577	83.6	550	76
Sleeping under mosquito net				
Children slept under mosquito net last night	94	13.5	50	6.8

4.3: Feeding Practices

Table 6: Feeding practices

	Mountainous		*Coastal Plain*	
	N	*%*	*N*	*%*
Still breastfeeding	169	68.4	175	71.4
Number of feeds (other than breastfeeds)				
No feed	12	5.0	8	3.4
One feed	27	11.3	15	6.4
Two feeds	28	11.7	49	20.8
Three feeds	107	44.6	122	51.7
Feeding 4 times and above	66	27.5	42	17.8
Number of milk feeds (other than breastmilk)				
No milk feed	68	34.9	118	49.8
One milk feed	28	14.4	17	7.2
More than one milk feed	99	50.8	102	43.0

As shown in Table 6, only 68.4% and 71.4% of children aged 6 to 24 months are continuing breastfeeding in Mountainous Zone and Coastal Plain Zone respectively. Additionally, only 27.5% of this category of children in the Mountainous Zone and 17.8% in Coastal Plain Zone had 4 and above feeds other than breastfeeding in the previous day. Inappropriate infant and young child feeding practice of giving milk (other than breastmilk) to children over 6 months

of age was recorded as common in the two zones with percentages of 65.2% of children (in the Mountainous Zone) and 50.2% of children (in the Coastal Plain Zone) in the previous day to the survey.

4.4: Characteristics of the children assessed

Table 7: Mountainous zone: Age and Sex distribution

	Boys		Girls		Total		Ratio
AGE (mo)	no.	%	no.	%	no.	%	Boy:girl
6-17	98	52.7	88	47.3	186	26.6	1.1
18-29	76	49.0	79	51.0	155	22.2	1.0
30-41	87	53.4	76	46.6	163	23.4	1.1
42-53	68	50.0	68	50.0	136	19.5	1.0
54-59	26	44.8	32	55.2	58	8.3	0.8
Total	355	50.9	343	49.1	698	100.0	1.0

Table 8: Coastal Plain: Age and Sex distribution

	Boys		Girls		Total		Ratio
AGE (mo)	no.	%	no.	%	no.	%	Boy:girl
6-17	96	57.8	70	42.2	166	22.6	1.4
18-29	111	55.2	90	44.8	201	27.3	1.2
30-41	92	55.4	74	44.6	166	22.6	1.2
42-53	79	53.7	68	46.3	147	20.0	1.2
54-59	32	57.1	24	42.9	56	7.6	1.3
Total	410	55.7	326	44.3	736	100.0	1.3

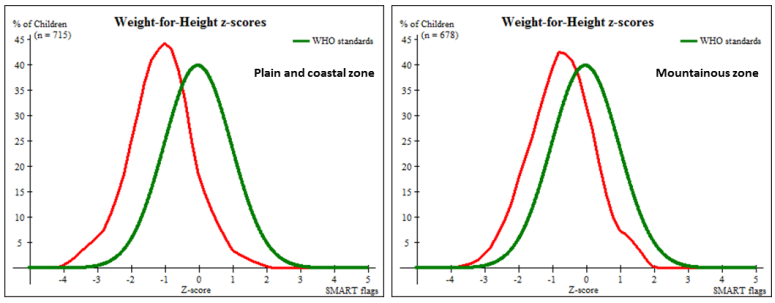
Generally there were equal numbers of boys and girls assessed in the two surveys, implying representativeness of the sample collected during the survey. There were however more boys than girls assessed in the Coastal Plan across all the age categories, as shown in Tables 7 & 8.

4.5: Nutrition Status

Below is a summary of the anthropometric results for both the Mountainous and Coastal Plain nutrition survey results. Data quality was validated using the Plausibility check function of the SMART for ENA software. The Mountainous data quality was excellent (plausibility data quality score of 4) while the Coastal Plain was acceptable (plausibility data quality score of 13) (Ref: Annex 13 for data quality results)

4.5.1: Acute Malnutrition Rates

Though there is an overall shift to the left of the study population when compared with the reference population, as per the graphs shown (implying presence of malnutrition), there is a clear difference in nutrition vulnerability between the two zones, based on global acute malnutrition rates. The interpretation was made based on the 2006 WHO Growth Standards.



The level of wasting with oedema – also known as global acute malnutrition (GAM) – found in Mountainous Zone is **9.4%,** which classifies as 'poor' as per the WHO categorization of the severity, while in the Coastal Plain the GAM rate is **15.1%,** which is 'critical' according to the WHO categorization, as shown in Tables 9 & 10 (including the confidence intervals). Pockets of high nutritional vulnerability among some

marginalised groups in the Coastal Plain were noted and reported. Levels of severe acute malnutrition (SAM) of 1% and moderate acute malnutrition (MAM) of 8.4% in the Mountainous Zone are lower than the national ones of 2003, while levels of SAM of 3.1% and MAM of 12% in the Coastal Plain Zone are close to the national ones of 2003 (The national level of GAM of 2003 Family Health Survey is 14.3%[8], while the 2010 IFPRI estimation based on the 2005-06 HBS is 15.7% for GAM and 4.4% for SAM. The earlier GAM estimate for Taiz Governorate by IFPRI was a GAM rate of 20.9% and SAM of 4.4%).There were two cases of oedema identified in the Mountainous Zone.

Table 9 : Taiz Mountainous Zone: Acute Malnutrition (Wasting) Rate			
	All *n = 680*	*Boys* *n = 348*	*Girls* *n = 332*
Prevalence of global malnutrition (<-2 z-score and/or oedema)	(64) 9.4 % (95% CI: 7.4 - 11.9)	(44) 12.6 % (95% CI: 9.4 - 16.7)	(20) 6.0 % (95% CI: 3.8 -9.3)
Prevalence of moderate malnutrition (<-2 z-score and >=-3 z-score	(57) 8.4 % (95% CI: 6.5 - 10.9)	(38) 10.9% (95% CI: 7.9 - 18.8)	(19) 5.7 % (95% CI: 3.6 - 8.9)
Prevalence of severe malnutrition (<-3 z-score and/or oedema)	(7) 1.0 % (95% CI: 0.5 - 2.2)	(6) 1.7 % (95% CI: 0.7 - 3.9)	(1) 0.3 % (95% CI: 0.0 - 1.9)
Oedema	(2) 0.3% (95% CI: 0.1-1.2)	(2) 0.6% (95% CI: 0.1-2.4)	0

The prevalence of oedema is 0.3 %

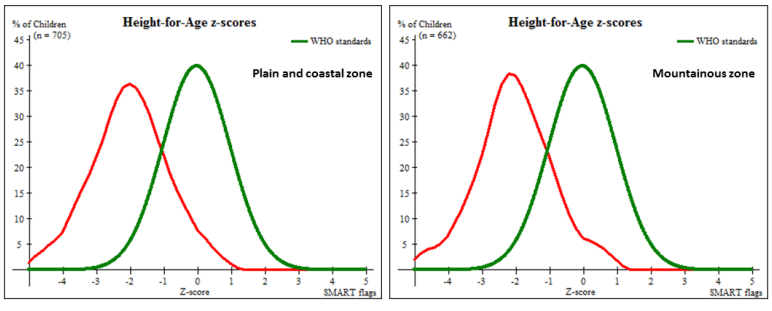
Table 10: Taiz Coastal Plain Zone: Acute Malnutrition (Wasting) Rate			
	All *n = 715*	*Boys* *n = 400*	*Girls* *n = 315*
Prevalence of global malnutrition (<-2 z-score and/or oedema)	(108) 15.1 % (95% CI: 12.6 - 18.0)	(68) 17.0 % (95% CI:13.5 - 21.1)	(40) 12.7 % (95% CI: 9.3 - 17.0.)
Prevalence of moderate malnutrition (<-2 z-score and >=-3 z-score	(86) 12.0 % (95% CI: 9.8 - 14.7)	(52) 13.0 % (95% CI: 9.9 - 16.8)	(34) 10.8 % (95% CI: 7.7 - 14.9.)
Prevalence of severe malnutrition (<-3 z-score and/or oedema)	(22) 3.1 % (95 CI: 2.0 - 4.7)	(16) 4.0 % (95% CI:2.4 - 6.5)	(6) 1.9 % (95% CI: 0.8 - 4.3)

The prevalence of oedema is 0.0 %

The prevalence of acute malnutrition based on the NCHS reference is reflected the summary of Table 15, below.

4.5.2: Chronic Malnutrition Rates

Stunting prevalence as shown in Table 11 & 12 in Mountainous Zone is 51.5% while in Coastal Plain zone it is 49.1%. There is also an overall shift to the left of the study population deviating from the reference population. The prevalence of severe stunting is 17.1% and 19.1% in Mountainous Zone and Coastal Plain Zone, respectively. The statistical details of the



[8] As interpreted using new WHO Child Growth Standards: Yang H, de Onis M. 'Algorithms for converting estimates of child malnutrition based on the NCHS reference into estimates based on the WHO Child Growth Standards'. BMC Pediatrics 2008, 8:19 (05 May 2008)

stunting rates are as shown in the tables below.

Table 11: Taiz Mountainous Zone Chronic Malnutrition (Stunting) Rate			
	All *n = 662*	*Boys* *n = 334*	*Girls* *n = 328*
Prevalence of stunting (H/A<-2 z-score)	(341) 51.5 % (95% CI: 47.6 - 55.4)	(175) 52.1 % (95% CI: 46.6 - 57.6)	(167) 50.9 % (95% CI: 45.4 - 56.4)
Prevalence of moderate stunting (<-2 z-score and >=-3 z-score)	(228) 34.4 % (95% CI: 30.8 - 38.2)	(112) 33.5 % (95% CI: 28.5 - 38.9)	(116) 35.4 % (95% CI: 30.2 - 40.8)
Prevalence of severe stunting (H/A<-3 z-score)	(113) 17.1 % (95% CI: 14.3 - 20.2)	(62) 18.6 % (95% CI: 14.6 - 23.2)	(51) 15.5 % (95% CI: 11.9 - 20.0)

Table 12: Taiz Coastal Plain Zone Chronic Malnutrition (Stunting) Rate			
	All *n = 705*	*Boys* *n = 390*	*Girls* *n = 315*
Prevalence of stunting (<-2 z-score)	(346) 49.1 % (95% CI: 45.3 - 52.8)	(199) 51.0 % (95% CI: 46.0 - 56.1)	(147) 46.7% (95% CI: 41.1 - 52.3)
Prevalence of moderate stunting (<-2 z-score and >=-3 z-score)	(211) 29.9 % (95% CI: 26.6 - 33.5)	(123) 31.5 % (95% CI: 27.0 - 36.4)	(88) 27.9 % (95% CI: 23.1 - 33.3)
Prevalence of severe stunting (<-3 z-score)	(135) 19.1 % (95% CI: 16.3 - 22.3)	(76) 19.5 % (95% CI: 15.7 - 23.8)	(59) 18.7 % (95% CI: 14.7 -23.6)

The above stunting levels exceed the 40% threshold for critical levels according to WHO (2000), hence the situation is of great concern. The rates are however lower than the estimated national stunting levels of 58%.

4.5.3: Underweight Rates

Underweight prevalence is shown in Tables 13 & 14. The rate in the Mountainous Zone is 35%, while in the Coastal Plain Zone it is 44.3%. The prevalence of severe underweight is 9.1% and 13.4% in Mountainous Zone and Coastal Plain Zone, respectively. An overall shift of the study population is shown in the graphs, reflecting the overall deviation of the study population from the reference population, implying presence of widespread malnutrition. The statistical details of the underweight prevalence are shown in the tables 13 & 14 below.

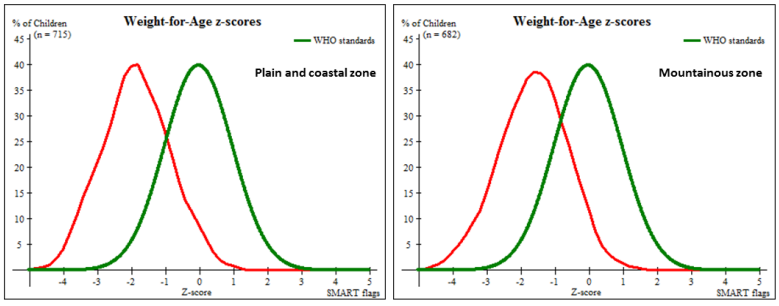


Table 13: Taiz Mountainous Zone Underweight Rate			
	All *n = 682*	*Boys* *n = 347*	*Girls* *n = 335*
Prevalence of underweight (<-2 z-score)	(239) 35.0 % (95% CI: 31.5 - 38.8)	(124) 35.7 % (95% CI: 30.7 - 41.1)	(115) 34.3 % (95% CI: 29.3 - 39.7)
Prevalence of moderate underweight (<-2 z-score and >=-3 z-score)	(177) 26.0 % (95% CI: 22.7 - 29.4)	(87) 25.1 % (95% CI: 20.7 - 30.0)	(90) 26.9 % (95% CI: 22.3- 32.0)
Prevalence of severe underweight (<-3 z-score)	(62) 9.1 % (95% CI: 7.1 - 11.6)	(37) 10.7 % (95% CI: 7.7 - 14.5)	(25) 7.5 % (95% CI: 5.0 - 11.0)

Table 14: Taiz Coastal Plain Zone Underweight Rate			
	All *n = 715*	*Boys* *n = 398*	*Girls* *n = 317*
Prevalence of underweight (<-2 z-score)	(317) 44.3 % (95% CI: 40.7 -48.1)	(183) 46.0 % (95% CI: 41.0 – 51.0)	(134) 42.3 % (95% CI: 36.9 – 47.9)
Prevalence of moderate underweight (<-2 z-score and >=-3 z-score)	(221) 30.9 % (95% CI: 27.6 - 34.5)	(125) 31.4 % (95% CI: 26.9 – 36.3	(96) 30.3 % (95% CI: 25.3 – 35.7)
Prevalence of severe underweight (<-3 z-score)	(96) 13.4 % (95% CI: 11.1 – 16.2)	(58) 14.6 % (95% CI: 11.3 – 18.5)	(38) 12.0 % (95% CI: 8.7 – 16.2)

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

Table 15: Summary of Malnutrition Rates by Ecological Zones

	Mountainous			*Coastal Plain*		
	n	***%***	***95% CI***	***n***	***%***	***95% CI***
Global Acute Malnutrition (WHZ<-2 or oedema)	64	9.4	7.4 – 11.9	108	15.1	12.6 – 18
Severe Acute Malnutrition (WHZ<-3 or oedema)	7	1	0.5 – 2.2	22	3.1	2 – 4.7
Oedema	2	0.3	0.1 – 1.2	0	0	
Global Acute Malnutrition (WHM<80% or oedema)*	35	5.1	3.6 – 7	56	7.8	6 – 10
Severe Acute Malnutrition (WHM<70% or oedema)*	6	0.9	0.4 – 2	1	0.1	0 – 0.9
Stunting rate (HAZ<-2 z score)	341	51.5	47.6 – 55.4	346	49.1	45.3 – 52.8
Severe stunting rate (HAZ <3 z score)	113	17.1	14.3 – 20.2	135	19.1	16.3 – 22.3
Underweight Rates (WAZ<-2 z score)	239	35	31.5 – 38.8	317	44.3	40.7 – 48.1
Underweight rate (WAZ_-3 z score)	62	9.1	7.1 – 11.6	96	13.4	11.1 – 16.2

* NCHS reference is used.

4.6: Mortality

The crude death rate in Mountainous Zone is 0.27 per 10,000 per day, while it is 0.21 per 10,000 per day in Coastal Plain Zone. The rate is higher among females than males (0.26 and 0.23 respectively) in Mountainous Zone while it is higher among males than females (0.29 and 0.13 respectively) in Coastal Plain Zone.

Table 16: Mortality data

	Mountainous		*Coastal Plain*	
	U5	*Total*	*U5*	*Total*
Total HHs surveyed	482		603	
Total Population assessed in HHs	624	4100	810	4827
Number who joined the HHs	51	599	36	441
Number who left the HHs	47	599	31	467
Number of births	23	25	17	17
Number of deaths	4	9	5	9
Mortality rate (per 10,000 per day)				
Under-five	**0.71**		**0.69**	
Crude	**0.27**		**0.21**	

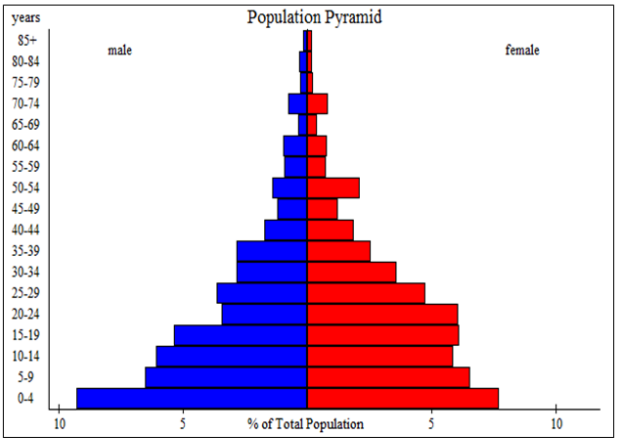
The under-five death rate in Mountainous Zone and in Coastal Plain Zone are 0.71 and 0.69 per 10,000 per day, respectively.

These rates are low and within acceptable levels according to WHO categorisation, hence not raising concern.

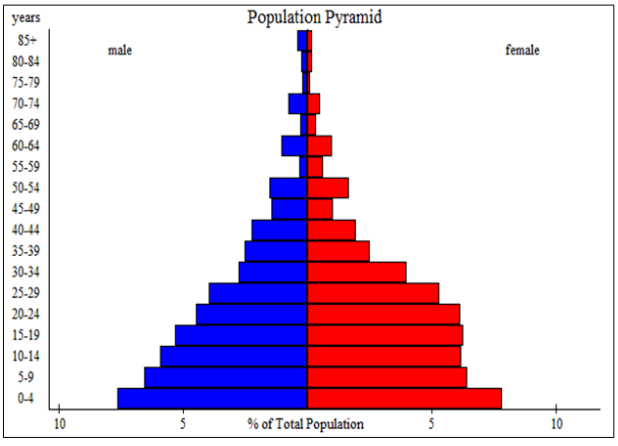
In Mountainous Zone, breathing difficulty is the cause of 30% of deaths, suspected measles is the cause of 10% and violence is the cause of 10% of deaths, while in the Coastal Plain Zone, breathing difficulty is the cause of 22.2% of deaths and suspected measles is the cause of 11.1% deaths. 80% and 88.9% of deaths happened in current location / place of stay in Mountainous Zone and Coastal Plain Zone, respectively.

4.6.1: Population Pyramid

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



Plain and coastal zone



Mountainous zone

5.0 DISCUSSION AND VARIABLE ASSOCIATION

Levels of malnutrition in Taiz Governorate are lower than the national level (15.7% according to IFPRI estimations based on 2005-06 HBS data) and much lower than that recorded in neighbouring Hodeidah governorate (GAM rate of 31.7%, Nov 2011). Rates of GAM in Taiz found in this survey are also lower than that previously estimated for Taiz (GAM rate 20.9% and SAM rate of 4.4%, according to IFPRI, 2010). The GAM rates in the Coastal Plain and the Mountainous Zones were classified as 'poor' (9.4%) and 'critical' (15.1%) respectively according to WHO categorization. According to WHO, GAM rates of less than 5% are acceptable, GAM rates between 5 - 9.9% indicate the situation is poor, GAM rates between 10-14.9% are serious, while GAM rates of 15% and above are critical and indicate an emergency situation.

Levels of stunting and underweight found in this survey are above the WHO 'critical' levels thresholds of 40% and 30% respectively. The results indicate an emergency nutrition situation in the Coastal Plain based on the acute malnutrition levels, hence a need for emergency response to avert excess mortality due to malnutrition. The stunting rates call for integrated response to reduce the prevalence and the resultant longer-term effect of stunting (children not reaching their full potential in productivity; population might record excess mortality).

The level of stunting in Mountainous Zone is not statistically different from that in Coastal Plain Zone. However, stunting levels are statistically higher in rural than urban areas (X^2: 19.8,P<0.0001, df 1). Significant statistical difference is also seen in severe stunting (X^2: 15.7, P<0.0001, df 1). No significant difference was found in stunting and severe stunting between boys and girls. Stunting level is significantly lower among children aged 6 –12 months than among other age categories (X^2: 16.4, P<0.01, df 4).

Unlike stunting, underweight is significantly higher in Coastal Plain Zone than in Mountainous Zone (X^2:12.2, P<0.001, df 1). Severe underweight is also higher in Coastal Plain Zone (X^2: 6.4, P<0.01, df 1). Underweight and severe underweight are also significantly higher in rural than urban (X^2: 8.1, P<0.01, df 1) and (X^2: 18.8, P<0.00001, df 1). Although there is no significant difference in underweight observed between boys and girls, some significant difference in severe underweight between girls and boys is noted (X^2: 3.7, P<0.05, df 1). The prevalence of underweight among children aged 6 to below 24 months is lower than among other age categories (X^2: 16.0, P<0.01, df 4)

Significant difference is noted between the two zones in GAM (X^2: 10.3, P<0.001, df 1) and SAM (X^2: 7.1, P<0.01, df 1). No significant difference in GAM between rural and urban, but some significant difference in SAM between rural and urban, is recorded (X^2: 4.0, P<0.05, df 1). Between girls and boys, significant difference is noted for GAM (X^2: 12.5, P<0.001, df 1) and SAM (X^2: 6.1, P<0.01, df 1)

Overall, the Coastal Plain Zone is more vulnerable than the Mountainous Zone and the rural population is more affected by malnutrition than the urban dwellers. Access to health services, dietary diversity and quality of source of drinking water seem better in urban than in rural areas.

5.1: Child Feeding, Vitamin A Supplementation and Malnutrition Levels

Among children aged 6 to 24 months, there is statistically significant difference in stunting and severe stunting between those still breastfed and those who have ceased breastfeeding. Stunting was found to be higher among those still breastfeeding than

those ceased breastfeeding (X^2: 10.9, P<0.001, df 1) in contrast to the expected better nutrition status for those breastfeeding and receiving additional complementary food. Stunting as a result of poor infant feeding might manifest later in life, since it is a chronic condition. The stunting recorded might not necessary be associated with feeding, could be due to disease, low birth weight, etc. There was no significant difference recorded for severe underweight as well as for GAM between those still breastfed and those who had ceased to breastfeed, while in the case of SAM, higher rates were found among those who had ceased breastfeeding than those still breastfeed (X^2: 4.4, P<0.05, df 1).

The number of feeds (other than breastfeeds) shows no effect on levels of stunting and severe stunting; however higher level of underweight was noted among those fed less than four meals per day than those having four feeds and above (X^2: 9.6, P<0.01, df 1). This difference is statistically significant for severe underweight (X^2: 2.7, P<0.05, df 1). GAM is found to be higher among those having a number of feeds (other than breastfeeds) less than four per day than those having four feeds and above (X^2: 5.7, P<0.01, df 1), but there is no association between feeding frequency and SAM prevalence. A significant proportion of children (70%) do not receive the recommended number of meals (4 meals and above), as per UN-FAO recommendations.

It is notable that the vitamin A coverage (supplementation 6 months prior to the survey) was lower than the recommended 95% coverage (Sphere Standards, 2011). Stunting was found higher among those did not receive vitamin A supplement during the last 6 months than among those who did (X^2: 3.9, P<0.05, df 1). This difference is recorded for severe stunting (X^2: 4.9, P<0.05, df 1) and is also noted for underweight (X^2: 6.9, P<0.01, df 1), severe underweight (X^2: 14.1, P<0.001, df 1), and GAM (X^2: 6.7, P<0.01, df 1), but not observed for SAM.

Suboptimal infant and child feeding and insufficient essential services, vitamin A supplementation being a proxy for such public health services, seem to negatively affect the nutrition well-being of Taiz's population.

5.2: Morbidity and Malnutrition Levels

The disease prevalence was recorded as being high in Taiz Governorate. In the Mountainous Zone the survey found diarrhoea - 33.9%, ARI – 46.7%, fever – 46.3%. Similar prevalence was recorded in the Coastal Plain Zone: diarrhoea – 29.7%, ARI - 50.6%, and Fever - 49.9%. The prevalence could indicate low herd immunity, inadequate health services, or inappropriate living condition, predisposing the population to illness. Generally, the mortality risk due to malnutrition is high, with an estimated 35% mortality during emergency being associated with malnutrition while other conditions have lower rates of association, according to Lancet, 2008. High disease prevalence only worsens the situation.

Nevertheless, unlike the pattern in areas where acute malnutrition and diarrhoea are highly prevalent, such as in Hodeidah Governorate, no statistical significant effect was observed for diarrhoea two weeks prior to the Taiz survey on the prevalence of severe and moderate stunting, underweight and wasting.

No significant difference was found in stunting or severe stunting between those who had and those who had not had ARI (cough or breathing difficulty) two weeks prior to the survey. However, underweight was found to be higher among those who had

suffered from ARI than those who had not (X^2: 4.9, P<0.05, df 1). This difference was more evident among the cases with severe underweight (X^2: 11.5, P<0.001, df 1). GAM was also found to be higher among those who had had ARI than those who had not (X^2: 8.8, P<0.01, df 1), but there was no association between ARI with SAM prevalence or SAM cases.

There was statistical significance between presence of fever and stunting. More children with fever two weeks prior to the survey were found to be stunted than those without fever (X^2: 3.5, P<0.05, df 1), severe stunting (X^2: 5.2, P<0.001, df 1), underweight, (X^2: 6.7, P<0.01, df 1), severe underweight (X^2: 11.3, P<0.001, df 1) and GAM (X^2: 6.6, P<0.01, df 1), but no effect was seen for fever on SAM.

Overall, a relationship was identified between illness and malnutrition, calling for appropriate and adequate health service provision in order to address the malnutrition.

5.3: Nutrition Status and Household Caretaker Education

As in numerous other surveys carried out in Yemen since 1991, stunting was found to be higher among children of household caretaker with lower education levels (X^2: 11.7, P<0.05, df 4). Consistent association was recorded between low education level with severe stunting (X^2: 29.6, P<0.0001, df 4), underweight (X^2: 62.3, P<0.0001, df 4), severe underweight (X^2: 35.6, P<0.0001, df 4) and GAM (X^2: 25.2, P<0.0001, df 4), but there was not statistically significant relation between caretakers' education level with proportion of children with SAM. Caretakers with higher education are more exposed to information, knowledge and awareness on appropriate child care, leading to better nutrition wellbeing for the children.

5.4: WASH and Nutrition Situation

Stunting was found to be lower among children from households using clean storage for drinking water (X^2: 5.9, P<0.01, df 1). Similarly, households using clean drinking water storage had lower levels of severe stunting, (X^2: 8.6, P<0.01, df 1), underweight (X^2: 14.3, P<0.001, df 1), severe underweight (X^2: 18.9, P<0.0001, df 1) and GAM (X^2: 11.0, P<0.001, df 1) but the association was not significant between households using clean water storage and proportion of SAM cases.

The different types of latrines seemed to have some relation with some of the variables for nutrition status. Open pit latrine and defecation in the open were found to have association with the high levels of severe stunting (P<0.0001, df 4), underweight (P<0.0001, df 4), severe underweight (P<0.0001, df 4) and GAM (P<0.0001, df 4), but no relationship was recorded between the system of faecal disposal (type of latrine used) with either overall stunting rates or SAM rates.

The household caretaker handwashing practice showed some correlation with malnutrition levels. Low proportion of severe stunting were noted among children in households where caretakers reported practicing handwashing after using latrine (X^2: 7.4, P<0.01, df 1). The good practice of handwashing after latrine was also associated with lower prevalence of underweight (X^2: 12.0, P<0.001, df 1), severe underweight (X^2: 10.7, P<0.001, df 1), GAM (X^2: 6.6, P<0.01, df 1) and SAM (X^2: 5.0, P<0.05, df 1). Handwashing before eating meals was associated with lower levels of severe underweight (X^2: 5.7, P<0.05, df 1), while handwashing after eating meals was

associated with lower levels of stunting (X^2: 7.5, P<0.01, df 1), severe stunting (X^2: 5.0, P<0.05, df 1), underweight (X^2: 5.9, P<0.01, df 1), severe underweight (X^2: 7.5, P<0.01, df 1) and SAM (X^2: 5.0, P<0.05, df 1). Handwashing before cooking was found to be associated with lower levels of stunting (X^2: 6.2, P<0.01, df 1), underweight (X^2: 6.7, P<0.01, df 1) and severe underweight (X^2: 5.3, P<0.05, df 1)

The above analysis indicates consistent association between hygiene practices with malnutrition, implying that hygiene promotion is a key intervention contributing to health and eventually better nutrition well-being of the population.

6.0 RECOMMENDATIONS

Although the nutrition situation, as measured by prevalence of acute malnutrition, is better in Taiz than in some other places in Yemen (including national level), the case load is still high since Taiz is the country's most populous governorate. Although mortality is still low, the critical levels of stunting across the governorate and the critical GAM levels in the Coastal Plain Zone require urgent intervention to avert deterioration. The situation in the Mountainous Zone needs close monitoring and mitigation. It is also important to note that there are pockets of vulnerability, especially in the Coastal Plain Zone, with high levels of acute and chronic malnutrition, comparable to the prevalence seen in neighbouring Hodeidah Governorate.

The presence of multiple aggravating factors including poor feeding practices, diseases, poor hygiene, insufficient coverage of essential services such as immunization and micronutrient supplementation, and low education for some caretakers, indicate a need for delivery of a package of interventions that not only address the critical wasting and stunting levels but also the poor GAM rates in the Mountainous Zone. Delivery of intervention services catering for both mothers and children, especially during the window of opportunity (from conception till the child is 2 years and beyond), is essential in addressing the critical levels of stunting, reducing wasting and maintaining death rates at their low levels.

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

Immediate Interventions

- Expansion and strengthen of CMAM services in the Coastal Plain with particular focus on pockets of vulnerable *Ozlas (group of villages with same characteristics*) is urgently required. All CMAM services should adhere to CMAM protocol (ensuring systematic treatment and full consideration of moderate acute malnutrition management) that should be integrated with infant feeding in emergency services, hygiene promotion and food security intervention. Interventions need to be prioritized in districts with pockets of malnutrition and with high SAM rates (mostly in the Coastal Plain area).
- Accelerate Infant and Young Children Feeding (exclusive and sustained breastfeeding and complementary feeding practices for children aged 6 to 24 months) and micronutrient interventions (including deworming) for acute and chronic malnutrition mitigation.
- Promote intervention integration and expansion to address risk factors associated with disease, sub-optimal food frequency, household food security, knowledge of child care etc, delivered/coordinated under basic minimum package for child survival and targeting the crucial period of the window of opportunity (pregnancy till the child is 2 years).
- Establish partnerships among/ between the government, UN and NGOs to accelerate the response scale-up in Taiz.

Medium Term Interventions

- Develop detailed response plans articulating district level humanitarian needs, delivering response package, coverage and gaps for easier response progress analysis and advocacy.

- Integrate MUAC screening and referral, deworming, awareness raising on hygiene and water treatment/storage, as well as IYCF, in Child Health Day activities.
- Promote improved latrine use and other services enhancing hygiene services, for instance Community Led Total Sanitation (CLTS) strategy.
- Undertake periodic vitamin A supplementation as per WHO global recommendation, and facilitate provision of multiple micronutrients in addressing the high stunting levels.

Other Recommendations

- Further investigation is needed to understand why acute malnutrition is found higher in boys than girls in both this survey and surveys conducted in Hajjah and Hodeidah governorates.
- Further investigation is also needed to understand the reasons of low mortality as shown by this survey and previous surveys in spite of the endemic critical malnutrition rate.

Annexes

Annex 1: Taiz Nutrition Survey Questionnaire

استبيان رقم: .....

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

مسح الحالة التغذوية والوفيات في محافظة تعز – فبراير 2012

استبيان الأسرة (نموذج 1)

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

الموافقة	.1 نعم		
	.2 لا		انتقل إلى النهاية

تاريخ المقابلة	يوم		شهر		سنة			
			2	Ø	1	2	Ø	2

المديرية	العزلة	القرية أو الحي
الاسم	الاسم	الاسم

اسم رب الأسرة:	

فريق المسح رقم		الاسم	التوقيع
	الاسرة والأنثروبومتري		
	الوفيات		
	رئيس الفريق		

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

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

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

1

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	Ø	2	1	Ø	2	

هل المنطقة حضرية (1) أم ريفية (2)	

رمز القرية أو الحي			رمز العزلة		
رمز المديرية			رمز المحافظة	5	1
رقم طبقة المسح			رقم العنقود		

العمل المكتبي

	الاسم	اليوم		الشهر		السنة				التوقيع
إدخال البيانات										
المراجعة										
ترميز أخرى										

الملاحظات

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استبيان رقم: .....

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

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

س 002 – س 003: بيانات رب الأسرة

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

س 004: بيانات راعي الأسرة

H004	المستوى التعليمي لراعي الأسرة		
	.1	أمي.	
	.2	يقرأ ويكتب.	
	.3	تعليم أساسي.	
	.4	تعليم ثانوي.	
	.5	تعليم عالي (جامعة أو كلية أو معهد).	

استبيان رقم: .....

س 005: مصدر دخل الأسرة

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

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

H006	ماهو المصدر **لمياه الشرب** في منزلكم؟ المصدر الرئيسي (خيار واحد فقط) والمصدر البديل (خيار واحد أو اتركه فارغا في حالة عدم وجوده)	H006a المصدر الرئيسي	H006b المصدر البديل	
	.1	أنابيب مياه موصلة إلى البيت.		
	.2	أنابيب مياه موصلة إلى فناء البيت.		
	.3	بئر مفتوحة غير محمية.		
	.4	بئر مفتوحة محمية.		
	.5	خزان مغطى لحصاد مياه الأمطار.		
	.6	خزان مفتوح لحصاد مياه الأمطار.		
	.7	سيارة نقل المياه (وايت ماء)		
	.8	مياه صحية معبأة (حدة، شملان، كوثر الخ)		
	.9	مياه سطحية غير محمية (وادي، عين ماء جاري، الخ)		
	.10	عين ماء محمية		
	.11	أخرى: تذكر		

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

استبيان رقم: .....

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

استبيان رقم: .....

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

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

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

استبيان رقم: .....

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

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

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

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

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

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

10

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

Questionnaire Number: .....

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

Nutritional Status and Mortality Survey – Taiz Governorate – February 2012

Household Questionnaire (Form 1)

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

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

Date of interview	day		month		year			
			0	2	2	0	1	2

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

Name of head of household	

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

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

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

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

Questionnaire Number: .....

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

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

Team Number		

Family Reference Number				

Date of Interview	day		Month		year			
			0	2	2	0	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	5
Survey layer number			Cluster number		

.....

Desk work

	Name	day		month		year				Signature
Data entry										
Review										
Other encoding										

Remarks:

.....

.....

.....

.....

.....

.....

Questionnaire Number: .....

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

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

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

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

Q002 – Q003: Head of household data

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

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

Q004: Family caretaker data

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

Questionnaire Number: .....

Q005: Family income source

	What is the **primary** source of income for the family?		
H005	1.	Sale of non-qat agricultural products	
	2.	Sale of livestock and livestock products	
	3.	Sale of seafood	
	4.	Trading	
	5.	Temporary work	
	6.	Monthly salary	
	7.	Transfers (from emigrants)	
	8.	Craftsmanship	
	9.	Farming/sale/transport of qat	
	10.	Gifts, grants	
	11.	Other: specify -	

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

	What is the source of **drinking water** in your home? Main source (choose one only) Alternate source (choose one or leave empty if it not applicable)		**H006a** Main source	**H006b** Alternate source
H006	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.)		
	10.	Protected spring water.		
	11.	Other: specify -		

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

Questionnaire Number: .....

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

H008	**Note**: **Investigate** availability of storage for **drinking water**. Is the water container clean, i.e. no mold or algae present?			
	1.	Yes.		
	2.	No.		

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

Questionnaire Number: .....

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

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

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

Questionnaire Number: .....

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

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

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

Questionnaire Number: .....

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

Questionnaire Number: .....

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

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

Questionnaire Number: .....

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

Annex 2: Taiz Mortality Survey Questionnaire

رقم إستبيان الأسرة: .....

مسح الحالة التغذوية والوفيات في محافظة تعز – فبراير 2012

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

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

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

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

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

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

Family Reference Number: .....

Nutritional Status and Mortality – Taiz Governorate – February 2012

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

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

Team number: _____ Family reference number: _____ Survey layer: _____

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

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

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

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

Annex 3: Taiz Governorate Nutrition Survey Team, 7 – 23 Feb 2012

Team No.	Survey Team	Position	Duty Station
1	Sadeq Hassen Nagi al-Kdasi **(Team Leader)**	Planning dept HO	Al-Gahera
	Samah Ahmed Mohamed	Nurse	Al-Gahera
	Amal Mahdi Abdullah Nagi	Nurse	Al-Gahera
	Hayat Ali Mahdi Saeed	Nurse	Al-Gahera
2	Dr. Mohamed Ali Al-faki **(Team Leader)**	Deputy PHC director	Al-Gahera
	Asmahan Saeed Mohamed Ghaid	MW	Al-Shamaeteen
	Sharefah Sharef Abdullah	Nurse	Al-Mawaset
	Zuhoor Mohamed Nagi Khalid	MW	AL-Rouna
3	Dr. Fahd Al-Nadhari **(Team Leader)**	Hosp Director	Al-Mesrakh
	Entedar Abdo Mohammed Farhan	Morshidah	Al-Sallam
	Kafah Saeed Gahtan Mohamed	Morshidah	Al-Sallam
	Nagat Ali Mohamed Ghafer	CMW	Mawza
4	Dr. Adel Abdul Hamid Al-Absi **(Team Leader)**	Malaria coordinador	Al-Gahera
	Tahani Mohamed Abdul-whab Mohmed	Nurse	Al-Gahera
	Afrah Abdull Aziz Saif	CMW	Al-Mawaset
	Asia Maresh Ali Saeed	CMW	AL-Rouna
5	Abo Baker Saif Ghanem Al-ghalal **(Team Leader)**	Nurse	Al-Tazi
	Twka Abdo Domiani	Nurse	Al-Makha
	Rwkaih Mohamed Ali Dieb	MW	Al-Makha
	Aswan Mohamed Abdullah	Nurse	Al-Tazia
6	Abdulla Mohamed Abdul Rahman Algeadi **(Team Leader)**	HC director	Al-Gahera
	Soad Mohamed Nagi	Lab technician	Al-Gahera
	Kifaih Mohamed Saeed Al-Shargabi	Nurse	Salah
	Afrah Ibrahim; Mohamed Hassen	Nurse	Al-Gahera
	Reserve team		
	Eshraq Mohamed Sarhan	Volunteer	Al-Gahera
	Fakhira Ahmed Hazah Owthman	CNW	Al-Mawaset
	Ibtisam Noman Abdo Ali	MW	Al-Makha
	Survey Coordinators/ Supervisors		
	Dr. Fadhle AbdulKarim AbdulGabar	Hosp director	Al-Shamaeteen
	Dr. Abdul Basset	PHC director /HO	Al-Gahera
	Mansoor Abdo Mohamed	Hod. Nutrition dept coordinator	Hodiedah
	Walid Abdul-Malik Sallam	MOHP/Nutrition dept	Sana,a
	Aref Mohamed Awfan **(Plus Logistics)**	Taiz Nutrition dept	Al-Gahera

Team No.	Survey Team	Position	Duty Station
		coordinator	
	Dr. Mohamed Al-Emad	WHO	Sana,a
	Nasser Hamoud Al-Ashwal	MoH	Sanaa
	Nagiba Al-Mahdi	UNICEF Taiz	Taiz
	Data Entry Team		
	Ibrahim Ali Mohamed Ali Al-Samet	HO/Data Clerk	Al-Gahera
	Nabil Al-Shami	Data Entry HO/ emergency dept	Al-Gahera
	Technical Support Team		
	Saja Abdulla	Nutrition Cluster	UNICEF Sanaa
	Najib Abdulbaqi	Nutrition Officer	UNICEF Sanaa
	James Kingori	Regional Nutrition Specialist	UNICEF MENA

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

Weight:

	Precision: Sum of Square [W2-W1]	Accuracy: Sum of Square [Superv.(W1+W2)-Enum.(W1+W2]	No. +/- Precision	No. +/- Accuracy
Supervisor	2.17		2/5	
Enumerator 1	9.83 POOR	8.40 POOR[9]	2/4	6/1
Enumerator 2	0.30 OK	2.65 OK	1/6	2/5
Enumerator 3	98.06 POOR	76.17 POOR[10]	2/4	3/5
Enumerator 4	1.61 OK	4.24 OK	3/5	4/5
Enumerator 5	0.23 OK	3.34 OK	1/4	1/7
Enumerator 6	0.29 OK	2.20 OK	4/1	3/7
Enumerator 7	0.10 OK	2.33 OK	3/4	4/5

Height:

	Precision: Sum of Square [H2-H1]	Accuracy: Sum of Square [Superv.(H1+H2)-Enum.(H1+H2]	No. +/- Precision	No. +/- Accuracy
Supervisor	66.15		8/1	
Enumerator 1	1030.72 POOR	683.35 POOR[11]	6/4	6/4
Enumerator 2	10.78 OK	101.81 OK	6/3	3/7
Enumerator 3	6.27 OK	73.84 OK	5/3	5/5
Enumerator 4	3.79 OK	78.48 OK	6/2	7/2
Enumerator 5	11.53 OK	91.60 OK	5/1	5/5
Enumerator 6	773.17 POOR	355.42 POOR[12]	6/3	4/6
Enumerator 7	7.24 OK	74.51 OK	8/1	7/3

MUAC:

	Precision: Sum of Square [MUAC2-MUAC1]	Accuracy: Sum of Square [Superv.(MUAC1+MUAC2)-Enum.(MUAC1+MUAC2]	No. +/- Precision	No. +/- Accuracy
Supervisor	90.01		4/4	
Enumerator 1	1.55 OK	89.78 OK	5/5	1/9
Enumerator 2	1.74 OK	100.77 OK	4/5	1/9
Enumerator 3	0.76 OK	94.15 OK	6/4	9/1
Enumerator 4	1.89 OK	89.88 OK	5/4	4/6
Enumerator 5	4.95 OK	86.36 OK	4/3	6/4
Enumerator 6	191.40 POOR[13]	238.95 OK	4/4	6/4
Enumerator 7	4214.00 POOR[14]	3053.89 POOR	3/6	4/6

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

[9] Accuracy of measurement noted and rectified 12.3 kg vs 15.4 kg
[10] Data entry error noted - rectified
[11] Error identified with staff who entered measurement different to the one read, e.g. writing 79 instead of 97 cm as read out in Arabic
[12] Digital preference detected in rounding off to the nearest 1 cm and differences in the two measurements. Accuracy was emphasized and caution on the differences between measurement read versus measurement written.
[13] Inaccuracy and low precision recorded after comparing the 1st and 2nd reading
[14] Inaccurate recording of MUAC measurement – confusing height measurement with MUAC in the recording, i.e. 79 cm vs 14.1cm

Annex 5: Reference Table for Age Estimation

الطريقة التقريبية لحساب العمر بالاشهر

مواليد العام 2007

العمر بالاشهر	حتى تاريخ			من تاريخ		
	سنة	شهر	يوم	سنة	شهر	يوم
59	2007	3	10	2007	2	11
58	2007	4	10	2007	3	11
57	2007	5	10	2007	4	11
56	2007	6	10	2007	5	11
55	2007	7	10	2007	6	11
54	2007	8	10	2007	7	11
53	2007	9	10	2007	8	11
52	2007	10	10	2007	9	11
51	2007	11	10	2007	10	11
50	2007	12	10	2007	11	11
49	2008	1	10	2007	12	11

مواليد العام 2008

العمر بالاشهر	حتى تاريخ			من تاريخ		
	سنة	شهر	يوم	سنة	شهر	يوم
48	2008	2	10	2008	1	11
47	2008	3	10	2008	2	11
46	2008	4	10	2008	3	11
45	2008	5	10	2008	4	11
44	2008	6	10	2008	5	11
43	2008	7	10	2008	6	11
42	2008	8	10	2008	7	11
41	2008	9	10	2008	8	11
40	2008	10	10	2008	9	11
39	2008	11	10	2008	10	11
38	2008	12	10	2008	11	11

مواليد العام 2009

العمر بالاشهر	حتى تاريخ			من تاريخ		
	سنة	شهر	يوم	سنة	شهر	يوم
37	2009	1	10	2008	12	11
36	2009	2	10	2009	1	11
35	2009	3	10	2009	2	11
34	2009	4	10	2009	3	11
33	2009	5	10	2009	4	11
32	2009	6	10	2009	5	11
31	2009	7	10	2009	6	11
30	2009	8	10	2009	7	11
29	2009	9	10	2009	8	11
28	2009	10	10	2009	9	11
27	2009	11	10	2009	10	11
26	2009	12	10	2009	11	11
25	2010	1	10	2009	12	11

مواليد العام 2010

العمر بالاشهر	حتى تاريخ			من تاريخ		
	سنة	شهر	يوم	سنة	شهر	يوم
24	2010	2	10	2010	1	11
23	2010	3	10	2010	2	11
22	2010	4	10	2010	3	11
21	2010	5	10	2010	4	11
20	2010	6	10	2010	5	11
19	2010	7	10	2010	6	11
18	2010	8	10	2010	7	11
17	2010	9	10	2010	8	11
16	2010	10	10	2010	9	11
15	2010	11	10	2010	10	11
14	2010	12	10	2010	11	11
13	2011	1	10	2010	12	11

مواليد العام 2011

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

مواليد العام 2012

العمر بالاشهر	حتى تاريخ			من تاريخ		
	سنة	شهر	يوم	سنة	شهر	يوم
1	2012	1	10	2011	12	11
اقل من شهر	2012	2	10	2012	1	11

هام :للتحويل من الهجري الى الميلادي يجب العودة الى جداول التحويل المسلمة للفرق

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

تواريخ المناسبات والأحداث

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

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

Dates of events

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

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

Annex 7: Cluster Sampling for Taiz Mountainous Ecological Zone

Village/ City	Ozla	District	Cluster No
Hadad	AlRojaieah	AlShamaitain	1
AlMeqla'a	AlQaraisha	AlShamaitain	2
AlSaa'eer	Doba'a AlKharej	AlShamaitain	3
A'maq	AlDha'a	AlSelow	4
Wadi Jadeed	AlQaherah	AlQaherah	5
Osaiferah AlGharbeia	AlQaherah	AlQaherah	6
AlDhaboa'a AlSofla	AlQaherah	AlQaherah	7
Sanemat	Sanemat	AlMesrakh	8
AlLoginat	AlModhafar	AlModhafar	9
Madinat AlNoor AlGharbiah	AlModhafar	AlModhafar	10
Seenah	AlModhafar	AlModhafar	11
AlSawani AlGharbiah	AlModhafar	AlModhafar	12
AlMashjab	AlSawa'a	AlMa'afer	13
AlBoaieb	AlKlaeba	AlMa'afer	14
Kharsa'a	Bani Yousef	AlMawaset	15
Kareefa	Qadas	AlMawaset	16
AlAjf	Bani Esa	Jabal Habashi	17
AlMarabedah	AlAhkoom	Haifan	18
Mawqa'a	Samea'	Samea'	19
Mora'ah	AlRaina	Sharab AlRawna	20
AlDomainah	Bani Serri	Sharab AlRawna	21
Wadi AlSabab	Awader	Sharab AlRawna	22
AlMadahef	AlTebhah	Sharab AlSalam	23
AlLoya AlOlya	Bani Saba	Sharab AlSalam	24
Harat Kelaba	Sala	Sala	25
Harat Bank AlTasleef	Sala	Sala	26
Sala	Sala	Sala	27
AlHabeel	AlDhabab	Saber AlMawadem	28
AlNejadah	AlNejadah	Saber AlMawadem	29
Dhe Anqab	Hadnan	Mashra'ah Wa Hadnan	30
AlMehdad	AlAqrodh	AlMesrakh	RC
Hazman Asfal	AlAifoa'	AlMawaset	RC
Wadi Maksab	AlQehaf	Jabal Habashi	RC
Wa'alan AlA'shar	AlA'rooq	Haifan	RC

Annex 8: Cluster Sampling for Taiz Coastal Plain Ecological Zone

Village/ City	Ozla	District	Cluster No
AlJe'bala	AlA'moor	AlTaiziah	1
AlSamkar	AlJanadiah AlSofla	AlTaiziah	2
AlOmaqi	AlJanadiah AlOlya	AlTaiziah	3
AlDhabeeba	AlHaima AlOlya	AlTaiziah	4
AlRawdh	AlRobaie'e	AlTaiziah	5
AlShaqa	AlSofla	AlTaiziah	6
AlGalaheb	AlHashma	AlTaiziah	7
Fayadh	Qayadh	AlTaiziah	8
AlAzyood	AlJoma'a	AlMakha	9
AlShadhelia	AlZahari	AlMakha	10
AlMakha	AlMakha	AlMakha	11
AlDosh	Bani AlHakam	Dobab	12
Afnan	AlShawaifa	Khadeer	13
AlQuba Wa Kawakebah	Khadeer AlSelmi	Khadeer	14
Mahwal Asfal	Khadeer AlSelmi	Khadeer	15
Markez AlShorman	Akhraq	Mawiah	16
Hemeriam	Israr	Mawiah	17
Jabal Amaemah	Aojoh	Mawiah	18
AlLaseeb	Khadeer AlBuraihi	Mawiah	19
AlWa'rah	Amaemah	Mawiah	20
Bani Obaidan	Maryah	Mawiah	21
AlManbar	AlAkhlood	Maqbanah	22
AlBarh	AlHabeebah	Maqbanah	23
Sawagh AlWadi	AlSawagheen	Maqbanah	24
AlDhameen	AlMagashea'a	Maqbanah	25
AlMawj	AlMalahedha	Maqbanah	26
Shabiah	AlYaman	Maqbanah	27
Mahraqah AlOlya	Mahraqah	Maqbanah	28
AlWaheez	AlAhmol	Mawza'	29
AlMosana	Mawza'a	Mawza'	30
AlGhail	AlBokarah	AlWazeiah	RC
AlRaidah	Khadeer AlBadow	Khadeer	RC
AlJahdan	Khadeer AlSelmi	Khadeer	RC
AlSaleef	Bani Salah	Maqbanah	RC

Annex 9: Sampling Frame of Taiz Mountainous Ecological Zone

City/ Village	Population	City/ Village	Population	City/ Village	Population
الفرجه	1136	الابن الاسفل	129	الضحضاح	253
المساجد	831	الابن الاعلي	118	الطره	282
المسيوب	313	الجبانه	304	النبخين	357
الشمه	1524	الرما	310	تلجه	159
الضبيعه	712	السعه	851	خزافر	162
العفا	1213	الشوحط الاسفل	1351	نجيره	82
القضاة	853	الشوحط الاعلي	95	هوب مسجح	115
الوريده	1076	الكدحي	65	الاكمه	597
حبيب اصليح	2995	اللكمة	287	الاكيمه	1192
الحماري	82	المجارين	98	الكثيف	584
الزحط	109	المحاور	164	علياقه	267
الزوق	39	المحمولة	258	قحام	153
القاهر	395	المخروقه	125	الجهيمة	2468
الكداحي	50	المركز	403	الحترشه	661
الكديد	267	الهنداعه المقصوص	110	المحابرة	346
اللكمه	79	شعبة علي	165	بني عمر	1795
بندح	916	كبالله	50	الشرف	420
جحبير	121	الجذد	467	الظفر	440
التربة / المستشفي	294	الحبين	568	المجازع	440
التربة / القحفة-دار الشرف	2209	السلق	75	النزيهه	768
التربة / حارة المدرسة	1500	الطويله	192	جراحفه	154
التربة / الطيار	1296	المقابر	165	محدان	371
التربة / الشرف	3006	ذيابه	109	البقيره	1309
التربة / حارة المحكمة	518	شباعه	241	الذئاب	65
التربة / الامن القديم	556	قحفة السوق	107	السحوله	1352
التربة / الفرزة	308	نفضان	202	الصميده	1268
التربة / القيادة	1496	الاودر	1984	الضوه	1168
التربة / حصبرة	1325	نوبة بني شيبه	1155	الكدره	559
الحضارم	708	السيل	441	الهجمه	1341
الحائط	11	الصنعه	838	هيجة عينة	553
العركيه	10	الغيل	1341	الاكمه	718
الكهدة	65	القشاطيط	260	البجره	221
المحصامه	485	القشيب	565	البرح	195
المناقل	314	الشاجمه	1865	الحبيل	170
الهواسط	392	القبلي	5497	الذنبة	209
هدد	3222	الوسطى	4366	الزقزوق	204
الضياء	3307	بني مسن	2010	السبيل	57
دقم الغراب	2231	حباجر	972	الشيخ محمد	76
غبيره	915	حجفات	3852	الصليعه	203
محيظه	1011	الخبل الشامي	688	الظهرور	67
افرادوجراعيه	186	الخبل اليماني	660	العفيف	120
الاعمور	478	الخليج	682	الغباسي	250
الجديله	327	الدمدم	721	الفريدات	121
الحبهنه	784	الشريره	977	القباع	22
الزعيمه	960	العرشاني	15	القحاف	128
الزميله	777	المداح	333	القحيفه	44
السحبيه	322	وادي ثب	1135	المتله	244
الشغيره	1323	وادي ثب الغربي	667	المدهف	579
الصفونه	1792	المقلاع	609	المراقب	585
الصليحه	658	الابطال	438	المراكبه	81
العردنه	1392	الزين	778	المعبار	140
المسابله	562	الشرجه	851	المقطر	67
برح الرحب	484	الشرف	1136	الهزيز	189
بني احمدعلي	129	الفروق	592	ذى مشكار	68
بني سالم	341	النقيل	556	سقل الذراع	150
الوطن	1100	بني مسن	107	سوق السبت	294
برح الظهر	1229	بين المساجد	572	صورين	232
صدن	1290	حالزة	434	عبر الاعلى	208

عبيره	81	تجمع الروقنه	64	الرصاح	200
عشرات	352	تجمع الضعيف	60	الرويعي	403
قحفة الجاب	264	تجمع النهيز جبل الضعيف	125	السوجية	144
قحفة السويقه	412	تجمع جبل الضعيف السجي	44	الشعوب الإسفل	175
قحفة الشعبه	81	تجمع جبل الضعيف برح الخير	21	الشعوب الاعلى	129
قحفة الشوط	76	الحمرة	307	الصليح	160
قماحه	192	الظهيره	275	الطيء	191
كامله	45	العرام	729	العارضه	24
الاثاءء	68	صبران	785	العرام	99
الاجروم	181	الحقيبه	62	العقام	329
الاكمه	673	الذراع	181	الغروق	126
الباتعين	54	القدمه	132	الغول	260
البيرح	13	الكبه	699	القبعين	392
الجند	573	الكشرار	959	القبه	22
الحمر	18	اللكيمه	614	الكدمه	226
الدار	20	المدفع	341	اللوص	115
الذراع	92	المنظره	793	المزابرين	55
الزحط	73	الهقام	297	المسوري	101
السيل	66	حشه	277	المشير	263
العاديه	225	ذى الخير	342	المقابله	133
العرجوش	24	قطبه	351	النزيهه	96
العرض	92	موقعه	535	النموط	32
العفقاء	59	القحفه	370	النويدره	192
القحفه الواقع	61	جبل صبران	283	بئرين سعدين	118
القزحى	70	دار بوبه	213	حامد	103
اللجعه	1	السعير	391	حبيل كعدد	276
اللكيمه	48	الحبيشيه	293	حطامه	98
المفتحة	154	الخرف	347	دار الخطاف	248
المكسر	20	الدقم الاعلى	222	دار عون	142
النوبه	100	الرديمه	522	سوق البرح	316
حاجر	188	الزريبه	906	عوزمه	355
حبشه	83	الصبيره	219	قحفة الداجني	501
ذا الشحن	199	الظهرور	210	قحفة الرخام	85
عرش	563	العارضه	749	قحفة الصليح	109
قبع دجبره	23	القبرين	44	قحفة الطيّ	335
قحفة المسلوع	31	القهب	437	كرابه	462
قحفة الهويشه	118	الكبه	623	ملله	1561
قحفة حميد	145	الكدره	423	مناخ زهيه	82
كبدا	81	الكدمه	162	نجد النص	112
كشاح	93	المؤاف	72	الاشاعر	673
مصينعه	193	المابنيه	467	الجند	203
الجبرتي	193	المحداده	235	الجيار	254
الجزيل	1059	المخانع	263	الحشيف	435
الجيزه	881	حجتين	594	الدمنه	238
الحديه	706	قحفات	678	الصردف	564
الحصب	149	قحفة عامر	366	الصبيره	558
السعير	209	قحفة ويدين	166	الصبيره الجديده	17
العجرم	1003	كدفة	769	العدوف	9
العمالين	237	كربات	322	الكباب	660
القرار	1556	محاليب	148	الكداش	427
القريعه	879	معهره	313	حارة الكليه	24
القصيصه	1113	احباش	99	ذالقبان	2341
القلعة	1544	الاكمه	65	عهده	541
الكبه	166	البهيم	42	نابه	1976
المديحيس	1265	الحاج صلاح	87	هيجة الورس	131
المصنعه	469	الحاميه	115	يهومن	170
الموجر	1799	الحنف	263	الحمر	650
بني سليمان	440	الدار الجديد	123	الطور	672

العقيف	614	المشجب	2271	مدينة تعز / مدرسة الثورة	2909
الكتابه	556	المناره	1043	مدينة تعز / العقبة ش 26 سبتمبر	3630
المرادع	434	جعيشان	1449	مدينة تعز / الجمهوري السفلي	4053
المغربه	696	الاجراف	666	مدينة تعز / الجمهوري العليا	2404
النوبه	314	المكوي	1579	مدينة تعز / شرق المستشفى الجمهوري	1006
شعب زينه	574	الودور	555	مدينة تعز / المستشفى الجمهوري	1924
الدمنه	368	وادي جحافي	1378	مدينة تعز / غرب المستشفى الجمهوري	5679
الشرف	743	الاكام	307	مدينة تعز / عقبة مفرح	3553
حظه	470	الجنات	1212	مدينة تعز / السواني الشماليه	1712
واسر	1119	الحريف	106	مدينة تعز / المجليه	4195
الابهول	1071	الحذير	167	مدينة تعز / حبيل المجلية	3097
الاشعوب	903	الكسب	405	المحداد	2126
الخال	755	المجاهيش	228	الاسلاف	644
الشعب	1074	الموسطه	189	الاظهور	697
المحرقه	403	النجد	320	الاكدان	1767
مزابر	1401	حيران	264	الحجرين	2914
مضيض	437	دار السالم	180	الحوجله	503
الحجر	1859	سائله الحابس	43	الخال	1451
الحقيب	578	وادنه	348	الدمنه	1030
القحفه	388	مدينة تعز / وادي جديد	6178	الذنيب	2041
القطين	1331	مدينة تعز / عصيفرة الغربية	2505	الشبيله	552
كزازة	876	مدينة تعز / الضبوعه السفلي	8045	الصرم	3722
البطنه	586	مدينة تعز / الجنيد	2416	الضجاج دبه	910
الحود	883	مدينة تعز / زيد الموشكي	3282	العارضه	1242
الشرف	1777	مدينة تعز / الروضة	1422	العمد	1028
الصيار	1002	مدينة تعز / الروضة الجنوبية	2049	المخعف	3199
بيت القاضي	376	مدينة تعز / شعب منصور	1348	المخيرعه	1642
الاقيوس	1271	مدينة تعز / الروضة الشمالية	7447	المودمه	564
الضبه	5325	مدينة تعز / جبل حبيل	1397	الميسار	1186
القبيبة	1013	مدينة تعز / الشجرة	1935	النجادي	2107
حبك	844	مدينة تعز / الرواس	827	الوجد	4981
اعماق	723	مدينة تعز / الوعش	1203	بلعان	2653
الذنيب	469	مدينة تعز / الدجيرا	1526	حسات	1430
الشعابي	355	مدينة تعز / المقنش	2213	حمه السفلي	2096
الضعة	920	مدينة تعز / جبل الجرة	3068	حمه العليا	1036
العزر	404	مدينة تعز / شعب سلمان الشرقية	1026	حيده	1446
المعينه	430	مدينة تعز / شعب سليط	2708	حيسان	329
الموسطة	887	مدينة تعز / المسيح الاعلي الشمالي	2936	دبه	5517
حجامة	1082	مدينة تعز / المسيح الاسفل الجنوبي	4178	راس النقيل	392
حمدة	666	مدينة تعز / المسيح الشرقي	3372	شمار	628
صعرة	548	مدينة تعز / السلخانة الجنوبية	2290	كور	1485
الاذمور	1621	مدينة تعز / السلخانة الغربية	7370	هبه	749
الحصبة	191	مدينة تعز / السلخانة الوسطى	3979	هجمه	783
الظهرين	2578	مدينة تعز / نجد الله أكبر	9924	ورقه	559
الغبيره	371	مدينة تعز / شعب الشرمان	3185	الكشرار	555
الشريف	594	مدينة تعز / عصيفرة الشرقية	2720	اللفج	87
الصالحف	368	مدينة تعز / الروضة الغربية	7178	ذي الشرح	857
العارضه	994	مدينة تعز / الروضة الشرقية	2390	ظهرة انبيان	1850
العزله السفلى	685	مدينة تعز / دار المعلمين	1742	الاجراف	222
بيت بكرين	769	مدينة تعز / عصيفرة الوسطى	4329	العقور	260
الجبانه	384	مدينة تعز / الضبوعةالقبلية	3636	الكداح	315
الصعيد	3116	مدينة تعز / روضة الكوثر	6137	الكسار	473
القابلة	1298	مدينة تعز / أكمة العكابر	3860	جاره	679
المثافي	711	مدينة تعز / حوض الاشراف الغربي	5506	الاهواب	50
المصينعه	657	مدينة تعز / النقطة الرابعه	3117	الجبجاب	125
المقاطرة	537	مدينة تعز / الضبوعةالعليا	3911	الحبيشه	490
المنصورة	1561	مدينة تعز / الضبوعة	6082	الدمنه	638
الحصبه	1047	مدينة تعز / التحرير الأسفل	3253	السحلوله	342

الصافح	369	مدينة تعز / مدينة النور الغربية	3626	مدينة تعز / الجمالي	970
الظهور	271	مدينة تعز / صينه	10271	مدينة تعز / المظفر	2726
العارضه	62	مدينة تعز / السواني الغربية	4460	مدينة تعز / الميدان	283
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الحدة	206	عنشق	2428	خشاع	362
الدوامي	351	الاساعده	1511	قرضان	954
الرباط	362	الاظفار	1008	قيد	405
الرحبه	2214	الجبال	429	وادي هزام	480
القحاف الاضبايع	1164	الحمري	1256	الشعوبه	1016
الكداح	204	السقادي	592	الظهره	1052
المشاقب	269	الشجره	1838	الوادي الاسفل	690
الوادي	167	المحل	657	الوادي الاعلي	1182
الوعشه	148	الحقل الاسفل	1486	مدينة تعز / حارة كالتبه	4065
شجاف	2068	الريسي	1155	مدينة تعز / حارة بنك التسليف	9162
الظهيرا	1709	السنعات	1043	مدينة تعز / صالة	1915
القردوحه	1657	القبول	1402	مدينة تعز / البنراء	426
المؤسس	1209	بني عبيد	1212	مدينة تعز / الوعل	486
المدوره	1646	خباءة	1902	مدينة تعز / الصافيه	2178
وادي الحجر	3001	شقاحه	1042	مدينة تعز / النجدين	2715
الاعروق	4682	مصارع	1169	مدينة تعز / الشاقب	351
الافراد	1002	وادي كحال	638	مدينة تعز / جبل الدوملة	3003
الجبيره	965	الحقل الاعلى	916	مدينة تعز / حارة مؤسسة الحبوب	2934
الصنع	2853	الدوف	965	مدينة تعز / حارة سوق الجملة	8666
المدقه	684	الكبب	1254	مدينة تعز / الساحولي شرقي	1544
بنى عبدالله السفلى	1820	المعبل	576	مدينة تعز / الشعابي العالي	287
بني صلاح	1409	المعر	2443	مدينة تعز / المعمار	125
بني عبدالله العليا	1512	بشيمه	1789	مدينة تعز / ذراع الشاقب	330
بني قاسم	1278	دي مالح	408	مدينة تعز / الساحولي غربي	321
تباشع	533	ضراب	1811	مدينة تعز / الشعابي	608
نصف بني المجيدي	544	معاين	1871	مدينة تعز / حارة الجهيم	1659
وضيحة السفلى	1861	العقاب	464	مدينة تعز / حارة رومان	766
وضيحه العليا	3237	المصعد	794	مدينة تعز / كالتبه السفلى	203

مدينة تعز / حارة كعب الروس	966	/ جبل ادود	38	لوزم	1126
مدينة تعز / شعبة كريمة	3272	جبل ادود / متاع	595	العدارقي	1087
مدينة تعز / حارة الفتح	5165	جبل ادود / المهيال	420	الموسطه	1544
مدينة تعز / حارةالزهراء	9698	جبل ادود / المشراح	241	الجبه	1813
مدينة تعز / حارة قرزة صنعاء	1138	جبل ادود / العرض	137	الخسف	700
مدينة تعز / حارة الملاعب	6583	جبل ادود / المجازين	66	الشعب	1998
مدينة تعز / حارة حبيل الظبي	7402	جبل ادود / الاجواد	145	العدوف	1408
مدينة تعز / حارة شعب الدباء	4169	جبل ادود / المعينه.	386	القويع	2038
مدينة تعز / حارة الرضوان	9613	جبل ادود / الحوائط	75	المرزوح	1420
مدينة تعز / حارةمستشفىالثورة	4650	جبل ادود / قمم	310	حده	1274
مدينة تعز / المحوى	3012	جبل ادود / الواد	172	قراضه	4437
مدينة تعز / المعهد الصحي	1457	جبل ادود / بيت الحرف	120	النجاده	1711
مدينة تعز / حارة الاشيط	7436	جبل ادود / الصرف	75	الجنهبي	1668
مدينة تعز / العايدي	519	جبل ادود / الهنيف	197	الرهن	1370
مدينة تعز / الكعب	5017	جبل ادود / الشويحطين	32	الشقب	4653
مدينة تعز / الجحملية الشرقية	3807	جبل ادود / الجامع	181	المعينه	1289
مدينة تعز / الجحمليه السفلي	6432	جبل ادود / العرين	133	عركب	2036
مدينة تعز / الجحمليه الغربيه	3801	جبل ادود / دانق	125	كحلان	1896
مدينة تعز / الجحمليه الوسطى	7603	جبل ادود / خباءه	166	نهمان	1317
مدينة تعز / حارةالمستشفىالعسكري	1262	جبل ادود / الجباره	29	يذان	2494
مدينة تعز / حارةالجحمليه العليا	6065	جبل ادود / سمحه	161	الدمينه	1422
مدينة تعز / حارةشعبات	4217	جبل ادود / الشراعب	235	الرباط	558
مدينة تعز / حارة الحرازيه	3667	جبل ادود / الزناح	171	الظهره	1676
مدينة تعز / حسنات	661	جبل ادود / المبراع	105	العزله	2511
مدينة تعز / المدرسة	1249	جبل ادود / المقروض	415	راس	854
مدينة تعز / القحفه	561	جبل ادود / المحاجر	89	ابعر	1376
مدينة تعز / الهرار	347	جبل ادود / العارضه	89	الاشعاب	732
مدينة تعز / عرض الحوص	551	جبل ادود / شعب الضاحه	75	الخلل	727
مدينة تعز / النجد	526	جبل ادود / الشرقي	187	الصرمين السفلي	1385
مدينة تعز / الشرف	842	جبل ادود / نجد الجره	311	العريش	1132
مدينة تعز / المنسامة	495	جبل ادود / المدروجه السفلي	148	المرداعه	590
مدينة تعز / الجرز	1164	جبل ادود / المدروجه العليا	300	المسادر	652
مدينة تعز / الحميراء	4702	جبل ادود / المئاتية	239	تباشعه	1089
مدينة تعز / محمد علي عثمان	2068	جبل ادود / كوكبان	277	فلاح	1422
مدينة تعز / الارجم	953	جبل ادود / المدهف	136	الصراري	831
مدينة تعز / وادى صالة	900	جبل ادود / الارجام	250	التيداني	1747
مدينة تعز / شرقي القصر	1670	جبل ادود / التوبه	35	ذي البرح	2941
مدينة تعز / رضاجة	581	جبل ادود / الرباط	128	الابراع	642
مدينة تعز / الساتل	2948	جبل ادود / النوامي	173	الخضارب	478
مدينة تعز / الحوبان	5407	جبل ادود / العويرضه	84	الرباط	708
مدينة تعز / الجديمة	1556	جبل ادود / المحراق	326	العنين	1784
مدينة تعز / القلعة	937	جبل ادود / المكامئ	70	المرفد	354
مدينة تعز / حارة القبة	3737	جبل ادود / المجهب	95	المساحين	716
الديم	1423	جبل ادود / المهازع	230	المعالن	788
ذي مرين	805	عقاقه	4204	سيعه	609
ذي مهنه	688	عقبه	2575	الاقيوس	536
عميقه	1621	العاوات	320	الشراجبه	1075
محزف	1385	العداقي	293	الصريح	933
العرمه	2054	العقائر	522	الصبيره	1804
العزلة	4644	العنين	535	المحراق	1910
الموسطه	4711	القبع	380	المشر	427
نجد ميهال	3167	المحرس	496	المشياف	4031
الكريفه	822	حصان	366	شعبه السوق	634
بتع	1510	نجد العبد	405	قطن	971
حجر ميهال	1878	الشعابي	779	وادي السحب	1546
حفر	1119	العدنه	973	ذي عقب	988
الحبيل	1469	العركاب	986	الاشاتي	779
الضباب	4545	اللجم	2256	الحجف	970

الكشار	936
المحرس	1251
حذابه	1306
حذنان	3100
عان ذبهه	1010
مهال حذنان	1859
نجد ذى عقب	2007
نمه	866
الصفاصف	2271
المجبرين	2445
المسالبه	3560
المهال مشرحه	1072
النهج	1133
مشرحه	1547
نجد مشرحه	1715
وادى الوحيه	1163

Annex 10: Sampling Frame of Taiz Coastal Plain Ecological Zone

City/ Village	Population	City/ Village	Population	City/ Village	Population
الذراع	1334	الصبيحه	1061	الهايه	340
الرباط	1645	اللصبه	888	حنيل الحمره	187
ذخور	2561	المضرابه	1642	دار محمد سعد	73
العراكم	3885	سبات	795	الدرج	462
القرف	1698	عكيش	495	الضويحاء	492
المودمه	3736	نجد اعوج	1808	المسنج	901
خرابة الاصرار	1099	الجرف	1883	الملساء	419
شعب الخادم	3177	الديح	831	الاغوال	2052
شعب الريحان	309	الربوع	796	البريهي	1849
التبشاعه	377	الرده	491	الجانحب	782
الجعباله	2793	الرماده	2092	الحوجله	1560
الساكن	8193	الروض	1640	الخرابه	425
المقاشره	2467	الطيار	962	الدمينه	1322
اليهاقر	875	الظهرة	1082	الرمده	981
حنيل اسود	3901	المنطرح	256	السويداء	1000
خرابة المدرك	757	الناصره	1089	العامره	274
رعضه	904	رباط الربيعي	1605	العرسوم	1286
الجعدى	2245	رباط الشقة	711	الغيل	396
الاقروض	458	شعفه	603	الكحل	370
الاكيم	310	الزواقر	1598	المشارب	625
الحزم	2264	العتيمه	1776	شعب ايوب	2063
الخرائب	1656	العثربيه	2183	غراب اعلى	1202
الخانو	961	وادي الحاجب	2443	نشيط	1214
السمكر	4324	وادي الطويل	2087	الانمور	2460
الطيسله	351	الجوف	1655	الشوبهيه	1067
العربه	4238	الداخله	1425	الكرباء	5880
دخلة ساكن	923	القهيدة	1153	المنطرح	1069
اكام سعد	1015	وادى العون	689	حمره	934
اكمة شقيف	2197	البتراء	1293	مدرات	1355
الجند	3183	الحرير	552	الدخل	493
الحنسر	1280	الحقالى	1560	تلعه	242
الخزيعه	2174	الدمينه	1351	قياض	1787
الدرج	1351	الدهنة	252	كشران	740
الدول	1577	الشاقة	1508	وادى الذراع	5206
الذنبتين	1147	الصوفى	1441	الاخدور	2163
الرباط	1170	المليح	997	الاهروم	3000
الشيحان	1158	النجدين	457	الحصين	6172
العماقي	3654	وادى بطاح	691	العزله	7177
العماكر	1869	وادي عرش	907	برطاس	1654
القحفه	502	وعل	299	الازيود	4305
القرعامه	4865	الجنين	831	الجمعة	3298
القصير	1214	الرتنانه	188	الزغبري	2891
المجيدي	585	النسيريه	746	الشبارة	5027
المنزل	2584	جبل اعلى	810	المعامرة	2923
ذخار	526	حنيل ضفعات	1899	المناصيب	944
ساكن الشيخ	920	قرانه	2008	جحزر	2648
شعب صالح	288	مسلقه	6554	جعاشي	1593
عراكض	853	الرجحه	256	حاضنيه	1315
الحمائر	4043	الزباديه	329	الرويس	285
شهره	2658	السراجيه	118	الزهارى	1611
وادى العريق	3437	السمسره	100	السوداد	117
الخمس	1376	العاوه	181	الشاذلية	2490
الظبيبه	1716	العرير	166	الكديحة	4627
المقلد	1765	العقش	244	الملك	82
المنزل	1199	المدين	159	حسي سالم	2382
شقب	5493	المعقاب	199	نوبة عامر	1567
الجبانه	1809	النقيل السفلى	151	يختل	4850
الحروف	2443	النقيل العليا	297	الخضراء	982

الزهيرة	1493	جبل العمري	594	الطلح	176
المخاء	12737	ذباب	4217	الطمنه	93
الهلبي	128	غريره	1704	العزيبة	1675
البابلي	2816	واحجه	4134	القبه و كواكبه	2197
الثوباني	2191	جزيرة ميون	228	المالح	750
الجروبة	735	الاعموق	1402	المحل	1098
الجريب	1979	الذنيب	1086	الممضاض	414
الطيبليه	722	القصور	476	الناصرية	1843
العشيرة	1411	المشرق	336	جبل الظهر	768
الغرافي	6401	المصينعه	810	جبل حميد	1004
حسي بن علوان	1488	سلاعف	1358	حبيل الديوان	535
الحيمه	568	صومة	1532	حلحلة	2026
الخنبه	520	عزاف	578	حلق	804
الصنمه	2686	عفان	1157	حنوب	1147
الكربه	682	مارة	1885	خرابة شقير	760
المبذل	918	مضيض	316	ربوة غراس	1131
الجريب	498	نجد الركيب	396	رحبان	1867
الشباب	82	اساه	609	سعدة	2937
العقده	617	الجـوّة	1617	شعب لنوريين	2247
الغيل	1089	الدحداح	1447	شعبة شقير	172
القميرية	245	الدهنة	799	عليسه	1732
قناهو بن علي	790	الديم	1613	غراب	1727
وادي بكير	1192	الراهدة	14873	قضاة واعبان	1661
السويداء	576	الرحبيه	2390	كارع	287
الحجج	105	الريدة	3542	محول اسفل	1379
الحجيره	645	السحي	427	محول اعلى	2966
الحرثه	920	العقيق	3326	مصور	507
الزريبه	311	الغدير	1038	مكيد فان	197
الزريره	260	الكسيبة	1082	همادنة	2796
الطور	402	المطلوح	988	همدان	3121
الغريف	722	المليساء	1960	وادى الاكمه	1485
الغويقه	739	النمرين	410	وادي الحسين	6459
الغيل	435	بني عانو	575	واقص	1054
القاعده	635	سجيرية عليا	1108	اخرق	2144
القحفه	854	سجيريه سفلى	664	الساكن	725
القشعه	309	شطيفة سفلي	1511	النجارين	812
حبوه المدد	167	شطيفة عليا	965	عرق الشرمان	2836
حصيب القويه	1445	ضبوان اسفل	2322	لطاف	1504
حصيب المهوق	747	ضبوان اعلى	1920	مركز الشرمان	2151
الردف	1158	قيسة	459	الجلب	958
الشقيراء	4943	محول البدو	642	الذنبه	2286
حنه السفلى	691	مقشاش	912	الرافعه	1163
حنه العليا	2889	الاعهوم	413	المجاليه	137
شعبو	1008	الاكام	480	الهفور	210
غيل الحاضنه	879	الاهجور	2244	عامره العليا	147
مبتعه	652	الجرينة	1159	نجد وعامره	1076
وادي المعقم	1215	الجهدان	982	الخرابه	352
الحجاريه	99	الحقيباء	1811	الركبه	134
الحريقه	740	الحلية	948	العنين	397
الدوش	3017	الخزيعة	898	الهشم	548
الرواع	1056	الدمنة	12061	حبيل الراوس	894
السويدا	209	الدهادهة	1914	وادي الدار	629
السيمال	628	السدرة	357	الاتمور	1151
العرجوش	123	الشعبة	332	الحوابنه	1087
العقه	165	الشيخين	1511	الخروف	1013
الفحيشه	34	الصحصاح	998	الخال	812
الكدحه	4148	الصرام	2936	الدهنه	2021
المطرح	661	الصرفة	601	الزريعة	1326

السعيدة	1518	شعره	843	الدخول	1596
الصوينة	580	الاقيوس	1631	العجلان	484
العصريه	474	الجبيل	800	اللصبه	929
القضاة	3791	الدموم	470	المديفن	1109
القنصاله	316	الشاربيه	2455	المعيقيب	272
ذابة	2672	الطين	1207	الهجر	360
هميريم	1555	اللصيب	3243	بيدح	846
الاكاديتين	89	العرحب	2016	جوارنه	695
الحنيل	355	الميدان	810	حضونه	300
الحورار	189	بيت عطاي	1037	ذنبة الزربي	95
السليق	386	شعب السميع	277	سعنب	651
العفيف	275	قزاحه	1105	سقم	675
المضيض	956	حنيل سعد	2736	عطرده	1256
النقيل	151	خانوه	2542	قباعه	252
جبل الجوش	78	محربه	1477	نقناف	710
جبل جربان	245	الجيل	1195	الشط	995
عكاظ	443	العنين	734	المنبر	2123
البطنه	1086	القرم	909	حويسية	1055
الحوادل	471	ذكوان	313	هوب الوقيع	1739
الظهرة	4668	فدمان	848	وادي الجسر	1463
المشواس	470	الرخوة	1558	وادي عنس	1405
المطلاح	895	الغيل	746	الاعدوف	993
الجرف	591	مشارع	1701	الجعشاشه	1836
الحمرور	556	الذنبه	1028	الجيله	540
الحنانه	1055	الشعبين	624	الخشيله	474
الشورامي	693	الغول	972	الذنبه	155
المعين	876	الوعرة	3471	الزجايه	281
المكارثه	395	حضارة	2277	الشريمه	3500
صبرة	114	ذراح	962	الصيادة	812
عومان	191	شوكان	3565	الطمطمه	1535
الزربيه	313	قرم	1099	الغبيشه	425
شعب المشارق	470	ماويه	3646	المدابيه	118
قماهده السفلى	1478	مشجب	2577	المطاوفه	1199
قماهده العليا	762	الجدله	888	المعيرة	645
مسيلقه	486	القشم	391	الهيجه	907
الرميدي	1987	المعق الاعلى	545	جبل الصياده	694
الغيالي	719	قرينع	853	عشار	38
المبادر	1532	الحصين	1036	عنبه	231
الحنكه	3231	الرباط	876	المثانيه	556
جبل عماعمه	1980	المعيطيب	1925	المحامدة	618
عدنات	425	حنيل الطويل	1340	المراجعه	1285
قبعين	2313	حوافله	1214	بني الفخر	1180
مصوام	1256	الاتصال	2062	بني معلاء	1227
صلول باهر	883	الجنيد	1109	البرح	1944
وادى باهر	607	بني عبيدان	3156	التبيبه	3910
وعرة باهر	1348	مريه	1340	الجعاريره	2180
الساكن	385	الحميراء	1896	الربع	4311
السويداء	514	الشيخ عبيد	1909	الصوفية	1694
القبقاب	156	الجفه	1111	العرف	2815
المصواله	551	الخريبه	1003	الكعب	756
جرانع	2708	وهيب	1530	الابارهه	1140
حنيل الضبيعه	471	الجبلين	717	الازهور	1201
(الشرف)صبره	1000	العوراء	771	الاسخور	364
مريران	205	الغرق	1265	الاكمة	1050
الجيف	344	بحاره	652	المغادره	1725
الخالف	1543	جريزه	918	النجيد	701
الدرب	1009	الاقحوز	38	بني جعفر	739
الشجب	1699	الجرابيب	84	بني سلمان	1144

بني صالح	933	الهدى	173	الضجاج	54
بني هلال	607	حيس	178	القوقع	641
سواغ الجبل	1275	الاشعوب	965	الكدف	164
سواغ الوادي	1737	الاصنور	1035	المجبجب	161
الحصيب	528	البطنه	959	المغربه	40
الحمراء	362	البليعه	704	المنابره	437
الستير	272	الحقيل	1572	بيدحه	396
الصراديف	476	الرباط	1153	شعب الجباليه	194
المزيهيف	342	(تجمع بدو)الرباط	44	كدامه	327
الحجار	934	السعيده	2532	الحسينه	892
العارضه	1333	المنير	965	السلامة	2972
عسق	843	الموج	2046	الشعابي	2012
الحيمة	307	الموجر	3533	الهيجاء	1405
الديمه	176	الهقيف	2484	جوالب	1008
الرباعنه	970	ركاب	2390	محرقه السفلى	905
الطليله	613	ظمين اعلى	1286	محرقه العليا	1268
القصيفه	46	مرابعه	1351	ارجوح	76
الكعب	1409	مقبنة	2812	الاعذور	2236
بني عبدالله	1081	مقبنه	1749	الاعروض	1832
بني علي	2212	الجبل	2239	الاكمه	2670
بني غالب	238	الذنيب	1471	الجوف	1627
العفيرة	2054	الرويحه	1297	الغزوز	338
القطنه	598	الادروس	757	المساكنه	2407
المعصرة	548	الطوير	1633	بن بحير	507
الهديده	167	الكويحه	1009	بني بكر	1795
وادي الشط	524	المزانده	1909	بني سلطان	2045
الجبيه	2489	شبيه	1080	بني عامر	798
الحياجي	1124	الخيفه	320	بني عثمان	123
الرجحه	437	السويهره	2617	بني مقبل	1147
القشعه	832	الطفيلي	314	المقيصع	4039
النشيفه	842	بوميه	2124	الهاملي	4741
الرفاع	674	جبل الحكيمه	1729	الوحيز	2528
الكديمة	884	مقدم راس	1985	جسر رسيان	1620
المحل	1205	يعاقبه	1903	الاتيمه	1232
الحازم	567	الضيجه	2016	شعبو	1506
الداحس	249	بني حجاج	978	العريش	4690
الظمين	1124	بني دريغم	1637	العقمه	4493
العشاعيش	567	صفونه	107	الغيل	1667
القحيزه	1171	وادي موشا	1025	الحجافيه	2790
القطينيه	193	البتيراء	1110	الحجفه	292
القلات	286	البرح	460	الحد	2501
الكريف	784	العامره	629	الحدابيه	725
المقلب	1959	الغول	1986	السفالية	1888
برح الشجين	1219	سحبان	1951	الموسنه	2047
بني علي	613	الاجين	1451	موزع	6045
جند	1915	الخرابة	1455		
حبلقه	326	الذنبه	467		
حمر	204	السليف	1363		
قطبه	967	العصره	1058		
مجربه	1320	الفريصه	644		
محاطبه	2036	المحل	478		
هيجة بني صالح	238	المغربه	911		
الجربيه	894	حمره	1540		
الشط	99	خزيجه	1345		
المحوى	68	مشاوز	980		
المريكز	287	ملحم	1192		
النوبه	99	هجده	5977		
الهجر	220	وادي السحي	1103		

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[15].

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;
14. Fills the referral form if necessary;
15. Ensures that houses with missing data are revisited before leaving the field the same day;

[15] 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.

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 تعز – فبراير 2012

استمارة إحالة طفل مصاب بسوء تغذية حاد وخيم

الأخوة/ المرفق الصحي : .....

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

محيط ذراع الطفل بالسنتيمتر (ØØ. Ø)	سنتيمتر	
طول / ارتفاع الطفل بالسنتيمتر (ØØØ. Ø)	سنتيمتر	

وجود التوذم: (نعم / لا)

تاريخ القياس	يوم	شهر	سنـــــة
			2 Ø 1 1

يرجى تعاونكم معه/ معها

وتقبلوا تحيات فريق المسح

اسم المشرف الميداني .....

توقيعه

Annex 13: Assessments Quality Checks

Taiz Mountainous Ecological Zone: Overall Data Quality

Plausibility check for: Mountains-Taiz-Yemen-022010.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 (% of in-range subjects)	Incl	%	0-2.5 0	>2.5-5.0 5	>5.0-10 10	>10 20	0 (1.6 %)
Overall Sex ratio (Significant chi square)	Incl	p	>0.1 0	>0.05 2	>0.001 4	<0.000 10	0 (p=0.650)
Overall Age distrib (Significant chi square)	Incl	p	>0.1 0	>0.05 2	>0.001 4	<0.000 10	2 (p=0.053)
Dig pref score - weight	Incl	#	0-5 0	5-10 2	10-20 4	> 20 10	0 (4)
Dig pref score - height	Incl	#	0-5 0	5-10 2	10-20 4	> 20 10	2 (10)
Standard Dev WHZ	Excl	SD	<1.1 0	<1.15 2	<1.20 6	>1.20 20	0 (0.93)
Skewness WHZ	Excl	#	<±1.0 0	<±2.0 1	<±3.0 3	>±3.0 5	0 (-0.04)
Kurtosis WHZ	Excl	#	<±1.0 0	<±2.0 1	<±3.0 3	>±3.0 5	0 (-0.08)
Poisson dist WHZ-2	Excl	p	>0.05 0	>0.01 1	>0.001 3	<0.000 5	0 (p=0.956)
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.

Taiz Coastal Plain Ecological Zone: Overall Data Quality

Plausibility check for: Plain and Coastal-Taiz-Yemen-022010.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 (% of in-range subjects)	Incl	%	0-2.5 0	>2.5-5.0 5	>5.0-10 10	>10 20	0 (0.7 %)
Overall Sex ratio (Significant chi square)	Incl	p	>0.1 0	>0.05 2	>0.001 4	<0.000 10	4 (p=0.002)
Overall Age distrib (Significant chi square)	Incl	p	>0.1 0	>0.05 2	>0.001 4	<0.000 10	4 (p=0.005)
Dig pref score - weight	Incl	#	0-5 0	5-10 2	10-20 4	> 20 10	0 (1)
Dig pref score - height	Incl	#	0-5 0	5-10 2	10-20 4	> 20 10	0 (5)
Standard Dev WHZ	Excl	SD	<1.1 0	<1.15 2	<1.20 6	>1.20 20	0 (0.94)
Skewness WHZ	Excl	#	<±1.0 0	<±2.0 1	<±3.0 3	>±3.0 5	0 (-0.01)
Kurtosis WHZ	Excl	#	<±1.0 0	<±2.0 1	<±3.0 3	>±3.0 5	0 (0.30)
Poisson dist WHZ-2	Excl	p	>0.05 0	>0.01 1	>0.001 3	<0.000 5	5 (p=0.000)
Timing	Excl	Not determined yet 0		1	3	5	
OVERALL SCORE WHZ =			0-5	5-10	10-15	>15	13 %

At the moment the overall score of this survey is 13 %, this is acceptable.

Annex 14: Tables of Weighted Finding of Nutritional Status

The weighted prevalence of GAM and SAM is 11.4% and 2.1% in rural and 10% and 0.4% in urban areas, while levels are higher among boys (14.3% and 2.6%) than girls (8.2% and 0.8%). It was also found high in ages 6 – 24 months compared to other age categories.

The weighted prevalence of stunting in Taiz Governorate is 50.6% with severe stunting of 17.8%. Thus, the severity for Taiz is classified as 'critical' as per WHO categorization. The prevalence of stunting is higher in rural (53.9%) with severe stunting of 20% than urban (39.2%) with severe stunting of 10%, and high as 55.7% among children in the third year of age. Levels of stunting and severe stunting in boys are 51.7% and 18.9% and in girls are 49.5% and 16.6% respectively.

The weighted prevalence of underweight in Taiz Governorate is 38.3% with severe underweight of 10.6%. The prevalence of underweight is higher in rural (40.3%) with severe underweight of 12.5% than urban (31.1%) with severe underweight of 3.9%. Levels of underweight and severe underweight among boys are 39.6% and 12.1% and among girls are 37% and 9% respectively. All figures mentioned above have been calculated after exclusion of SMART flags.

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

Stunting		N	%	95% Conf Limits	
				Lower	Upper
Mountains (n = 873.84)	Moderate	300.96	34.4%	31.3%	37.7%
	Severe	149.16	17.1%	14.7%	19.8%
	Moderate and severe	450.12	51.5%	48.1%	54.9%
Plain and coastal (n = 486.45)	Moderate	145.59	29.9%	25.9%	34.2%
	Severe	93.15	19.1%	15.8%	23.0%
	Moderate and severe	238.74	49.1%	44.6%	53.6%
Rural (n = 1063.26)	Moderate	359.94	33.9%	31.0%	36.8%
	Severe	212.58	20.0%	17.7%	22.6%
	Moderate and severe	572.52	53.8%	50.8%	56.9%
Urban (n = 297.03)	Moderate	86.61	29.2%	24.1%	34.8%
	Severe	29.73	10.0%	6.9%	14.1%
	Moderate and severe	116.34	39.2%	33.5%	44.9%
Girls (n = 650.31)	Moderate	213.84	32.9%	29.3%	36.7%
	Severe	108.03	16.6%	13.9%	19.7%
	Moderate and severe	321.87	49.50%	45.60%	53.40%
Boys (n = 709.98)	Moderate	232.71	32.8%	29.4%	36.4%
	Severe	134.28	18.9%	16.1%	22.0%
	Moderate and severe	366.99	51.7%	47.9%	55.4%
6 - below 12 months (n = 154.02)	Moderate	50.88	33.0%	25.7%	41.1%
	Severe	12.75	8.3%	4.6%	14.0%

Stunting		**N**	**%**	**95% Conf Limits**	
				Lower	**Upper**
	Moderate and severe	63.63	41.3%	33.6%	49.6%
12 - below 24 months (n = 339.63)	Moderate	104.91	30.9%	26.1%	36.1%
	Severe	63.69	18.8%	14.8%	23.4%
	Moderate and severe	168.6	49.6%	44.2%	55.1%
24 - below 36 months (n = 334 .83)	Moderate	109.35	32.7%	27.7%	38.0%
	Severe	77.07	23.0%	18.7%	28.0%
	Moderate and severe	186.42	55.7%	50.2%	61.1%
36 - below 48 months (n = 298.53)	Moderate	105.21	35.2%	29.8%	40.9%
	Severe	49.68	16.6%	12.7%	21.5%
	Moderate and severe	154.89	51.9%	46.0%	57.6%
48 - below 60 months (n = 233.28)	Moderate	76.2	32.7%	26.6%	39.0%
	Severe	39.12	16.8%	12.2%	22.1%
	Moderate and severe	115.32	49.4%	42.8%	56.0%
Taiz (n = 1360.29)	***Moderate***	***446.55***	***32.8%***	***30.3%***	***35.4%***
	Severe	***242.31***	***17.8%***	***15.8%***	***20.0%***
	Moderate and severe	***688.86***	***50.6%***	***47.9%***	***53.3%***

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

Underweight		**N**	**%**	**95% Conf Limits**	
				Lower	**Upper**
Mountains (n = 900.24)	Moderate	233.64	26.0%	23.1%	29.0%
	Severe	81.84	9.1%	7.3%	11.2%
	Moderate and severe	315.48	35.0%	31.9%	38.3%
Plain and coastal (n = 493.35)	Moderate	152.49	30.9%	26.9%	35.2%
	Severe	66.24	13.4%	10.6%	16.8%
	Moderate and severe	218.73	44.3%	39.9%	48.8%
Rural (n = 1087.32)	Moderate	302.1	27.8%	25.2%	30.6%
	Severe	136.2	12.5%	10.6%	14.7%
	Moderate and severe	438.3	40.3%	37.4%	43.3%
Urban (n = 306.27)	Moderate	84.03	27.4%	22.6%	32.9%
	Severe	11.88	3.9%	2.1%	6.9%
	Moderate and severe	95.91	31.3%	26.2%	36.9%
Girls (n = 660.93)	Moderate	185.04	28.0%	24.6%	31.6%
	Severe	59.22	9.0%	6.9%	11.5%
	Moderate and severe	244.26	37.0%	33.3%	40.8%
Boys (n = 732.66)	Moderate	201.09	27.4%	24.3%	30.9%

Underweight		**N**	**%**	**95% Conf Limits**	
				Lower	**Upper**
	Severe	88.86	12.1%	9.9%	14.8%
	Moderate and severe	289.95	39.6%	36.0%	43.2%
6 - below 12 months (n = 156.03)	Moderate	34.29	22.0%	15.6%	29.1%
	Severe	16.2	10.4%	6.0%	16.1%
	Moderate and severe	50.49	32.4%	24.9%	40.1%
12 - below 24 months (n = 348.87)	Moderate	76.5	21.9%	17.8%	26.7%
	Severe	34.86	10.0%	7.1%	13.7%
	Moderate and severe	111.36	31.9%	27.1%	37.1%
24 - below 36 months (n = 342.24)	Moderate	114.12	33.3%	28.4%	38.7%
	Severe	37.56	11.0%	8.0%	14.9%
	Moderate and severe	151.68	44.3%	39.0%	49.8%
36 - below 48 months (n = 305.19)	Moderate	82.71	27.1%	22.3%	32.5%
	Severe	33.78	11.1%	7.9%	15.3%
	Moderate and severe	116.49	38.2%	32.6%	43.8%
48 - below 60 months (n = 241.26)	Moderate	78.51	32.5%	26.8%	39.0%
	Severe	25.68	10.6%	7.2%	15.4%
	Moderate and severe	104.19	43.2%	36.8%	49.7%
Taiz (n = 1393.59)	***Moderate***	***386.13***	***27.7%***	***25.4%***	***30.2%***
	Severe	***148.08***	***10.6%***	***9.1%***	***12.4%***
	Moderate and severe	***534.21***	***38.3%***	***35.8%***	***41.0%***

3: Wasting among children distributed per zone, residency place, gender, and age category

Wasting		**N**	**%**	**95% Conf Limits**	
				Lower	**Upper**
Mountains (n = 897.6)	Moderate	75.24	8.4%	6.7%	10.4%
	Severe	9.24	1.0%	0.5%	2.0%
	Moderate and severe	84.48	9.4%	7.6%	11.6%
Plain and coastal (n = 493.35)	Moderate	59.34	12.0%	9.4%	15.3%
	Severe	15.18	3.1%	1.8%	5.1%
	Moderate and severe	74.52	15.1%	12.1%	18.6%
Rural (n = 1086)	Moderate	105.48	9.7%	8.0%	11.7%
	Severe	23.1	2.1%	1.4%	3.2%
	Moderate and severe	128.58	11.8%	10.0%	13.9%
Urban (n = 304.95)	Moderate	29.1	9.5%	6.6%	13.5%
	Severe	1.32	0.4%	0.0%	2.3%
	Moderate and severe	30.42	10.0%	7.0%	14.0%

Wasting		**N**	**%**	**95% Conf Limits**	
				Lower	**Upper**
Girls (n = 655.59)	Moderate	48.54	7.4%	5.6%	9.8%
	Severe	5.46	0.8%	0.3%	2.0%
	Moderate and severe	54	8.2%	6.3%	10.7%
Boys (n = 735.36)	Moderate	86.04	11.7%	9.5%	14.3%
	Severe	18.96	2.6%	1.6%	4.1%
	Moderate and severe	105	14.3%	11.9%	17.1%
6 - below 12 months (n = 155.34)	Moderate	20.28	13.1%	8.1%	19.2%
	Severe	1.38	0.9%	0.0%	3.5%
	Moderate and severe	21.66	13.9%	9.1%	20.6%
12 - below 24 months (n = 348.93)	Moderate	40.83	11.7%	8.6%	15.7%
	Severe	7.41	2.1%	1.0%	4.4%
	Moderate and severe	48.24	13.8%	10.5%	18.0%
24 - below 36 months (n = 343.56)	Moderate	22.8	6.6%	4.3%	9.9%
	Severe	9.48	2.8%	1.4%	5.3%
	Moderate and severe	32.28	9.4%	6.6%	13.1%
36 - below 48 months (n = 303.18)	Moderate	23.1	7.6%	5.0%	11.4%
	Severe	2.76	0.9%	0.2%	3.0%
	Moderate and severe	25.86	8.5%	5.7%	12.4%
48 - below 60 months (n = 239.94)	Moderate	27.57	11.5%	7.9%	16.4%
	Severe	3.39	1.4%	0.3%	3.6%
	Moderate and severe	30.96	12.9%	8.9%	17.8%
Taiz (n = 1390.95)	***Moderate***	***134.58***	***9.7%***	***8.2%***	***11.4%***
	Severe	***24.42***	***1.8%***	***1.2%***	***2.6%***
	Moderate and severe	***159***	***11.4%***	***9.8%***	***13.2%***

5: Oedema among children distributed per zone, residency place, and gender

Oedema	**N**	**%**	**95% Conf Limits**	
			Lower	**Upper**
Mountains (n = 877.8)	2.64	0.3%	0.1%	1.0%
Plain and coastal (n = 494.04)	0	0.0%	0.0%	1.0%
Rural (n = 1070.22)	2.64	0.2%	0.1%	0.8%
Urban (n = 301.62)	0	0.0%	0.0%	1.6%
Girls (n = 651)	0	0.0%	0.0%	0.7%
Boys (n = 720.84)	2.64	0.4%	0.1%	1.2%
Taiz (n = 1371.84)	***2.64***	***0.2%***	***0.0%***	***0.7%***

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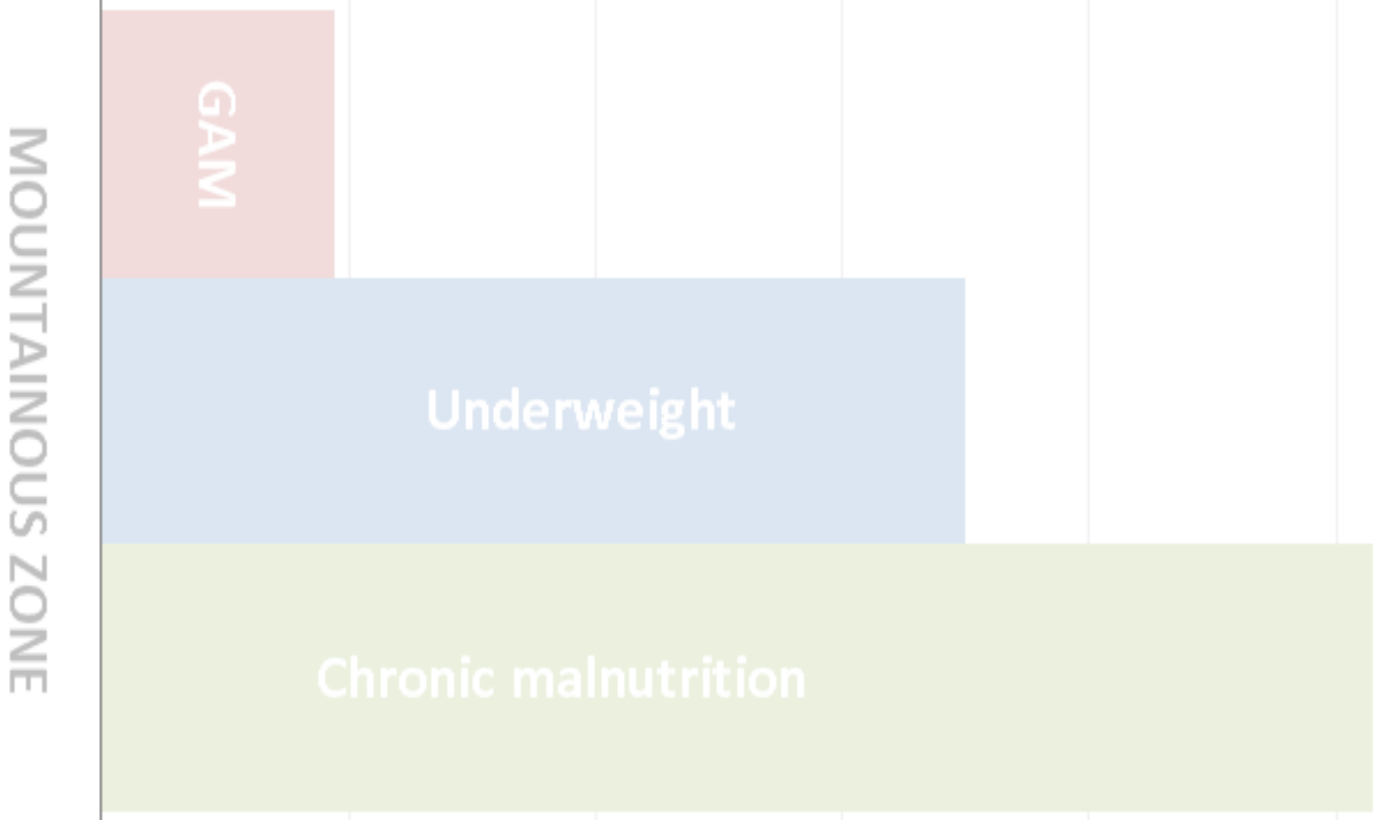
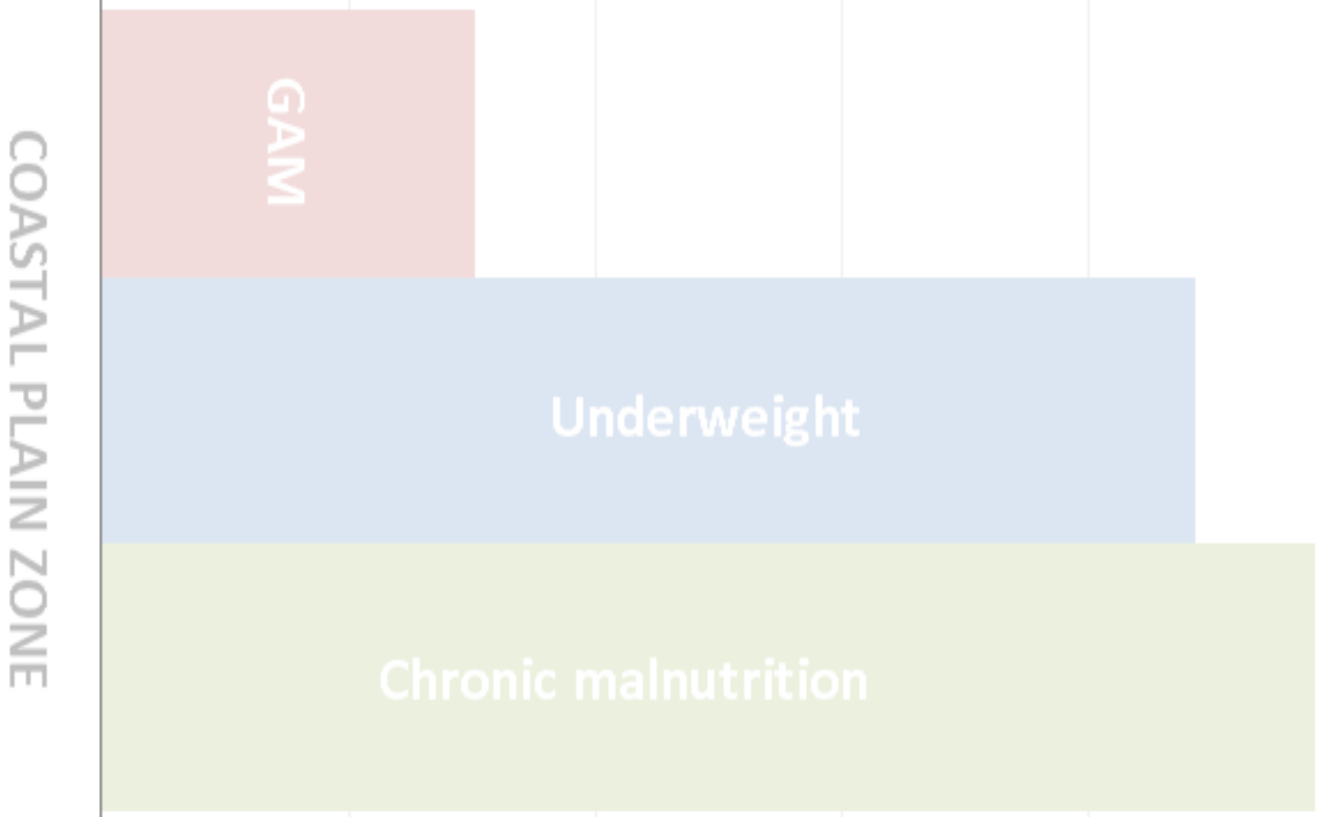
Taiz Governorate Public Health and Population Office
Box 1012
Tel: + 967 4 270666/700
Fax: + 967 4 270600
Taiz, Republic of Yemen
Email: info@taizhealth.com, taizhealth@gmail.com
Web site: http://www.taizhealth.com