ANAEMIA, INFANT FEEDING AND ANTHROPOMETRIC SURVEY

In

Kharaz Refugee Camp and surrounding host villages Yemen

July 2010

UNHCR IN COLLABORATION WITH MOH, ENN &CSSW

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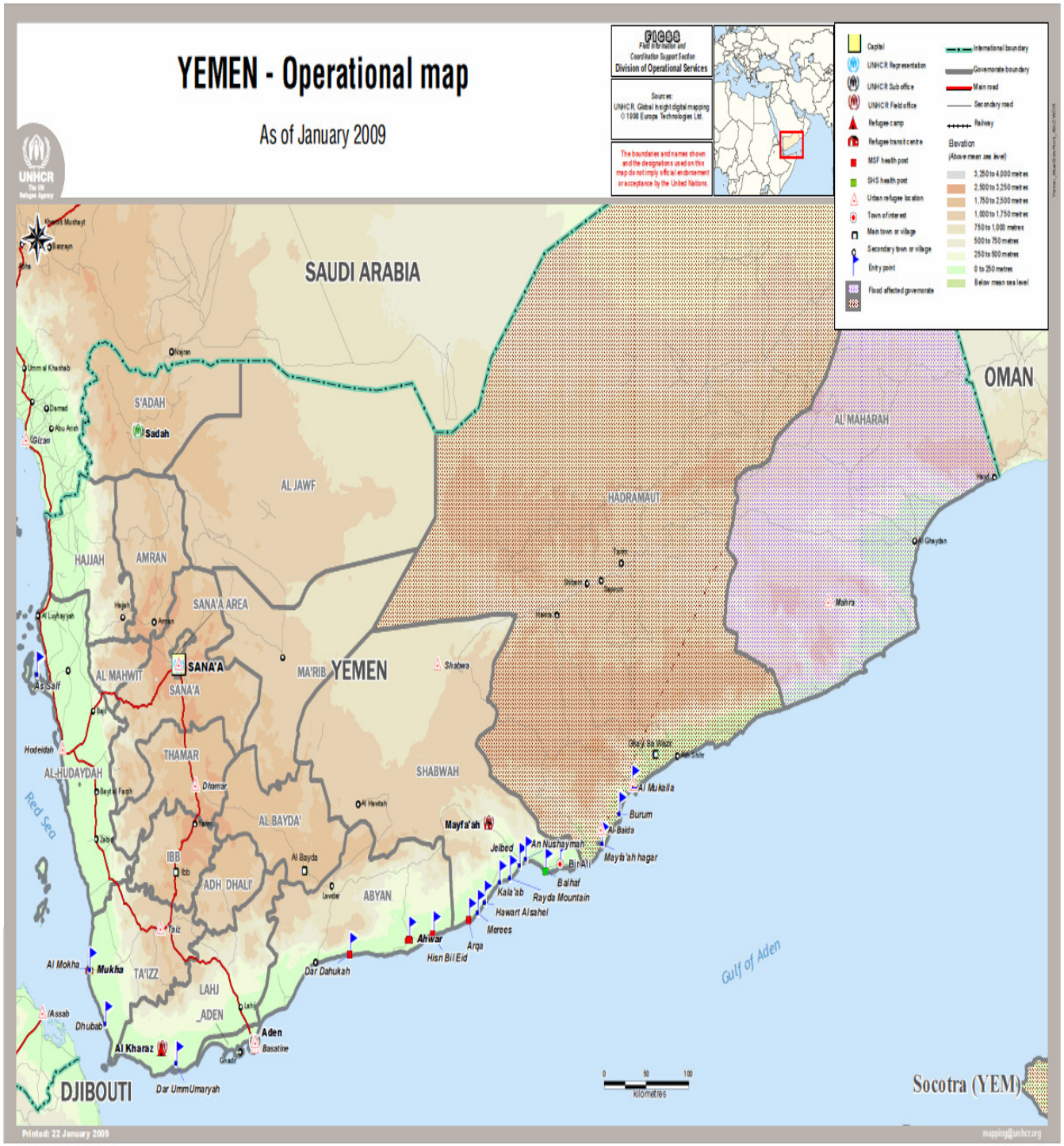
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Executive Summary

Kharaz refugee camp and the surrounding host communities are in the southern coast of Yemen which is approximately two hours drive from Aden. The camp was established in 2001 and hosts refugees mainly from Somalia with a very small population of Oromo from Ethiopia. A nutrition survey was conducted in Kharaz refugee camp and surrounding host villages from July 21-24th in the camp and July 25-26th in the local villages respectively. The aim of the survey was to assess the prevalence of malnutrition in young children aged 6-59 months and to determine the prevalence of anaemia among children aged 6-59 months, and women of child bearing age (15-49 yrs, non-pregnant). The survey also assessed infant and young child feeding practices, individual food intake, and retrospective mortality and morbidity in both the refugee camp as well as the surrounding host communities. The survey was funded and initiated by UNHCR and carried out in collaboration with CSSW and ENN (Emergency Nutrition Network).

The refugee camp is set in a well organised system with blocks of about 25 households each. All households have specific address numbers that consist of the block and the household number. Systematic random sampling was used to select households to survey in the camp. In the surrounding host communities, due to the small population size, an exhaustive survey was conducted. Anthropometric measurements were taken on children 6-59 months and infant feeding practice was measured using a 24-hour recall questionnaire. Blood haemoglobin was measured in children, and women through a finger prick using the HemoCue 201 machine. Individual dietary diversity was collected in women and general ration distribution records were analysed for nutritional content. Crude mortality and under five mortality data, together with child morbidity assessment, were also obtained during the survey.

Anaemia (Hb<11.0 g/dl) was present in 58.9% (95% CI: 53.2-64.4) and 48.4% (95% CI: 41.8-54.7) of the children aged 6-59 months and women of reproductive ages in the camp respectively. The prevalence of anaemia in the surrounding areas was found to be 64.5% and 54.8% in children and women respectively. A significant reduction in anaemia

prevalence was observed in children in the camp compared to last year's survey of 77.9% ($p<0.001$), however no significant improvement was detected in the host communities ($p=0.15$). A number of intervention measures in the camp could be attributed to the improvement albeit the need to strengthen the quality of program management.

Anthropometric data was analysed using both the WHO 2006 Growth Standards as well as the 1977 NCHS Reference. Global acute malnutrition prevalence (wasting and/or oedema) was found to be 8.7 % (5.9 - 12.5) and 10.0 % in Kharaz refugee camp and the surrounding host community respectively based on the WHO 2006 Growth Standards. Severe acute malnutrition prevalence was found to be 1.7 % (0.7 - 4.0 95% C.I.) and 1.4 % in Kharaz and the host community respectively. Stunting prevalence in children aged 6-59 months (HAZ <-2) was found to be 22.0 % (17.4 - 27.3) and 34.2 % in Kharaz and surrounding host community respectively. Comparing these anthropometric results to last year's survey, it appears that the prevalence has staggered within the same range despite several intervention strategies.

Vaccination coverage ranged from 86.8% (83.0-90.0) for combined measles coverage to 96.9% for BCG and at acceptable coverage in both the refugee camp as well as the surrounding host communities.

Mortality rates over a recall period of 90 days were within acceptable limits with 0.23/10,000/day (95% CI, 0.09-0.60) and 0.31/10,000/day (95% CI, 0.05-1.72) for the crude and under five mortality rates respectively in the refugee camp. Due to the small population of the surrounding villages mortality data was not collected, however there were no deaths reported in the last three months.

Data on the general food ration distribution showed adequate attainment of the required kilocalories; however, poor attainment of essential micronutrients was noted. There was lack of any fortified blended food distributed in the general food distribution in the camp, which could contribute to the under attainment of essential micronutrients. Sale of food through specific traders in the camp and borrowing of money using and depositing the

ration card as a surety (guarantee) are very common in the camp, which is thought to contribute to poor household food security as well as the high number of refugees in major towns in Yemen. A high number of absent households and movement of refugees were also observed during the survey which in turn affects the refugees health and nutrition outcome and makes it difficult for provision of services.

There is need to improve both the general food ration food types as well as the distribution system of the supplementary food. Streamlining and improving health care delivery, especially in terms of drugs availability will be an important improvement in health related services. Concerted efforts need to be made in order to curb on the sale of food and high absenteeism especially of vulnerable groups in order to monitor and manage the refugee's health and nutrition status. Similar intervention strategies need to be introduced into the surrounding host communities. Further detailed recommendations for action based on the findings of this survey are provided following the discussion.

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ACRONYMS AND ABBREVIATIONS

ARIs	Acute Respiratory Infections
CHWs	Community Health Workers
CI	Confidence Interval
CSB	Corn-Soya Blend
CSSW	Charitable Society for Social Welfare
GAM	Global Acute Malnutrition
Hb	Haemoglobin
ITNs	Insecticide-treated bed nets
MOH	Ministry of Health
MUAC	Mid Upper Arm Circumference
NCHS	National Center for Health Statistics
NGO	Non Governmental Organization
SAM	Severe Acute Malnutrition
SD	Standard Deviation
SFP	Supplementary Feeding Programme
SHS	Society for Humanitarian Solidarity
TFCs	Therapeutic Feeding Centres
TFP	Therapeutic Feeding Programme
UNHCR	United Nations High Commissioner for Refugees
WFP	World Food Programme
WH	Weight for Height
WHM	Weight-for-Height Percentage of the Median
WHO	World Health Organisation
WHZ	Weight-for-Height z-scores

1.0 Introduction

UNHCR in collaboration with the government of Yemen re-established its activities in 1992 after the influx of the large Somali refugees, asylum seekers and other populations outside the refugee camps in order to provide basic humanitarian assistance and support that is aimed at attaining durable solutions. As of April 2010, a total of 237,000 refugees were being assisted and supported in Yemen. While the majority of the refugees are Somalis, a smaller populations of Eritrean, Ethiopians, Iraqis also exist. The refugees stay mainly in urban settlements in Yemen while an estimated 17,808[1] refugees stay in Kharaz refugee camp. In 2009, more than 48,000 new arrivals arrived at the shores of Yemen, the majority of whom moved to the urban areas where there is already limited resources and hence an increased strain on the government.

Kharaz camp and surrounding villages are located in the Lahaj Governorate in a valley west of Aden in the southern part of the Republic of Yemen. The camp was built between 2000 and 2001. It is an open camp where most of the refugees depend on food aid and other livelihoods sources are very scarce. During summer when the climate is very hot, a large number of refugees move to Sana'a, or to the urban areas of Aden, where they try to find opportunities for earning their living. In addition to the Kharaz camp, UNHCR is operating a reception centre for new arrivals at Mayfa'a, east of Aden.

Currently, Kharaz camp consists of 59 blocks, each with 25 shelter units built with cement, where refugees have access to adequate latrines. Each block has a water distribution point and a garbage collection point. The camp also has 400 out-shelters constructed with bushes, plastic sheets and clothes and over 71 temporary tents which accommodate continuous new registered arrivals over recent years due to the renewed fighting in Somali. UNHCR is currently planning to build additional blocks of shelters to move the refugees from the bushes.

Over 17,000 refugees live in the camp and about 1,500 Yemenis in the surrounding villages. Kharaz camp shelters mainly Somalis and Ethiopians. Somalis are granted

[1] UNHCR Data reports

refugee status by the Yemeni Government. Yemen is party to the 1951 convention and its 1967 Protocol and the Government recognizes Somalis as refugees on *prima facie* basis, in accordance with the definition contained in the 1969 Organisation of African Unity (OAU) convention on refugees. Ethiopians on the other hand are not automatically considered as refugees and are interviewed first before being recognized according to their request in a process known as Refugee Status Determination..

2.0 Health and nutrition

CSSW with the support of UNHCR provides health and nutrition services to the refugees in the camp. The organisation provides out patient care and limited inpatient care as well as primary health care services and HIV/AIDS awareness and prevention programs. Refugees who require specialised medical care not available in the camp are referred to Aden public hospitals. The health facility caters for both the local community and the refugees. There are at least five doctors: two general medical doctors, one paediatrician, one gynaecologist and one visiting psychiatrist.

Both staffing and essential drugs are said to be satisfactory with some shortage experienced before the delivery of the monthly supply. Upper and lower respiratory tract infection, acute watery diarrhoea, cardiovascular disease, Urinary tract infection, skin disease, anaemia and Sexually Transmitted Infections (STIs) are the main top diseases in descending order in the outpatient consultations. Malaria cases are highly seasonal but prevalence are very low all through out the year. The survey carried out in 2009 by Mentor et al showed prevalence less than 1.3%.

A nutritional survey carried in 2009 in Kharaz refugee camp, surrounding villages around the camp and Sana'a showed GAM of 7.2% (5.4 – 9.5), 9.9% (6.5 – 14.8) and 10.9% (8.0 – 14.6) respectively[2]. While these values indicated a serious nutritional situation, the prevalence of anaemia in the same period showed a more alarming situation. Anaemia as an indicator of iron deficiency and as a proxy for other micronutrient deficiencies was

[2] UNHCR (2009) Anthropometric, retrospective mortality and hemoglobin measurement survey

measured during this survey in addition to the anthropometric measurements. Prevalence of anaemia in children 6-59 months was 77.9%, 73.0%, and 47.5% in Kharaz refugee camp, villages surrounding Kharaz and Basateen respectively. The overall prevalence of anaemia was 63.3%.[3] All these figures surpass the 40% WHO threshold, thus making anaemia a priority public health importance. Although this study did not include women of reproductive age, it is logical to anticipate high anaemia prevalence in this group as well. There is continued anaemia testing at the health facility with the use of the Hemocue 201 supplied by UNHCR.

Prevalence of acute respiratory infection was 21.3% in Sana'a, 22.2% in Kharaz camp and 16.3% in Basateen according to the 2009 nutrition survey, while the prevalence of diarrhoea ranged from 25.2% in Basateen, 30.9% in the villages surrounding Kharaz camp, 36.3% in Sana'a and 25.4% in Kharaz camp. The prevalence of fever was 37.0% in Kharaz camp, 47.8% in Basateen, 45.1% in Kharaz villages and 51.6% in Sana'a. Malaria, which is a major contributor of anaemia in developing countries was very low in all the survey sites with a cumulative prevalence of 1.27%[4]. It is however important to note that the survey was done in June during the low season of transmission.

Information on the prevalence of exclusive breastfeeding was not available in the 2009 survey, however, early initiation of breast feeding was good ranging from 92.6.% in villages surrounding Kharaz to 74.3% in Sana'a urban population.

The factors thought to contribute to the nutritional and micronutrient problems in the refugee camp from the previous findings were as follows:

- Poor food diversification
- Lack of fortified food
- Limited access to fresh products and very little opportunities for access to markets or livelihoods

[3] UNHCR/ Mentor (2009) Malaria and Anaemia survey Basateen and Kharaz camps Yemen
[4] UNHCR/ Mentor (2009) Malaria and Anaemia survey Basateen and Kharaz camps Yemen

- Frequent disease outbreaks
- Poor infant and young child feeding practices
- Limited nutritional program coverage
- High tea consumption and wheat based diet (high phytate and polyphenol/tannin content of the diet).

Blanket supplementary feeding with Wheat Soya Blend (WSB) for all children under five years old was also established in the middle of 2010. All children in the camp, on a monthly basis receive, a premixed ration of 2400g WSB, 300g of sugar together with 300g of oil. Tuna fish that had previously been provided to all children under 3 years old was cut in the last two months (June-July 2010), which was mainly due to management issues rather than supply problems.

Plans to introduce MNP (micronutrient powder) in all children aged 6-59 months in both the refugee camp and in the local community is underway as part of the anaemia reduction programme. A one month preliminary acceptability trial is on going in seven blocks in the camp and one village in the surrounding villages to get an understanding of community perception and acceptability of the proposed intervention.

WASH programs are provided by SHS (Society for Humanitarian Solidarity) in conjunction with UNHCR. The construction of toilets is done at the initial construction of the shelter with each shelter having one toilet. Water is provided by SHS and there is a main water point at the centre of each block. Families use long pipes to draw water to their household and block members draw water in turns. There is minimal walking to the water point. More than the standard required amount of water is said to be received by the refugees. This supply of water is also replicated in the surrounding local communities with each village having piped water at a particular point in the village.

3.0 Survey Objectives

Study Objectives

The survey was conducted in Kharaz refugee camp as well as the population in the surrounding areas of Kharaz camp. The objectives listed below thus apply to both groups of the survey.

- To assess the prevalence of malnutrition of children 6 to 59 months of age.
- To determine the prevalence of anaemia in children aged 6 – 59 months and non-pregnant women of reproductive age (15-49 years).
- To assess the retrospective morbidity of children aged 6-59 months.
- To assess the vaccination coverage of children under 5 years.
- To assess the retrospective mortality of both crude and under five years children.
- To assess eating habits of women using a individual dietary diversity score and analyse the food aid ration monitoring data.
- To assess the prevalence of timely initiation of breastfeeding, continued breastfeeding and timely introduction of complementary foods.
- To provide recommendations on actions to be taken to address the situation.

4.0 Survey Methodology

4.1 Staff training and team organization

The survey was undertaken by five teams with six persons in each team, which included one team leader, two anthropometric measurers, two haemoglobin measurers and one interviewer. Most of the team members were employees of CSSW and included nurses, nutrition promoters and community health workers. The staff were identified by the CSSW management and most of the staff participating had been involved in the previous surveys with the exception of the staff selected from the local community. The staff from the local community were however reduced to five members and each was attached to a well trained and experienced team of five other members. A supervisor was recruited to assist the Nutrition consultant and UNHCR health coordinator in supervision especially in UN restricted areas like the local villages. The training took place on 13th, 19th and 20th

of July 2010. Although there were disruptions and security problems on the first day of the training, that forced UNHCR staff to be evacuated the following day, the remaining days of the training went on smoothly.

The training covered the following topics:

- Anaemia causes, signs and symptoms, health impact, risk groups and diagnosis
- The purpose and objectives of the survey
- Anthropometry
- Correct methodology for operating the HemoCue and testing haemoglobin.
- Safety precautions and waste disposal system
- Interviewing techniques and recording of data. Role-play was used to ensure that the interviewers knew how to ask the questions and also how to record the responses accurately
- Household selected for the survey were also explained and when it was necessary to replace a household
- Consent and team introduction to the household

Practical training sessions were held on anthropometry and sample collection and surveyors practiced on volunteer children at the hospital who have come for either immunisation or treatment at the hospital practical haemoglobin testing was also done with the survey coordinator taking blood samples on some of the participants. All the participants were then given an opportunity to do the test and get tested as well. A video on how to do the haemoglobin measurement was also shared with the staff in order to strengthen the theory and practical demonstration. Role plays of the questionnaires were done with each team acting as the survey team and a household, and vice-versa. Designated team members were responsible for specific assignment. The nurses were selected to do the haemoglobin measurement due to their better understanding of safety precaution.

There was no adequate time to visit actual households to do pilot testing, however surveyors practiced the questionnaires with women and their children in the hospital

Filled questionnaires were collected and seen through by the survey coordinator and errors encountered were reported back to the teams. A further emphasis was done on areas of perceived weakness.

Each team was assigned certain block numbers and village names in the surrounding local population. Due to the usual food distribution period at the end of the month, teams were asked to skip if need be if one of the target blocks was involved in the food distribution on that day and were instructed to come back to the block the next day.

Regular supervision and support to the field teams was provided by the Survey Coordinator, UNHCR Medical coordinator and CSSW community health coordinator. This regular supervision was however limited to the camp, and due to security restrictions both the survey coordinator and the UNHCR medical coordinator could not visit the villages in the surrounding local population, hence the CSSW community health coordinator handled the supervision of teams in the villages.

4.2 Target Population Groups for the Survey

The table below shows the different target groups that were sampled in all the households and the measurements taken

Table 1 Target population and procedure

Target Population	Measurements
Children (6-59 months)	Anthropometry, morbidity questionnaire, supplementation and vaccination coverage, and HB.
Non pregnant, Women (15-45 years)	HB and questionnaire

4.3 Sample Size Calculation

The sample size required for the survey was based on the assumed prevalences and desired precision given below for each parameter. The sample size calculations were

carried out using the ENA for SMART software version November 2008[5]. The refugee camp is organised in blocks with each block having about 25 households with each house having a unique address. It was therefore possible to use systematic random sampling for selecting the households to survey in the camp. Due to the small population size in the surrounding villages, an exhaustive survey was conducted.

4.3.1 Anaemia

The sample size for haemoglobin measurements was calculated to be 263 children while 292 children were required for the anthropometric measurements. A total of 92 women were found to be required for the anaemia assessment but this number was raised by 20% to cater for pregnant and lactating women (not included in the final analysis). A non response of 10% and a 20% change in anaemia prevalence from the last survey were assumed. The sample size was also based on an assumed prevalence of anaemia of 77.9% and 50% for both children and women of reproductive age in the camp respectively.

4.3.2 Global acute malnutrition (GAM, wasting) in children 6-59 months

Based on a GAM prevalence of 7.2% obtained from the 2009 survey, a desired precision of +/- 3% and 95% confidence (5% alpha risk) , the minimum sample size required was 285 children + 10% non response =314.

4.3.3 Mortality rate

Based on an estimated rate of 0.46 deaths/10,000/day[6], a desired precision of 0.3, and recall period of 90 days, the sample size required was 2182 which was equivalent to 418 households allowing for 15% non response. The most common date that could be remembered by all the refugees was the third food distribution which was on 28th of April 2010 making the recall period exactly 90 days long.

4.3.4 Overall sample size

The calculation of the sample size assumed a total population of 3400 (20% of 17000) and 300 (20% of 1500) for children 0-59 months in Kharaz camp and surrounding

[5] Software used for sample calculation: Erhardt et al (2008) ENA for SMART: Emergency nutrition assessment. www.nutrisurvey.de\ena\ena.html

[6] UNHCR Nutrition Survey 2009

villages respectively. The total number of women of reproductive age (15-49 years) was estimated at 3400 (20% of 17000) and 300 in the refugee camp and the surrounding areas respectively.

Assuming 1.5 children per household, 5 households were sampled per block in the estimated 81 blocks but only 3 of these households per block were sampled for the anthropometry and anaemia assessments. A total of 7 villages recognised by UNHCR were visited in the local community during the survey.

4.3.5 Sampling

UNHCR registration data was used for sampling although these figures were the number of refugees registered in the camp and not necessarily the actual number of refugees in the camp or each section. However this data was the only available information on the actual population in the camp.

The camp is organized in a well arranged blocks with about 25 shelters in each block. Each household has a unique identification number that is made of the block number and the house number. It was therefore possible to do systematic random sampling. However there was a group yet to be allocated permanent shelters and were in tents and are commonly referred to as the "bushes". Although these households have also been listed and allocated house specific numbers by UNHCR, it was difficult to sample them using these numbers. This was because on the tent, there were various other numbers allocated by implementing partners and it was not possible to identify which was the UNHCR number. However CSSW had registered these refugees in the bushes in blocks like settlement for ease of health monitoring and CHW house allocation. The CSSW house lists that were grouped in blocks of 25 houses were used for the sampling of the bushes.

A higher number of households were required for interview to collect the mortality information. A total of 419 households were required for sampling which included a 15 % of non response. Out of 83 blocks including the bushes, a total of five households were required to be visited in each block.. The block size (25 shelters) was divided by five to

get the sample interval of five. A random number in between 1 and 5 was then selected from the random number tables. In this case the number 4 was randomly picked and thereafter added to the sample interval of 5. So in each block houses numbers 4, 9, 14,19,24 were visited. And since we did not need all the houses for anthropometric and anaemia data collection, houses 9 and 19 were similarly randomly selected from the list of the five households to only include the mortality questionnaire.

Households were defined as people sharing food. Absent subjects who were not far from the household or the camp were located or re-visited at least twice. Absent subjects who could not be located or found after at least two visits were not replaced. Two attempts were made to locate absent households and only if reliable information was available that the residents of the households were not within the camp did we replace the empty households with the next house on the left.

5.0 Data Collection

All the questionnaires and anthropometric and haemoglobin measurements were performed in the household and data entered in their respective data collection sheets.

5.1 Measurement of Haemoglobin

Measurement of haemoglobin (Hb) was performed using a portable photometer 'HemoCue Hb 201[7]. Haemoglobin measurement was done on all children aged 6-59 months and women, in all the selected households in the camp while all households were visited in the local villages.

The first drop was allowed to form and was wiped away using tissue paper. The second drop was transferred into a HemoCue cuvette for the measurement of haemoglobin. The cuvette was filled from one drop using a continuous action and any blood on the sides was wiped away from the faces of the cuvette with lint free tissue before immediate insertion into the photometer. The reading was in grams per decilitre.

[7] HemoCue AB, Box 1204, SE-262 23 Angelholm, Sweden.

The table below shows the cut off values used to define anaemia in this study, based on the cut-off recommended by WHO[8].

Table 2 Cut-off Points for Defining Anaemia[9]

Age/Sex groups	Haemoglobin g/dl			
	Total	Mild	Moderate	Severe
Children 6 - 59 months	<11.0	10.9 - 10.0	9.9 - 7.0	< 7.0
Adult females >15 years	<12.0	11.9 - 11.0	10.9 - 8.0	< 8.0
Pregnant Women	<11.0	10.9 - 10.0	9.9 - 7.0	< 7.0

In population anaemia surveys, classification of anaemia according to severity of anaemia is important in order to understand the public health significance of the problem in the population. The table below gives the different classification of public health significance of anaemia for population assessments.

Table 3 Classification of the public health significance of anaemia in populations on the basis of prevalence estimated from blood levels of haemoglobin[10]

Category of public health significance	Prevalence of anaemia (%)
Severe	≥ 40
Moderate	20.0 – 39.9
Mild	5.0 – 19.9
Normal	≤ 4.9

HemoCue controls

[8] The management of nutrition in Major Emergencies, WHO, 2000
[9] World Health Organization. 2001. Iron Deficiency Anaemia: Assessment, Prevention, and Control. *A guide for programme managers.*WHO/NHD/01.3
[10] World Health Organization. 2001. Iron Deficiency Anaemia: Assessment, Prevention, and Control. *A guide for programme managers.*WHO/NHD/01.3

There was lack of hemocue liquid controls and it was not possible to control the machines, however inter machine agreement was measured by measuring the haemoglobin levels of five survey teams in the five hemocue machines. The readings of haemoglobin concentrations of subjects between machines were close and the coefficient of variation (C.V.) was less than 5%.

HemoCue 201 machines are sensitive to heat and are mainly meant for use in indoor testing of anaemia. There have been reported problems of the hemoCues in the previous survey due to the heat. In the present survey, precautions were taken so that similar problems were not encountered. The teams were asked to start the survey early when the sun is not hot, and were also asked to conduct the hemocue measurement under a shade and avoid direct sunlight. A cooler box with 1-2 cold ice boxes was also provided to the teams so that the machines could be kept inside wrapped in paper bag when not in use. Although these precautions minimised the problem of the hemocue, it however illustrates the challenges in using this machine in such hot and humid climate and the need to get the Hemocue 301 model is urgent. The HemoCue 301 machines have already been purchased and distributed to health partners within Aden and Kharaz refugee camp and will be used for future surveys as well. It is however important to mention that the current use of the HemoCue 301 in the health facilities are hampered by lack of cuvettes.

5.2 Anthropometric Measurements

Anthropometric measurements were taken on all children 6-59 months in households 4, 14, and 24 in every block. Weight measurement was done using the hanging Salter scale. The clothes on the child were removed as much as possible, shoes were removed before weighing the child. The reading on the scale was ensured to be at zero mark before any measurement. The reading was taken to the nearest 100 grams.

Height or length was taken using a Shorr Infant-Child-Adult Height Board[11] to the nearest mm. Children less than 24 months old were measured lying down while children from 24-59 months were measured standing. Oedema was assessed by placing thumb

[11] Shorr Productions, USA

pressure on to both feet of the children for a period of three seconds and thereafter observing for the presence or absence of an indent. All bilateral oedema cases reported by the survey teams were verified by either the UNHCR Nutrition Consultant or the Survey Coordinator.

The acute malnutrition prevalence was estimated from the weight for height (WH) index values combined with the presence of oedema. The table below gives the classification of the WH indices expressed in Z-scores[12]. The WH indices were calculated using the NCHS Reference 1977[13] and WHO Growth Standards 2006.

Table 4 Definitions of acute malnutrition using WFH and/or oedema in children aged 6-59 months

Category of acute malnutrition	Z-scores	Oedema
Severe acute malnutrition	< -3 SD	Yes/No
	> -3 SD	Yes
Moderate acute malnutrition	< -2 SD and ≥ -3 SD	No
Global acute malnutrition	< -2 SD	Yes/No

5.3 Individual food intake

Information on the number of meals usually eaten and the number of meals eaten on the day preceding the survey was solicited to establish the food security status of the households. Similarly, information on the family member/s that missed a meal the day preceding the survey and the reasons for missing the meal/s were asked. Information on food ration adequacy and the duration that the ration lasted, together with the coping mechanisms used when the ration runs out, were also sought. Households were also asked to cite and describe the type of foods eaten the previous day starting with the food eaten in the morning.

[12] SMART METHODOLOGY version 1 2006. Measuring Mortality, Nutritional Status and Food Security in Crisis Situations

[13] NCHS: National Center for Health Statistics (1977) NCHS growth curves for children birth-18 years.United States. Vital Health Statistics. 165, 11-74.

5.4 Information on Infant Feeding Practices

Information on initiation of breastfeeding following delivery, the timely introduction to complementary feeding and frequency of feeding were sought. Diversity of complementary feeding was investigated using the internationally recommended 24 hour recall method.[14] Vaccination history was taken from the vaccination cards and verbal reports were accepted if the card was not available. The availability or absence of the vaccination card was also noted in the questionnaire.

5.5 Morbidity and Mortality data

Parents were asked about history of diarrhoea, acute respiratory infections, fever and suspected malaria of their children in the two weeks preceding the survey. They were also asked about action taken in case of diarrhoea in terms of use of oral rehydration solution (ORS) and fluid intake. Mortality data was collected using the method recommended by SMART[15]. The crude mortality rate (CMR) and the U5 mortality rate were calculated using ENA software and expressed in number of deaths per 10,000 people per day. The third food distribution date was used as the beginning of the recall period (total recall period of 90 days). The formula below was applied:

Crude Mortality Rate (CMR) = 10,000/a*f/ (b+f/2-e/2+d/2-c/2)

Where:
a = Number of recall days
b = Number of current household residents
c = Number of people who joined household during recall period
d = Number of people who left household during recall period
e = Number of births during recall period
f = Number of deaths during recall period

[14] Food Agriculture Organisation. 2007.Guidelines for Measuring Household and Individual Dietary Diversity. Rome, Italy

[15] SMART 2006. Measuring Mortality, Nutritional Status and Food Security in Crisis Situation: Smart Methodology

5.6 Collection of Questionnaire Data

Two separate questionnaires (data collection forms) were developed and used for children 6-59 months and women. The questionnaires were formulated in English, translated into Somali and then provided to some team members to review if the meaning in English was captured in Somali. Questions were addressed to the subjects in Somali in the camp and in Arabic in the surrounding local villages. All survey staff conducting the interviews were native Somalia speakers and fluent in Somali. Age and date of birth were collected from vaccination cards for infants and children, when available and by verbal recall for women. The interviewers used a calendar sheet to determine age.

5.7 Qualitative data collection

Time did not permit the implementation of focus group discussions and hence qualitative data collection was limited to key informant interviews and observations. Key informants included CSSW staff, nutrition department, food distribution team, Refugees ground council and block Leaders and parents of children.

5.8 Data Management

Data was entered and stored in three separate data files in Epi data corresponding to the different target groups and indicators assessed: Children 6-59, women, and mortality. Each household was assigned a unique ID based on the block number and household number i.e 23/09 for household number nine of block 23. Data cleaning was done by running frequency tables and distributions in order to check for outliers and repeated entries.

Data was imported from Epi data to SPSS (Version 16.0 for analysis). Excel spread sheets were used for graphical presentations. Child anthropometry data was exported to excel and subsequently imported into ENA for SMART software (Version October 2007) for data cleaning, validation and data analysis. Plausibility checks were done on the children anthropometric data stored in ENA for SMART software to check for possible errors and data quality.

5.9 Ethics and Informed Consent

The aim and objectives of the survey were discussed and agreed with all the implementing partners in the camp. Information about the survey was disseminated to the refugees through the ground council. A two day awareness raising was done by the ground council by going to every block and explaining to them the intended nutrition and anaemia survey. Verbal approval of the survey was sought from the ground council before the survey, which was granted unanimously by all section leaders.

During the survey, when teams arrived at a household they first explained the purpose of the survey and explained the procedures to be undertaken as well as the duration it might take. Similarly the pain inflicted by the prick was explained and it was made clear that the selected subjects could either accept or reject participation and there would be no negative consequences and nothing would happen to the participant's routine service delivery in the camp. The teams also stressed that the information the participants give had no direct effect on their ration cards, health care and other services. This was particularly important in order to get reliable information on the dietary diversity score as well as the mortality information.

Verbal consent was taken for all the measurements and procedures. Verbal consent was sought from the parents of children and individual consent was taken from women. Use of written consent was found not very helpful given the high illiteracy rate and also for the complexity and sensitivity of the community to signing documents even if they accept what is been asked for. All records collected during the survey were kept as confidential. Children who were found to be severely anaemic or malnarished were given a referral form and sent to the health facility for further management.

5.10 Implementation Schedule

The training took place on 13th, 19th and 20th July 2010. The actual data collection took 6 days from 21-24th in the camp and 25-26th July in the local villages.

5.11 Logistics

UNHCR office provided transport during the training and survey periods as well as materials for both the survey and training. CSSW also provided transport as well as the staff, training venue and some survey equipment. It is however important to mention transport of teams to field sites was a bit of a problem and CSSW transport was not always available due emergencies they had to attend to transport patients to Aden. It is thus important to budget for private car hire in future activities.

6.0 Results

Data collection lasted 6 days from 21st - 26th July 2010. There were no major problems during the training as well as during the survey except some minor problems encountered in the local villages. The local community did not want men to interview and measure their women and children. They only allowed the male survey team members to take the anthropometric measurements, which we thought could have caused some bias in data collection. This also resulted to overworking the few available women in the teams. In general most households visited were receptive and there were no refusal of households to participate in the survey. There was however high number of absent selected households in the camp.

Table 5 summarises the number of people sampled during the survey in the different population groups and their ages and gender.

A total of 225 and 126 non pregnant women of reproductive age were selected for haemoglobin measurement during the survey in the camp and surrounding villages respectively. A combined number of 52 women were either pregnant or both pregnant and lactating and were therefore excluded from the analysis. This is mainly because haemoglobin concentration is affected by gestational age and the possibility of getting an accurate gestational age measurement was determined to be too difficult.

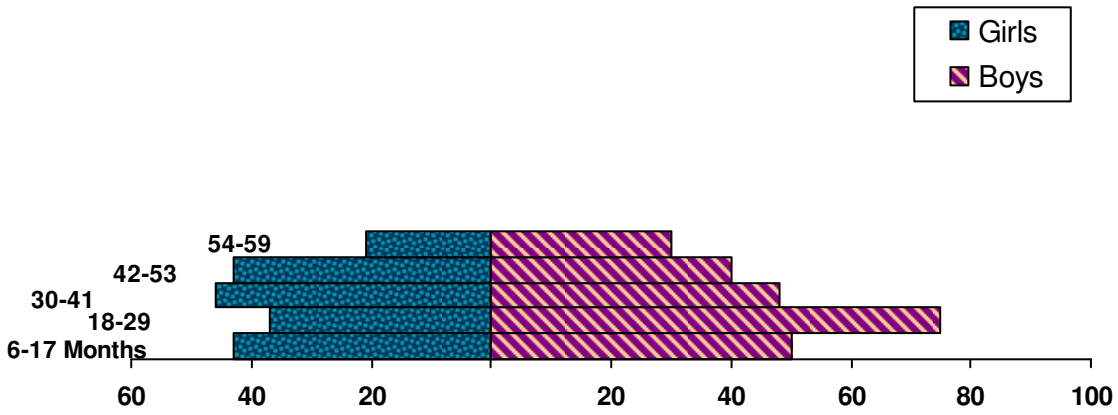
Information was collected on a total of 435 children aged 6-59 months with 293 and 142 children selected in the camp and in the surrounding villages respectively. The data from these children was used for feeding practices, haemoglobin, immunization status and anthropometric measurements. After data cleaning, anthropometric data was analysed on 432 children with 291 and 141 children in the camp and the surrounding villages respectively. A combined total of 3 children were excluded from analysis due to incorrect age and incorrect information on the weight or height. A combined number of 433 children aged between 6-59 months were analysed for haemoglobin. The ratio of boys to girls ranged from 0.9 - 1.4. Figure 3 shows the age – sex pyramid of the sampled child population.

On the other hand we had a high number of absent households in Kharaz camp, which was estimated to 27.3% of the total sampled household. This high proportion of absent households meant that we needed to resample some more households, which was similarly done in a systematic method in all the sampled blocks.

Table 4 Characteristics of the population sample groups

Group	Population Group	Eligible Age Range	N	Actual Age range	Mean Age	Median Age
Kharaz refugee camp	Children	6-59 (Months)	293	6-59	31.1±15.6months	31.0
	NP Women	15-49 Yrs	225	15-60	29.7±8.5yrs	30.0
Surrounding areas	Children	6-59 (Months)	142	6-59	30.9±15.6months	28.0
	NP Women	15-49 Yrs	126	15-47	27.7±8.7 yrs	27.0

Figure 1 Age-Sex pyramid of the sample children population



6.1 Anaemia

The table below shows the prevalence of anaemia and categories of anaemia. A combined number of 433 children were tested for anaemia in both the refugee camp and the surrounding villages with 292 and 141 children sampled in the refugee and in the surrounding villages respectively. The prevalence of total anaemia (<11 g/dl) among under five children was 58.9% (53.2-64.4) and 64.5% (56.4-72.0) for the refugees and the local villages respectively. There was no significant difference in prevalence of total anaemia between the two groups (p=0.524) in the camp and the surrounding host communities.

There was a slightly higher anaemia prevalence found in girls as compared to boys however there was no significant difference between the sexes (P=0.318) with combined prevalence of anaemia in boys being 59.1% and 63.2% for girls. A higher number of the anaemia cases were either moderate or mild with only 2.7% (2.2-3.2) and 2.8 % (1.1-7.1) severe cases in the camp and the surrounding villages respectively.

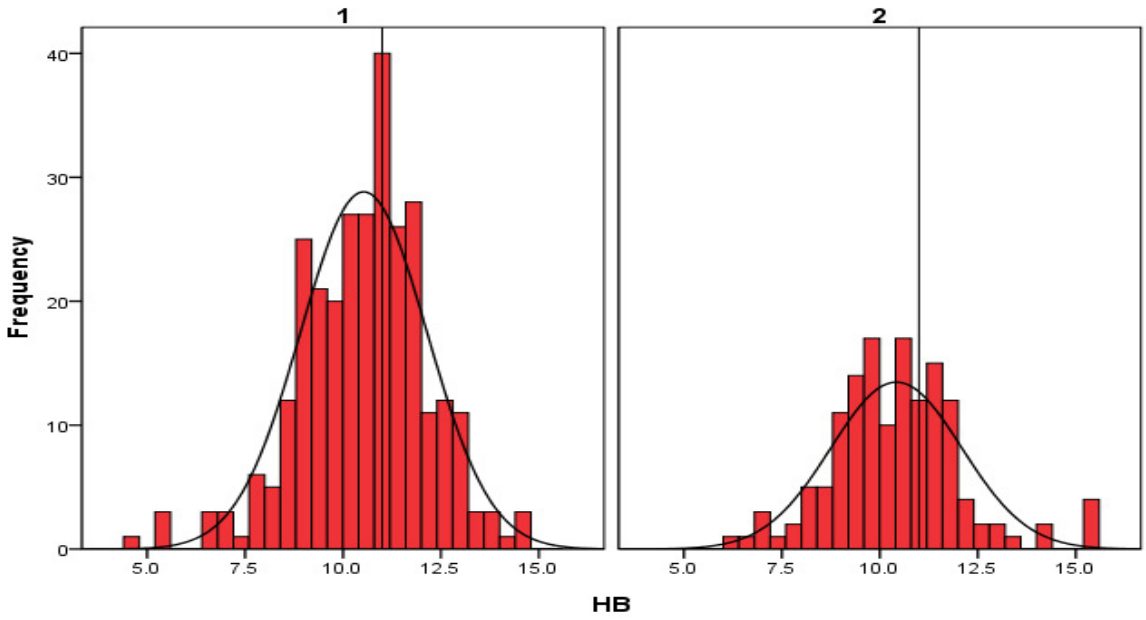
Out of the total number of 352 non pregnant women of reproductive age tested for anaemia, 226 were from the camp while 126 women were measured in the surrounding areas. The prevalence of anaemia (<12 g/dl) was 48.4% (41.8-54.7) and 54.8% (46.1-63.2) for the refugee women and the surrounding areas respectively. There was also no significant difference in the prevalence of anaemia among the two groups of women (p=0.446). Data were analysed for the association between anaemia and duration of living in camp. The finding showed that no association was seen between anaemia prevalence and the duration living in the camp (p=0.692). There was also no association between haemoglobin concentration and consumption of tea or amount of tea consumed either (p=0.464).

The graphs below show the distribution of haemoglobin concentration in women and children in each group.

Table 5 Haemoglobin level and prevalence of Anaemia

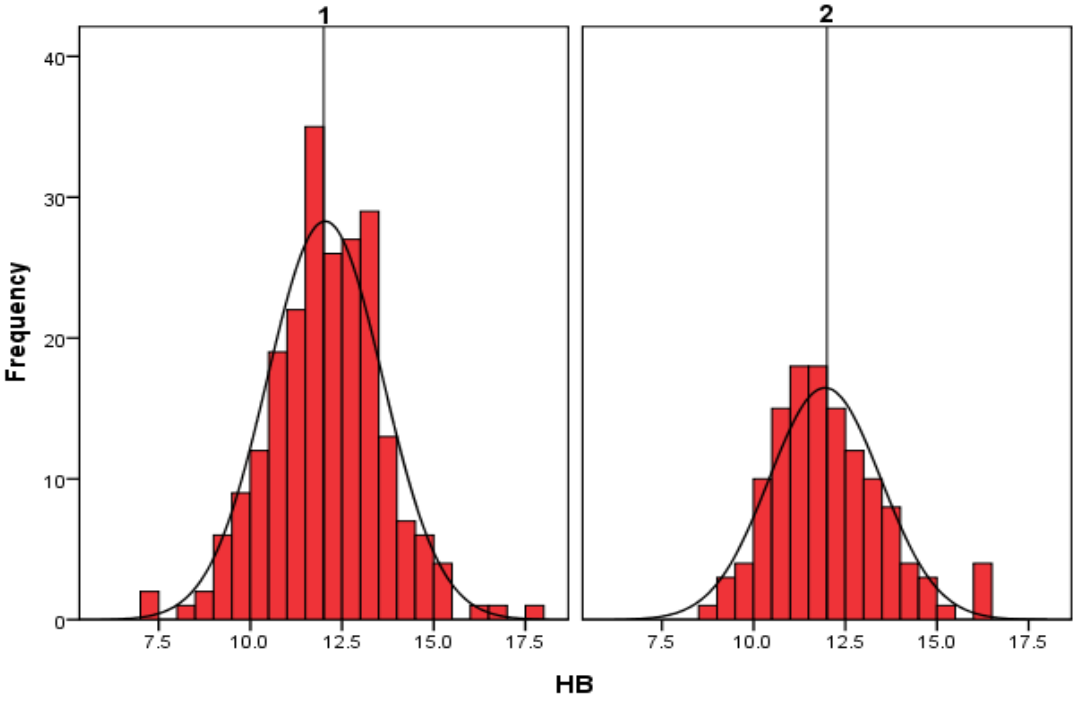
	Population Group	N	Mean Hb g/dl (SD)	Range (g/dl)	Total Anaemia (95% CI)	Mild Anaemia (95% CI)	Moderate Anaemia (95% CI)	Severe Anaemia (95% CI)
Kharaz Camp	Children 6-59 months	292	10.5±1.6	9.9	58.9% (53.2-64.4)	26.4% (21.7-31.7)	29.8% (29.8-35.3)	2.7% (2.2-3.2)
	NP Women 15-45 years	226	12.0±1.6	10.6	48.4% (41.8-54.7)	25.6% (20.4-31.7)	22.0% (17.2-28.0)	0.9% (0.2-3.2)
Surrounding local populations	Children 6-59 months	141	10.4±1.7	9.3	64.5% (56.4-72.0)	25.5% (19.1-33.3)	36.2% (28.7-44.4)	2.8% (1.1-7.1)
	NP Women 15-45 years	126	11.9±1.5	7.7	54.8% (46.1-63.2)	28.6% (21.4-37.0)	26.2% (19.3-34.5)	0.0%

Figure 2 Distribution of Heamoglobin concentration in children



NB: 1=Kharaz camp 2=Local community.

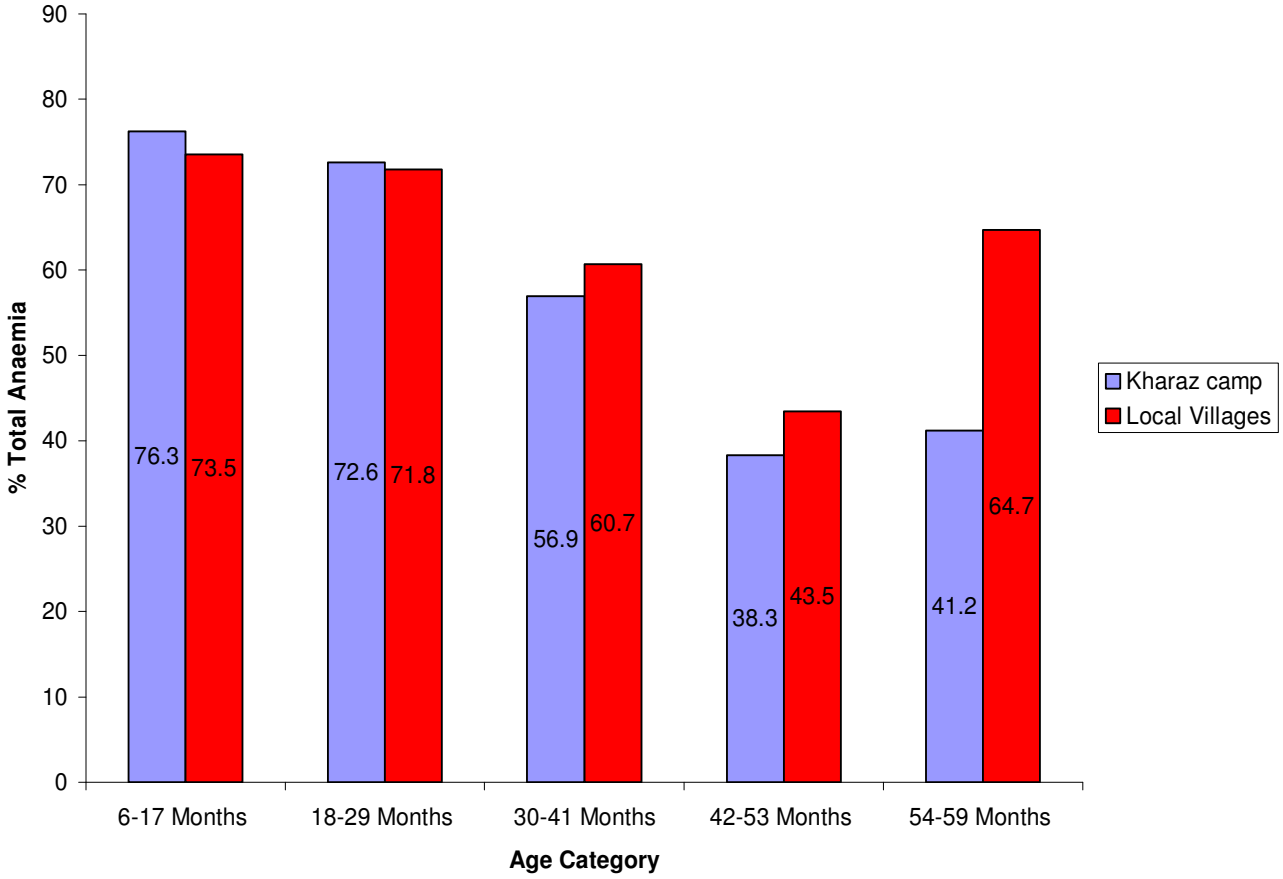
Figure 3 Distribution of Heamoglobin concentration in Non Pregnant Women



NB: 1=Kharaz camp 2=Local community.

As shown figure 4, the trends of anaemia tend to reduce with increasing age. Children less than two years old appear to be the most affected by anaemia. However there was also a slight increase noted in the last age group of 54-59 months, especially in the surrounding villages. It is however important to note that sample size is smallest for the 54-59 age groups hence making statistical comparisons less meaningful because of low precision of results

Figure 4 Prevalence of Anaemia with Age group



6.2 Anthropometry in 6-59 month children

The overall prevalence of global and severe acute malnutrition and individual group prevalence's are shown in table 7 and a breakdown of acute malnutrition by age is given in also given in table 8. The analysis was performed on 286 and 135 children in the camp and the surrounding villages respectively. A total of seven children were excluded from each group due to out of range values identified using the ENA for SMART software

(Version 2007). For data cleaning, the range of +4 and -4 Z- scores from the sample mean was used and values beyond these z scores (SMART flags) were flagged and not included in the analysis. Prevalence is given for the weight for height (WH) indices in z-scores using the WHO Standards 2006 and similarly the prevalence using NCHS Reference 1977 are also annexed. No cases of oedema were reported in the camp or in the surrounding villages and all the cases were of marasmic type. GAM prevalence for the Kharaz and surrounding host villages was 8.7% (5.9 - 12.5) and 10.0% respectively.

Table 6 Prevalence of Acute Malnutrition in Children (WFH z-score -WHO 2006)

	Global (95 % CI) (<-2 z-scores)	Moderate (95 % CI) (<-2 z-score and >=-3) no oedema	Severe (95 % CI) (<-3 z-scores and/or oedema)	Mean Z scores (± SD)
Kharaz refugee camp	8.7 % (5.9 - 12.5 95% C.I.)	6.9 % (4.5 - 10.4 95% C.I.)	1.7 % (0.7 - 4.0 95% C.I.)	-0.63±1.05
Surrounding villages	10.0 %	8.6 %	1.4 %	-0.50±1.29

Figure 5 Distribution of Weight for Height z-scores in 6-59 Months in Kharaz refugee camp

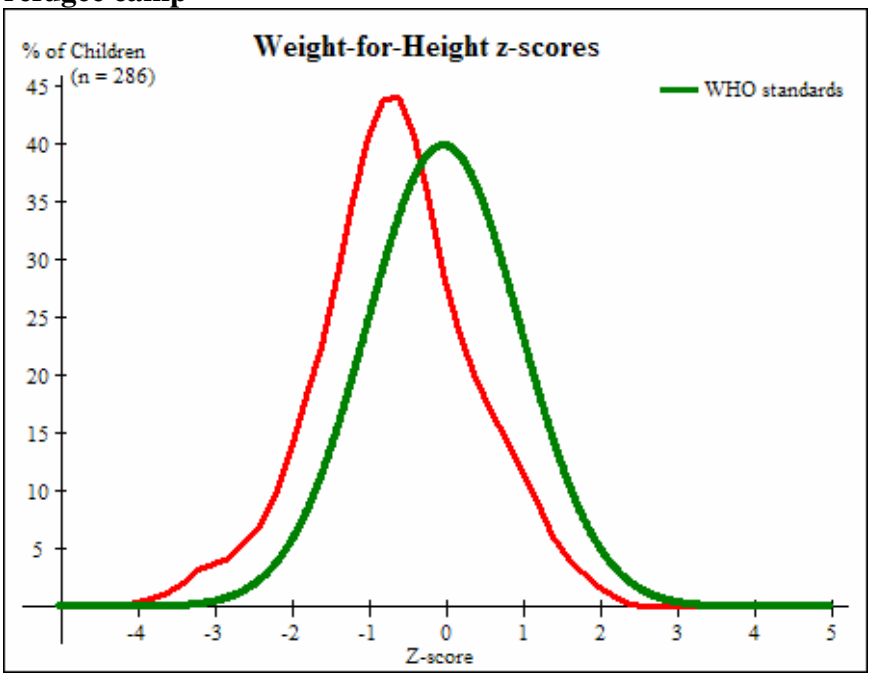


Figure 6 Distribution of Weight for Height z-scores in 6-59 Months in Surrounding villages

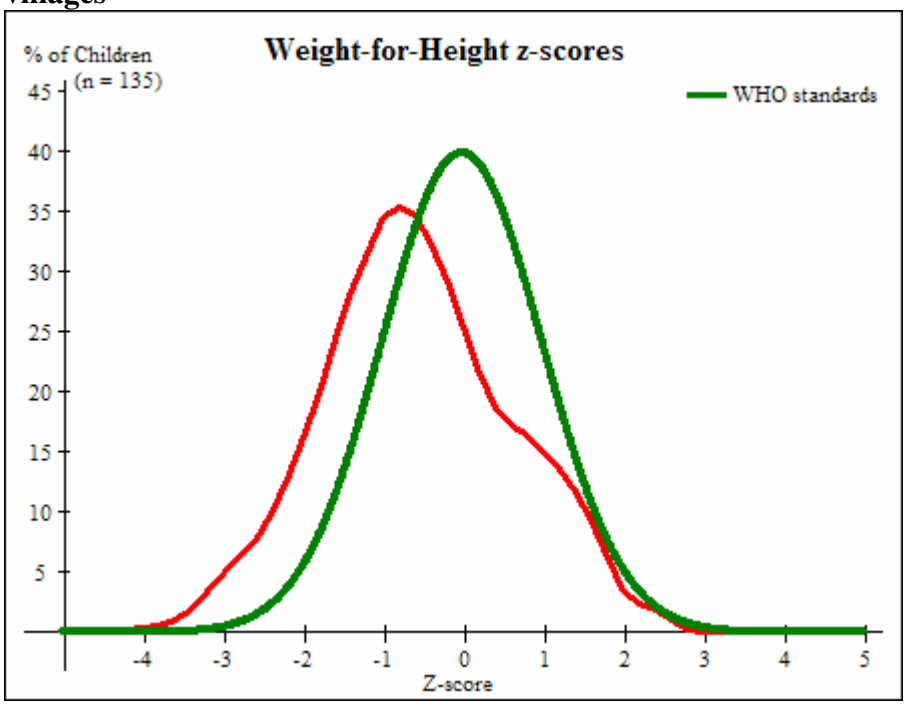


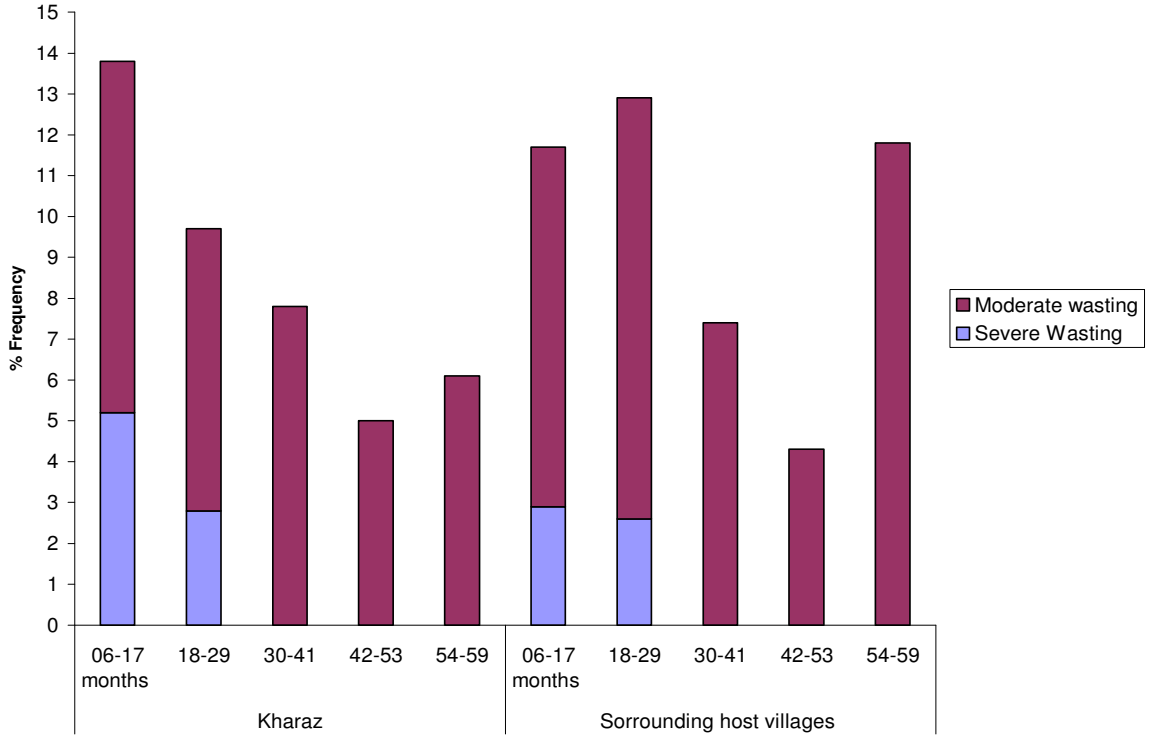
Table 7 Prevalence of acute malnutrition by age based on weight-for-height z-scores and/or oedema in Kharaz

		Severe wasting (<-3 z-score)		Moderate wasting (>= -3 and <-2 z-score)		Normal (> = -2 z score)		Oedema	
Age (mths)	**N**	**No.**	**%**	**No.**	**%**	**No.**	**%**	**No.**	**%**
6-17	58	3	5.2	5	8.6	50	86.2	0	0.0
18-29	72	2	2.8	5	6.9	65	90.3	0	0.0
30-41	64	0	0.0	5	7.8	59	92.2	0	0.0
42-53	60	0	0.0	3	5.0	57	95.0	0	0.0
54-59	33	0	0.0	2	6.1	31	93.9	0	0.0
Total	287	5	1.7	20	7.0	262	91.3	0	0.0

Table 8 Prevalence of acute malnutrition by age based on weight-for-height z-scores and/or oedema in Surrounding host villages

		Severe wasting (<-3 z-score)		Moderate wasting (>= -3 and <-2 z-score)		Normal (> = -2 z score)		Oedema	
Age (mths)	**N**	**No.**	**%**	**No.**	**%**	**No.**	**%**	**No.**	**%**
6-17	34	1	2.9	3	8.8	30	88.2	0	0.0
18-29	39	1	2.6	4	10.3	34	87.2	0	0.0
30-41	27	0	0.0	2	7.4	25	92.6	0	0.0
42-53	23	0	0.0	1	4.3	22	95.7	0	0.0
54-59	17	0	0.0	2	11.8	15	88.2	0	0.0
Total	140	2	1.4	12	8.6	126	90.0	0	0.0

Figure 7 Prevalence of Malnutrition by age category based on weight-for-height z-scores



There are some patterns in malnutrition prevalence across age groups. The two age groups at the lower ends in both surveys (6-17 and 18-29) show a relatively higher prevalence of SAM as well as GAM. The prevalence of SAM however reduces drastically with an increase in age. This is also similar for moderate wasting that reduces with age with a slight increase in the last age group (54-59).

6.3 Chronic Malnutrition (Stunting)

The prevalence of chronic malnutrition (stunting) was 22.0 % (17.4 - 27.3) and 34.2 % (26.2 - 43.2) for the refugee camp and the surrounding host community respectively. This is shown in table 10 and the distribution of Height for Age (HFA) z-score indices is given in figures 8 and 9. Girls had a significantly higher prevalence of stunting 30.0% (24.3 - 36.5) as compared to the boys 22.5 % (16.8 - 29.4) (P=0.036).

Table 9 Prevalence of Chronic Malnutrition in Z-scores (Stunting) in Children (HFA z-score WHO 2006)

Chronic Malnutrition	Prevalence of stunting (<-2 z-scores)	Prevalence of moderate stunting (<-2 z-score and >=-3 z-score)	Prevalence of severe stunting (<-3 z-score)	Mean (± SD)
Combined[16]	26.7 % (22.5 - 31.4)	18.3 % (14.8 - 22.5)	8.4 % (6.0 - 11.6)	-1.19±1.30
Kharaz	22.0 % (17.4 - 27.3)	17.4 % (13.3 - 22.5)	4.5 % (2.6 - 7.8)	-0.89±1.30
Surrounding villages	34.2 %	20.5 %	13.7 %	-1.68±1.14

NB. Values in brackets are 95% C.I

[16] The combined data was not weighted

Figure 8 Distribution of Height for Age Z score (stunting) in Kharaz camp

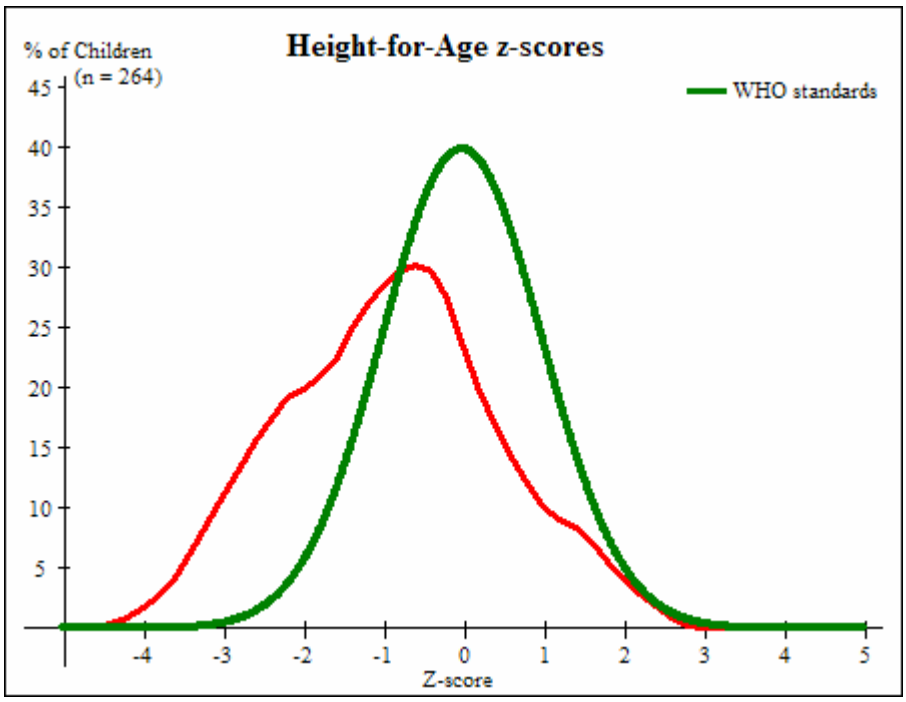
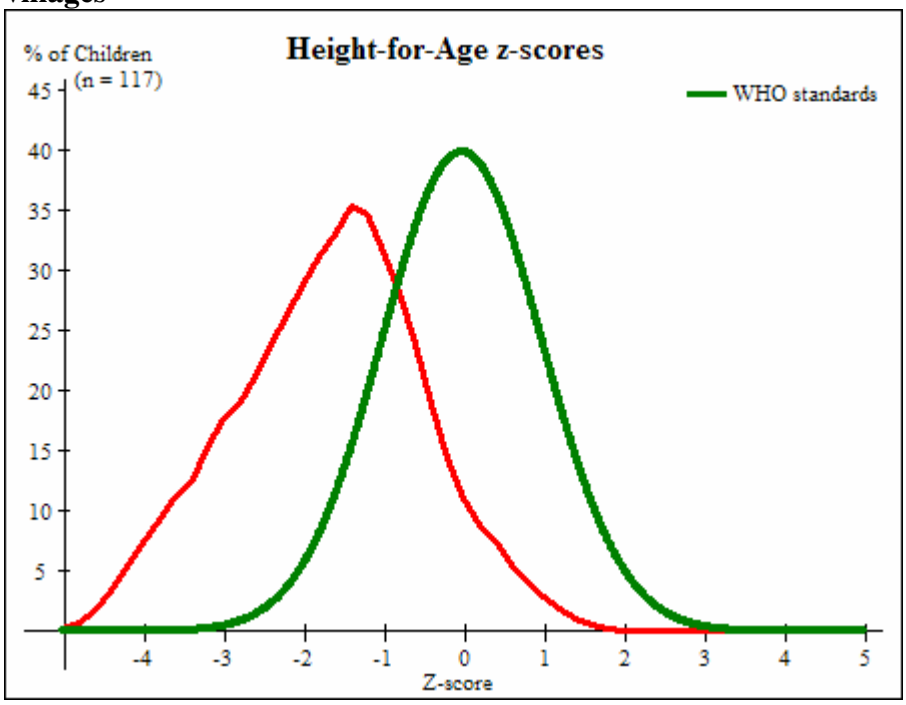


Figure 9 Distribution of Height for Age Z score (stunting) in surrounding host villages



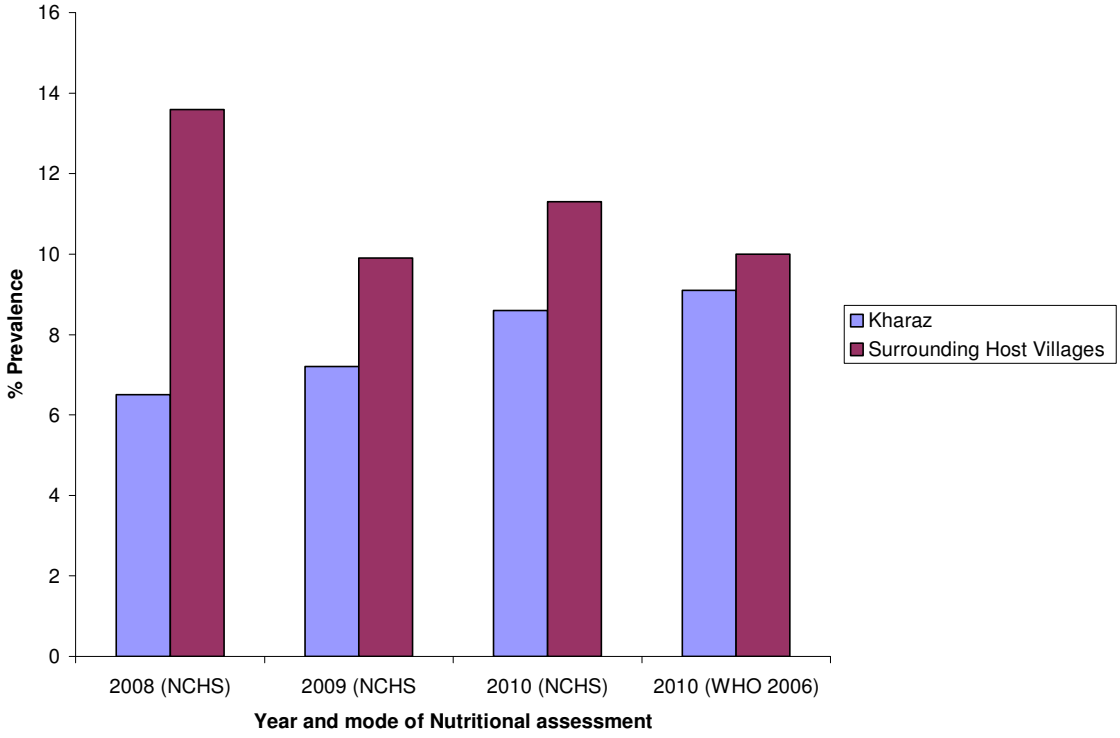
6.4 Trends in malnutrition in Kharaz and surrounding villages 2008-2010

As shown in Figure 10 below the prevalence of GAM has been on a stable trend since 2008 with minimal signs of improvement or deterioration. The prevalence of GAM in the camp was not significantly different from the prevalence in 2009 (p=0.422).

Although it appears that the prevalence in the camp has increased from the last survey, this change is not significant (p=0.422) and still within the limits of the confidence intervals. Similarly there was no significant difference between the prevalence of GAM in 2009 and 2010 in the surrounding villages (p=0.961). The prevalence of SAM seems to have increased from zero to 1.4 in both the camp and the local villages. This is however expected as the reference population in the analysis of the data was changed from NCHS 1977 to WHO 2006. WHO standards result in increased SAM through increasing the value of the weight for height <-3 z-scores cut-off[17]. On the other hand the period of doing the assessment varied between this survey as compared to last year's survey. This survey was done in July just before the start of the month of the Ramadan which could have contributed to the high household absenteeism, whereas the 2009 survey was done in May, which was about 2-3 months before Ramadan and before the climax of the summer (heat).

[17] Marko Kerac and Andrew Seal 2006. Operational implications of using 2006 World Health Organization growth standards in nutrition programmes: secondary data analysis

Figure 10 Trends in Kharaz and Surrounding areas from 2008-2010



6.5 Infant and Young feeding practices

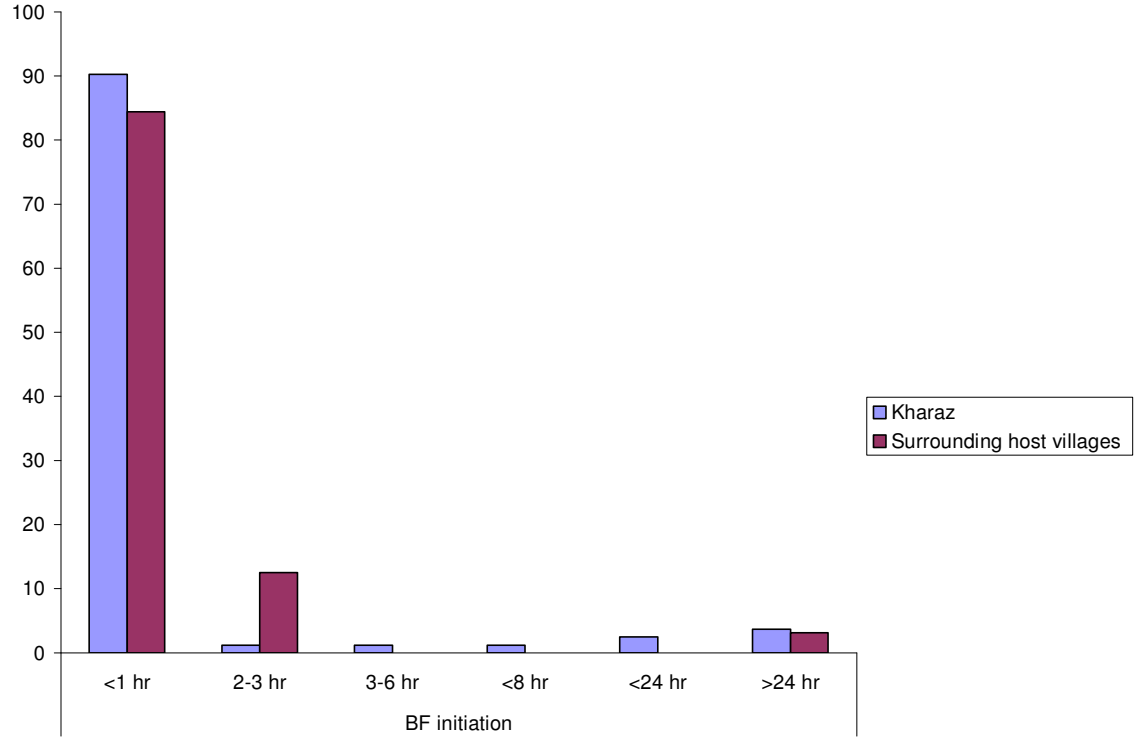
The key infant feeding and morbidity indicators are summarized in table 11 below. The prevalence of timely initiation of breast feeding was high and was found to be 90.2% (81.9-95.0) and 84.4% in the Kharaz refugee camp and surrounding local villages respectively. This indicator defines the number of infants or children who were put to the breast within 1 hour of birth. The indicator assesses whether mothers initiate breastfeeding within one hour after birth, which has benefits to both the mother and the baby. This indicator therefore shows a good number of women initiating early breastfeeding in both the refugee camp and the host community.

Table 10 Indicators of Morbidity and Infant and Young Child Feeding Practices

		Combined		Kharaz		Surrounding host community	
Indicator	Sampled Age Range	N	Prevalence % (95% CI)	N	Prevalence % (95% CI)	N	Prevalence %
Ever Breastfed	6-23	129	88.4% (81.6-92.8)	92	89.1% (79.9-93.2)	37	86.5%
Timely Initiation of Breastfeeding	6-23	114	88.6% (79.4-91.9)	82	90.2% (81.9-95.0)	32	84.4%
Continued Breastfeeding at 12 months	12-16	37	86.5% (72.0-94.1)	21	81.0% (60.0-92.3)	16	93.8%
Continued Breastfeeding at 24 months	20-23	32	50.0% (30.9-63.6)	27	55.6% (37.3-72.4)	5	20.0%
Timely Complementary Feeding	6-10	42	57.1% (42.2-70.9)	28	60.7% (40.7-75.5)	14	50.0%
Reported Prevalence of Diarrhoea*	6-23	151	23.2% (17.7-30.5)	103	29.1% (21.2-38.5)	48	10.4%
Continued Feeding During Diarrhoea	6-23	35	76.2 (61.0-88.0)	30	73.3% (55.6-85.8)	5	100%
Use of ORS during Diarrhoea	6-23	35	74.3 (57.9-85.8)	30	70.0% (52.1-83.3)	5	100
Reported prevalence of ARI *	6-23	151	36.4% (29.2-44.4)	103	44.7% (37.3-56.2)	48	18.8%
Reported prevalence of Suspected fever	6-23	151	29.1% (22.5-36.8)	103	33.0% (24.7-42.6)	48	20.8%

** prevalence are significantly significant between the refugee camp and the local host community*

Figure 11 Initiation of Breastfeeding after birth



The prevalence of continued breastfeeding at 12 months and at 24 months measure the percentage of children 12- 16 and 20-23 months who are breastfed. This therefore is a measure of the breastfeeding duration. The prevalence of continued breastfeeding was 81.0% (60.0-92.3) and 93.8% (71.7-98.9) for Kharaz camp and surrounding villages respectively. From this, it is evident that a higher proportion of women in the surrounding villages continue breastfeeding at 12 months. However the levels sharply reduce to 20.0% for those who continue at 24 months in the surrounding areas. The corresponding prevalence in Kharaz is 55.6% (37.3-72.4) which implies slightly under 50% of the women stop breastfeeding earlier than 24 months.

The timely complementary feeding indicator gives an overall measure of the degree to which women have complied with the recommendation that infants aged 6 - <10 months receive appropriate and adequate complementary foods in addition to breast milk. The complementary feeding indicator is intended as a basic, simple indicator of feeding patterns among children in the age group 6 - <10 months. By this age, it is recommended

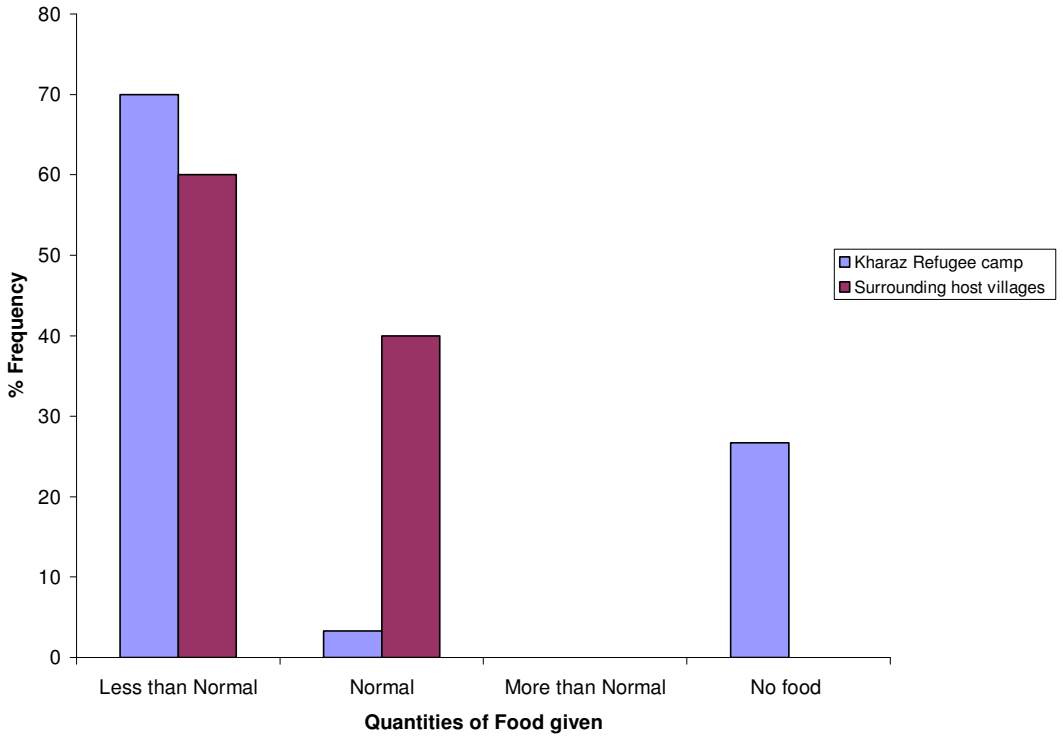
that infants should be receiving solid foods in addition to breast milk. “Solids” are defined as foods of mushy (semi-solid) or solid consistency such as porridge but does not include fluids such as fruit juice. The timely initiation of complementary foods in Kharaz refugee camp and the surrounding host community was 60.7% (40.7-75.5) and 50.0% respectively. Majority of women indicate that they smash the daily cooked food for the children or give porridge while a smaller number of household indicated giving mashed potato etc. The surrounding host villages indicated similar practices and mainly using mashed pancakes.

6.6 Prevalence of Diarrhoea and Feeding Response

In the 14 days prior to the survey prevalence of diarrhoea was reported to be 29.1% (21.2-38.5) and 10.4% for the refugees and the surrounding areas respectively. There was relatively a higher prevalence of diarrhoea in the refugee population than the host communities. No case definition of diarrhoea was used and information provided here relied on what the mother thought was abnormal bowel movement in her child. There was no significant difference between age groups in diarrhoea cases for the combined groups (P=0.648)

We did not evaluate the health seeking behaviour but rather assessed the quality of home based management of diarrhoea. The percentage of children offered continued feeding during diarrhoeal episodes was assessed in children and infants less than 24 months. This indicator measures the change in frequency with which foods (breastmilk and/or other foods) are offered during diarrhoea compared to when the child is healthy. About 73.3% (55.6-85.8) and 100% of the children in the camp and surrounding areas respectively were offered continued feeding during diarrhoea however none of the children were offered increased feeding. Similarly majority of the children in the refugee camp reported to have diarhoea were offered reduced feeding. On the other hand in the refugee camp a higher proportions of 26.7% of those who reported to have diarhoea in the last two weeks were also not offered food during diarrhoea. This is not a good indicator of home management of diarrhoea and with reduced or no food, the likelihood of the diarrhoea progressing to malnutrition is high due to loss of water and electrolytes.

Figure 12 Levels of feeding infants during diarrhoea



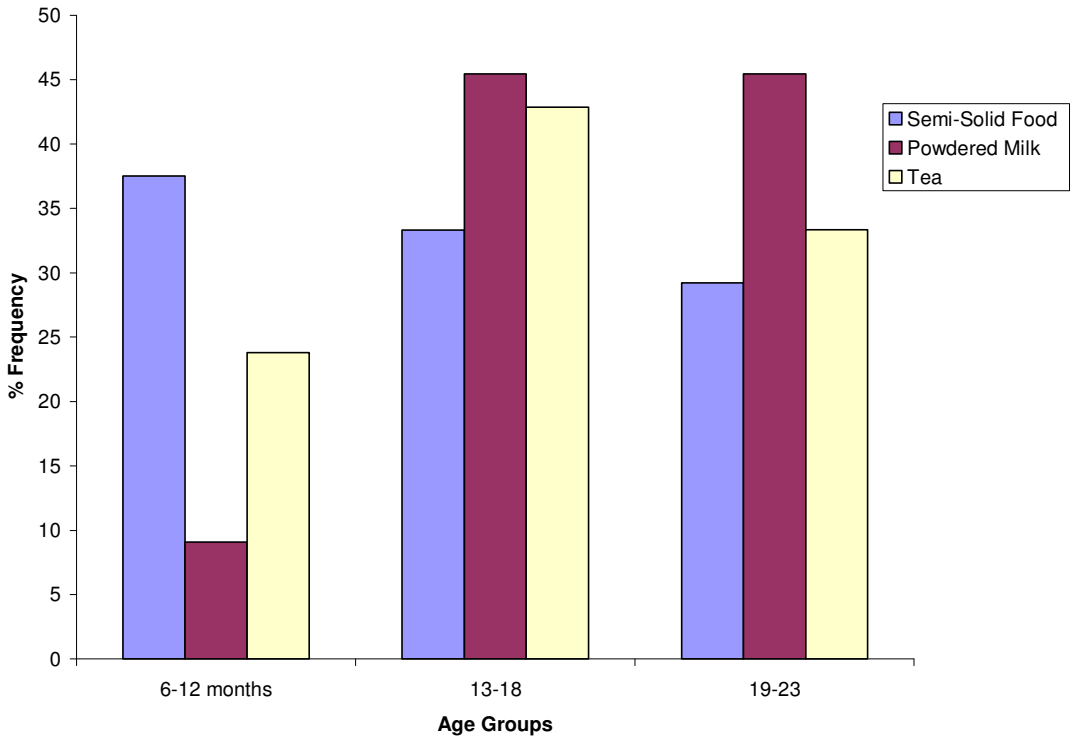
Morbidity episodes due to suspected fever and acute respiratory infections were 33.0% (24.7-42.6) and 20.8% for Kharaz and the Surrounding host villages respectively. As the prevalence of malaria in the camp is negligible, the fever episodes were probably due to other infections rather than malaria. Nevertheless about half of the children sampled reported acute respiratory infection (ARI) in the last 14 days before the survey. This indicator could also contribute to the number of reported fever cases. ARI was identified by the mother responding to the three signs of cough, rapid breathing and fever. ARI can be either viral or bacterial and is highly seasonal. This data was collected during the hot season which characterise the environment as hot, humid, windy and dusty, which subsequently contribute to high allergic rhinitis and flu type illnesses.

6.7 Introduction of Tea, mushy food and powdered milk by Age

The table below show the introduction of tea in children aged between 6 and 23 months. The introduction of tea is a concern, given the established role of tea in reducing iron

absorption and increasing the risk of iron deficiency. It can be seen that a high proportion of children in both the refugee camp and the surrounding villages are introduced to tea at an early age. Apparently tea is used to soften the pancake that is usually given to children.

Figure 13 Consumption of Tea, powdered Milk and Solid foods



6.8 Vaccination coverage from cards

A vaccination/health card for children 6-59 months was possessed by 90.4% (86.5-93.3) and 85.2% in Kharaz and surrounding areas respectively. Vaccination coverage ranged from 86.8% (83.0-90.0) for combined measles coverage to 96.9% for BCG.Verbal reports of vaccination in the absence of a card were recorded but not included in the analysis. This was however negligible. The minimum coverage standards recommended for measles is 95%[18] and this indicates that more efforts are required in order to meet this target in the camp.

[18] Minimum Standards in Health Care' The Sphere Project (2000)

Table 11 Vaccination coverage from card among children 6-59 months old

Vaccination type	Combined		Kharaz		Surrounding villages	
	N	Coverage % (95% CI)		Coverage % (95% CI)	N	Coverage % (95% CI)
Epi Card	435	88.7% (85.4-91.4)	293	90.4% (86.5-93.3)	142	85.2%
BCG	386	96.9% 94.7-98.2)	265	98.1% (95.7-99.2)	121	94.2%
Pentavalent 3	386	95.9% (93.4-97.4)	265	95.8% (92.7-97.7)	121	95.9%
Measles*	386	86.8% (83.0-90.0)	265	85.7% (80.9-89.4)	121	89.3%

* since the coverage of measles vaccination was calculated among 6-59 months rather than 9-59months. Coverage rate could be diluted

6.9 Household food consumption and food sources

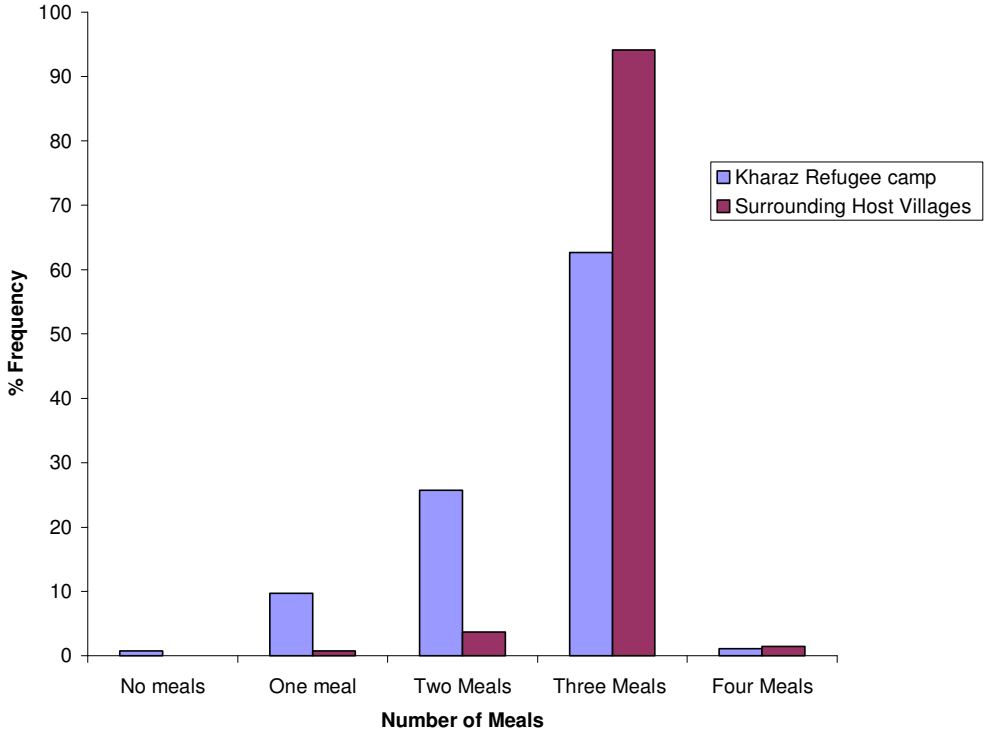
6.9.1 Meal patterns for refugees and host population

As shown in the table below, the mean frequency of consumption of meals was 2.5 ± 0.7 and 2.9±0.3 for Kharaz and the surrounding areas respectively. Assessment of the daily meals eaten is done on the assumption that the recommended daily caloric intake requirements can only be met by eating three meals per day, which is used as a proxy indicator of the food security status of households. Over 74.3% of the combined population consume three meals and with 25.7% of the households reporting consuming two meals and below. There was however significant difference in the number of meals normally eaten between the camp and the surrounding villages (P<0.001) as shown in figure 14 below. About 36.2 % of the women in the refugee camp indicated consuming less than three meals normally, which indicates a substantial food insecurity situation in the refugee camp. It is however important to interpret this finding with caution as is normally the case it is hard to get accurate information about this indicator and refugees may have exaggerated, assuming that there may be some benefits if under stated.

Table 12 Mean number of meals normally eaten

Questions	N	Mean±SD
Kharaz refugee camp	268	2.5± 0.7
Surrounding host villages	136	2.9±0.3

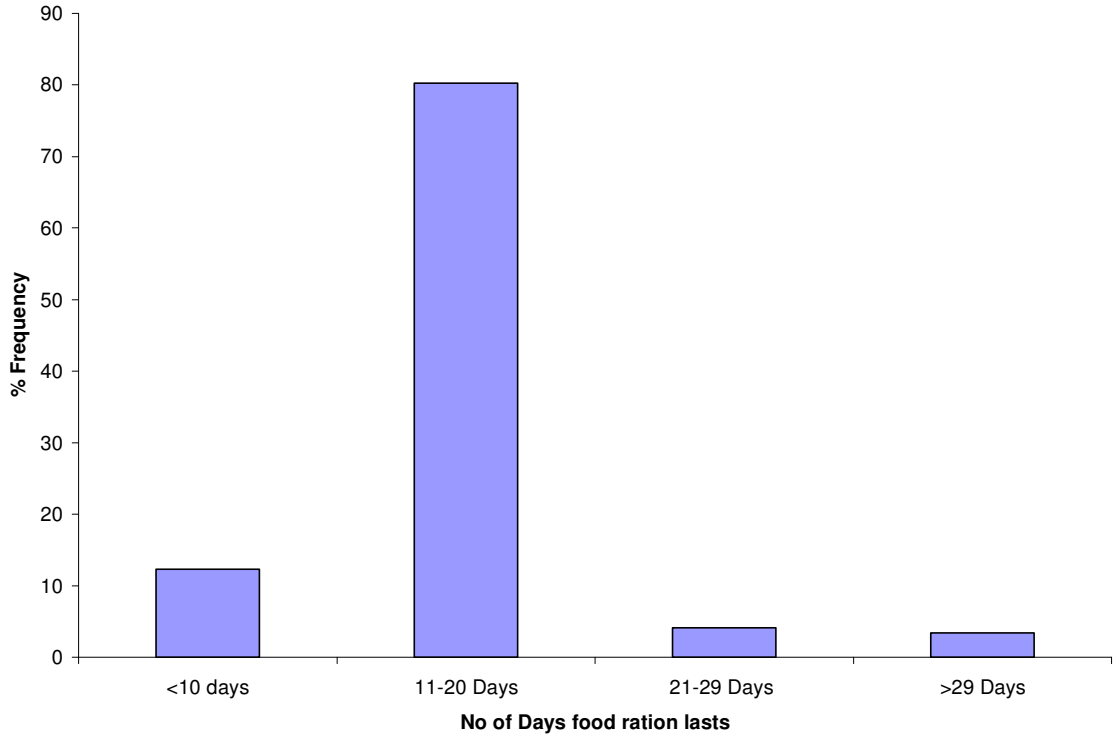
Figure 14 Frequency of the number of Meals Normally Eaten



6.9.2 Duration the food ration lasts

The mean number of days the food ration lasts was estimated at 16.7 days (SD 5.1) with about 96.6% of the households reporting that the food ration does not last for the intended 30 days, while only 3.4% said the food ration given is enough for the intended number of days. The figure below shows the pattern of responses on the duration the food ration lasts. From this figure it is evident that the majority of the refugees report that the food ration lasts less than the intended number of days.

Figure 15 Frequency of duration the food ration lasts



As shown in the graph below, half of the women said they borrow from relatives and neighbours when then food ration finishes before the next distribution. It is however also important to note the number of respondents who say they buy food when the ration runs out. This also corresponds, though not exactly, with the coping mechanisms, where apart from the relief aid from International organizations, the sale of food and ration card surety is also most common.

Although not mentioned by the majority of the households the selling of food is a very common practice in the refugee camp. As can be seen in the sources of NFI there was a significant number of households that said they use the ration card surety systems. This is a situation where one borrows money from some specific camp traders and instead pay with the month's ration. Some families have been reported to be in problems where they lost all the food to this re-payment. Visits of the food distribution sites also showed the women traders at the corridors of food distribution waiting for those they lent money. It was reported that some people are deceitful and they disappear when they take the food and hence the women traders sit at the gate where they can be able to catch their debtors.

There are disadvantages and advantages of this system which is further discussed in the subsequent sections.

Figure 16 Coping mechanism of households

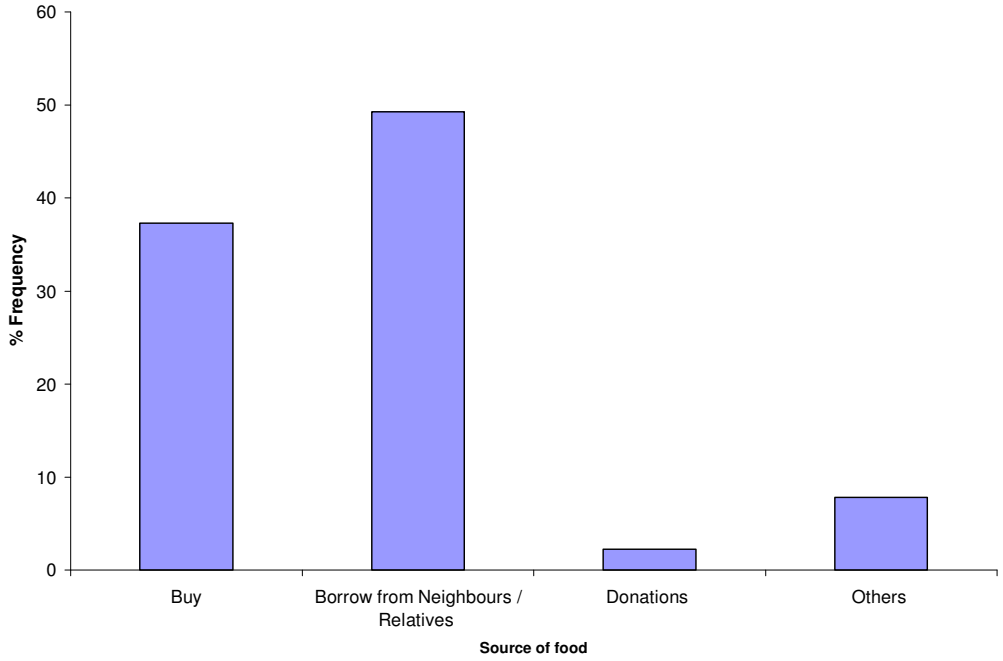
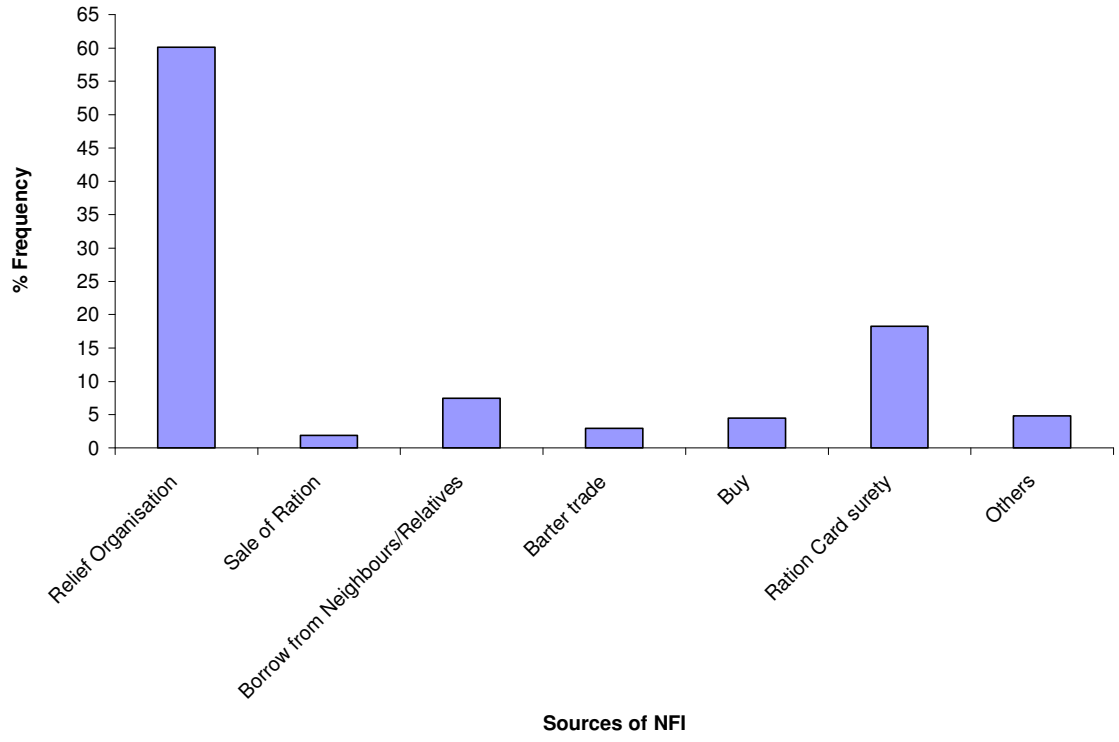


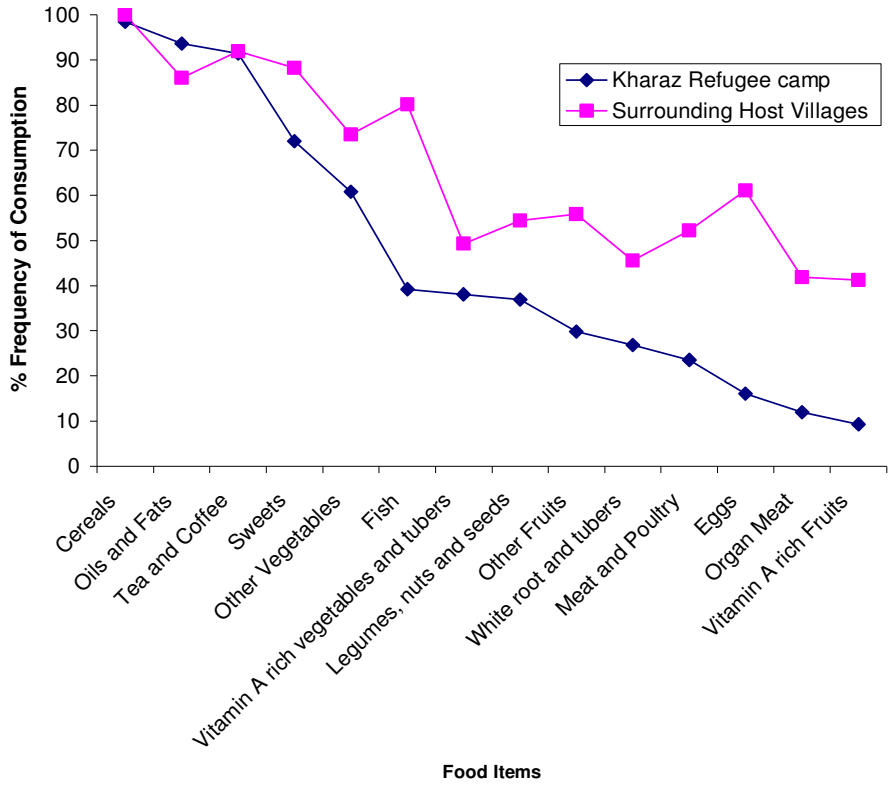
Figure 17 Source of Non Food Items (NFI)



As shown in the figure below, a high number of households in the refugee camp consume cereals, oils and tea. There are limited sources of Vitamin A rich food and other micronutrients. Although a substantial number of households consume beans and other lentils, the inhibitory effect of tea on iron absorption cannot be ignored. From the graph below, it is also evident that there was a significant difference in food types between the refugees and the surrounding host community with the latter reporting better and varied food types.

It is however important that this information is analysed with care since the reliability of the information is hard to verify in refugee settings. Many might under state their information in the hope that they get more. We however stressed from the beginning in the consent information that the information would not affect their food ration, access to health care etc.

Figure 18 Dietary diversity score



6.10 Food Distribution Analysis

The food distributed for the last six months managed to meet the agreed kilocalorie requirement. The consultant also managed to witness a food distribution during the survey period. The following food items are distributed to the refugees on a monthly basis. There is an organised system of food distribution, despite the lack of shades for the waiting refugees. Food measurement is done twice, with the initial food item measurement at the point of collection and subsequently all the food is again measured at the exit and addition and subtraction of food items is done depending on whichever is applicable. This second measurement is mainly to assess if the correct amount of food is given to the refugees. It is however important to note that this is done by the same organisation and external monitoring of the food ration amounts is not done.

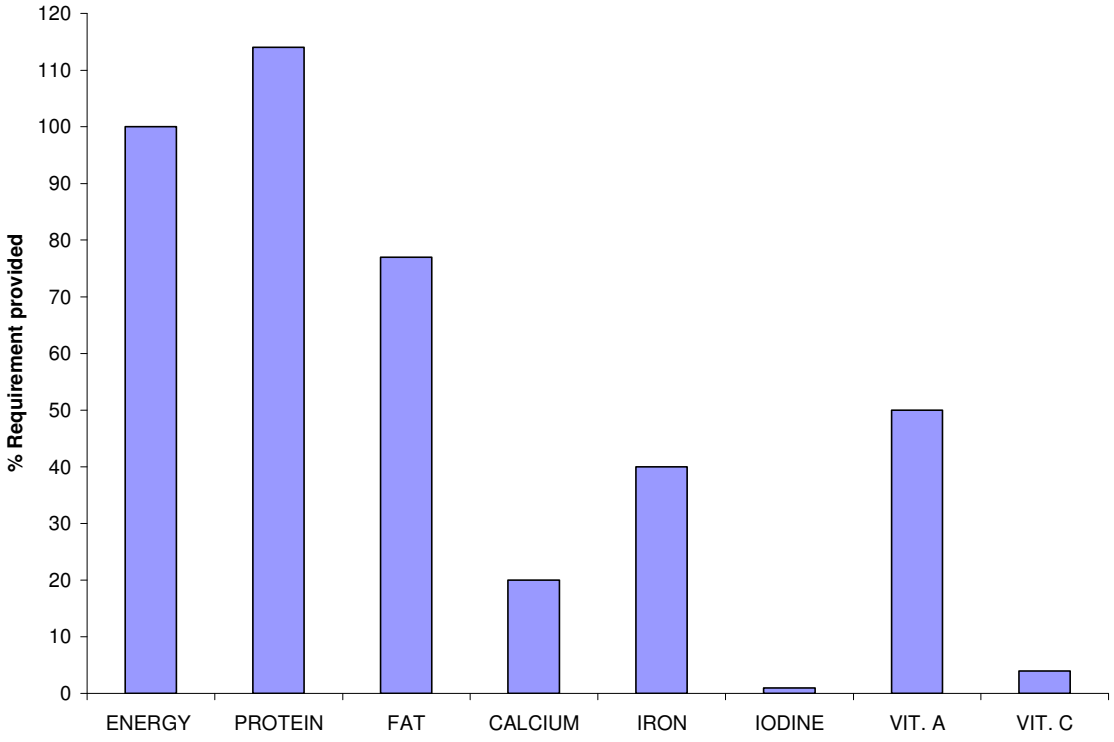
Table 13 Quantities and food items distributed in the camp.

Food item	Amount per month per person in grams	Amount per day per person in Grams
Wheat Flour	9000	300
Rice	4500	150
Pulses	1800	60
Sugar	600	20
Oil (fortified with Vit A/D	750	25
Salt	150	5

Using NutVal, a spreadsheet application developed by UNHCR, WFP and UCL, the nutrient content of the distributed ration was analysed for macro- and micro- nutrient content. The graphs below indicate the levels of energy and nutrients supplied in the month of the survey. It can be seen that the energy content of the ration is about 100% of the 2100 Kcal minimum requirement. The protein and fat contents are fairly adequate as well. There is however inadequate supply of vitamin C, vitamin A, iron and calcium.

Salt was not added to the analysis because the distribution of salt is done on a three monthly basis. During the food distribution visit done by the survey coordinator, it was not possible to verify whether the salt distributed was iodised or not.

Figure 19 Macro and Micronutrients provided in the food ration



It is important to note that while the food quantity could be sufficient theoretically, there is a need to introduce at least one fortified food in order to meet the micronutrient requirement of the food ration. It is however important to note that WFP states that the wheat flour distributed to the refugees is fortified, however efforts to verify this were not possible. The wheat flour does not have a label of any fortification information as per the international standards of labelling fortified food and attempts to visit the fortification companies were fruitless. It is in this view that we treated the wheat flour distributed in the camp as not being fortified in the meantime, until further evidence to suggest otherwise is obtained.

On the other hand, while there are no complaints on the quantity of food supplied, it is however important that external monitoring of food ration amounts are done.

6.11 Retrospective mortality data

During the survey, a total of 1,962 people were found in the assessed households. Among them 388 children were below the age of five years. Over the 90 days preceding the survey, a total of four deaths were reported with three adults and one child under five years old. It was however important to note due to the small population size, the mortality data for the surrounding areas was not applicable. There were however no deaths during the last 90 days in the surrounding areas reported. The following mortality rates were obtained for Kharaz refugee camp.

Crude mortality rate=0.23(0.09-0.60)/10,000/day
Under five Mortality rate=0.31 (0.05-1.72)/10,000/day

From this data, the rates of both crude mortality and under five mortality are within acceptable limits[19][20]. Sourcing information on mortality was the most difficult aspect of the survey, as the teams had to explain in detail the purpose of this question and ensure the household that their ration card number will not be affected.

6.12 Focus group Discussions

Although there was not adequate time to do a detailed focus group discussion, some key questions were added to the organized focus group discussion that was conducted for the MNP acceptability trial. The consultant wanted to mainly get an opinion on the sale of food through the ration card surety system.

The members described this issue as a situation where refugees borrow money from specific traders in the camp and hand in their ration card as a surety. At the end of the month, the refugee goes to the trader, takes the card and goes to the ration distribution site where he/she is provided with a card for ration collection. They then hand over this card to the trader, where they collect the food on behalf of the refugees. Personal

[19] Minimum Standards in Health Services: Humanitarian Charter and Minimum Standards. http://www.sphereproject.org/dmdocuments/handbook/hdbkpdf/hdbk_c5.pdf
[20] Nutrition Working Group. 2006. Nutrition Assessment Guidelines: recommendations for Somalia

presence of food collection is only required when taking the card for the ration collection and the actual food collection does not require a personal presence.

In some cases, the trader collects only the full sacks and gives the few open kilos to the refugee. Also sugar and oil is not part of this deal and this is taken by the refugee. Each complete individual monthly ration is sold at 1,000 riyals which is equivalent to about 4.5 USD. In some rare cases the traders and the refugee agree on a modality that the trader takes one month and the other month is left to the refugee.

The women expressed the circumstances of taking the loan was due to various circumstances that required money. They mainly mentioned the need for vegetables and meat as a sauce for the food, need for money to buy non food items, they also expressed that there was always lack of essential drugs in the hospital and many times they were asked to go and buy the drugs which similarly required money.

None of the four focus groups of women of about 7-9 women said she was free from the debt. Some said they never see their ration cards since they are always borrowing every month. There was however concerns that many households go into this arrangement and end up missing food to put on the table and thereby rely on relatives, friends and begging. There was a typical case of a woman in one of the groups who only relied on her neighbors' and had no food at the home for months. The increased number of women beggars in Aden and major towns in Yemen is also thought to be a consequence of these arrangements.

The members stated that while the system was beneficial to large families that could sell part of the food to buy non food items, it was disastrous for small families as the food could not be divided. But majority said the system was bad and many households in the camp were trapped in this debt system. They also expressed the legality of this system, where the trader can take then to the police for evading to pay back.

Observation at the food distribution also showed that there were women traders seated on the corridor of the food distribution site. They did this for fear of some people evading paying back the loan.

The women expressed the need to increase the food ration to cater for this, improve drug supply in the clinic, and introduce vegetables in the food ration in voucher form so as to minimize this debt trap.

6.13 Factors associated with Malnutrition and Anaemia

Poor infant feeding

Poor infant feeding and care practices. As shown above in the results there is delayed initiation of timely complementary feeding and where it is initiated the number of feeding times is low. Although theer are alot of infant feeding messages disseminated in the camp as well as in the health facility, more workis still needed on community education.

Lack of livelihood diversification

The refugee camp is located in one of the most remote and desertic areas of Yemen. External sources of income in terms of jobs and employment are scarce. A large population travel to Aden for jobs and begging. Lack of adequate coping strategies also affects the populations at this time of economic crisis. The majority of the refugees are entirely food aid dependent and livelihood diversification and coping mechanisms are limited.

Lack of fortified food in GFD

The general food distribution does not cover the population's micronutrient requirements and is lacking in fortified foods. This has consequences for the growth and development of the children and well as the general population's health. The lack or limited availability of external sources of income and distance to markets, also makes the availability of micronutrient rich foods impossible.

High absenteeism from the camp

As shown in our survey, there was a high number of absent families from the camp - up to 30%. This level is alarming. It is assumed that a high number of this people go to major towns in Yemen to beg while a few male populations do some casual work like cleaning cars in the cities. In many cases these refugees go with their children in order to attract sympathy and there are reported cases where children are brought back to the camp with severe or moderate malnutrition. The number of Somali refugee beggars in Aden is overwhelming and annoying nuisance in mosques and shopping centres.

Reduced nutrition infrastructure and health service provision

Currently active case finding of malnourished children is erratic in the camp and absent in the local host communities. This is important to indentify cases before they become severely malnourished. The distribution of WSB is chaotic due to poor arrangements of distribution, inadequate staff, and lack of adequate space. This has led to many households turning back without collecting their monthly WSB ration. The quality of the WSB was also criticized by many women in the FGD. They claim that there are weevils in the WSB.

There is a need to further improve availability of drugs in the camp. The availability of a nurse nutritionist to be in charge of the department would be desirable. This will subsequently improve set up of the nutrition department as well as facilitate better liaison with UNHCR Medical coordinator on supplies and program management.

The tuna fish supplementary program also stopped in the last two months, which is perhaps due to poor organizational system than stock issue.

High morbidity and poor feeding during diarrhoea

As shown above, the morbidity of ARI and diarrhoea account highly on the child morbidly thereby contributing to the child's health and subsequently to the weight for height measurements. With prevalence of 23.2% (17.7-30.5), 36.4% (29.2-44.4) 29.1% (22.5-36.8) for diarrhoea, ARI and fever which might contribute to the ill health of the children. The home management of diarrhoea and feeding during diarrhoea was generally poor in the camp. It is important to note that that 26.7% of infants/children suffering from diarrhoea in the refugee camp had their feeding withdrawn. Withdrawal of feeding during diarrhoea can reduce the chances of full recovery and is an important risk factor for developing both moderate and severe malnutrition especially during the time of the outbreak when a higher number of children are affected. This therefore may have been a main contributing factor to the high GAM prevalence found in the survey.

Sale of food

As described above, the sale of food contributes highly to the household food insecurity. There has been a high number of household that stated they use this ration card surety system to get access to money. While the money that is either borrowed or obtained from the food is much smaller than what is available in the market, the same can not last the expected duration of the month, hence the resort to begging and waiting from neighbors. A number of families seem to be trapped in this system.

Child age

Child age is also a risk factor for both the prevalence of malnutrition as well as anaemia. Higher prevalence of malnutrition as well as anaemia were found in children under the age of two years. This is thought to be related to the poor feeding practices in the camp as well as a physiological vulnerability in children of this age. There also seems to be limited choices for alternative foods for this age group. It is assumed that the older age groups of children share the available foods at the household.

Consumption of tea

The consumption of tea has been associated with reduced absorption of iron that is important in the formation of haemoglobin. The high tea consumption among children and women may also contribute to the high prevalence of anaemia in this population. The majority of the refugees consume tea either with food or immediately after food. The Somali pancake is soaked in tea before it is served to children. The limited iron availability in the food ration, coupled with the inhibitory effect of tea may therefore greatly contribute to the high prevalence of anaemia.

Lack of livelihood diversification

Lack of adequate coping strategies also affects the populations at this time of economic crisis. The majority of the refugees are entirely dependent on food aid and livelihood diversification possibilities and coping mechanisms are limited.

7.0 Discussion

The nutritional survey undertaken in Kharaz refugee camp used a systematic sampling method while a census method was used in the surrounding host villages. The prevalence of malnutrition was about the same as during previous assessments, showing serious malnutrition rate according to WHO classification. The prevalence of GAM was 8.7% (5.9 - 12.5 95% C.I.) and 10.0% (6.1 - 16.1 95% C.I.) in Kharaz and Surrounding villages respectively. This figure however shows some stable prevalence and have neither deteriorated or improved. The prevalence of stunting was 22.0% (17.4 - 27.3) and 34.2% (26.2 - 43.2) in Kharaz and the surrounding villages respectively. It is important to note that stunting is a measure of a long term malnutrition problem and it is evident in this case that the children in the surrounding areas were more stunted than those in the refugee camp. The difference was also reported in the previous studies.

The anaemia prevalence was found to be 58.9% (53.2-64.4), 48.4% (41.8-54.7) for children and women in the refugee camp respectively while the prevalence for the surrounding areas was 64.5% (56.4-72.0) and 54.8% (46.1-63.2) for the children and the women respectively. The levels of anaemia in both the children and women is still high and severe which exceeds the 40% WHO threshold and thus classified as priority public health problem. It is however important to note that there has been a significant reduction of about 20% in anaemia in children in the camp from 77.9- 58.9%, which is thought to be partly contributed by the improved blanket supplementation albeit poorly delivered as well as the complementary tuna fish supplies. The prevalence in the surrounding areas reduced by about 8.5 % but this reduction was however not significant.

The refugee camp, as well as the surrounding host communities are still under priority preference in reducing anaemia and well as malnutrition. The need to further look at possible options of intervention in the surrounding areas will be important if some improvement in anaemia and malnutrition is to be realized. The local surrounding population suffer worse food security problems than the refugees, with poor sources of livelihoods and lack of food aid support, they are much affected.

The minimization of food sale together with controlled movement of refugees within the camp especially for the vulnerable groups are priority protection challenges that need to be looked at. These two factors impart heavily on the nutrition and health conditions of the camp and improvement of nutrition and micronutrient status in the camp become an up-hill task if the refugees can easily sell the food items given and move to the major cities at will and subsequently coming back in worse health situation.

The controlled movement and sale of food has to similarly be accompanied by service improvement within the refugee camp. Introduction of at least one fortified blended food and ensuring adequate supply of drugs and services at the health facility will also be important in improving the nutrition and health situation of the refugees. A complete improvement of the nutrition and supplementary programs in the hospital are also priority activities. Better interaction between the refugee population and the health care providers are also important in understanding the socio, cultural barriers to better service delivery.

Finally, while some significant improvement is shown in the anaemia prevalence in children in the refugee camp, sadly there was no data to compare the prevalence of anaemia in women for both the camp and the surrounding areas. It is therefore important that current intervention strategies are maintained and improved, while we look to other alternative options of improving the health and nutrition situation of the both the refugees and the host community. Special attention to introduce intervention strategies in the surrounding communities need to be prioritised.

8.0 Recommendations

Income generating activities

- Despite the fact that some income generating project are available in the camp provided by ADRA, Intersos and other organisation, the need to further expand this is clear. Access to soft loans for income generating activities will be important in improving self reliance activities and improve camp food security situation by providing additional source of income.
- The expansion of this income generating project to the surrounding areas will also be very important.

Health and Nutrition

- There is need for CSSW and UNHCR to work together to strengthen the public health program in terms of improving on essential drug supplies in the camp.
- Discussions and implementation of multi storey gardens and home gardens is already on-going between UNHCR and ADRA. There is need to further continue this effort and try to roll out to all the blocks in the camp in phases. Active community mobilisation will also be important to encourage unwilling refugees and better understand and react to their barriers..
- Exploration of other nutrition intervention livelihood practices like animal rearing, chicken keeping etc should also be explored.
- The improvement of the nutrition department including organized distribution of supplements needs to be done. Improvement of space capacity and staff capacity will be important.
- Strengthen active case finding of malnourished children both in the camp and initiate this activity in the surrounding villages. This activity needs to be undertaken by the community health workers. Training of CHW for the surrounding villages to take part in this activities will be important.
- At least the availability of a qualified nurse nutritionist at the nutrition department will be important for professional management of the department and for ease of coordination with UNCHR medical coordinator.

- Improvement of the supply of Hemocue cuvettes in the hospital will be important way of ensuring continuous use of the Hemocue machine for HB estimation. Retraining of the laboratory staff on the HemoCue use and quality control measures will be important.

Health Education

- Despite the presence of many health education campaign materials in the camp written in Somalian, the impact of this on behaviour change needs to be evaluated. Knowledge and attitudes of the refugees play a key role in the nutritional status of their children. The need to continue and strengthen health education campaigns is paramount. A timetable of health education programs on nutrition and in the local language need to be developed.
- An IEC campaign on maternal nutrition including, benefits of home gardening and important food types need to be developed. Other issues such as infant feeding and prevention of infections should also be addressed as a matter or priority.

Implementing integrated anaemia control and prevention strategy

In order to reduce the prevalence of anaemia in the refugee camp there is need to implement a program for anaemia control that involves:

- Dietary improvement through education to encourage selection of iron-rich foods to improve iron content and bioavailability.
- The role out of the multi story gardens to sections and households and proper monitoring and offering advice will be helpful to improve the access to micronutrient rich foods.
- To educate on the impact of tea on the absorption of iron.
- Introduction of Micronutrient supplements in the camp and in the surrounding villages to vulnerable groups.
- Implementing de-worming programs for all children above 2 years and also introduce de-worming program at the ANC.
- Linking intervention strategies to related health and nutrition programs.

Refugee movement

- UNHCR, with the support of other partners and the Government of Yemen have to improvise methodologies for continued provision of services to the refugees whether in the camp or outside the camp.

Food aid monitoring

- There is need to look at strategies to reduce the sale of food in the camp and physical presence of beneficiaries need to be emphasised during food distribution.
- There is need to introduce at least one fortified blended food item in the general food distribution. The confusion on the wheat flour fortification needs to be cleared and if indeed the flour is fortified it should be labelled together with the level of fortification.
- The provision of a shade for the refugee at the food distribution site is important.
- It is recommended that UNHCR and WFP implement a regular monitoring of food aid distribution and post-food aid distribution.
- Methods of removing the household from the food sale trap needs to be discussed among the implementing partners.
- Provision of voucher system for the refugees to cater for essential vegetables need to be also discussed.

Monitoring of the health and nutrition situation in the camp

- Kharaz refugee camp is a delicate emergency situation both for nutrition as well general food security. The need to have continued UNHCR staff to support CSSW and monitor the general nutrition and food security situation is important. Frequent review meetings with all the agencies concerned in the refugee camp will be necessary in order to follow progress and detect areas of deterioration much faster.

Repetition of the survey

It will be important to review the progress of the nutritional and anaemia program after the intervention programs are instituted.

9.0 Annex

Annex 1 Prevalence of acute malnutrition based on NCHS 1977

	Kharaz refugee camp	Surrounding Host community
Prevalence of global malnutrition (<-2 z-score and/or oedema)	8.6 % (5.9 - 12.4)	11.3 % (7.1 - 17.6.)
Prevalence of moderate malnutrition (<-2 z-score and >=-3 z-score, no oedema)	7.2 % (4.8 - 10.8.)	9.9 % (6.0 - 16.0)
Prevalence of severe malnutrition (<-3 z-score and/or oedema)	1.4 % (0.5 - 3.5)	1.4 % (0.4 - 5.0)

Annex 2 Prevalence of stunting based on the NCHS 1977

	Kharaz	Surrounding areas
Prevalence of stunting (<-2 z-score)	18.3 % (14.1 - 23.3)	29.9 %
Prevalence of moderate stunting (<-2 z-score and >=-3 z-score)	13.8 % (10.2 - 18.5 95% C.I.)	19.7 %
Prevalence of severe stunting (<-3 z-score)	4.5 %	10.3 %

Annex 3 List of the Anemia/Nutritional survey workers

SN	Name	Responsibility	Group
1	Ibrahim Amen Ibrahim	Team Leader	ONE
2	Ramla Salah Ali	Blood collector	
3	Amal Adam Mohamed	Assistant	
4	Omar Ayub Ali	Registration	
5	Mohamed Yousuf Saeed	Weightier	
6	Galal Yousuf Abdo	Assistant	

SN	Name	Responsibility	Group
7	Safia Abdi Omar	Team Leader	TWO
8	Abduraheem Abdullahi Mudei	Blood collector	
9	Hamdi Abdullahi Ali	Assistant	
10	Jabir Nasser Ibrahim	Registration	
11	Abubakar Mohamed Sh. Ali	Weightier	
12	Bassam Abdulkhalakh	Assistant	

SN	Name	Responsibility	Group
13	Faduma Mohamed Jama'a	Team Leader	THREE
14	Saddam Hussein Ahmed	Blood collector	
15	Badria Abdulkader Mohamed	Assistant	
16	Nuradeen Sheikh Mohamed	Registration	
17	Nima'a Daher Warsame	Weightier	
18	Mohamed Abdalla Abdo	Assistant	

SN	Name	Responsibility	Group
19	Abubakar Enno Mo'alim	Team leader	FOUR
20	Suleiman Abdullahi Mudei	Registration	
21	Fardusa Mohamed Abdulaziz	Blood Collector	
22	Faduma Abubakar Mayow	Assistant	
23	Sa'ad Musa Jama'a	Weightier	

24	Yousuf Bagash Abdo	Assistant	

SN	Name	Responsibility	Group
25	Mohamed Adam Hussein	Team leader	FIVE
26	Zahra Mohamed Ali	Blood collector	
27	Osman Qasem Hussein	registration	
28	Maryam Omar Ahmed	Blood ass.	
29	Ahmed Anwar Hussein	Weightier	
30	Sadik Abdo Slim	Assistance	
	Hussein Mahmoud Odawaa:	Supervisor	