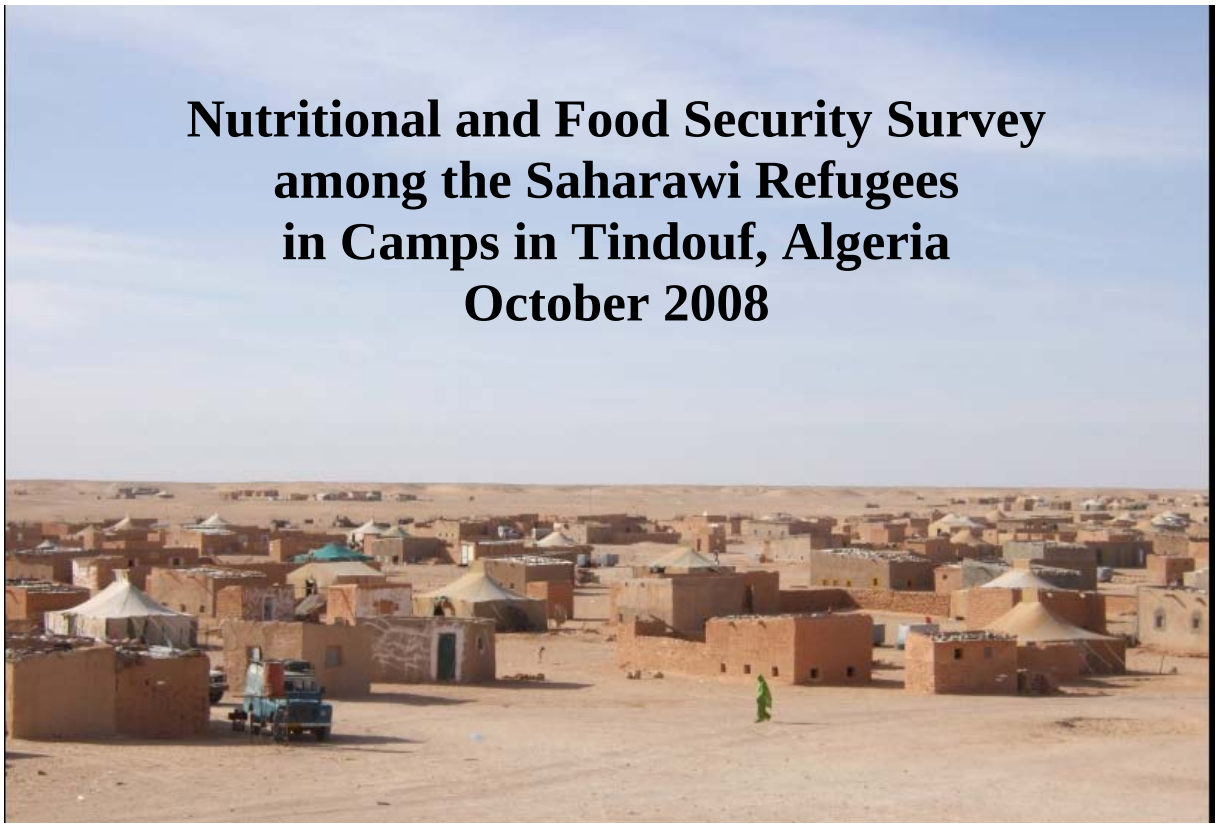
SAHARAWI ARAB DEMOCRATIC REPUBLIC
MINISTRY OF PUBLIC HEALTH

Nutritional and Food Security Survey among the Saharawi Refugees in Camps in Tindouf, Algeria October 2008



WFP World Food Programme

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Acronyms

AECID	Agencia Española de Cooperacion International para el Desarrollo
ARI	Acute Respiratory Infection
AUC	Akershus University College
BMI	Body Mass Index
CDC	Centre for Disease Control
CMR	Crude Mortality rate
CRS	Saharawi Red Crescent Society
CTC	Community-based Therapeutic care
DDS/IDDS	Dietary Diversity Score = Individual Dietary Diversity Score
ECHO	European Commission Humanitarian Aid
FCS	Food Consumption Score
GAM	Global Acute Malnutrition
HAZ	Height for Age Z score
Hb	Haemoblobin
IDDS/DDS	Individual Dietary Diversity Score = Dietary Diversity Score
JAM	Joint Assessment Mission
MdM	Médicos del Mundo
MoH	Ministry of Health
MUAC	Mid-upper arm circumference
NCA	Norwegian Church Aid
NGO	Non Governmental Organisation
PNSS	Programme Niño Sano
RUTFs	Ready to use Therapeutic foods
U5MR	Under 5 mortality rate
UN	United Nations
UNHCR	United Nations High Commissioner for Refugees
WAZ	Weight for Age Z score
WFP	World Food Programme
WHZ	Weight for Height Z score
WSB	Wheat Soya Blend

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Summary

In February/March 2008 a cross-sectional cluster survey was conducted in the Saharawi refugee camps. The main objectives of this nutritional survey were to assess the prevalence of acute and chronic malnutrition, the prevalence of anaemia and investigate possible causes of the malnutrition among children and women in fertile age in the camps.

Totally 892 children (6-59 months) and 797 women (15 – 49 years) were selected from 215 households. Anthropometric measurements (weight and height) were preformed and pre-coded questionnaires for background information at household and individual level and food intake was collected. A HemoCue B-Haemoglobin analyser was used to measure the level of haemoglobin.

Household food security and individual food intake

The refugees are dependent of food aid and at the time of the survey the food distribution was irregular and insufficient.

About 43 % of the households reported having any livestock and most of them had 1-2 goats/sheep.

The food consumption score (FCS) at household level showed that 15 % of the households was defined to have poor consumption

At the individual level 42 % of the children ate from 4 or less of 11 food groups and 45 % of the women ate from 5 or less. The food groups they consumed from were the basic diet such as cereals, lentils, oil, tea, and onion and potato.

Limiting of portion size, adults reducing their portions in order for children to have more and relying on less expensive or not preferred food appeared to be most widely and frequently used coping strategies among the households.

Recommendations

The fresh food distribution is a positive development and should be sustained to the extent possible. Also the dry food pipeline should to the extent possible be kept full so that pipeline breaks are avoided. As recommended in the JAM in 2007 a food security stock to cover 3 months distribution should be re-established.

Children

Acute malnutrition (wasting) among children (6-59 months)

The prevalence of global acute malnutrition (GAM) (WHZ <-2 z-score) in the camps was found to be 18 %, whereas the prevalence of severe acute malnutrition (SAM) (WHZ <-3 z-score) was found to be 5 %, according to WHO 2005 standard. (The same results given with the old NCHS 1977 references, were 19 and 3 % respectively). This is a drastic increase compared to the findings in 2005[1] when the prevalence of GAM was 8 % with 2 % being severe. There were no significant differences between genders but the youngest children < 1½ years was significant more acute malnourished than the older. If more than 20 % of children less than 5 years found acute malnourished or if the prevalence is 10 - 19 % and aggravating factors such as inadequate general food ration is present, this is considered as serious.

MUAC (children 6-59 months)

When using MUAC as indicator for acute malnutrition it was found that 7 % of the children were malnourished (MUAC 11-12.5 cm) and out of this 0.7 % had a MUAC of less than 11 cm. When broken down per age it could be seen that it was children aged 6-17 months who had the highest prevalence of malnutrition when measure with MUAC.

Chronic malnutrition (stunting) (children 6-59 months)

The prevalence of stunting (HAZ<-2 z-score) was 32 % (26 % with NCHS 1977 reference) with 9 % (7 % with NCHS 1977 reference) of the cases being severely stunted (HAZ <-3 z-score). There were no significant differences between genders. This is a decrease compared to the findings in 2005 where the global prevalence was 39 % and severe 16%.

[1] All the previous surveys refer to has used the NCHS reference 1977

Underweight (children 6-59 months)

The prevalence of underweight (WAZ <-2 z-score) was 32 % (38 % with NCHS 1977 reference) with 9 % (the same with NCHS 1977 reference) of the cases being severely underweight (WAZ <-3 z-score). This is an increase when comparing to the survey conducted in 2005 when the prevalence was 29 % and 8 % severe.

Anaemia (children 6-59 months)

The observed prevalence of anaemia among children aged 6-59 months was 62 % with (Hb<11g/dl) out of which 6 % were severe (Hb<7 g/dl). This is a reduction compared to the finding in the survey done in 2005, where the prevalence of anaemia was 69 % (Hb <11g/dl). When the prevalence of anaemia is 40 or higher this is considered as severe. The youngest age group (6-30 months) was significant more affected than the older.

Food intake (children 6-59 months)

Children from El Aiune had significant lower diet diversity score than the other camps, probably because in all camps but El Aiune fruit and vegetable distribution happened the same week as the survey.

Foods that showed a positive influence on the malnutrition was intake of dairy products, vegetables, oils, cereal, fortified food, sweets and tea.

Foods that have been eaten more by those that was not anemic compared to those that was, was meat, egg and carrot. Tea was not found to have any negative effect on anaemia or the other indicators.

Causes of malnutrition (children 6 -59 months)

The main causes of malnutrition (including anaemia) among the children were found to be inadequate food intake and diarrhoea.

The type of food eaten had an influence on the malnutrition and anaemia but also the amount and how often a child ate had significant influence. Those that ate 1-2 times per day, compared with those that ate 3 times or more, were significant more acute malnourished, chronic malnourished and anaemic.

Children that suffered from diarrhoea were significant more acute malnourish and more anaemic.

Recommendations

The advises when it comes to food for prevention of malnutrition and anaemia is that the children should be given diversity of food: different kind of cereals; milk and milk products; vegetables; fruit; meat; egg and oils. As long as the diversity of food is not sufficient, fortified food as WSB should be given as prevention of malnutrition and anaemia to all children (blanket) under 3 or 5 years depending on the recourses. Even though the tea was not found to have any negative effect on anaemia or the other indicators, the children should not have too much of that or soft drinks, chocolate, candy and other sweets because it can oust other healthy foods and it can also gives undesirable problems with overweight. Also, action should be taken in terms of diarrhoea prevention, focusing in the sources of contamination, particularly in food and drinking water.

The work should be expanding to also hosted prevention of malnutrition and giving nutrition as well as hygiene training and message. All staff at the dispensaries needs training at different levels and this should be taken into account when the Saharawi National Nutrition Programme is developed. The activities designed to train mothers should be reviewed and reinforced, particularly in terms of feeding and hygienic practices (eg. exclusive breastfeeding, complementary feeding, hand- washing before eating, etc.).

Women

BMI (non-pregnant women 15-49 years)

The non-pregnant women had an average of BMI of 24.5. Nine percent were underweight (BMI <18.5), 27 % were characterised as overweight (BMI >25) while 20 % of the non-pregnant women were obese (BMI > 30).

Anaemia (women 15-49 years)

Fifty four percent of the non-pregnant women were anaemic (Hb<12) out of which 11 % were severe (Hb<8). Compared with the goitre survey performed in 2007 (46 % anaemic) there was an increase in the prevalence but compared with the micronutrient survey in 2005 (67 % anaemic) the prevalence of anaemia was reduced but it is still high.

In pregnant women the prevalence of anaemia was 66 % (Hb<11) with 15 % of the cases being severely anaemic (Hb<7). Compared to the survey conducted in 2005 (76 % anaemic), there seems to be a decrease in the prevalence of anaemia among pregnant women but still high.

MUAC (pregnant women 15 -49 years)

The majority of the pregnant women had a MUAC of more than 25 cm, 16 % had between 21 and 25 and non less than 21 cm.

Causes of malnutrition (women 15 -49 years)

Women who reported suffering from cardiac diseases had significantly higher BMI than women who did not. Women who reported suffering from a celiac disease had significantly lower BMI. The women who were underweight had significantly lower Hb than the others.

Pregnant women had significant lower Hb than those not and also the breast feeding woman had lower Hb than the others. Also the age of the women affected the Hb; those less than 20 years and those elder than 40 had a significant higher haemoglobin than the others.

The last child's age also effected the Hb, those with children less than both 2 and 5 years were significant more anaemic than those with older children.

Also the numbers of meals per day affected the women's Hb negatively. There were significant differences between those that said they had had 1- 2 meals and those that had 3.

Women in El Aiune had significant lower diet diversity than all the other camps. Dividing the food groups in simple food items, showed that carrot, potato and jam had positive effect on Hb and neither lentils nor tea showed significant effect.

Recommendations

In view of the data, there is a clear need for a strategy to fight anaemia. To treat the anaemia it is necessary to give iron supplementation and all the women of reproductive age, and particularly the pregnant and lactating women, have to be made aware of the serious situation they are in. It is also critical that adequate food is available such as meat contain iron that effect the haemoglobin directly, fruit, juice and vegetables containing vitamin C that help the absorption of iron from other foods, as well as fish (canned or fresh) that helps on the absorption of iron. Also WSB contain iron and is special good for prevention of anaemia. Giving iron supplementation together with some iron absorption food items and nutrition and health information should be one of the strategies to fight the anaemia among both women and children.

Overweight and obesity among women are also an issue of concern due to the health implications and awareness about this issue should be raised. It should be considered in the Nutrition strategy too.

Various NGOs and agencies have their projects and plans in place. There is an urgent need for a joint strategy to tackle the longstanding problem of malnutrition both among the children and women in the camps.

There is a need of a Saharawi National Nutrition Programme with strategies where all the agencies have joint objectives, outcomes and indicators. The formation and implementation of such global strategies should be coordinated by MoH.

1 Situation analysis

The conflict over the Western Sahara reached a humanitarian and political crossroads in 1975, when tens of thousands of Western Sahara refugees migrated into Algeria. These refugees received humanitarian support from the Government of Algeria through the Algerian Red Crescent from 1975 to 1984, at which point the Government requested support from the international community to help in meeting their needs.

A UN settlement plan calling for a cease-fire between the parties in conflict - Morocco and the Popular Front for the Liberation of Saguia el Hamra and Rio de Oro (Polisario) and a referendum to choose between independence and integration was adopted in 1991. Thereafter, the UN Mission for the Referendum in the Western Sahara (MINURSO) was deployed to supervise the cease-fire, to identify eligible voters, and to prepare for the safe voluntary return of refugees to participate in the referendum.

Despite attempts to resolve the political impasse, a durable solution which would enable the refugees' repatriation has yet to be found and these refugees remain in the Sahara Desert in Algeria. Due to the harsh, arid desert environment, they remain highly vulnerable with insufficient livelihood options. Therefore, they continue to rely on international humanitarian assistance for their survival.

The Tindouf area is located on the Hammada, a vast desert plain of the Sahara Desert. Summer temperatures in this part of the Hamada, historically known as "The Devil's Garden", are often above 50°C and frequent sand storms disrupt normal life. There is little or no vegetation, and firewood has to be gathered by car tens of kilometers away. The Saharawi refugees reside in four main camps named after the abandoned cities in West Sahara: El Aiune, Ausserd, Smara, and Dakla. There are also some smaller satellite camps, such as the "February 27", serving as a boarding school for women. The headquarters of Polisario Front, with the government in exile of the Saharawi Arab Democratic Republic (SADR), are headquartered in Rabouni, a camp dedicated to administration.

1.1 Food security situation

Currently the refugees are receiving food aid from the World Food Programme (WFP), United Nations High Commissioner for Refugees (UNHCR), European Commission Humanitarian Aid (ECHO), Agencia Española de Cooperacion International para el Desarrollo (AECID) and some international Non Governmental Organisations (NGO). The last years the basic rations from WFP and UNHCR have contained wheat, rice, lentils, beans, sugar, yeast, oil and tea. ECHO and NGOs have been giving pasta, canned fish, barley and maize products. In the recent years ECHO and AECID have been giving fresh food and Wheat Soya Blend (WSB) to selected vulnerable groups. In addition some private actors have been giving various food, but on a ‘one- off’ basis. Due to limited numbers of markets and shops combined with limited food production, there are reasons to believe that the dietary diversity in the camps is poor.

Subsistence agriculture is difficult, however in the last years various organisations supported by the EU and AECID have started small scale horticulture and livestock production in the camps.

1.2 Socio-economic situation

In recent years there has been a rise of a basic market economy. There are number of grocery shops in the centers of the camps where one can find staple foods, fruits and vegetables,

biscuits and sweets. In addition there are shops that sell clothes and variety of household utilities.

Social services such as schooling and basic hospital care are organized by the refugees themselves. Six years of schooling are guaranteed and obligatory for all children. After that, many go to Algerian schools, and some pass on to universities in Algeria, Cuba, Spain or other countries that provide scholarships for Sahrawi students. Camp-wide literacy programs and education efforts directed specifically towards women have improved the literacy rates tremendously. According to a study by the Belgian branch of OXFAM, some 90% of the refugees are now considered literate, compared with below 10% in 1975, and the regional average of about 50%. However, jobs remain scarce and those Saharawis educated at universities abroad can rarely if ever find opportunities to use their skills in the camps.

There is no electricity supply in the camps. Exceptions are the settlement "27 February" and administrative centre Rabouni. However, some households have fridges running on gas and others have TV, mostly black and white, running on batteries.

1.3 Health and nutritional situation

Several nutritional surveys have been carried out since 1997 (CISP 1997, UNHCR/WFP 2002, Norwegian Church Aid (NCA)/Akershus University College (AUC) 2005, UNHCR/ WFP 2005 and NCA/AUC 2008) and have all revealed serious nutritional problems. Even though the prevalence of global acute malnutrition (GAM) (WHZ <-2) and chronic malnutrition (HAZ <-2) had decreased from 1997 to 2005 it still remains at high levels according to international standards. From 1997 to 2002 there was a remarkable decrease in anaemia (Hb <11 g/dl) among children aged 6-59 months. However from 2002 till 2005 the level of anaemia in this group has nearly doubled. The same tendency was found for anaemia in women of childbearing age. Surveys that investigated feeding practices among children have revealed poor infant and complementary feeding practice. Supply of water, both quantity and quality, is insufficient. There is limited data available of hygiene practices such as hand washing and the availability and use of latrines. Previous surveys have found prevalence of diarrhoea, acute respiratory infection (ARI) and fever among children in the camps.

Several surveys have suggested deworming as an activity to improve nutritional status. Surveys from various organisations, including University of Valencia, have indicated that worms are not a major problem in the camps. Children who come to Spain on the exchange programme do have parasites but not worms.

1.4 Food aid and food distribution

WFP has assisted the Government in meeting the basic nutritional needs of Western Sahara refugees since 1986. The ongoing Protracted Relief and Recovery Operation (PRRO 10172.2) started in January 2008 with 125,000 vulnerable beneficiaries. The previous PRRO lasted 3 years and four months. During this operation food aid was provided to a total of 158,000 beneficiaries through general food distribution, supplementary and school feeding programmes. However the operation was facing pipeline difficulties and less food than planned was distributed. In 2005 88 % of what was planned was distributed, in 2006 74 % what was planned was distributed and in 2007 only 66 % of what was planned was distributed.

In view of irregular supplies of food commodities, daily caloric intakes have been fluctuating from month to month. Ranging from 1,235 kcal to 1,800 kcal and dropped to only 500 kcal during the months of July and October 2007.

1.5 Rationale for the survey

In June 2007 Médicos del Mundo (MDM) and Valid International conducted an investigation of the feasibility of implementing Community-based Therapeutic Care (CTC) in the Saharawi refugee camps. The investigation concluded that acute and chronic malnutrition, including micronutrient deficiencies, still persists among the Saharawi population despite several interventions to reduce malnutrition. A CTC strategy was suggested to treat acute malnutrition and to enhance the capacity of Ministry of Health (MoH) to tackle the severe malnutrition in the camps.

The Joint Assessment Mission (JAM) conducted in January 2007 also concluded that a nutrition survey should be undertaken to get an overview of the current situation. The assessment also recommended including indicators on food security in order to better understand the underlying causes of malnutrition and to determine if the food intake is adequate. In addition, it was recommended that this survey would serve as a baseline for the new project that WFP started in 2008.

2 Objectives

The objectives of the survey were as follows:

To provide data on Crude Mortality Rate (CMR) in the camps

Under 5 Mortality Rate (U5MR) in the camps

To provide data on nutritional status of children aged 6-59 months in order to enable MDM, NCA and MoH to assess the impact of the CTC strategy

To investigate possible causes of malnutrition among children aged 6-59 month

To assess prevalence of anaemia in children aged 6-59 month

To investigate possible causes of anaemia among children aged 6-59 months

To investigate dietary intake of children aged 6-59 months

To provide data on nutritional status of women of child bearing age (15-49 years)

To investigate possible causes of malnutrition among women of child bearing age

To assess prevalence of anaemia in women of child bearing age

To investigate possible causes of anaemia among women of child bearing age

To investigate dietary intake of women of child bearing age

Obtain information of food security and coping mechanisms in the camps

To further built the local capacity to carry out the anthropometric and the haemoglobin (Hb) measurements (using the Haemocue).

3 Methods, material and data collection

A cross-sectional survey was conducted between 9th of March and 2nd of April 2008 near Tindouf in the Algerian desert. The target population was 150,000 refugees, 125,000 of these characterizes as vulnerable, living in 4 refugee camps. The target groups for the survey were children 6-59 months and women in fertile age, 15-49 years as shown in table 1.

Table 1. Table of population group and procedures, Saharawi refugee camps, March 2008

Population group	Procedures
Children 6-59 months	Questionnaire, weight, height/length, MUAC, haemoglobin measurement
Women of child bearing age (15-49 years)	Questionnaire, weight, height, MUAC, haemoglobin measurement

3.1 Stakeholders and implementation process

The design and implementation of the survey was lead by Médicos del Mundo on behalf of the Saharawi Ministry of Health with the technical assistance of Norwegian Church Aid, Akershus University College and World Food Programme. The survey was funded by AECID. The Saharawi Red Crescent society and UNHCR provided technical assistance during the data collection and with the analysis of the results. The responsibilities and contributions of all stakeholders are outlined in table 2 below.

Table 2 Stakeholders responsibilities and contribution, Saharawi refugee camps, March 2008

Activity	Agency
Overall coordination	MDM, MoH,
Technical coordination	NCA, AUC, WFP, MdM
Instrument design	NCA, AUC, WFP, MdM, MoH, PNSS
Sampling design	NCA, AUC, WFP, MdM
Nomination/provision of survey staff	MoH
Training of data collection teams	NCA, AUC, WFP, MdM, PNSS
Logistic support	NCA, AUC, WFP, MdM, MoH
Data collection supervision	NCA, WFP, MdM, PNSS, MoH
Data collection observation	UNHCR, CRS
Data entry	WFP, NCA, MdM, PNSS
Data analysis	WFP, AUC, NCA, MdM, CDC
Data reporting	AUC, NCA, MdM,WFP
Financial contribution	AECID

The duration of the survey from planning till implementation lasted from January-April 2008 with a two week of training of enumerators from 21st of February till 6th of March. Twelve enumerators were trained in all aspects of the survey instruments and received basic nutrition training. They were divided into three teams with four people per team. International staff from MdM, NCA, Niño Sano and WFP supervised the data collection. In addition, staff from UNHCR and CRS observed the data collection.

3.2 Sample size calculation

The sample size calculation was carried out using the Emergency Nutrition Assessment (ENA) for Standardized Monitoring and Assessment of Relief and Transitions (SMART) methodology version 1. The calculations were done with an estimated 18% of the population of 150,000 being children between 6-59 months and 18 % being women of child bearing age (15-49 years)[2]. Using previous numbers of people it was found that the number of people per camp was more or less the same. It was therefore decided that in order to be able to differentiate between the four camps the sample size was multiplied by four. In addition a +5% refusal rate was included. Table two shows the sample size calculation.

Table 3 Calculation of sample size, Saharawei refugee camps, March 2008

Children 6-59 months	**Prevalence in previous surveys (%)**	**Assumed current preva-lence (%)**	**Precision desired**	**Design effect (the actual design effect)**	**Sample size**	**To be able to different-tiate/each camp*4**	**In-cluding refusal rate of 5%**
GAM (Wasting)	7.7	8	+/- 5	1.8 (1.65)	203	812	**853**
Stunting	38.9	39	+/- 10	1.8 (1.15)	164	656	689
Underweight	28.8	29	+/- 10	1.8 (1.59)	142	568	596
Anaemia	68.5	69	+/- 10	1.8	148	592	623
Women of child bearing age							
Anaemia	66.4	66	+/- 10	1.8	155	620	**651**
Mortality	1.08 deaths/ 10000/day		+/- 1	2			**913**

From table 3 it can be seen that 853 children 6-59 months and 651 women of childbearing age was needed in order to have a representative sample. Previous surveys had indicated that there were three children aged 6- 59 months and two women of childbearing age in each household. This meant that 284 households needed to be included to get the required number of children aged 6-59 months and 326 households to get the required number of women of childbearing age.

No recent data on mortality rate was available so the mortality rate in the host population was used as basis for calculation of the sample size needed for the mortality survey. In Algeria the mortality rate is 1.08 deaths/10000/day. Using this number as a basis for sample size calculations, it was found that 913 people were needed for the mortality survey. Previous surveys have found that there were on average six people in each household, based on this, 152 households need to be visited. With forty eight clusters four households needs to be visited per day. This was covered by the main survey.

[2] UNHCR, UNICEF, WFP, WHO (2002). Food and Nutrition Needs in Emergency

3.3 Sampling

Since there were no lists of inhabitants in each Daira[3] available a cluster sampling approach was used. The Dairas were used as sections for allocation of clusters by using a Probability Proportional to Size (PPS) methodology. Since it was assumed that each camp has more or less the same population sized, the camps were divided into 48 clusters using the computer programme SMART, having an equal number of clusters in each camp. The list of clusters can be seen in Annex 1.

Each Daira had a health dispensary which was situated approximately at the centre. This was used as a point of spinning a pen to identify a random direction. An approximately line was followed to the end of the Daira, and the pen was spun again to identify another random direction. The first house in this direction was chosen randomly by selecting a number between one and 20 from a list. The next house on the right on the line was the house that was visited next. This continued till information from sufficient women and children was collected. If all houses along the line had been included and there was still a need for more women of child bearing age and/or children 6-59 month to be included, the pen was spun again and a new direction was followed. The selection of households was done by the supervising staff, representatives from Ministry of Health (both at national and local level) and nurses from the health centre in the Daira. During data collection the next household was always identified by the survey supervisor.

The definition of household was discussed extensively with Ministry of Health and the team members. As a conclusion a household were defined as people who routinely cook, eat and share the same ration. All eligible individuals (children 6-59 months and women of child bearing age) within the household were interviewed and measured. In case of refusals or if people were absent they were not replaced in the sampling plan. If a dwelling was empty, neighbors or the accompanying nurse were asked if it was likely that the residents would return. Provided that the household members would return before the team left the cluster the same day, the household was revisited, if not the household was skipped. Eligible children and women missing from a household were noted and if possible the household was revisited. In the cases where this was not possible the children and women were reported as missing.

3.4 Training of the teams

The selection of households, the survey and the training for the survey was overseen by a nutrition consultant from NCA/AUC, a nutritionist from MdM, a nurse from Niño Sano and a senior nutritionist from NCA/AUC, in collaboration with the Saharawi Ministry of Health. All survey team members were Saharawi refugee staffs who were fluent in Spanish and Hasania. The staffs were selected by the Saharawi Ministry of Health and followed an extensive training schedule for two weeks. The training included basic nutrition, survey objective, survey methodology on collection of anthropometry, dietary intake, mortality data, food security data, anaemia using Haemocue and identification of oedema. At the end of the two weeks of training the team members undertook an exam covering the questionnaires. This helped the survey supervisors to identify who would be most suitable for each responsibility within the team, and who would be the most suitable team leaders.

Following the theoretical training, four days of practical training, both in the national hospital and the field, was done. The training included testing of the questionnaire, familiarization

[3] Each of the four camps is divided into 6-8 administrative units called Daira

with the equipments and practical experience for the teams were carried out. During the practical training constructive feedback was given to the team members.

3.5 Survey instruments

On average, it took about one hour to complete the questionnaires and the anthropometric measurements in each household. This obviously depended on the size of the household.

3.5.1 Household Questionnaires

All questionnaires used were developed in close collaboration between MdM, NCA, Niño Sano, WFP, Red Crescent Society and MoH. The questionnaires used were also based on questionnaires used in previous surveys in the camps and internationally recognized tools. They were then modified to best reflect the situation in the camps in collaboration with the team members. The food security questionnaire was based on the questionnaire used by WFP in other countries and the dietary questionnaires were based on the questionnaire used in Demographic Health surveys (DHS surveys) and WFP surveys. The dietary questionnaire contained information of 24 hour recall and 7 days recall. The questionnaires developed to assess health seeking behaviors in women and children were based on international recognized questionnaires and questionnaires used in other surveys performed in the camps.

Food consumption, household level

In order to capture consumption patterns and a proxy for the diversity of the household diet the 'Food consumption score (FCS)' method developed by WFP was used. The system requires recording of food groups over a 7 day period. Each food type is allocated a score based on its nutrient density. Animal proteins and milk in the diet receive the highest score of 4. Cereals receive a score of 2; legumes a score of 3, and sugar/oils/fat/butter receive a score of 0.5.[4] The maximum possible FCS score, when it is used over 7 days, is 112. The higher the FCS, the more diverse and nutritional is the diet. Households that are consuming many different food items will score 36 points and higher, and this is classified as a high consumption diet. Those with a score of 21-35 have a medium consumption diet, and those scoring below 21 have a low consumption diet. This method is used to identify food access and consumption problems at the population's level and allows periodic comparisons for use in food security monitoring systems. Drops in food consumption scores over time alert monitors to the possibility of malnutrition in the near future thus serving as an early warning indicator (for details on methodology see www.wfp.org).

Dietary diversity, individual level

In order to capture the individual dietary diversity score (IDDS or DDS) questions about both the children's and the women's individual food intake was performed by asking about the food intake in the last 24 hours and 7 days. The food items were grouped in 14 groups and the same food groups were used for women and children. The food groups used were 1. Cereals and food made from grain (including wheat, rice, barley, gofio, bread, muffins, biscuits, spaghetti, couscous), 2. Dairy products (milk; powder milk, Candia, yoghurt and cheese), 3. Local goat and camel milk, 4. Vitamin A rich vegetables (carrots and pumpkin), 5. Other vegetables (potato, onion, tomato, peppers, beetroot), 6. Fruits (oranges, lemons, dates, banana, apple, juice and marmalade), 7. Lentils, beans, peas and nuts, 8. Canned fish (tuna, sardine, mackerel), 9. Meat (camel, goat, chicken, beef), 10. Liver, 11. Egg, 12. Tea, coffee,

[4] C-SAFE & WFP (2005). CHS Regional Analysis: Household Vulnerability and the Impact of Food Aid

sugar, candy, chocolate, soft drinks, 13. Fortified foods, 14. Oils and fat. An Individual Dietary Diversity Score (IDDS) is an index of how many food groups a person has eaten.

Individual Dietary Diversity Score (IDDS), measured by the number of food groups eaten by an individual in the last 24 hours (or 7 days), is a good proxy of the nutrient (mainly micronutrient) adequacy of the diet of an individual. IDD has been shown to be associated with the mean micronutrient adequacy of the diet of both breastfed and non-breastfed children, of adolescent and of adults as well. IDD has also been shown to be associated with the nutritional status of individuals (children under 5, women) after controlling for confounding socio-economic factors. The way to interpret the DDS results is currently not standardized. There is no standard list of foods or food groups, and no cut-off point, upon which the international community agrees for a broad use in all contexts. However, a huge research work is currently ongoing[5].

In this survey it was decided to use the 7 days intake when calculating the IDDS and the further analysis of the data. It was not much difference in the IDDS for the 7 days and 24 hours; for women mean IDDS was 5.6 for 7 days and 6 for 24 hours and for children mean IDDS was 5.3 to 5.9 respectively. IDDS for 7 days was calculated by taken how many times a food item was eaten during 7 days, gathering the numbers of the food items into food groups and divided on 7. Seven days was used to give extended information about the food intake.

3.5.2 Mortality questionnaires

For the mortality survey a questionnaire was designed to collecting information on the total number of people at risk and the length of time over which they were at risk. The recall period for retrospective mortality was set to be the previous 90 days, using the local elections in December as a point of reflection.

All questionnaires were formulated in English, translated into Spanish and then field tested and revised both before and after the pilot survey. The questions were addressed to the subjects in Hasania. The team members, together with the Saharawi coordinator, worked together to ensure a common translation to Hasania among different teams. All questionnaires are attached in Annex 2.

3.5.3 Anthropometric survey

Weight was determined using an electronic digital scale (UNISCALE) measuring to the nearest 100 g. Children were weighed standing alone or being held by a career or a member of the survey team. Because of low temperatures and cultural sensitivities women and children were allowed to wear some clothing. The weight of the clothes worn was estimated and withdrawn from the number that the scale was showing.

Height or length (children aged 6-23 months) of children 6-59 months and women of childbearing age was measured using a Height Board.

Mid-upper arm circumference (MUAC) was taken by using a UNICEF MUAC tape to the nearest mm.

The anthropometric indicators height and weight were used to assess the malnutrition among the children (6 -59 months) and were expressed as acute malnutrition or wasting (WHZ-

[5] SCN Task Force on Assessment, Monitoring and Evaluation. (March 2008). Fact sheets on Food and Nutrition Security Indicators/Measures: Dietary Diversity (DD)

score), chronic malnutrition or stunting (HAZ-score) and underweight (WAZ-score). This survey has introduced the new reference for assessing malnutrition, namely the WHO 2005 standards. In general the new standards are given higher prevalence of severe acute malnutrition and lower moderate (1-3 % differences) compared with the old references NCHS from 1977. For the analysis the WHO 2005 standards will be used but prevalence of malnutrition with the old references will also be showed in the tables of interest.

3.5.4 Measurement of Haemoglobin

The measurement of haemoglobin was be done in the household using a photometer "Haemocue B- hemoglobin" Photometer[6], utilising the azidemetemoglobin principle. A safety lancet (Hemocue) was used to make a finger prick. A drop of blood was transferred into a Hemocue cuvette for measurement of haemoglobin.

3.6 Logistics

Data from one cluster per day per team were collected. MoH was responsible for informing each Daira about the survey and a staff member from the daira accompanied each team every day of the data collection. The staff member had good prior knowledge of each family and was able to help to introduce the survey teams to the households.

3.7 Data management

A database was made in Access and all data was entered into Access by staff from WFP and NCA, MdM and NS. During the data entry there was a 10 % double entry. The anthropometrical data and mortality data were transferred to and analysed in the Emergency Nutrition Assessment programme also called SMART. For the plausibility test a cut off of Z scores SD -5/5 was used.

All data were transferred into SPSS version 14 and analysed in this programme.

3.8 Timeline

Table 4 shows the timeline that was drawn for the survey. The Saharawi Ministry of Health has an annual "Health Day" at the 24th April and the preliminary results should be present at that day.

Table 4 Timeline for the nutritional survey among Saharawi refugees, March 2008

	February				**March**				**April**				**May**			
Preparations	**x**	**x**														
Travel to the camps		**x**														
Training			**x**	**x**												
Survey					**x**	**x**	**x**	**x**	**x**							
Analysis									**x**	**x**	**x**	**x**				
Draft report											**x**	**x**	**x**			
Report finish														**x**	**x**	**x**

3.9 Survey constrains

There are a number of constrains and limitations that should be taken into account when considering the results of this survey. The first and perhaps the most important limitation is

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

the sampling frame. As mentioned above a cluster sampling approach was used. This method is known to have important bias that should be taken into considerations when interpreting the result. In addition, when the sample size was estimated it was assumed that the population of each camp was more or less the same. More recent data from MoH (see Attachment 1) indicates that there are fewer people in Dakla and more people in Smara and 27th. This means that the camp should have been treated as one survey and the Probability Proportional to Size (PPS) methodology should be used, reflecting the difference in size per camp. A weighing procedure was introduced by CDC when analysing the data to account for this.

The mortality rates were unrealistically high and indicates that either the enumerator has asked about the previous year or the subjects have not be able to think only three months back and have answered for a year. Pervious survey in 2005 indicated the same problem. It is therefore not possible to determine the mortality rate.

The number of pregnant women included in the survey is limited and it can be questioned if the results for pregnant women can be representative for all camps.

WFP joined the survey at a later stage hence the training on the household food security questions was limited. In addition, many of the female heads of households did not know the information that was asked. There are reasons to believe that these questions should have been targeted to other household members. However, this was difficult since it is normally the men who know about the economic activity in the household and in most household visited there were few or no men.

Fruits and vegetable distribution in all camps but El Aiune occurred the same week as the survey. There are reasons to believe that this affected the intake in children and women.

4 Results

This chapter will first describe the results from the interview at household level; demography, water and sanitation and food production and consumption. This will be followed by results of the children's health and nutrition and a discussion of causes of malnutrition. Then results on women's health and nutrition and a discussion of causes of anemia will follow.

4.1 Demography

A total of 215 households were interviewed during the survey. Average size of the interviewed households was 18 members. About 68 % of the interviewed household's size ranged from 11 to 25 members. The average number of women of childbearing age (15-49) and children aged 0-59 months was 5 in both groups. In the households 32 % of the women were above 15 years old and 19 % of the males the same age. The rest were children below 16 years old.

In one case it was reported that the head of the household was a man. In all other cases head of the household was woman aged more than 40 years old who fled from West Sahara 30 years ago. Therefore 38 % of them did not report on any kind of education and 31 % claimed having some sort of informal education. The table 5 provides the details on the educational level of the heads of the households.

Table 5 Education level of the head of households in Saharawi refugee camps, March 2008

Level of education	Frequency	Percent
None	75	38 %
Non formal	61	31 %
Less than 6th grade	29	15 %
Up to 6th grade-Primary	7	4 %
7th to 9th grade-Secondary	14	7 %
10^{th} to 12th grade-High school	10	5 %
Higher education	1	1 %
Total	197	

4.2 Housing and living conditions

Some 80 % of the households reported living in tents and brick structures. Seven percent reported living in tents only and 12 % reported living in brick houses only. The number of rooms (not including kitchen and bathroom) reported varied from 1-8, where the majority had between 1 and 3 rooms.

Fifteen percent of the households reported having color TV, 9 % reported owning a car and 8 % reported owning a fridge.

4.2.1 Livelihood activities and sources of income

As mentioned in the methodology chapter most of the women were not able to answer the questions on sources of income. Four percent of the households reported that they do not have any type of income and 55 % of the households either did not know or refused to answer on this question. Twenty five percent of the households reported that savings was the primary source of income, 9 % of the households reported that loans were their primary source of income and 3 % reported to have formal work as a primary source of income. Two percent confirmed that they have somebody overseas sending remittances regularly. Figure 1 shows the distribution of primary and secondary income sources among refugees.

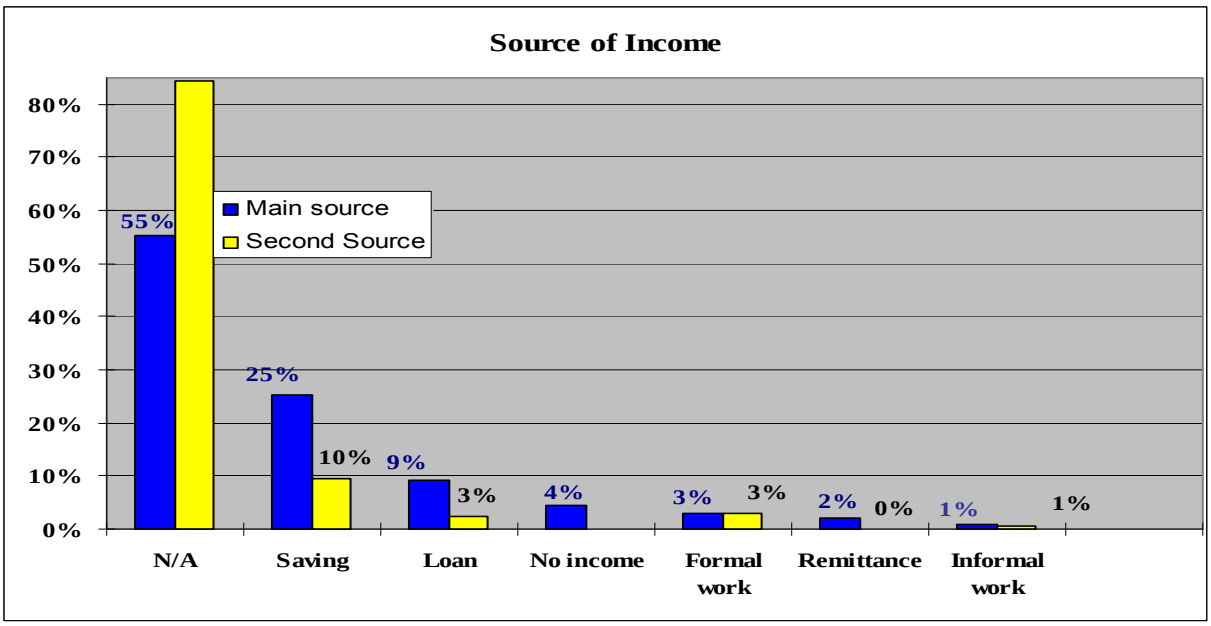

Figure 1 Distribution of primary and secondary income sources among refugees in Saharawi refugee camps, March 2008

Selling or exchanging relief food ration on other food commodities was confirmed by 52 % of the households and 7 % out of them confirmed that they have covered other non-food needs through the exchange/selling of their ration.

4.2.2 Household expenditures

As with household income, the women had difficulties reporting on the household expenditures. About 50 % of the households did not answer the questions on household expenditures. Among the remaining 50 %, 39 % reported not having purchase anything during last month. Thirty six percent had spent less than 90 Algerian Dinars[7] during the last month, 10 % spent below 1,950 Dinars, 12 % spend less than 3,900 Dinars and only 2 % spent more than 3,900 Dinars.

Most of the households' expenditures fall under the category of food and cloth. The data analysis showed that most frequently purchased commodities in the camps were meat, tea, tomato, cereal, canned fish and onion. The mean expenditure rate for purchasing of food commodities and clothing during last month were 232 and 236 Dinars respectively.

[7] Exchange rate in Tindouf during the survey in March 2008 was 1 USD=65 Algerian Dinars

Table 6 Household expenditure during last month, Saharwi refugee camps, March 2008

	Dinar used by 50 % of the HH	Dinar used by 10 % of the HH
Education, school fees	0	0
Fuel for cooking	65	362
Medical expenses, health care	6	69
Clothing, shoes	236	870
Repayment of debts/borrowing	39	317
Remittance to relatives and friends	0.2	3
Social events (i.e. expenditure during Ramadan)	5	61
Food	232	762
Telephone use	23	201
Transport in general	48	434

No expenses were reported under the category of education as primary school is free and expenses for schooling of children in Algeria or abroad are taking place during early September. Very minor expenditures were reported for health care purposes. The medical service is provided by aid agencies for all refugees and reported expenses were related probably to some additional medications.

4.2.3 Health

There is one 'national' hospital in Rabouni. In addition each camp has a hospital and each daira has a dispensario[8]. Medical services are free of charge and the only expense faced by patients is the cost of transportation.

Ninety nine percent of the women reported that they seek help outside of the home when the child is sick. The majority of the women, 79 %, reported to seek help from the hospital and 52 % from the dispensario, 43 % reported to seek help from traditional medicine and only 3 % of the women reported to seek help from relatives or friends. Even if the majority of the women reported using the hospital for treatment 72 % of them reported giving birth at home. When women are using the dispensario for vaccination and growth monitoring the children is given a health card and 36 % of the children had that at home.

4.2.4 Water

The main source of drinking water for the households is deep well water that is stored in containers by the house. The well water is transported to the containers in trucks on a regular basis. Eight percent of the households reported that they collect water from a common tap and then stored it by their house and an even smaller number of households reported that they collect water directly from the common tap and use in their house.

4.2.5 Sanitary services

Half of the households asked reported that they cleaned their water container once a month. Five percent reported that they never cleaned their water container and 9 % reported that they cleaned their container once a week.

[8] A dispensario is a locally primary health care centre.

Forty three percent of the households reported that they had a pit latrine. Forty two percent reported having an improved latrine, either cement or ceramic, and 13 % reported using the desert as a toilet facility, the most of them in Dakla. Eighty four percent reported having their own toilet facility and for those who shared, the toilet facility normally was shared with 1-3 other households.

Most of the household heads reported washing their hands after going to the toilet, before eating, after handling animals and before praying. Twelve percent reported using soap when washing their hands and 85 % said that they used soap sometimes. The main reasons for not using soap were that there was no soap in the house, even though they got it in the ration, and that the price of soap is high.

4.3 Food production and consumption

4.3.1 Food production

About 43 % of the households reported having any livestock. Out of these 80 % reported owning 1-2 goats/sheep. Seven percent reported having 1-2 camels and 11 % reported owning chicken. In addition 30 % reported owning goats or sheep but did not specify how many they own. In the food frequency questionnaire the women were asked about the sources of food and of those 61 % women saying they drank goat milk once or more the pervious week, 82 % said that this was from their own production.

The households have access to land but this is only fit for very small vegetable garden projects supported by irrigation and 1.8 % of the households reported having a vegetable garden. Carrots, onions, tomatoes and mint were mentioned as vegetables/herbs that were grown in the gardens. In some of the camps there are communal vegetable gardens that are managed by NGOs, the products from these are not included in this survey.

4.3.2 Food consumption at household level

The majority of the population in the camps relies on food aid. Some families can afford to buy other foods from the markets and about half of the households in this survey reported having sold or exchanged their ration in order to obtain other preferred foods and goods.

In addition to own production the women also reported getting foods as gifts from relatives or friends.

Food consumption score

In order to capture consumption patterns and dietary diversity the 'Food consumption score (FCS)' method developed by WFP was used. A FCS of above 35 is considered adequate, 35-21 as borderline and a score of less than 21 suggests poor food consumption. From table 7 it can be seen that about 15 % of the refugee households tallied a FCS of less than 21 suggesting poor consumption, 2 % - were borderline and the majority – 83 % scored above 35 suggesting adequate consumption.

Table 7 Food consumption score based on WFP methodology, Saharawi refugee camps, March 2008

Food Consumption Score	% Household
Poor consumption < 21	15 %
Borderline 21 – 35	2 %
Adequate Consumption > 35	83 %

The data analysis showed that households with higher number of women and children were tending to have higher FCS. Ownership of fridge and color TV set also showed to have statistically valid significance.

4.3.3 Coping mechanisms

Limiting of portion size, adults reducing their portions in order for children to have more and relying on less expensive or not preferred food appeared to be most widely and frequently used coping strategies among the households. Around 60 % of the interviewed households use this tactic almost daily. However 38 % did not find it necessary to reduce the quality of the food to cheaper options. More than half of the household heads stated that they skip entire day without any meal 1-2 days during a week. Ninety five percent of them said they never borrow food or rely on others help and another 74 % do not buy or borrow food on credit.

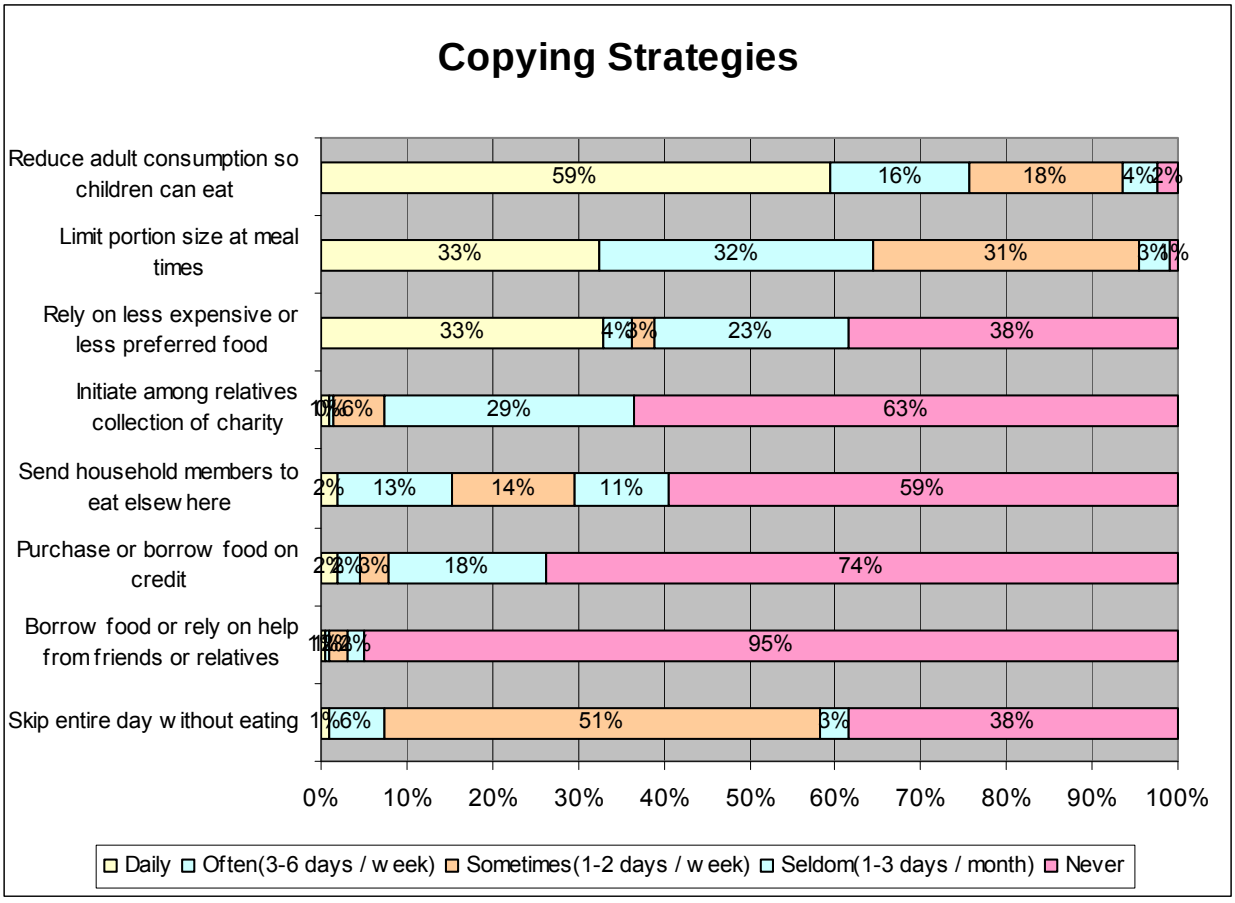

Figure 2 Copying strategy at household level for Saharawi refugees, March 2008

4.3.4 Quality and diversity of food at individual level

Dietary diversity, measured by the number of food groups eaten by an individual is a good proxy indicator of the quality of the diet. Both the women and the children were asked about the food intake in the last 24 hours and 7 days. An Individual Dietary Diversity score (IDDS or DDS) is an index of how many food groups a person has eaten.

The tables 8 and 9 the next pages show how many percent of the children and women reported having eaten from the food groups in the last 24 hours. The tables also try to indicate that there is a difference in intake between the camps.

Table 8 Percent of children (6 – 59 months) reported intake (24 hour recall) of various food groups, Saharawi refugee camps, March 2008

Food groups	Percent total N=871	Percent Smara N=222	Percent El Aiune N=228	Percent Ausserd N=210	Percent Dakla N=211
1. Cereals and food made from grain	93	95	89	94	92
2. Dairy products	51	56	44	55	48
3. Local goat and camel milk	55	55	51	59	54
4. Vitamin A rich vegetables and fruit	70*	87	32[1,4,5]	79	82
5. Other vegetables	86*	93	66[1,4,5]	91	94
6. Other fruits	57*	55	43	77[2,4,6]	55
7. Lentils, beans, peas and nuts	83*	91	74[1,6]	80[2]	88
8. Canned fish	15*	19	4[1,5]	10[6]	27
9. Meat	30*	37	19[1,4,5]	32	35
10. Liver	2	2	1	2	1
11. Egg	10	10	12	10	7
12. Tea, coffee, sugar, candy, choloade, coca, fanta etc	32*	32	42	38	16[3,6]
13. Fortified food	59	57	63	64	53
14. Oils and fat	88*	92	83[1,5]	85	92

*Significant difference Mann-Whitney Test $p<0.05$ between the camps, 1=between Smara and El Aiun, 2=between Smara and Ausserd, 3=between Smara and Dakla, 4=El Aiune and Ausserd, 5=El Aiune and Dakla, 6=Ausserd and Dakla

From Table 8 it can be seen that 93 % of children ate cereals the previous 24 hours. Other food groups that majority of the children had eaten were other vegetables, fats and oils and lentils. Fifty one percent had eaten dairy products and 30% had eaten meat and 59 % reported having eaten fortified foods. El Aiune seems to have the lowest percent of consumption for most of the food groups.

Table 9 Percent of women (15-49 years) reported intake (24 hour recall) of various food groups, Saharawi refugee camps, March 2008

Food groups	Percent total N=791	Percent Smara N=206	Percent El Aiune N=198	Percent Ausserd N=191	Percent Dakla N=196
1. Cereals and food made from grain	96	97	96	95	97
2. Dairy products	42*	54	30[1]	40	42
3. Local goat and camel milk	58	56	57	56	63
4. Vitamin A rich vegetables and fruit	75*	91	35[1,4,5]	88	87
5. Other vegetables	93*	97	83[1,4,5]	93	97
6. Other fruits	58*	58[2]	43[1,4]	79	53[6]
7. Lentils, beans, peas and nuts	89*	93	82[1,5]	88	92
8. Canned fish	17*	21	5[1,5]	12[6]	29
9. Meat	31*	36	22[1,5]	32	36
10. Liver	1	1	1	2	1
11. Egg	2*	1	4[5]	2	0
12. Tea, coffee, sugar, candy, choloade, coca, fanta etc	90*	93	88	86[2]	92
13. Fortified food	55*	54	55	64	47[6]
14. Oils and fat	94	96	92	92	95

*Significant difference Mann-Whitney Test $p<0.05$ between the camps, 1=between Smara and El Aiune, 2=between Smara and Ausserd, 3=between Smara and Dakla, 4=El Aiune and Ausserd, 5=El Aiune and Dakla, 6=Ausserd and Dakla

Table 9 shows that, for women it was the same tendencies as for children, where food groups such as cereals, other vegetables, oils and fats and tea coffee have been consumed by the majority of women, where as food groups such as dairy products, other fruits and meat have been consumed by fewer. The table also shows that women in El Aiune seem to have a lower percentage of consumption for most of the food groups.

When the IDDS was calculated only 11 food groups were used. The groups were as follows: cereals, total dairy, vitamin A rich fruits and vegetables, other vegetables, other fruits, lentils-beans-peas-nuts, canned fish, meat, liver, eggs and fortified foods. Commodities such as tea, coffee, soft drinks, sweets and oils were excluded as none of them contribute to what is defined as necessary/healthly food or nutrients. The table below shows the IDDS for both women and children based on the interview of 7 days intake.

Table 10 Individual Dietary Diversity Score (IDDS) for children (6-59 months) and women (15-49 years) based on 7 days intake interview, and how many percent that had eaten from the number of groups, Saharawi refugee camps March 2008

Dietary Diversity Score	**Percentage of children (6- 59 months) N=870**	**Percent of women (15-49 years) N=783**
0	2	0
1	2	0.3
2	4	2
3	7	5
4	12	11
5	23	26
6	22	28
7	16	19
8	8	6
9	2	0.6
10	0.1	0
11	0	0.1

The IDDS mean (±SD) for children 5.3 (±1.85) and for women was 5.6 (±1.39) meaning that half of the children and women had ate from 5-6 food groups, women from more than the children. The maximum score possible in this survey was 11.

Dividing the children's IDDS into three groups (low-, medium- and high IDDS) gave that 42 % of the children was in the lower group (eaten from 4 or less food groups), 22 % in medium (eaten from 5 food groups) and 36 % in the highest group (eaten from 6 or more food groups). Dividing the diet in the 3 categories of IDDS (see figure 3), children with low score had very basic diet and the food consumed most often was cereals, lentils, oil and vegetables such as potato and onion. Children in the medium category of IDDS had the same basic as those in the lower category, but also often consumed from groups such as carrot and fruits. Many of those in the highest category consumed from all this groups + also local milk and other dairy products and fortified food. Those in the highest category also consumed significant more often of canned fish, meat and egg.

Dividing the IDDS into three groups (low-, medium- and high IDDS) gave that 45 % of the women was in the lower group (eaten from 5 or less food groups), 29 % in medium (eaten from 6 food groups) and 26 % in the highest group (eaten from 7 or more food groups). Looking at the diet in the 3 categories of IDDS (see figure 4), women with low score had very basic diet and the food consumed most often was cereals, lentils, oil, tea and vegetables such as potato and onion. Women in the medium category of IDDS had the same basic as those in the lower category, but also often consumed[9] from groups such as local milk and carrot. Many

[9] Regarding "often consumed" as ca 70 % of those in the category.

of those in the highest category consumed from all this groups + also other dairy products than local milk, fruit, and fortified food. Those in the highest category also consumed significant more often of canned fish and meat.

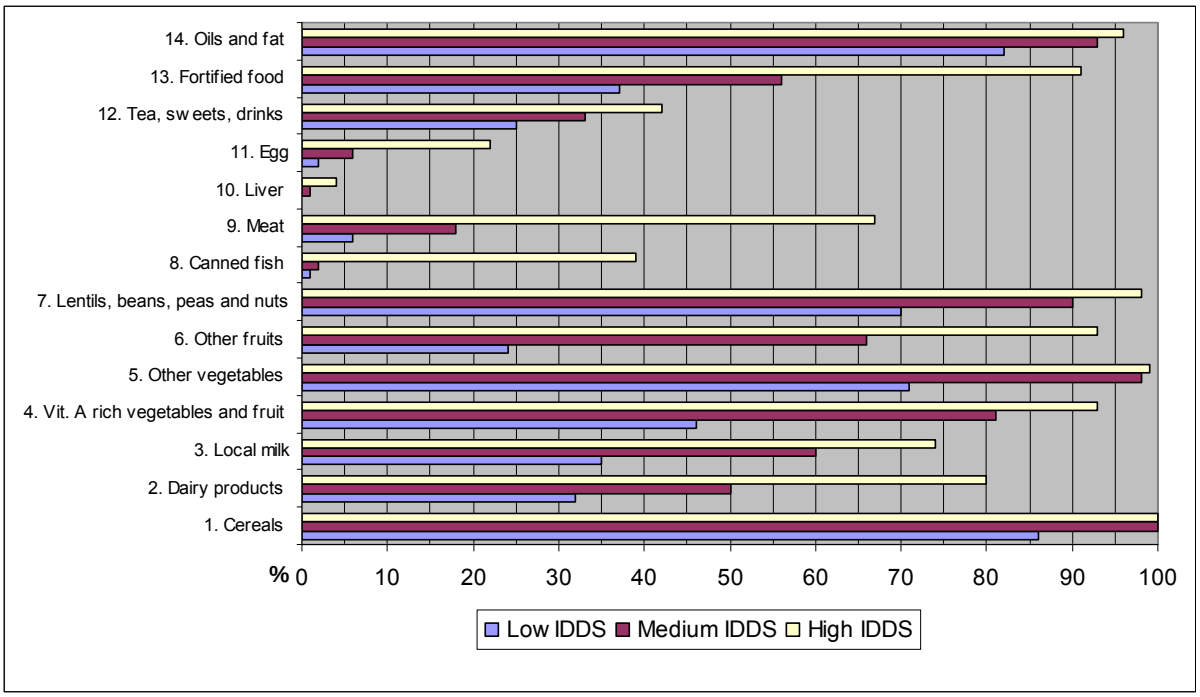

Figure 3 Percentage of children consumed from each food group as a function of the category of IDDS, Saharawi refuge camps, march 2008

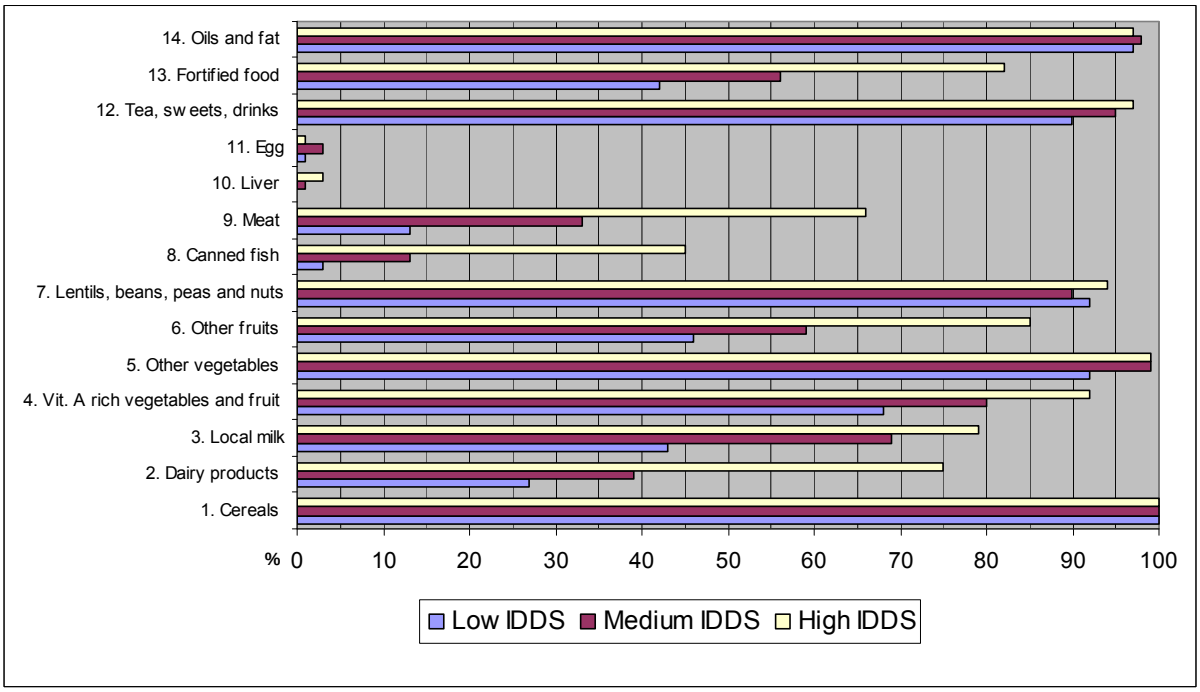

Figure 4 Percentage of women consumed from each food group as a function of the category of IDDS, Saharawi refuge camps, march 2008

4.4 Child health and nutrition

There were 892 children participating in the survey. The drop-out rate was approximately 5 % mainly because they were not present at the survey time. Table 11 shows the distribution of age and sex of the children included in the anthropometric and questionnaire surveys. Slightly more boys than girls participated in the survey but there were no significant differences in the age or sex distribution of the subjects ($p>0.05$). There were three children missing sex thus not included in this breakdown but included in the other analysis.

Table 11 Distribution of age and sex among children 6 – 59 months from the Saharawi refugee camps, March 2008

	Boys		Girls		Total		Ratio
	no.	%	no.	%	No.	%	Boy:girl
6-17 months	107	57	82	43	189	21	1.3
18-29 months	106	50	107	50	213	24	1.0
30-41 months	68	41	98	59	166	19	0.7
42-53 months	115	52	106	48	221	25	1.1
54-59 months	56	56	44	44	100	11	1.3
Total	452	51	437	49	889	100	1.0

4.4.1 Child morbidity and mortality

Since the last two weeks prior to the survey 47 % of the children reported to have had diarrhoea, out of which 30 % reported to have had bloody diarrhoea. Fifty three percent of the children reported suffering from difficulties breathing and 49 % reported to have had fever. Other diseases mentioned were allergy, anaemia, asthma, pain in the throat and headache.

Even though the data on mortality rates were not accurate there are reasons to believe that the reporting of causes of mortality was correct. Fifty two percent of the children that were reported dead had died of diarrhoea, 18 % of complications during birth, 14 % of Acute Respiratory Infection (ARI), 9 % of malnutrition, and 7 % of meningh encephalis.

4.4.2 Immunisation

Most of the information about vaccinations was collected from memory of the mother or caretaker (63 %) and the results should therefore be interpreted with care.

Almost all of the children 6-59 months had received vaccination against Tb (98 %), polio (98 %), DTP (95 %), hepatitis B (97 %) and measles (92 %, age 9- 59 months). Many of the children (71 %) had received Triple Virica vaccination and 7 % reported to have received Vitamin A capsules.

4.4.3 Child feeding practices

About 49 % of the children who were not breastfed at present had been breastfed for 24 months, 2 % percent of the children were breastfed only till they were 6 months (exclusive breastfeeding). Seventy eight percent started to give daily drinks with water, oil or sugar within the first moth.

Sixty percent of the women reported that they initiated breastfeeding 0-1 hours after birth. Only 8 % reported that they initiated breastfeeding more than 12 hours after birth.

About 3 % of the children had not eaten neither main meals or between meals the day before the interview. They had only been given milk and half of them were older then 10 months. Six percent of the children had been given 1 meal the day before, 75 % 2 meals and 11 % 3 meals. Not many were given meals between, 27 % were given once, 5 % twice and 1 % 3 time.

The mothers stared the complementary feeding of the children at different time, but approximately 32 % of the children were reported given foods like gruel, mashed potato and vegetable, rice, bread and other milk than breast milk at suitable time, which is at the age of 6 - 7 moths. Few were given solid food too early but most of them to late.

More than half of the children aged 6-59 months reported to receive WSB from the dispensaria and 3 % reported to receive plumpynut from the dispensaria.

4.4.4 Nutritional status of children

To assess the malnutrition among the children (6 -59 months) the anthropometric indicators height, weight and MUAC was used and expressed as acute malnutrition or wasting (WHZ-score), chronic malnutrition or stunting (HAZ-score) and underweight (WAZ-score). This survey has introduced the new reference for assessing malnutrition, namely the WHO 2005 standards. For the analysis the WHO 2005 standards will be used but the results calculated with the old references will also be showed in the tables. Hb was also measured as an indicator for anaemia

Acute malnutrition (wasting)

If a child is acute malnourished he is thinner than normal children. The condition can be moderate (between WHZ <-2 z-score and WHZ >-3 z-score) or severe (WHZ <-3 z-score). When the term global acute malnutrition is used (GAM), it means both moderate and severe count together (WHZ <-2 z-score). Using SAM (severe acute malnutrition) it is only those that have WHZ < - 3 z-score. In table 12 below the prevalence of global acute malnutrition (GAM <-2 z-score) is shown to be 18.2 % (19.2 % with the old NCHS 1977 reference) and this is used when reporting general (global) acute malnutrition. The prevalence of severe acute malnutrition (SAM <-3 z-score) was 5.4 (3.3 % with the old NCHS 1977 reference) but no oedema was detected.

If we want to distinct between how many that is moderate and severe we have to subtract the severe number from the global (18.2 – 5.4= 12.8). This is the same as those children that is between WHZ < - 2 z-score and > - 3 z-score. This gives us 12.8 % moderate and 5.4 % severe malnutrition.

If more than 20 % of children less than 5 years are found global acute malnourished or if the prevalence is 10 - 19 % and aggravating factors such as inadequate general food ration is present, this is considered as serious[10].There were no significant differences between the sexes or the camps in the prevalence of GAM or SAM.

[10] Public nutrition in complex emergencies. Young et al. Lancet 2004; 364: 1899-909

Table 12 Prevalence of acute malnutrition (wasting) based on weight-for-height z-scores and by sex, Saharawi refugee camps, March 2008*

	All		Boys	Girls
	n = 873		n = 445	n = 428
	WHO 2005 standard	NCHS 1977 reference		
Prevalence of global acute malnutrition (GAM) (<-2 z-score)	(159) **18.2 %** (14.7 - 21.7 95% C.I.)	**19.2 %**	(85) 19.1 % (15.0 - 23.2 95% C.I.)	(74) 17.3 % (12.6 - 21. 9 95% C.I.)
Prevalence of moderate acute malnutrition (<-2 z-score and >=-3 z-score)	(112) **12.8 %** (9.9 - 15.8 95% C.I.)	**15.9 %**	(60) 13.5 % (9.5 - 17.4 95% C.I.)	(52) 12.1 % (8.5 - 15.8 95% C.I.)
Prevalence of severe acute malnutrition (SAM) (<-3 z-score)	(47) **5.4 %** (3.7 - 7.1 95% C.I.)	**3.3 %**	(25) 5.6 % (3.5 - 7.8 95% C.I.)	(22) 5.1 % (2.9 - 7.4 95% C.I.)

When the prevalence of acute malnutrition was divided in age groups, then table 13 and figure 6 show that the children less than 18 months were significant more severely malnourished than the elder.

Table 13 Prevalence of acute malnutrition by age based on weight-for-height z-scores, Saharawi refugee camps, March 2008

		Severe wasting (<-3 z-score)		Moderate wasting (>= -3 and <-2 z-score)		Normal (> = -2 z score)	
Age (mths)	**Total no.**	**No.**	**%**	**No.**	**%**	**No.**	**%**
6-17	189	25	13.2	32	16.9	132	69.8
18-29	208	11	5.3	22	10.6	175	84.1
30-41	166	8	4.8	23	13.9	135	81.3
42-53	217	5	2.3	21	9.7	191	88.0
54-59	98	1	1.0	14	14.3	83	84.7
Total	878	50	5.7	112	12.8	716	81.5

The table 13 and figure 5 shows that 13 % of the children under 1 ½ years and 6 % in general of those under 5 are in need of treatment of severe acute malnutrition. In average 13 % of all children under 5 years need treatment for moderate acute malnutrition. It is common now to use plumpynut as a treatment for severe acute malnutrition and WSB for moderate acute malnutrition.

Figure 5 Prevalence of acute malnutrition by age based on weight-for-height z-scores, Saharawi refugee camps, March 2008

Usually acute malnutrition is managed in a supplementary feeding programme or CTC or a mix of this. One of the questions for those who are treating the children is how many children are 6 % and 13 %? In general 12.37 % of a population is between 0 and 4 years[11]. If the population is 125.000 approximately 15.500 children are under 5 years. Of these will 6 % (or 930 children) need to be treated with plumpynut and 13 % (2000 children) with WSB. After treated with plumpynut the children will be better and they will come in the group of moderate malnourished and also they will need WSB. But this numbers are only true if acute malnutrition (wasting) based on weight-for-height z-scores is used as the indicator.

If the percentage of the height for median weight[12] is used, as it has been used to define malnutrition in the dispenserias by using international WFP tables, the numbers will appear different as shown in table 14. When using percent of median weight for height with old references (NCHS 1977) 10.3 % (1596 children) of the children would appear as acute malnourished, of this 8.8 % (1364 children) moderate and 1.5 % severe (232 children)[13]. Using the new standard (WHO 2005) 6.9 % of the children (1070 children) would appear as acute malnourished, of this 5.9 % (915 children) moderate malnourished while 1 % (155 children) severe.

[11] Food and Nutrition Needs in Emergencies, 2002. UNHCR/UNICEF/WFP/WHO
[12] This is the indicator that can be found in the table that was adopted at the dispenserias and the hospitals some years ago
[13] Based on a population of 125.000 and approximately 15.500 children (12.75 %) under 5 years

Table 14 Prevalence of acute malnutrition among children (6-59 months) based on the percentage of the median, Saharawi refugee camps, March 2008

	WHO 2005 standard n = 878	NCHS 1977 reference
Prevalence of global acute malnutrition (<80%)	(61) **6.9 %** (4.9 - 9.0 95% C.I.)	**10.3 %**
Prevalence of moderate acute malnutrition (<80% and >= 70%)	(52) **5.9 %** (4.0 - 7.9 95% C.I.)	**8.8 %**
Prevalence of severe acute malnutrition (<70%)	(9) **1.0 %** (0.3 - 1.8 95% C.I.)	**1.5 %**

Also MUAC can be used to define malnutrition. Table 15 shows that less than 1 % of the children had MUAC less than 11 cm and thus defined as severe malnourished and in need of plumpynut and 7 % was defined as moderate malnourished and in need of WSB. This is approximately the same as for median weight for height.

Table 15 Prevalence of acute malnutrition among children (6-59 months) based on the percentage of MUAC, Saharawi refugee camps, March 2008

	n = 878
Prevalence of moderate acute malnutrition (MUAC 11 -12.5 cm)	(62) 7.1 %
Prevalence of severe acute malnutrition (MUAC <11 cm)	(6) 0.7 %

So, how to handle this different indicators? When reporting on malnutrition the z-scores usually are used, here 18 % global malnutrition, of them 12-13 % (2000 children) moderate acute malnourished and will need WSB, and 5-6 % severe (930 children) and will need plumpynut. When it comes to the management of a feeding programme also questions about resources and policy is an issue. In a long-term situation as in the Saharawi refugee camps, all acute malnourish children measured by z-score should have adequate help. These days (June 2008) the MoH/MdM are setting up a treatment of acute severe malnourished children in an adjusted CTC (not full scale CTC only the treatment part of it) and they are using MUAC < 11 cm as admission criteria and will probably treat around 108 children. When that activity is established and the people are trained they should be prepared to change the criteria to Z-score <- 3, meaning they will have to treat until 900 children with plumpynut instead of 108.

Chronic malnutrition (stunting)

When the state of malnutrition persist for a long period, then the child may become chronically malnourished. Then not only the weight but also the height are affected and the child remains too small (stunted) compared to his age. He is usually not thin and he looks normal as long as he is not compared with others that have normal height. This condition will not be found by using MUAC. It is necessary to take the height and use the age to find out if he is chronic malnourished (HAZ). Also here it can be moderate or severe and it is called moderate chronic malnutrition (between HAZ <-2 z-score and >- 3 z-score) and severe chronic malnutrition (HAZ <-3 z-score). Some are using the word stunting instead of chronic malnutrition. Global chronic malnutrition is the moderate and severe together (HAZ <-2 z-score).

The prevalence of chronic malnutrition, shown in table 16 was global 32 % with 9 % of the cases being severely stunted. Using the old NCHS 1977 references the prevalence would be 26 % and 7% severe. The figures are a decrease compared to the findings in 2005 where the prevalence was 39 %. By now we do not know why this has decreased but the prevalence is still a cause of concern and has to bee taken into account when running the nutritional programme.

Table 16 Prevalence of chronic malnutrition (stunting) based on height for age z-scores and by sex, Saharawi refugee camps, March 2008

	All n = 864		**Boys** n = 438	**Girls** n = 426
	WHO 2005 standard	NCHS 1977 reference		
Prevalence of global chronic malnutrition (<-2 z-score)	(273) **31.6 %** (28.2 – 35.0 95% C.I.)	**26 %**	(141) 32.2% (27.5-36.9 95% C.I.)	(132) 31.0% (26.3-35.7 95% C.I.)
Prevalence of moderate chronic malnutrition (<-2 z-score and >=-3 z-score)	(194) **22.5%** (19.2-25.7 95% C.I.)	**19 %**	(96) 21.9% (17.8-26.1 95% C.I.)	(98) 23.0% (18.7-27.3 95% C.I.)
Prevalence of severe chronic malnutrition (<-3 z-score)	(79) **9.1%** (7.4-10.8. 95% C.I.)	**7 %**	(45) 10.3% (7.5-13.0 95% C.I.)	(34) 8.0% (5.2-10.7 95% C.I.)

There were no significant differences between sexes or the camps but between the age group those from 18 to 41 months (1 ½ - 3 ½ years) are significant more affected by stunting than the others both younger and older see table 17 and figure 6.

Table17 Prevalence of chronic malnutrition by age based on height for age z-scores, Saharawi refugee camps, March 2008

		Severe chronic (<-3 z-score)		**Moderate chronic (>= -3 and <-2 z-score)**		**Normal (> = -2 z score)**	
Age (mths)	**Total no.**	**No.**	**%**	**No.**	**%**	**No.**	**%**
6-17	189	20	10.6	37	19.6	132	69.8
18-29	208	28	13.5	59	28.4	121	58.2
30-41	166	17	10.2	50	30.1	99	59.6
42-53	220	16	7.3	34	15.5	170	77.2
54-59	99	5	5.1	14	14.1	80	80.8
Total	882	86	9.8	194	22.0	602	66.2

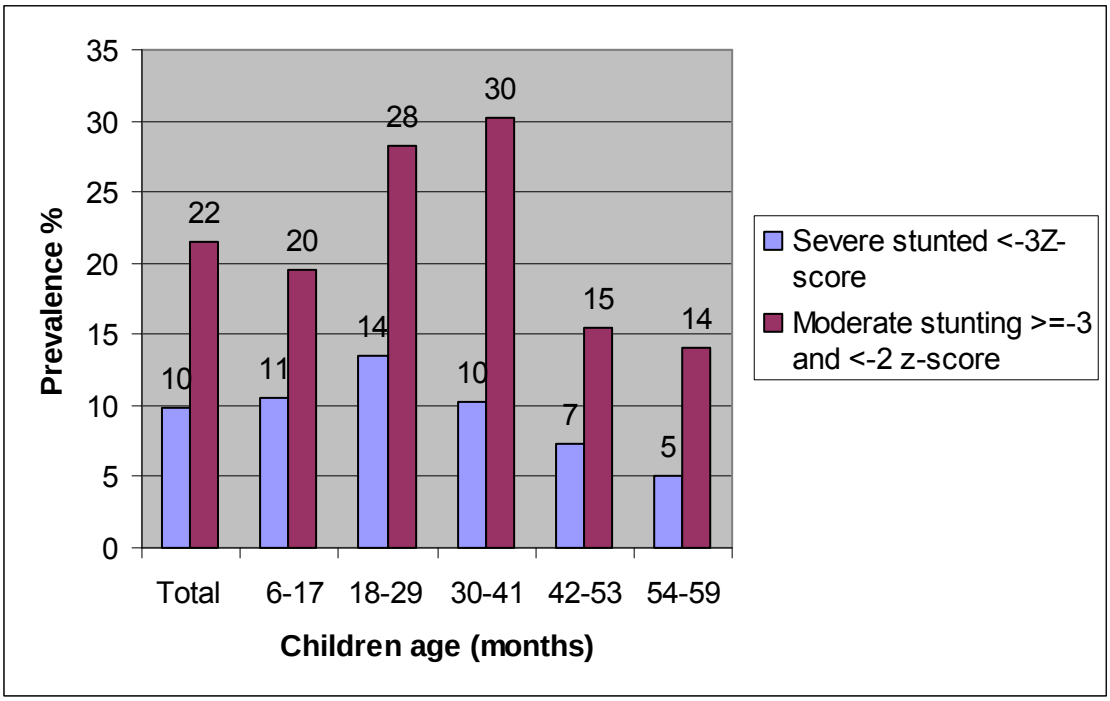

Figure 6 Prevalence of chronic malnutrition (stunting) by age based on height for age - scores, Saharawi refugee camps, March 2008

Underweight

The indicator underweight is a mix of the two others (acute and chronic malnutrition) and when a child has this situation he/she could be too thin or too small or both. This indicator is common used in growth monitoring program where growth of the individual child is followed by measuring weight and age. The prevalence of underweight, shown in table 18 was global 32 % with 9 % of the cases being severely underweight.

Table18 Prevalence of underweight based on weight for age z-scores and by sex, Saharawi refugee camps, March 2008

	All n = 881		**Boys** n = 447	**Girls** n = 434
	WHO 2005 standards	NCHS 1977 reference		
Prevalence of global underweight (<-2 z-score)	(278) **31.6%** (27.6-35.5 95% C.I.)	**38%**	(146) 32.7% (28.05-37.3 95% C.I.)	(132) 30.4% (24.7-36.1 95% C.I.)
Prevalence of moderate underweight (<-2 z-score and >=-3 z-score)	(200) **22.7%** (19.1-26.3 95% C.I.)	**29**	(100) 22.4% (18.0-26.7 95% C.I.)	(100) 23.0% (18.3-27.7 95% C.I.)
Prevalence of severe underweight (<-3 z-score)	(78**) 8.9%** (7.1-10.7. 95% C.I.)	**9**	(46) 10.3% (7.5-13.1 95% C.I.)	(32) 7.4% (4.7-10.1 95% C.I.)

Anaemia among children 6 59 months

The prevalence of anaemia among the children was still high, 62 % with Hb <11g/dl (6 % were severe (Hb < 7 g/dl) and 56 % moderate). Boys were affected more of sever anemia (Hb <7) than girls but the differences were not significant (see table 19).

Table 19 Percent of children (6-59months) in the different categories of anaemia, Saharawi refugees, March 2008

Genders	Categories of anaemia Percent of children (6-59 months)		
	Severe <7 g/dl	Moderate 7 -10.9 g/dl	Normal ≥11 g/dl
Boys (n=443)	8 %	55 %	37 %
Girls (n=425)	4 %	57 %	40 %
Total (n=868)	6 %	56 %	38 %

Figure 7 shows the total prevalence of anemic children and also prevalence of severe (Hb<7) anemia among children divided in camps. There were significant differences between the camps, with Smara having lowest prevalence of both total and severe anaemia.

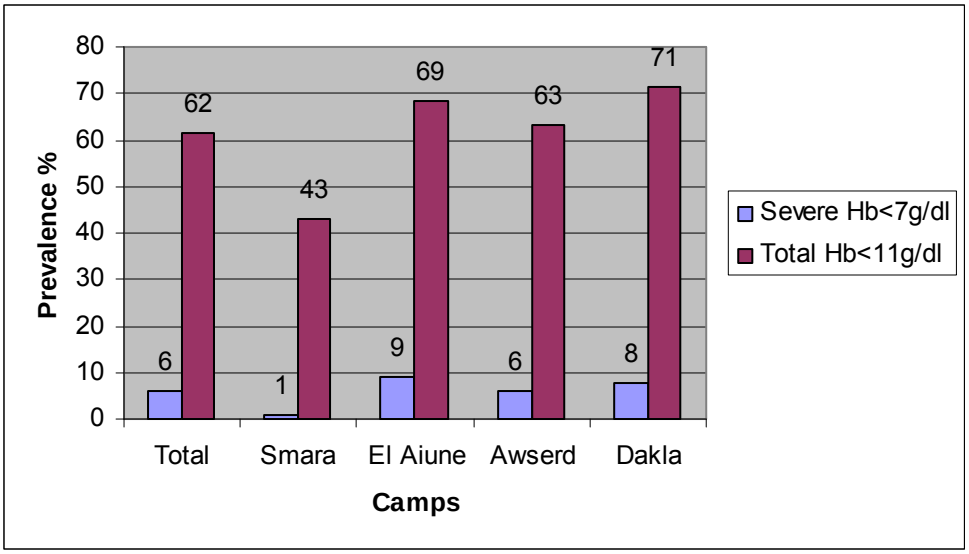

Figure 7 Prevalence of anaemia among children 6-59 months divided by camps, Saharawi refugee camps, March 2008

Figure 8 are showing the prevalence of severe (Hb<7) and moderate (Hb 7-10.9) anemia and also showing how many percent having normal Hb. Dividing by age shows again that the youngest (those from 6 -30 months) are significant more effected by anemia than the older.

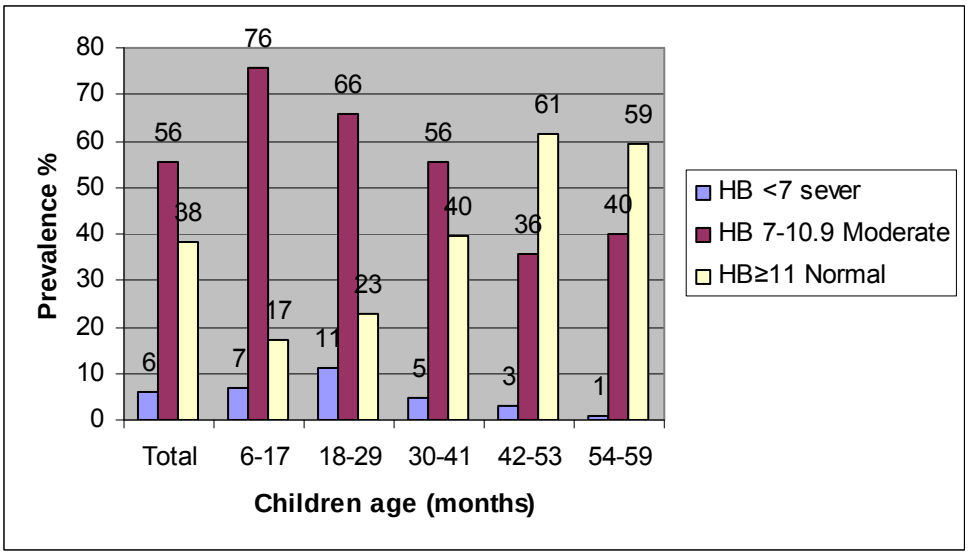

Figure 8 Prevalence of anaemia among children 6-59 months divided by age, Saharawi refugee camps, March 2008

According to WHO (2001), is it considered as a significant public health problem if a prevalence of anaemia is more than 40 %. Among the Saharawi children up to 2-2 ½ years, the prevalence was around 80 %.

4.4.5 Causes of malnutrition among children

Directly causes of malnutrition are usually inadequate food intake or disease or both, and underlying causes are such as food insecurity, inadequate care and inadequate health services, water and sanitation. The data is analyzed for trying to reveal some of these suspected causes.

Food intake

The food intake was measured by asking about the last 7 days intake (7 d recalls). The results showed individual dietary diversity score (IDDS) for the children at mean (±SD) 5.3 (±1.85). Dividing the IDDS in camps showed (figure 9) that there were significant differences in the mean IDDS. El Aiune had significant lower diversity than all the others and Ausserd had lower than Smara and Dakla. There were no differences between Smara and Dakla.

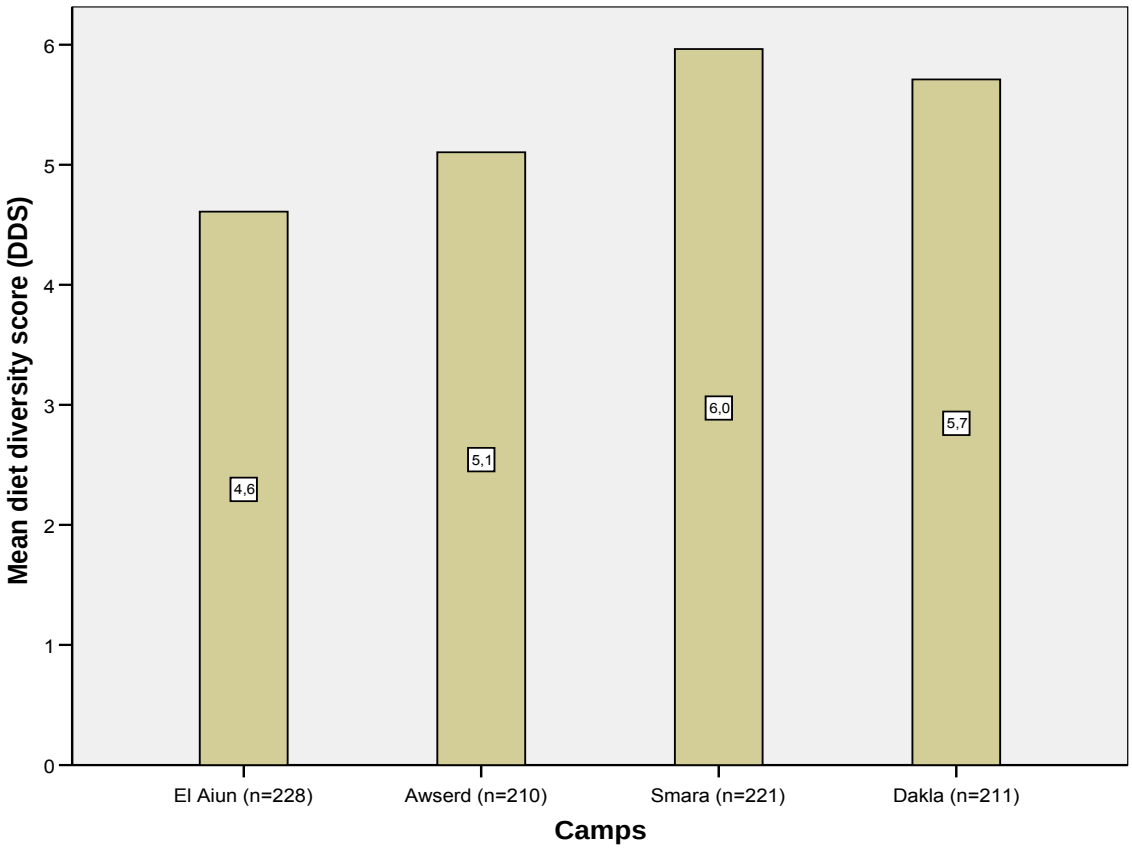

Figure 9 Mean individual dietary diversity score (IDDS) for the children from a 7 days intake interview divided in camps, Saharawi refugee camps, March 2008

When the data was further divided in age groups there were found significant differences between the youngest age group (6-17 months) and all the others. Figure 10 shows that there was the children under 1 year that had lowest mean IDDS. Figure 11 also shows that it was the children in El Aiune that had the lowest score, in all age groups. It should be noted that in all camps but El Aiune fruit and vegetable distribution happened in the same week as the survey which is likely to affect the intake. This shows how important the distribution of fresh food is.

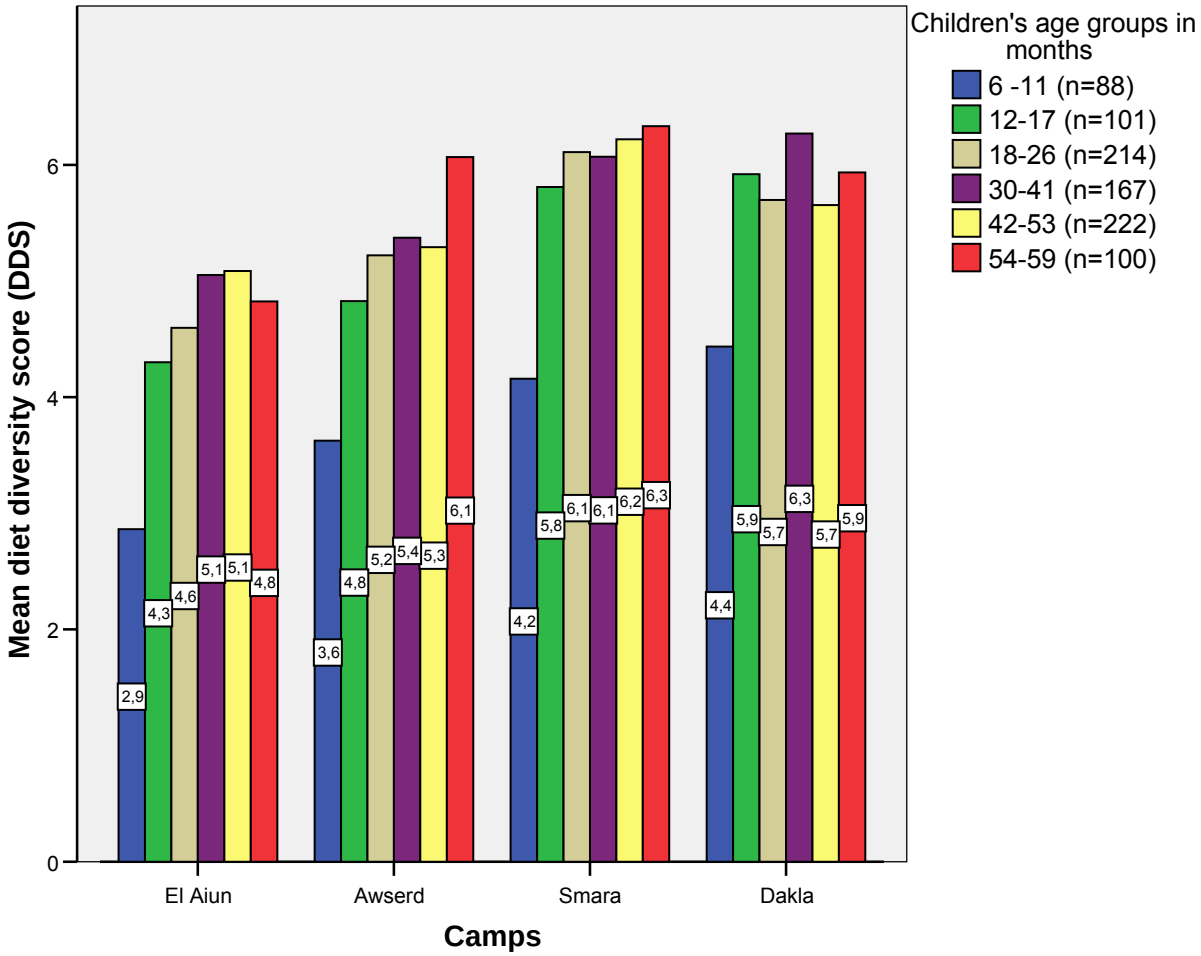

Figure 10 Mean individual dietary diversity score (IDDS) for children from a 7 days intake interview, in age groups and camps, Saharawi refugee camps, March 2008

The foods that showed a positive influence on the Z-score for acute malnutrition was intake of dairy products such as milk and cheese; other vegetables than carrot, such as onion and tomato; oils and fat; and sweets such as chocolate and candy; and tea. Children that had eaten these types of foods had a lower prevalence of acute malnutrition than those that had not. What these food items give is first of all energy (in fat, sweet and tea), protein (in milk and cheese) and vitamins (in onion and tomato).

Foods that showed a positive influence on Z-score for chronic malnutrition was cereals as rice, couscous, bread and biscuits; milk; tea; and fortified food such as WSB and fortified biscuits. Also these foods are rich in energy, protein and different vitamin and minerals. This shows also that giving food supplement as WSB can have a preventive effect on chronic malnutrition.

Foods that have been eaten more by those that was not anaemic compared to those that was, was meat; egg; and vegetables such as carrot. Tea was not found to have any negative effect on anaemia or the other indicators, contrary it seems that the sugar gives extra energy that the children need.

Another important thing which affects the prevalence of malnutrition and anaemia significant was the number of meals per day. About 3 % of the children (26 children) that had not eaten

neither main meals or between meals the day before (they had only had milk), and half of them were older than 10 months.

Children up to 2 years are advised to have 3 main meals and 2 – 3 between meals in between per day. Older children can manage with 3 main and 1 meals in between, so it is a concern that not more than 11 % (100 children) had taken 3 main meals the day before.

When the children are divided into 3 groups (1=eaten 0 or 1 times, 2=2 times and 3=3 times), the figure 11 shows that those in group 1 and 2 had significant less dietary diversity than those eating 3 times per day.

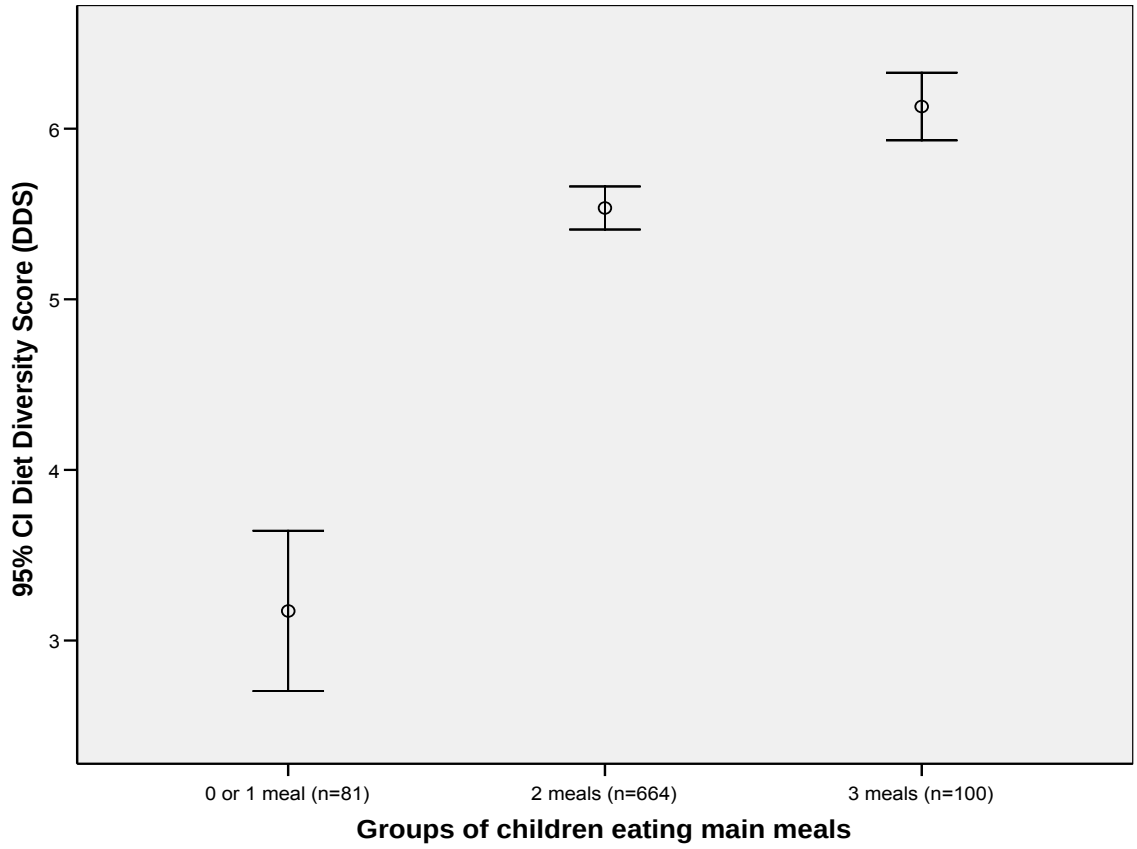

Figure 11 Effect of eating main meals on the individual dietary diversity score (IDDS) among children 6-59 months, Saharawi refugee camps, March 2008

That, not eating often enough, has a negative effect on the malnutrition. Figure 12 show that children in group1 were significant more acute malnourished than the others.

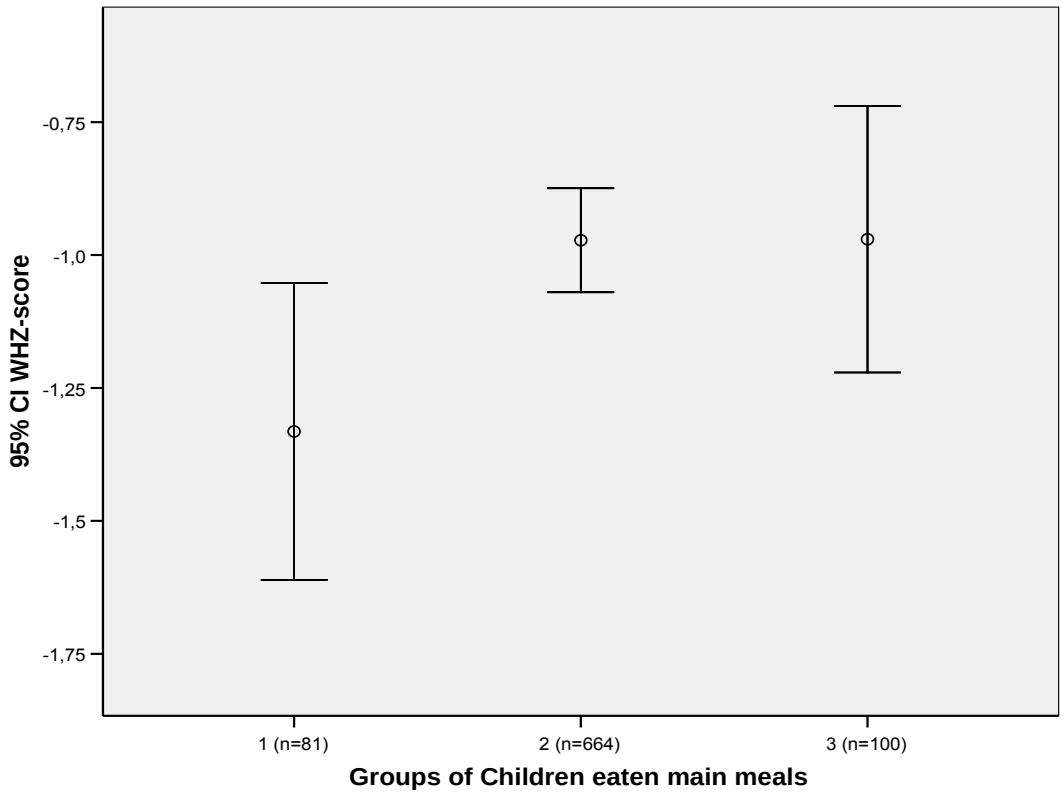

Figure 12 Effect of eating main meals on acute malnutrition among children 6-59 months, Saharawi refugee camps, March 2008

For those that was chronic malnourished the pattern was the same as for those acute; figure 13 is showing that those eating fewer meals are significant more chronic malnourished than those eating more often.

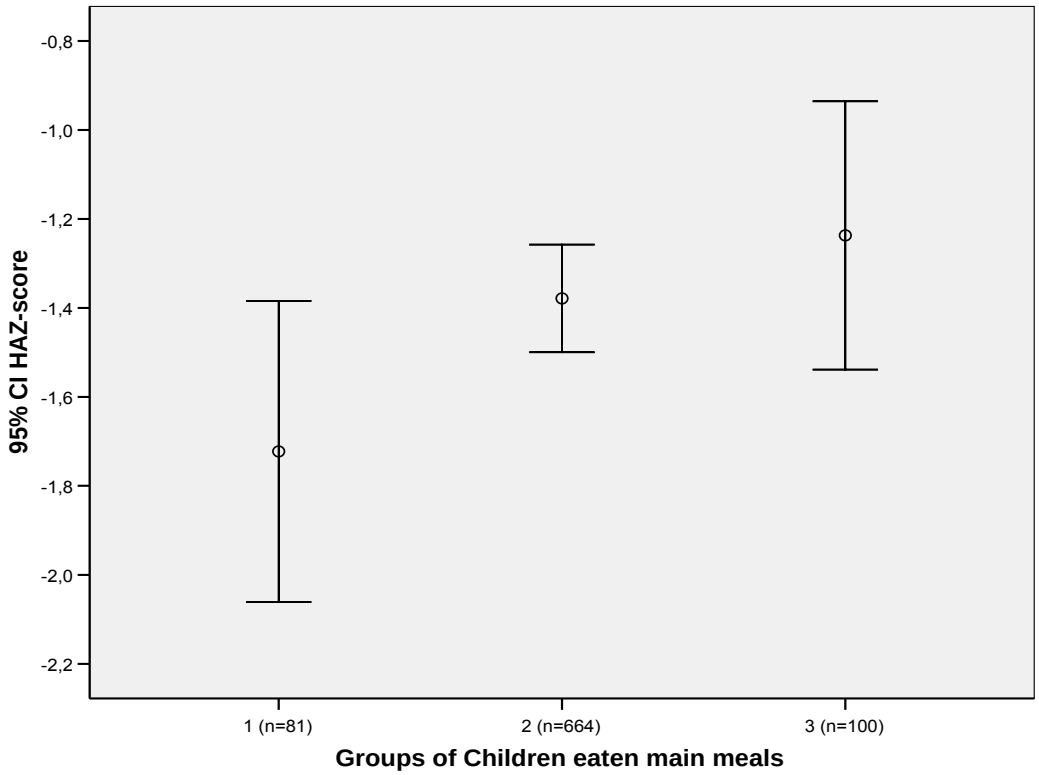

Figure 13 Effect of eating main meals on chronic malnutrition among children 6-59 months, Saharawi refugee camps, March 2008

Figure 14 is showing that the effect of eating main meals on anaemia is even stronger then on the acute and chronic malnutrition. It can be seen for all groups that increased number of meals per day significantly improves the level of haemoglobin.

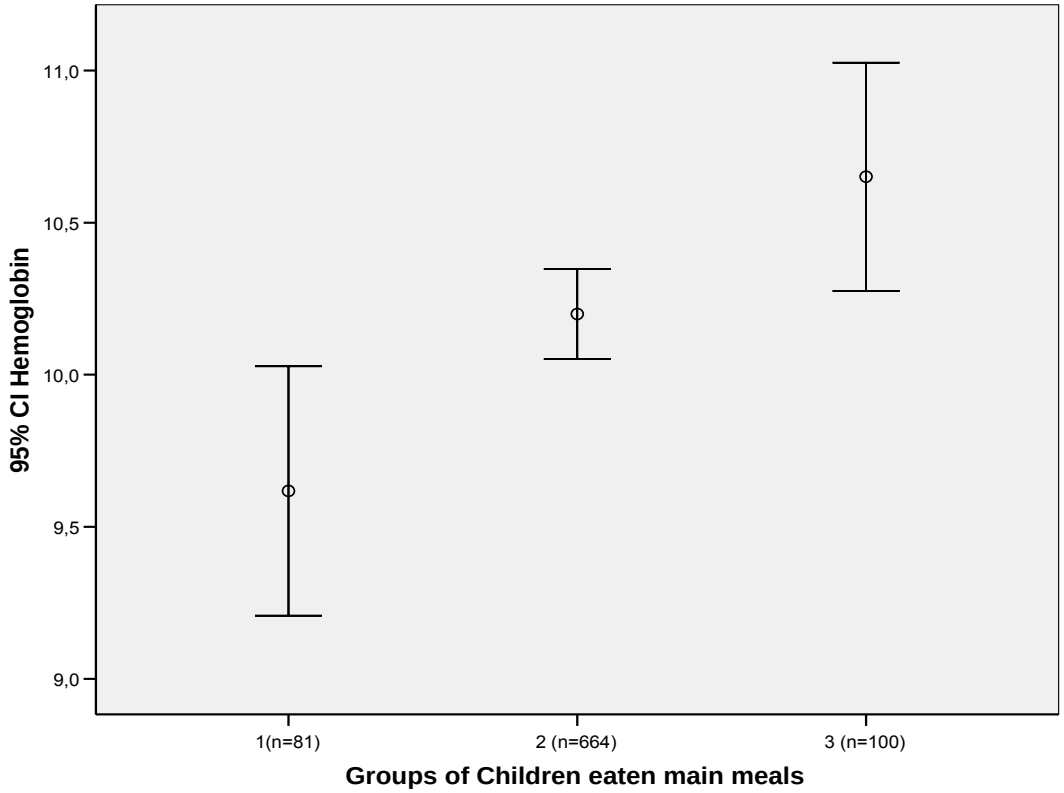

Figure 14 Effect of eating main meals on anaemia among children 6-59 months, Saharawi refugee camps, March 2008

Disease

The mothers were asked if the child had been ill the last two weeks before the survey. The mothers answered that 47 % (n=416) of the children had had diarrhoea and El Aiune had significant lower prevalence than Awserd and Dakla, but not Smara. Fifty three percent (n=474) had had coughing and 59 % (n=435) had had fever and both were significantly higher in Dakla. When analysing the information about illness according to age, it was seen that generally it was the youngest children that had been ill.

Diarrhoea affected negatively the children's WHZ (acute malnutrition) and Hb significant (see figures 15 and 16), while this was not seen when the child had had coughing or fever. The same trend was not found when comparing any of the illnesses with chronic malnutrition (stunting). It was not shown that any of the illness asked for had any influence on the chronic malnutrition.

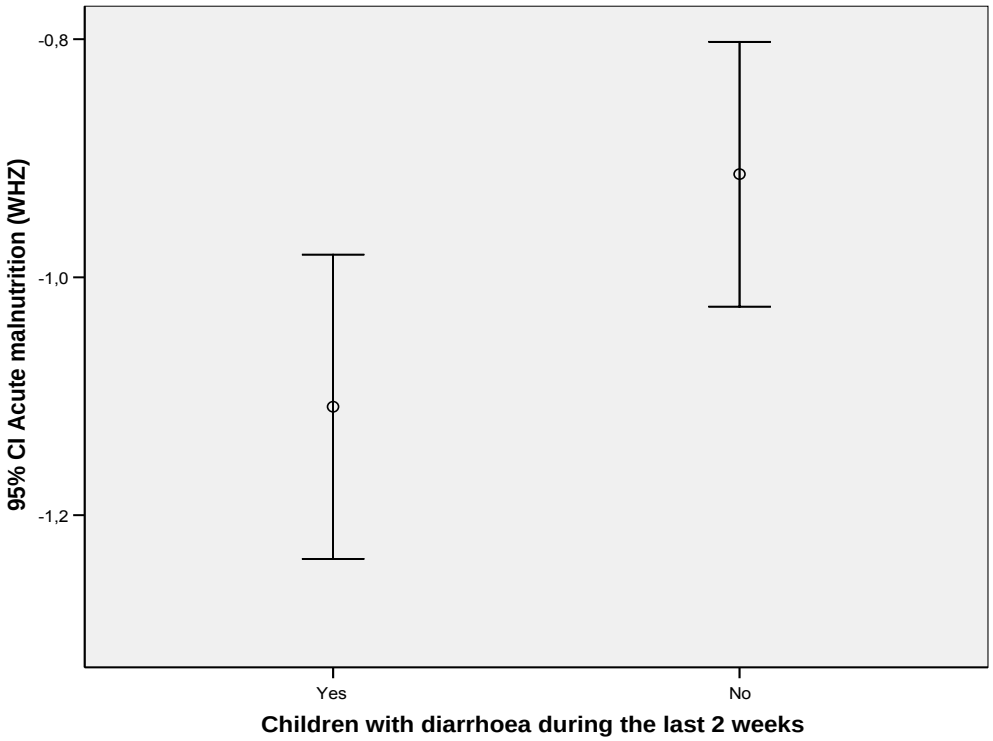

Figure 15 Effect of diarrhoea on acute malnutrition among children 6-59 months, Saharawi refugee camps, March 2008

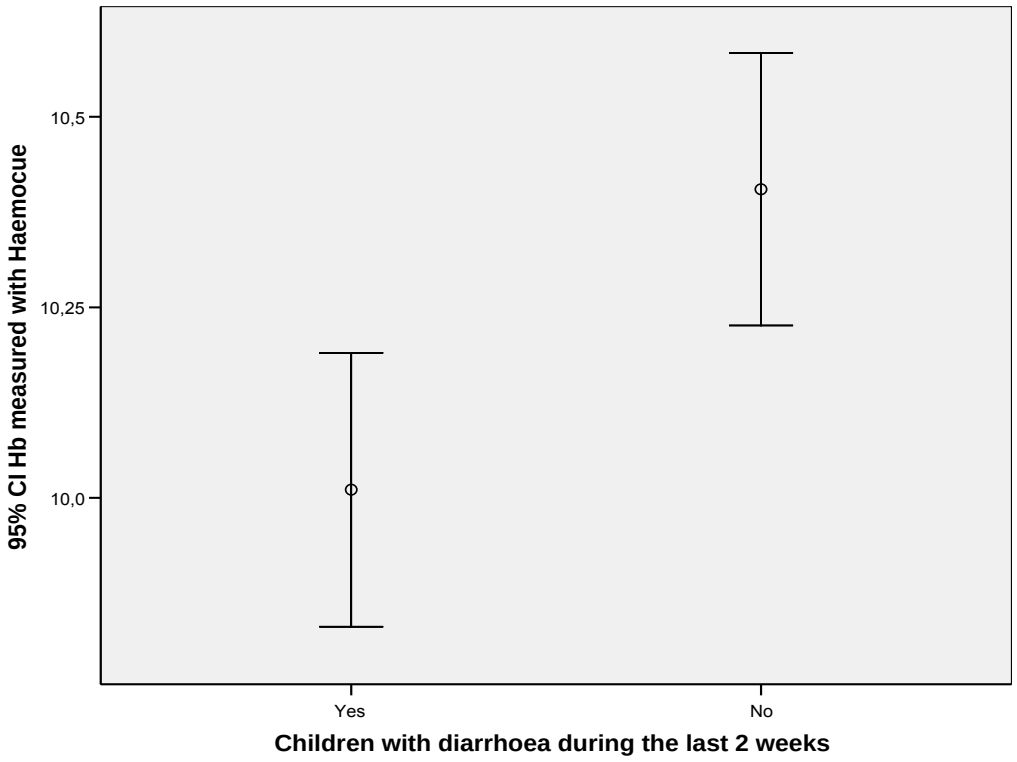

Figure 16 Effect of diarrhoea on anaemia among children 6-59 months, Saharawi refugee camps, March 2008

4.5 Women health and nutrition

Most of the women of child bearing age (15-49 years) who participated in the survey were married (79 %). Seventy one percent of them reported to know how to read and write. Forty seven percent of them reported to have less than primary school education and only 3 % reported to have higher education.

4.5.1 Women morbidity and adult mortality

Half of the women of child bearing age (15-49 years) (50 %) reported to suffer from night blindness (first sign of lack of vitamin A) (the local term was used when asking), 41 % reported to suffer from anaemia, 33 % from pneumonia and 20 % reported that they suffered from cardiac disease. Of the less frequently reported diseases were celiac disease which 2 % of the women reported and diabetes which 3 % of the women reported. Other diseases mentioned were allergies, asthma, head ache, pain in the joints, pain in the back and stomach ache. Twenty six percent of the women reported to have had diarrhoea in the last two weeks prior to the survey.

As for children, data on causes of mortality was collected. It was reported that 36 % of the people who had died had died from cardiac diseases, 15 % of diabetes, 16 % of pneumonia, 13 % of complications during birth, 11 % of other causes and 9 % of cancer.

4.5.2 Women eating habits and eating habits during pregnancy

More than half of the women (55 %) reported to eat less than usual during pregnancy, 41 % reported to eat the same as usual. Pregnant women need more than usually but only 2 % reported that they had eaten more.

Eight percent of the women of child bearing age (15-49 years) reported to take iron supplementation, and only 1 % reported to take vitamin A supplementation.

For the women of child bearing age (15-49 years) 35 % reported to receive WSB from the dispensaria and 2 % received plumpynut.

4.5.3 Nutritional status of women

There were 797 women participating in the survey. The drop-out rate was 5 % mainly because they were not present at the survey time. The average age of the women in the survey was 32 years. Eighty percent of the women had children that were alive and 46 % of those that had given birth said they have 1 to 9 children that died. Eight percent (n=63) of the women said they were pregnant and they are not included in the BMI results and they are analysed separately regarding anaemia.

BMI

For the non-pregnant women BMI (body mass index) was calculated. BMI is an indicator on the body size. Normal BMI from 18.5 to 25 means that if a person has a size that is in this range they are in less risk to get ill. Lower (too skinny) or higher (too fat) BMI are both giving risk for different illness.

The BMI was categorised as underweight (BMI<18.5), normal range (BMI 18.5-24.99), overweight (BMI 25-29.99) and obese (BMI ≥30).

The non-pregnant women had an average BMI of 24.5. Figure 17 show that 44 % had a BMI in the normal range (BMI 18.5-24.99), 9 % were possible undernourished (BMI < 18.5) while

27 % were overweight (BMI 25–30) and 20 % were obese (BMI >30) meaning that 47 % was categorized as obese or too fat. There were no significant differences between the camps.

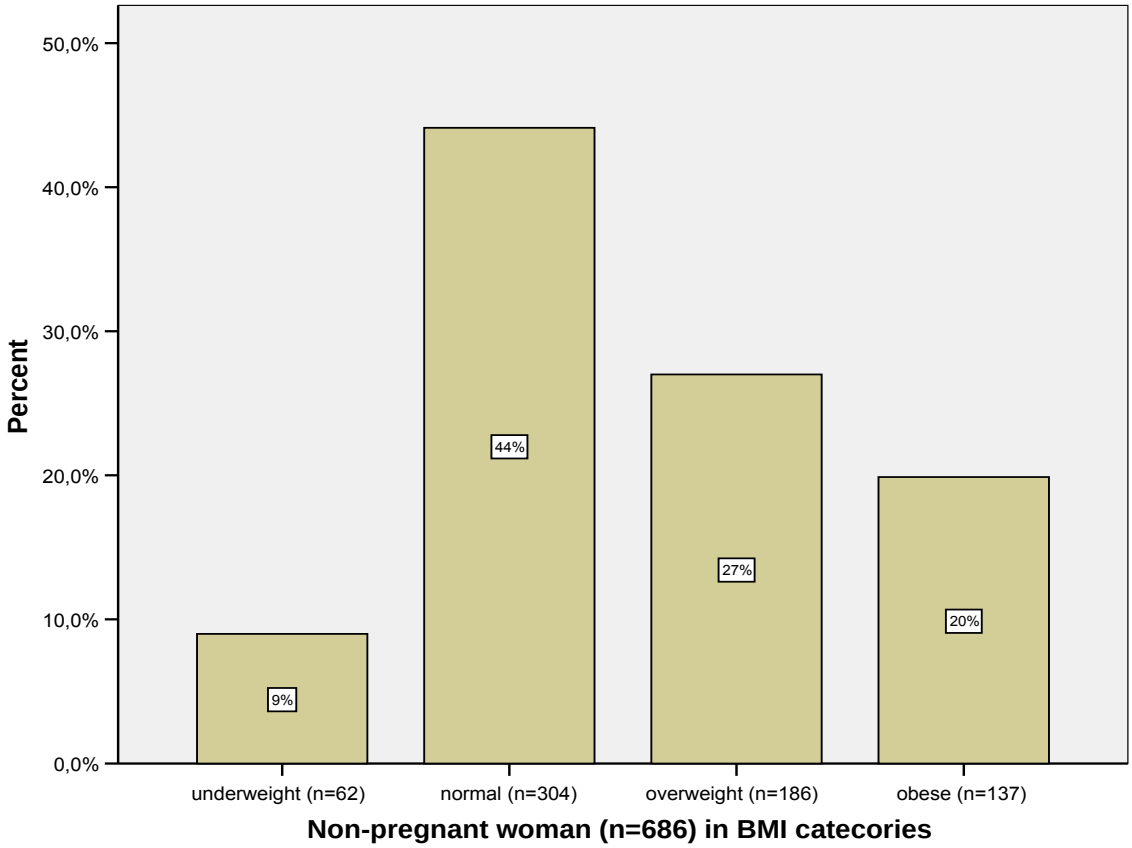

Figure 17 Proportion of non-pregnant women (15-49 years) in different BMI categories, Saharawi refugee camps, March 2008

MUAC

The pregnant women were measured by MUAC. MUAC for the pregnant, less than 21 cm can be regarded as underweight and usually they will be admitted to supplementary feeding[14]. Seventy one percent of the pregnant women (n=45) were measured with MUAC and none was less than 21 cm, but 16 % were between 21 and 25 cm around their upper arm and the rest had MUAC > 25 cm.

Haemoglobin

The median haemoglobin level among the non-pregnant women was 11.3 g/dl (min 4-max 18.2 g/dl). Table 20 shows that 54 % of the non-pregnant women were anaemic with 11 %, 28 % and 15 % classified with respectively severe, moderate and mild anaemia. In Smara the women had significant better haemoglobin levels (11.6 g/dl) than in the other camps. According to WHO (2001), a prevalence of anaemia of more than 40 % is considered as a significant public health problem.

[14] Community-based Therapeutic Care (CTC). Valid International, 2006

Table 20 Percent of non-pregnant women (15-49 years) in the different categories of anaemia, Saharawi refugees, March 2008

Camps	Categories of anaemia Percent of non-pregnant women (15-49 years)			
	Severe <8 g/dl	Moderate 8 -10.9 g/dl	Mild 11-11.9 g/dl	Normal ≥12 g/dl
Smara n=172	10 %	22 %	15 %	54 %
El Aiune n=169	10 %	27 %	18 %	45 %
Ausserd n=179	11 %	33 %	13 %	43 %
Dakla n=174	14 %	32 %	15 %	39 %
Total n=694	11 %	29 %	15 %	45 %

For the pregnant women the median haemoglobin level was 9.7 g/dl (min 5.7-max 15.0 g/dl). Table 21 shows that 66 % of the pregnant women were anaemic with 15 %, 36 % and 15 % classified with respectively severe, moderate and mild anaemia. There were no significant differences between the camps even though Smara had more women with normal Hb than the others.

Table 21 Percent of pregnant women (15-49 years) in the different categories of anaemia, Saharawi refugees, March 2008

Camps	Categories of anaemia Percent of pregnant women (15-49 years)			
	Severe <7 g/dl	Moderate 7 -9.9 g/dl	Mild 10-10.9 g/dl	Normal ≥11 g/dl
Smara n=17	12 %	24 %	24 %	41 %
El Aiune n=11	0 %	46 %	18 %	36 %
Ausserd n=14	21 %	36 %	7 %	36 %
Dakla n=17	24 %	41 %	12 %	29 %
Total n=59	15 %	36 %	15 %	34 %

4.5.4 Causes of anaemia among women

Causes of anaemia among women can be difficult to establish but in this survey we have tried some hypothesis such as issues regarding pregnancy and children, the women's health situation, and food habits and intake.

Figure 18 show that the severe anaemic non-pregnant women had significant lower BMI than both moderate and mild anaemia and the normal. At the same time the moderate and mild anaemic also had significant lower BMI than the normal. This differ from a survey in 2007[15] were there was found no differences between the groups.

[15]MoHSaharawi/NCA/AUC (March 2008). Prevalence of goitre and evaluation of food intake among Saharawi refugees in camps in Tindouf, Algeria.

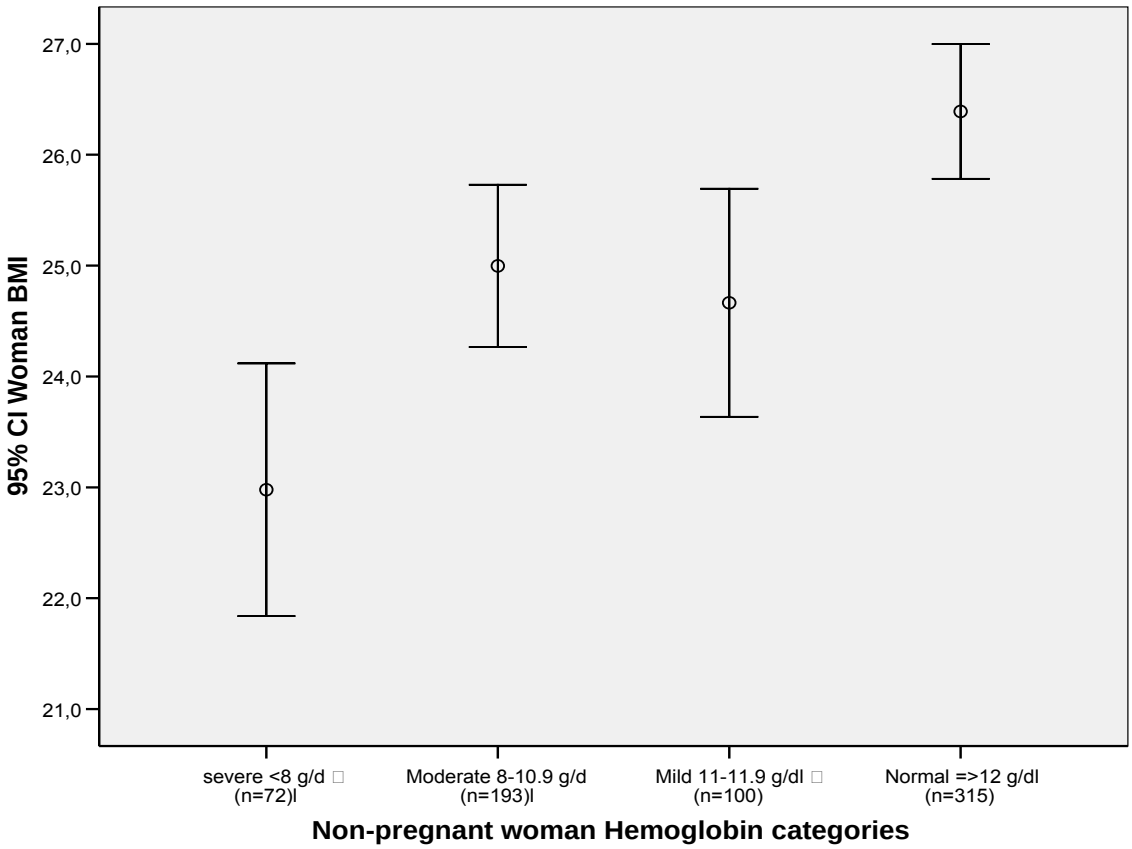

Figure 18 Effect of non-pregnant women's (15-49 years) different haemoglobin categories on the BMI, Saharawi refugee camps, March 2008

Those women that suffered from celiac disease (2%, n=17) had a significant lower BMI than the others but not lower haemoglobin.

Those women which said they suffered from cardiac disease (20 %, n=159) had significant higher BMI than those that did not. Those suffering from pneumonia had significant higher Hb than those not. For the other illnesses such as diabetes and night blindness there were no significant differences in BMI or Hb.

The women were asked if they had given birth or not. This information gave no differences in haemoglobin level nor did the numbers of children they had. What made differences was if she was pregnant (median Hb 9.9 g/dl vs. 11.3) or if she was breastfeeding (median Hb 10.8 g/dl vs. 11.4) at present.

The survey showed also that age of the last born child of the non-pregnant women made a difference. Figure 19 show differences between the groups, those with children less than 5 years were significant more anaemic than those with older children. The figure also show that those women that have given birth the last 2 years are those most affected by anaemia.

Also the age of the women seems to have a role; those less than 20 years and those elder than 40 had a significant higher median haemoglobin than the others (see figure 20).

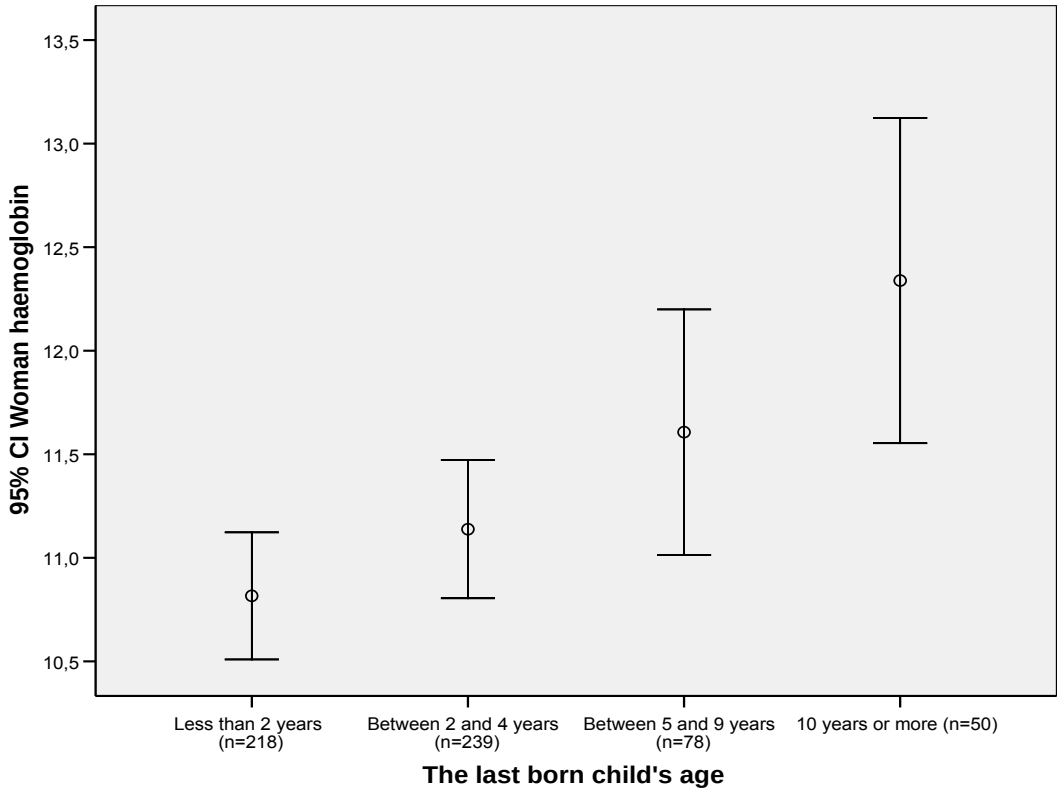

Figure 19 Effect of the last born child's age on non-pregnant women's (15-49 years) level of haemoglobin, Saharawi refugee camps, March 2008

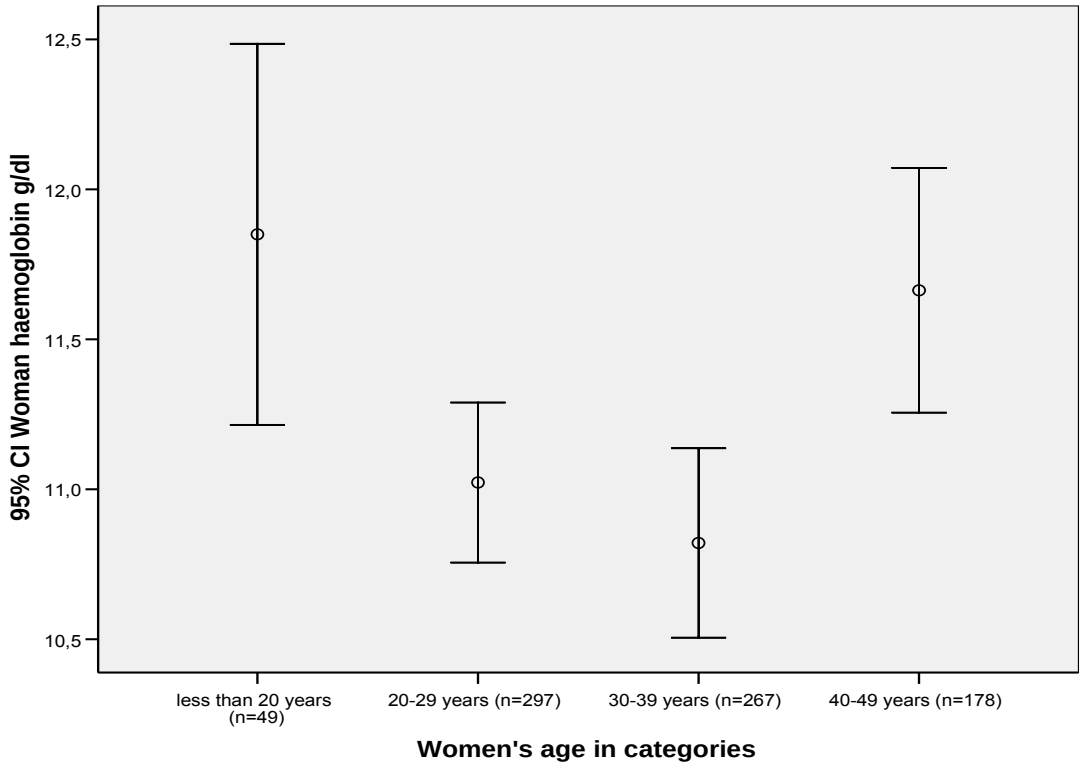

Figure 20 Effect of the women's age on the level of haemoglobin, Saharawi refugee camps, March 2008

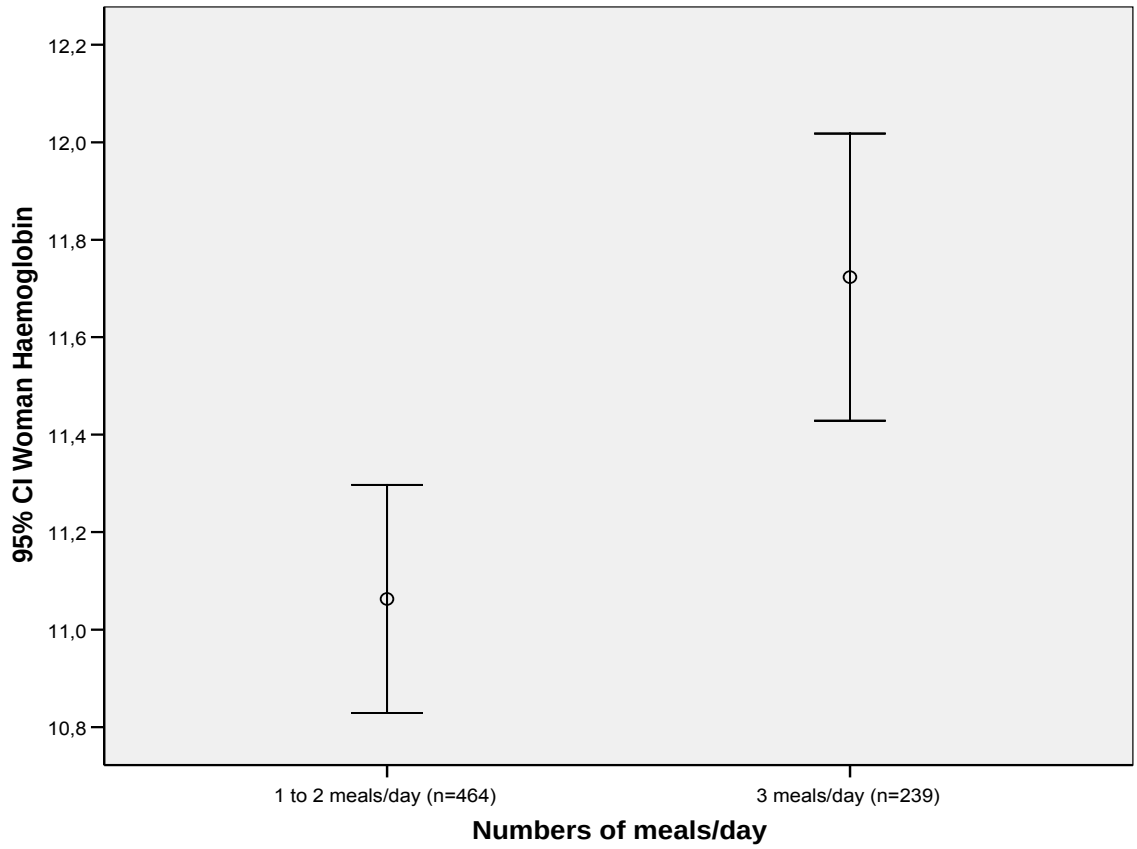

Figure 21 Effect of numbers of meals per day on non-pregnant women's (15-49 years) level of haemoglobin, Saharawi refugee camps, March 2008

Another important thing that seemed to affect the level of haemoglobin was the numbers of main meals the women eat per day. Figure 21 show significant differences between those that said they had had 1 or 2 meals and those that had 3. This is the same that was found for the children.

The food intake was also for the women measured by asking about the last 7 days intake (7 d recalls). The mean (±SD) of the individual dietary diversity score (IDDS) was 5.6 (±1.39).

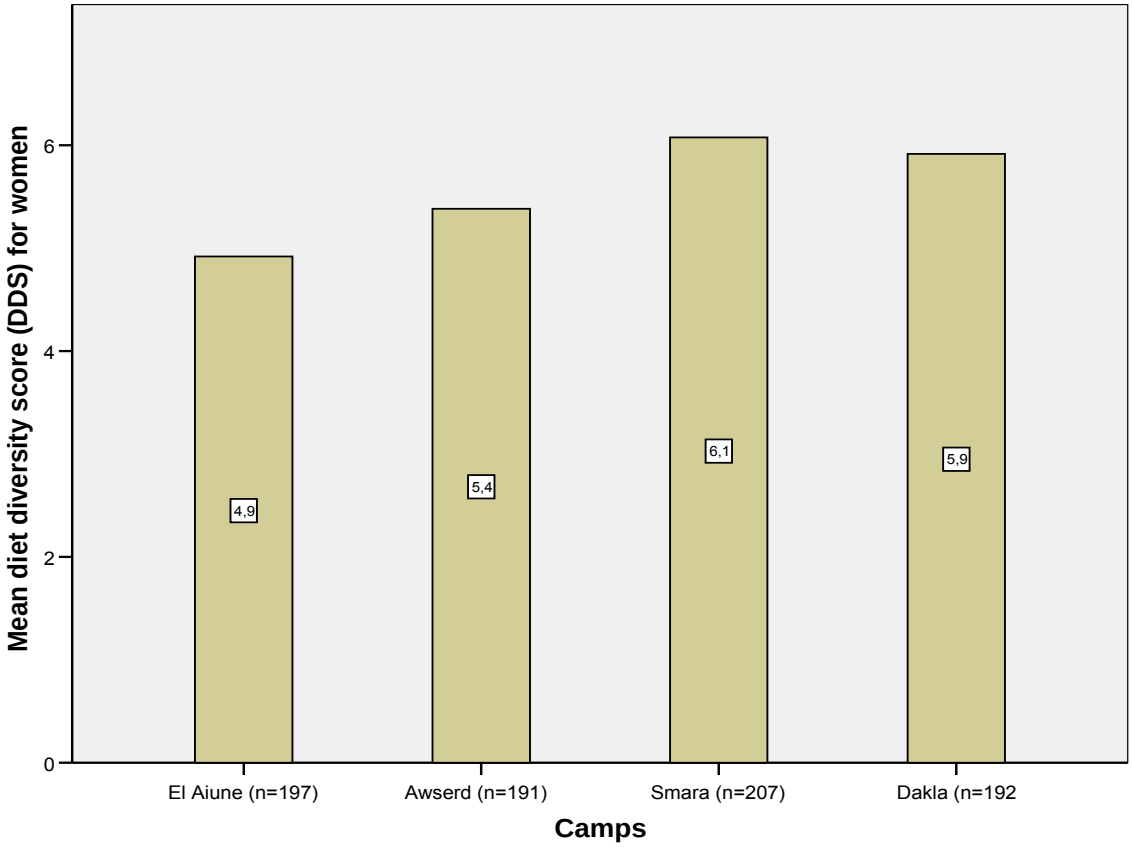

Figure 22 Women's mean individual dietary diversity score (IDDS) from a 7 days intake interview, divided in camps, Saharawi refugee camps, March 2008

Figure 22 show significant differences between the camps. Women in El Aiune had significant lower diet diversity than all the other camps. But also in Ausserd had the women significant lower diet diversity than in Smara and Dakla. Between Smara and Dakla were there no significant differences

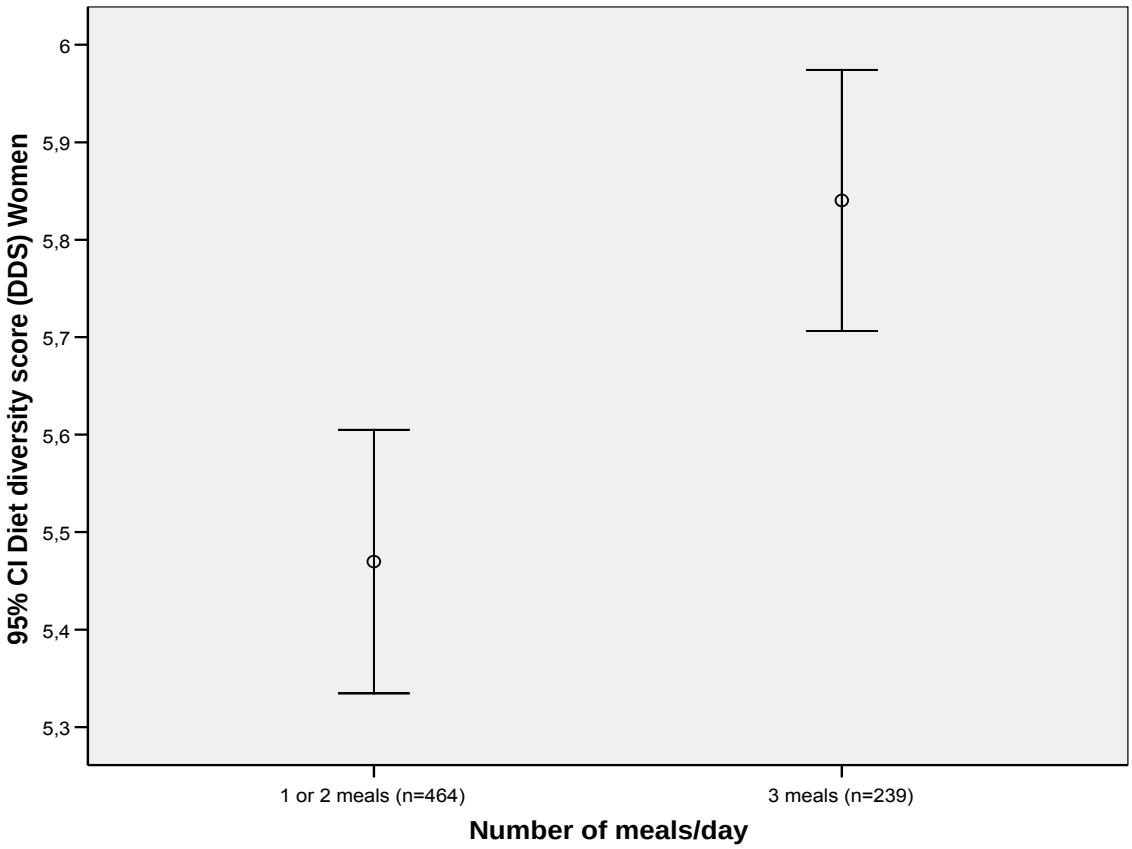

Figure 23 Numbers of women's meals/day on the mean individual dietary diversity score (IDDS), Saharawi refugee camps, March 2008

Number of meals per day affected the diet diversity score significant, as shown in figure 23. The survey did not show that the level of IDDS had any influence on the level of haemoglobin.

When the food groups was divided in simple food items, the data show that carrot, potato and jam had positive effect on the haemoglobin level and neither lentils nor tea showed significant effect.

5 Discussion and recommendations

5.1.1 Demography and living condition

It was 215 households that were selected for the survey and the average size of 18 members was much higher than expected. The average number of both women in child bearing age and children under 5 years in the households was 5. Also this was surprising high and should be taken into account with the next sampling selection.

The head of the household was all women (with exception of one) more than 40 years and with low education. For the women selected for the survey the literacy was better; 71 % of them reported to know how to read and write, but only 53 % had fulfilled primary school. This stat of illiteracy is necessary to have in mind when health and nutrition information is given.

The majority of the households had both tent and brick structures and 84 % had toilet facilities and the rest used the dessert, the most of these households were in Dakla. Soap was distributed with the ration but 85 % of the head of the households said they used soap only sometimes, and the reason was that they did not have enough from the ration and that it was expensive to buy. Only half of the households cleaned their water containers once a month. This situation is bad and it is important to arrange for sufficient outfit and information so people can practise a good hygiene.

Due to limitations in the methodology it was not easy to determine income and expenditure patters. However from the ones that did answer the questions it was clear that the main source of income was from savings. Most of the households' expenditures fall under the category of food and cloth. The data analysis showed that most frequently purchased commodities in the camps were meat, tea, tomato, cereal, canned fish and onion. The mean expenditure rate for purchasing of food commodities and clothing during last month were 232 and 236 Dinars respectively.

5.1.2 Household food security and individual food intake

The refugees are dependent of food aid and at the time of the survey the food distribution was irregular and insufficient. The food ration from WFP had the last year consisted of wheat flour, rice, pulses, sugar (+ Wheat soya blend for the children and enriched biscuits for school children), from UNHCR also yeast and tea and from ECHO and others it has been distributed pasta, tuna fish, potato, onion, carrot and fruit. During and after Ramadan it has also been distributed dates and camel meat. The amount has varied, some months no rice, half rations of wheat flour, no oil, maybe wheat flour but no yeast, bad quality lentils and so on. The refugees could never know how the food situation would be next week or month.

About 43 % of the households reported having any livestock and most of them had 1-2 goats/sheep. More than half of the women and children had drunk milk from the local animals. Very few of the households reported having a vegetable garden.

The food consumption score (FCS) at household level showed that 15 % of the households was defined to have poor consumption. Limiting of portion size, adults reducing their portions in order for children to have more and relying on less expensive or not preferred food appeared to be most widely and frequently used coping strategies among the households. Around 60 % of the interviewed households use this tactic almost daily.

At the individual level 42 % of the children ate from 4 or less of 11 food groups and 45 % of the women ate from 5 or less. The food groups they consumed from were the basic diet such as cereals, lentils, oil, tea, and onion and potato. All the food items were those given in the

rations and even though the refugees now also got some vegetables and fruit, is it not enough to bring the refugees out of the stat of poor dietary intake.

Recommendations

The fresh food distribution is a positive development and should be sustained to the extent possible. Also the dry food pipeline should to the extent possible be kept full so that pipeline breaks are avoided. As recommended in the JAM in 2007 a food security stock to cover 3 months distribution should be re-established.

5.1.3 Children

The prevalence of global acute malnutrition (GAM Z-scores) increased from 8 % in 2005 to 19 % in this survey 2008 (the NCHS 1977 reference) but 18 % according the new WHO 20005 standard. Severe acute malnutrition (SAM Z-scores) increased from 2 % to 3 % (the NCHS 1977 reference) but 5 % according the new WHO 20005 standard. When using MUAC, SAM and GAM were 0.7 % and 7.1 % respectively. The Saharawi authorities, via MdM, have already started treating severe acute malnutrition. This is a CTC approach, integrated in the existing health system (dispensaries), where the main focus activity is on finding, diagnosing and treating the severely acute malnourished children with Plumpynut.

One of the problems that the authorities faced was what kind of criteria to use when defining children as malnourished, due to the differences in prevalence. The CTC-activity are using MUAC < 11 cm as admission criteria but when the first phase is finished, the authorities has decided that the admission criteria should change from MUAC < 11 cm to SAM z-score <- 3.

The survey showed that it was the younger children that suffered from acute malnutrition and the elder from chronic. This is common but a problem. For treating the acute malnutrition it is important to start as soon as the condition has been revealed and before it become severe, and the age does not matter. Also for chronic malnutrition it is important to start as soon as it is revealed, but research[16] has shown that after the age of 2-3 years, the stunting condition is difficult to reverse and that too rapid weight gain can increase the risk for illness as diabetes 2 and cardiovascular disease in adult life. But both acute and chronic malnutrition can be prevented and it is important to not stop feeding the children with supplementary food as WSB. As long as the problem with the chronic malnutrition persist also this children has to be treated and followed.

The anemia among the children was reduced from 2005 when it was 68 % but it was still high, 62 %. It was still the youngest (6 -30 months) that was most affected and according to WHO (2001) is it considered as a significant public health problem if a prevalence of anaemia is more than 40 %. Among the Saharawi children up to 2-2 ½ years, the prevalence was around 80 %. This is not surprising and can probably be explained due to the poor quality of the complementary feeding and the feeding practises. It was also differences between the camps. Smara had significant lower prevalence (but still high 44 %) of both severe and moderate anemia among the children than the other camps. Calcium can inhibit the absorption of iron and samples of the drinking water were analyzed for, among others, calcium content in 2007[17]. Any of the water sources had levels over the Algerian recommendations of 200 mg/L.

[16] Maternal and child undernutrition: consequences for adult health and human capital Cesar G Victora, Linda Adair, Caroline Fall, Pedro C Hallal, Reynaldo Martorell, Linda Richter, Harshpal Singh Sachdev, for the Maternal and Child Undernutrition Study Group. Lancet 2008; 371: 340–57

[17] MoHSaharawi/NCA/AUC (March 2008). Prevalence of goitre and evaluation of food intake among Saharawi refugees in camps in Tindouf, Algeria

Though Smara had least calcium in the water, this difference is not enough to explain why Smara children had less anaemia than in the other camps.

The main causes of malnutrition (including anaemia) among the children were found to be inadequate food intake and diarrhoea.

The reason why it was inadequate food intake was both the lack of variety but also the amount. We know that during the last couple of years pipeline breaks and disputes over number of beneficiaries have been affecting the food supply in the refugee camps. When 90 % of the children only had eaten two meals or less the day before the survey, and that few meals was shown to affect negatively both the acute and chronic malnutrition and anaemia, it is shown that lack of food is a major cause of the increase malnutrition rates. But the concern around the feeding habits should also be taken serious. The population has to be informed about how important it is to feed the children often enough. So it is important that in the future the food is delivered on time and in the correct amount and that nutrition information about child feeding is continuing.

Also diarrhoea affected the nutritional status negatively and improving the hygiene to prevent diarrhoea is another effective way to improve the health of the children.

Recommendations

The advises when it comes to food for prevention of malnutrition and anaemia is that the children should be given diversity of food; different kind of cereals; milk and milk products; vegetables; fruit; meat; egg and oils. As long as the diversity of food is not sufficient, fortified food as WSB should be given as prevention of malnutrition and anaemia to all children (blanket) under 3 or 5 years depending on the recourses. Even though the tea was not found to have any negative effect on anaemia or the other indicators, the children should not have too much of that or soft drinks, chocolate, candy and other sweets because it can oust other healthy foods and it can also gives undesirable problems with overweight. Also, action should be taken in terms of diarrhoea prevention, focusing in the sources of contamination, particularly in food and drinking water.

The dispensaries in the camps are used both for mother and child control (MdM), growth monitoring and vaccination (Niño Sano), and treatment of severe (MdM) and moderate malnutrition (WFP). The work has been reinforced by using local technical nutritionists from the hospitals[18] and this should continue. Not all dispensaries function at the same level and it is important that the work both continue and is improved. *The work should be expanding to also hosted prevention of malnutrition and giving nutrition as well as hygiene training and message. All staff at the dispensaries needs training at different levels and this should be taken into account when the Saharawi National Nutrition Programme is developed. The activities designed to train mothers should be reviewed and reinforced, particularly in terms of feeding and hygienic practices (eg. Exclusive breastfeeding, complementary feeding, hand-washing before eating, etc.).*

5.1.4 Women

Even though some messages such as length of breastfeeding and initiating of breastfeeding after delivery seem to have trickled down and become a practice among the women there is clear evidence that more nutrition education is needed. Some examples are that most women

[18] Trained by NCA to work in the nutrition program at the hospitals.

reported having eaten less than usual during pregnancy and that the children were only feed twice a day.

The anaemia among the women is a persistent problem and the survey showed that it was the age group from 20 to 40 years that was most affected. Women that was pregnant or breastfeeding was also especially vulnerable. The survey also revealed that the age of the last child mattered, meaning that the space between the births is important. Activities that are directed towards these groups have to take into account that one of the reasons for the anaemia was that the women was not eating in a proper way, not according to the quantity nor the quality.

Recommendations

In view of the data, there is a clear need for an strategy to fight anaemia. To treat the anaemia it is necessary to give iron supplementation and all the women of reproductive age, and particularly the pregnant and lactating women, have to be made aware of the serious situation they are in. It is also critical that adequate food is available such as meat contain iron that effect the haemoglobin directly, fruit, juice and vegetables containing vitamin C that help the absorption of iron from other foods, as well as fish (canned or fresh) that helps on the absorption of iron. Also WSB contain iron and is special good for prevention of anaemia. Giving iron supplementation together with some iron absorption food items and nutrition and health information should be one of the strategies to fight the anaemia among both women and children.

Overweight and obesity among women are also an issue of concern due to the health implications and awareness about this issue should be raised. It should be considered in the Nutrition strategy too.

Various NGOs and agencies have their projects and plans in place. There is an urgent need for a joint strategy to tackle the longstanding problem of malnutrition both among the children and women in the camps.

There is a need of a Saharawi National Nutrition Programme with strategies where all the agencies have joint objectives, outcomes and indicators. The formation and implementation of such global strategies should be coordinated by MoH.

Assignment of Clusters

Geographical unit	Population size	Assigned cluster
Amgala	5827	1,2,3
Dchera	5311	4,5
Daoura	5959	6,7
Hagounia	5543	8,9
Bucraa	6065	10,11
Guelta	5847	12,13,14
Aguenit	4160	15
Tichla	4519	16,17
La gouera	5399	18,19
Biz-Ganduz	4654	20,21
Miyek	4911	22,23
Zug	4418	24,25
B. Lehlu	4345	26
Mahbes	4887	27,28
Farsia	5540	29,30
Ejdeira	5584	31,32,33
Hauza	5303	34,35
Tifariti	4905	36,37
Mheiriz	4609	38
27 de feb	5375	39,40,41
Bir-Enzaran	2752	42
Ain-el-Beida	2325	43
Gleibatt el Foula	3048	44
Bujdur	2861	45
Umdreiga	3437	46
El-Argub	2551	47
J'Refia	2954	48

Household Questionnaire
Mortality and nutrition survey in the Saharawi camps, February-April 2008

Date : |__|__| / |__|__| / **2008**
Day *Month*

Interviewer ID : |___|___|

Team number: |___|

Time: **Start** |___|___|:|___|___| **Stop** |___||___|:|___|___|

Household ID :
|____| |_____|_____| |_____|_____|
Camp *Cluster* *Household*

|_____|
Daira

Camp code
1 = Aiun **2** =Awserd **3** = Smara and 27th **4**=Dakla

Consent: We are conducting a survey on the nutrition and health situation in the camps. I would like to ask you some questions about your household. We will also weigh and measure all the children who are younger than 5 years of age and the women in your household that are 15-49 years old. Any information given will be kept strictly confidential and does not contain any names. This is voluntary and the household can choose not to answer any or all of the questions; however we hope that you will participate since your views are important. Do you have any questions? May I begin now?

YES_____ NO_____

Codes: 97= I have not asked
98= They don't want to answer
99= They do not know

SECTION 1– DEMOGRAPHICS

A household is defined as a group of people who routinely eat, cook and have the same ration.
Household members that work and stay occasionally outside the current location, but do eat with the household while present, should be included.

1.1-	What is the sex of the household head?		1	Female
			2	Male
1.2-	What is the marital status of the head of the household?		1	Married
			2	Divorced
			3	Living apart not divorced
	5.1.5 CIRCLE ONLY ONE OPTION		4	Widow or widower
1.3-	Highest level of education of household head		1	None
			2	Non formal
			3	Less than 6th grade
			4	Up to 6th grade (primary school)
			5	7th to 9th grade (secondary school)
			6	10th to 12th grade (High school/vocational studies)
			7	Higher education
1.4-	How many adults (18-59 years) in your household are engaged in some type of economic activity?		|_|_|	
1.5-	Total number of people currently living in the household, in total |_|_|	**Males**	Age in yr 0to5: |_|_|; 5< >15: |_|_|; 15< >49: |_|_|; 49+: |_|_|	
		Females	Age in yr 0to5: |_|_|; 5< >15: |_|_|; 15< >49: |_|_|; 49+: |_|_|	
1.6-	How many children have been born since the congress in December?		|___|___|	
1.7-	How many people have joined the household since the congress in December?		|___|___|	
1.8-	How many of the people who have joined the household are children under 5 years of age ?		|___|___|	

1.9-	How many people have left the household since the congress in December?	|___|___|
1.10-	How many of the people who have left are children under 5 years of age?	|___|___|
1.11-	How many people in total have died since the congress in December?	|___|___|
1.12-	What was the cause of death? **(Choose from the list below, please choose only one code per person)**	|___| |___| |___|
1.13-	How many of the people who died were children under 5 years of age?	|___|___|
1.14-	What was the cause of death? **(Choose from the list below, please choose only one code per person)**	|___| |___| |___|

Codes for Causes of Death of adults	**Cause of Death**	**Descriptions of causes of death**
1	*Cardio vascular diseases*	▪ 'Any cardiac problems'
2	*Diabetes*	▪ As per medical diagnose
3	*Cancer*	▪ As per medical diagnose
4	*'Pnemonia'*	▪ Any respiratory disease
5	*Complications during delivery*	▪ Any death just before, during or after delivery
6	*Other*	▪ Death cause by any of other factors than the ones listed above, including accidental death.

Codes for causes of death of children under 5	**Cause of death**	**Descriptions of causes of death**
1	Diarrhoea	• Any episode of three or more watery stools per day
2	Acute Respiratory Infection (ARI)	• Any infection in the respiratory system
3	Malnutrition	• Any individual presenting with swollen appearance (bilateral oedema) and/ or excessive thinness (wasting)
4	Complications during delivery	• Any perinatal death
5	Mening encephalitis	• Any infection of the brain and the menings
6	Other	• Death caused by any other factors than the ones listed above, including accidental death

Household Questionnaire
Mortality and nutrition survey in the Saharawi camps, February-April 2008

Interviewer ID : |___|___|

Household ID : |____| |_____|_____| |_____|_____|

Camp *Cluster* *Household*

Camp code
1 = El Aiun **2** =Awserd **3** = Smara and 27th **4**=Dakla

Codes: 97= I have not asked
98= They don't want to answer
99= They do not know

SECTION 2 – HOUSEHOLD INFORMATION

2.1-	What type of housing are they living in? **Enumerator Observation**	1	Tent
		2	Tent and brick structures
		3	Brick structures
2.2-	How many tents/ rooms (not including the bathroom and kitchen) does you household have?	|___|___|
2.3-	What is the main source of drinking water for your household? **(In option number 1 and 3 ask about bore holes Smara, 27th feb and Awserd ask about bore holes and wells for Dakla and Aiun)**	1	From well/bore hole and stored in container by the house
		2	From the common tap and stored in container by the house
		3	From well/ bore holes by the house
		4	Directly from the common tap
		5	From vendor
		6	Other _____
2.4-	How often do you clean your water container?	1	Never
		2	Once per week
		3	Once per month
		4	Once per year
		5	Less than once per year
		6	Other: Once every_____
2.5-	Where do the people in your house go to the toilet? **5.1.6 Circle the main option**	1	Pit latrine/ open pit
		2	Cement latrine
		3	Ceramic latrine
		4	Desert
		5	Other _____
2.6-	Does your household have its own toilet? **If yes, go to 2.8**	1	Yes
		2	No
2.7-	If no, who many other households do you share with?	|___||___|
2.8-	When did you last receive soap?	1	___||___ weeks
2.9-	When do you wash your hands? **Circle all the answers given**	1	Before eating
		2	After going to the toilet
		3	After handling animals
		4	Before cooking
			Other: _____
2.10-	Do you use soap when you wash your hands? **If yes, go to section 3.**	1	Yes
		2	No
		3	Some times
2.11-	If you do not use soap, why not? **Circle all the answers given**	1	Don't have soap in the HH
		2	Did not receive as part of the ration
		3	Too expensive

		4	Not available in market/ shop
		5	Other:

Codes: 97= I have not asked
98= They don't want to answer
99= They do not know

SECTION 3 – SOURCES OF INCOME / HOUSEHOLD ASSETS

Please complete the table.		During the **last 3 (three) months**, what were your household's most important income sources? (use income source codes, up to two sources)			
3.1-	Most important	|__|__|			
3.2-	Second	|__|__|			
Income source codes:		1 = Formal work 2 = Informal work 3 = Remittance 4 = Own Business		5 = savings 6 = Loan 7 = Gifts	
3.3-	Which of these assets you have?	1 = car	2 = refrigerator	3 = Color TV set	|___|___|

SECTION 4 – HOUSEHOLD FOOD PRODUCTION

4.1-	How many of the following animals do your family currently own?	1	None
		2	Goats |___|___|
		3	Camel |___|___|
		4	Chicken and hens |___|___|
		5	Other: |___|___| |___|___|
4.2-	Which of the following fruits and vegetables do you grow in your kitchen garden?	1	None
		2	Tomatoes
		3	Onions
		4	Carrots
		5	Pepper
		6	Turnip
		7	Other:

Household Questionnaire
Mortality and nutrition survey in the Saharawi camps, February-April 2008

Interviewer ID : |___|___|

Household ID : |____| |_____|_____| |_____|_____|
Camp *Cluster* *Household*

Camp code
1 = El Aiun **2** =Awserd **3** = Smara and 27th **4**=Dakla

Codes: 97= I have not asked
98= They don't want to answer
99= They do not know

SECTION 5 – HOUSEHOLD EXPENDITURE & DEBT

		Monetary expenditure **during the last 1 (one) month (in Algerian Dinares or in Duros)**
5.1-	Education, school	|_____|(AD); |_____| (Duro);
5.2-	Fuel for cooking?	|_____|(AD); |_____| (Duro);
5.3-	Medical expenses, health care	|_____|(AD); |_____| (Duro);
5.4-	Clothing, shoes	|_____|(AD); |_____| (Duro);
5.5-	Repayment of debts	|_____|(AD); |_____| (Duro);
5.6-	Remittance to relatives and friends	|_____|(AD); |_____| (Duro);
5.7-	Social events (i.e. expenditure during weddings, funerals, etc.)	|_____|(AD); |_____| (Duro);
5.8-	Food	|_____|(AD); |_____| (Duro);
5.9-	Telephone use	|_____|(AD); |_____| (Duro);
5.10-	Transport (not included above) including travel abroad	|_____|(AD); |_____| (Duro);

5.11-	During **the past 3 months**, did you or any member of your household borrow money? **If no, go to Section 6**	1 = Yes	2 = No	|__|__|

5.12-	If yes why did you borrow?	1 = To buy food	5 = To pay for education
		2 = To pay for health care	6 = Other
		3 = To cover expenses on cattle/farm	|__|__|
		4 = To start a business	

Codes: 96= They still have food left from previous distribution
97= I have not asked
98= They don't want to answer
99= They do not know

SECTION 6 – COPING STRATEGIES

In the **last month**, how frequently did your household resort to using one or more of the following strategies in order to meet your household's needs? **MARK ONE ANSWER PER STRATEGY**

		Never	Seldom (1-3 days / month)	Sometimes (1-2 days / week)	Often (3-6 days / week)	Daily
6.1-	Skip entire day without eating					
6.2-	Limit portion size at meal times					
6.3-	Reduce adult consumption so children can eat					
6.4 -	Borrow food from friends or relatives					
6.5-	Rely on less expensive or less preferred food					
6.6-	Purchase or borrow food on credit					
6.7-	Send household members to eat elsewhere					
6.8-	Accept help from friends/relatives that have collected					
6.9-	Other coping strategies, mention |_____|					

SECTION 7 – FOOD AID

7.1-	a) When (in weeks) did you receive the following food as food aid?		b) How long did it last?
7.1.1- Wheat		|_____| Weeks	|_____| weeks
7.1.2- Rice		|_____| Weeks	|_____| Weeks
7.1.3- Spaghetti		|_____| Weeks	|_____| Weeks
7.1.4- Lentils/ beans		|_____| Weeks	|_____| Weeks
7.1.5- Tuna		|_____| Weeks	|_____| Weeks
7.1.6- Vegetable oil		|_____| Weeks	|_____| Weeks
7.1.7- WSB		|_____| Weeks	|_____| Weeks
7.1.8- Sugar		|_____| Weeks	|_____| Weeks
7.1.9- Tea		|_____| Weeks	|_____| Weeks
7.1.10- Fruits (apple and orange)		|_____| Weeks	|_____| Weeks
7.1.11- Vegetables (carrots and potatoes)		|_____| Weeks	|_____| Weeks

7.2-	Did you exchange or sell any of the commodities you received as food aid? **If no, finish the questionnaire**	1	Yes
		2	No
7.3-	If yes, what did you sell/exchange? **Circle all the answers given**	1	Cereals
		2	Pulses
		3	Oil
		4	Sugar
7.4-	If yes, why did you trade or sell them? **Circle all the answers given**	1	To obtain other/preferred food stuffs
		2	To obtain cash to buy animals
		3	To obtain cash for food for animals
		4	Other:

Questionnaire for Women 15-49 years
Mortality and nutrition survey in the Saharawi camps, February-April 2008

Date : |__|__| / |__|__| / **2008**
Day *Month*

Interviewer ID : |___|___|

Time: **Start** |___|___|:|___|___| **Stop** |___||___|:|___|___|

Woman ID : |____| |_____|_____| |_____|_____| |____|____|
Camp *Cluster* *Household* *Woman*

Camp code
1 =Aiun **2** =Awserd **3** = Smara and 27th **4**=Dakla

Codes: 97= I have not asked
98= They did not want to answer
99= They do not know

SECTION 5 – QUESTIONNAIRE FOR WOMEN AGED 15-49 YEARS

This section should be filled out for the women aged 15-49 years. If more than one woman lives in the household fill out ONE form for EACH woman.

5.1-	How old are you?		|__|__|
5.2-	Marital status?	1	Married
		2	Not married
		3	Divorced
		4	Widowed
5.3-	Do you know how to write?	1	Yes
		2	No
5.4-	Do you know how to read?	1	Yes
		2	No
5.5-	How long education do you have?	1	None
		2	Less than 6th grade
		3	Up to 6th grade (primary school)
		4	7th to 9th grade (secondary school)
		5	10th to 12th grade (High school/vocational studies)
		6	Higher education
5.6-	Are you pregnant?	1	Yes
		2	No
		3	Don't know
5.7-	How many children do you have? **If none, write 0 and go to 5.10**	Alive |___|___|	Dead |___|___|
5.8	How old are they? **Write the age of each one, starting with the youngest**	|__|__| |__|__| |__|__| |__|__| |__|__| |__|__| |__|__| |__|__| |__|__| |__|__| |__|__| |__|__|	
5.9-	Are you currently breastfeeding?	1	Yes
		2	No
5.10-	Do you suffer from night blindness (use local term)?	1	Yes
		2	No
		3	Don't Know
5.11	Are you suffering from any of the following conditions? **Read all options and circle all options given**	1	Anemia
		2	Diabetes
		3	Cardiac diseases (hypertension)
		4	Celiac disease
		5	Pneumonia
		6	Other :
		7	No
5.12-	Have you had diarrhoea in the last 2 weeks? (Diarrhoea is three or more loose or watery stools per day)	1	Yes
		2	No

5.13-	Are you getting any of the following foods from the dispenseria?	1	WSB
		2	Plumpy nut
		3	No
5.14	Are you currently taking iron supplements in capsules/liquid?	1	Yes
		2	No
5.15	Are you currently taking Vitamin A supplements in capsules?	1	Yes
		2	No

Questionnaire for Women 15-49 years
Mortality and nutrition survey in the Saharawi camps, February-April 2008

Date :	|__|__| / |__|__| / **2008** *Day* *Month*
Interviewer ID :	|___|___|
Woman ID :	|____| |_____|_____| |_____|_____| |____|____| *Camp* *Cluster* *Household* *Woman*

Camp code
1 = El Aiun **2** =Awserd **3** = Smara and 27th **4**=Dakla

Codes: **97= I did not measure**
98= They do not want to participate

Anthropometry for women 15-49 years

If the woman is pregnant, measure the MUAC. If not measure height and weight

5.16a-	Weight	|__|__|.__| kg	
5.16b	Estimated weight of clothes	1	1 kg
		2	2 kg
5.17-	Height	|__|__|__|.__| cms	
5.18-	MUAC	|__|__|.__| cms	
		|__| more than 25 cm	
5.19-	Hb measured with Haemocue	|__|__|.__|	
5.20-	Does this woman need referral?	1	Yes
		2	No

Cut off points for anemia in women

	Total	Mild	Moderate	Severe
Women of child bearing age ≥15	<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

Cut off points for MUAC of pregnant women

	Moderate
Pregnant women	<21 cm

Questionnaire for children under 5 year of age
Mortality and nutrition survey in the Saharawi camps, February-April 2008

Date : |__|__| / |__|__| / **2008**
Day *Month*

Interviewer ID : |___|___|

Child 1 ID: |____| |_____|_____| |_____|_____| |____|___| |___|
Camp *Cluster* *Household* *Woman* *Child*

Child 2 ID |____| |_____|_____| |_____|_____| |___|___| |___|
Camp *Cluster* *Household* *Woman* *Child*

Codes: 94= This child is not linked to any woman (i.e. orphan, mother living abroad, child living with relatives)
95= They have not eaten/drunk this
97= I have not asked
98= They don't want to answer
99= They do not know

SECTION 6 – CHILD NUTRITION - 6MONTHS TO 5 YEARS

	Questions for adult caretaker of child		CHILD 1		CHILD 2
6.1-	Relationship of respondent to child	1	Mother	1	Mother
		2	Father	2	Father
		3	Other Caretaker	3	Other Caretaker
6.2-	Sex of child	1	Female	1	Female
		2	Male	2	Male
6.3-	Date of birth **Mark the source of information with X** Information from the vaccination card |__| Information from memory |__|	|__|__|.|__|__|.|__|__| Day Month Year		|__|__|.|__|__|.|__|__| Day month year	
6.4-	Where was s/he borne?	1	Home	1	Home
		2	Hospital	2	Hospital
		3	Dispenseria	3	Dispenseria
6.5-	When you were pregnant with this child did you eat: **Read each option**	1	Less than usual	1	Less than usual
		2	Same as usual	2	Same as usual
		3	More than usual	3	More than usual
6.6-	Has this child ever been breastfed at any time in his/her life? **If yes go to 6.8**	1	Yes	1	Yes
		2	No	2	No
6.7-	If no, why not? **Go to 6.12**	1	The child refused	1	The child refused
		2	The mother was too weak	2	The mother was too weak
		3	Someone advised not to breastfeed	3	Someone advised not to breastfeed
		4	Other:	4	Other:
6.8-	Is this child still breastfeeding now? **If yes, go to 6.11**	1	Yes	1	Yes
		2	No	2	No
6.9-	If the child is not breastfeeding now, for how many months did you breastfeed this child?	1	|__|__| months	1	|__|__| months
6.10-	If the child is not breastfeeding now, why did you stop? **Circle one option, don't prompt them**	1	Because the child did not want anymore	1	Because the child did not want anymore
		2	Because you though it was time to stop	2	Because you though it was time to stop
		3	Because you were pregnant again	3	Because you were pregnant again
		4	Because you did not have breast milk left	4	Because you did not have breast milk left
		5	Other:	5	Other:

6.11-	How long after birth did you start breastfeeding?			1	0-1 Hours	1 0-1 hours
				2	2-6 hours	2 2-6 hours
				3	7-12 hours	3 7-12 hours
				4	More than 12 hours	4 More than 12 hours
6.12-	At what age did you begin to feed this child daily with any fluids other than breast milk like: ? **Read all options**	1	Water with sugar	____ months		____ months
		2	Oil	____ months		____ months
		3	Infant formula	____ months		____ months
		4	Other	____ months		____ months
6.13	At what age did you begin to feed this child daily with other foods like:? **Read all options**	1	Gruel; trigo, gofio, rice, barley	____ months		____ months
		2	Bread, biscuits, muffin	____ months		____ months
		3	Mashed vegetables; potatoes, carrots	____ months		____ months
		4	Milk; goat, camel, powder	____ months		____ months
		5	Lentils	____ months		____ months
		6	Rice, spaghetti	____ months		____ months
		7	Dates	____ months		____ months
		8	Other	____ months		____ months
6.14-	Since 2 weeks ago has this child had diarrhoea? *(Diarrhoea is three or more loose or watery stools per day.)* **If no diarrhoea, go to 6.16**			1	Yes	1 Yes
				2	No	2 No
6.15-	If this child had diarrhoea, was there blood in it? *(Bloody diarrhoea is three or more loose or watery stools with blood in them per day)*			1	Yes	1 Yes
				2	No	2 No
6.16-	Since two weeks ago has this child had a cough during which s/he had difficulty breathing?			1	Yes	1 Yes
				2	No	2 No
6.17-	Since two weeks ago has this child had a fever?			1	Yes	1 Yes
				2	No	2 No
6.18-	Is this child suffering from any other disease? **If yes, write the disease**			1	Yes _____	1 Yes _____
				2	No	2 No
6.19-	When your child is sick do you seek advice or treatment for the illness outside of the home? **If no, go to 6.21**			1	Yes	1 Yes
				2	No	2 No

Questionnaire for children under 5 year of age
Mortality and nutrition survey in the Saharawi camps, February-April 2008

Interviewer ID : |___|___|

Child 1 ID: |____| |_____|_____| |_____|_____| |___|___| |_____|
Camp Cluster Household Woman Child

Child 2 ID |____| |_____|_____| |_____|_____| |___|___| |_____|
Camp Cluster Household Woman Child

		CHILD 1		CHILD 2	
6.20	If yes, from where do normally you seek care? **Circle all mentioned- but do not prompt respondent**	1	Hospital	1	Hospital
		2	Dispenseria	2	Dispenseria
		3	Traditional medicine	3	Traditional medicine
		4	Relative or friend	4	Relative or friend
		5	Market	5	Market
		6	Pharmacy	6	Pharmacy
		7	Other- specify _____	7	Other- specify _____
6.21-	Has this child received the following vaccinations/ supplements (in form of tablets)? **Mark the source of information with X** Information from the vaccination card |__| Information from memory |__|	1	Measles	1	Measles
		2	Tb	2	Tb
		3	Hepatitis B	3	Hepatitis B
		4	Polio	4	Polio
		5	DTP	5	DTP
		6	Triple Virica	6	Triple Virica
		7	Vitamin A	7	Vitamin A
6.22	Does this child receive any of the following foods from the dispenseria? **If no, go to anthropometry section**	1	WSB	1	WSB
		2	Plumpynut	2	Plumpynut
		3	No	3	No
6.23	If yes, after distribution, on average how long does this ration last?	|__|__| weeks		|__|__| weeks	
6.24	If yes, is the food shared with other HH members?	1	Yes	1	Yes
		2	No	2	No

Questionnaire for children under 5 year of age
Mortality and nutrition survey in the Saharawi camps, February-April 2008

Date : |__|__| / |__|__| / **2008**
Day *Month*

Interviewer ID : |___|___|

Child 1 ID: |____| |_____|_____| |_____|_____| |____|___| |_____|
Camp *Cluster* *Household* *Woman* *Child*

Child 2 ID |____| |_____|_____| |_____|_____| |____|___| |_____|
Camp *Cluster* *Household* *Woman* *Child*

Codes: **94= This child is not linked to any woman (i.e. orphan, mother living abroad, child living with relatives)**
97= I did not measure
98= They did not want to participate

Anthropometry for children 6-59 months					
		CHILD 1		**CHILD 2**	
6.25-	Sex of the child?	1	Female	1	Female
		2	Male	2	Male
6.26-	Date of birth	|__|__|:|__|__|:|__|__|	|__|__|:|__|__|:|__|__|
6.27-	Does this child have bilateral oedema?	1	Yes	1	Yes
	Observe, do not ask	2	No	2	No
6.28-	Does this child have a physical deformity making it difficult to obtain an accurate height?	1	Yes	1	Yes
	Observe, do not ask	2	No	2	No
6.29a-	Weight	|__|__|.__| kgs		|__|__|.__| kgs	
6.29b-	Estimated weight of clothes	1	0.5 kg	1	0.5 kg
		2	1.0 kg	2	1.0 kg
6.29c-	Actual weight (weight - estimated weight of clothes)	|__|__|.__| kgs		|__|__|.__| kgs	
6.30-	Length/Height	|__|__|__|.__| cms		|__|__|__|.__| cms	
6.31-	MUAC	|__|__|.__| cms		|__|__|.__| cms	
6.32	Hb measured with Heamocue	|__|__|.__| g/dl		|__|__|.__| g/dl	
6.33-	**FOR THE ENUMERATOR:** Does this child need referral?	1	Yes	1	Yes
		2	No	2	No

Cut off points for anemia in children

	Total	**Mild**	**Moderate**	**Severe**
Children 6-59 months	<11.0	10.9-10.0	9.9-7.0	<7.0

Cut off point for MUAC in children

	Moderate	**Severe**
Children 6-59 months	< 12.5 cm	<11 cm

Food questionnaire for children and women
Mortality and nutrition survey in the Saharawi camps, March-April 2008

Date: |__|__|.|__|__|.2008
Day Month Year

Interviewer ID: |___|___|

Women Id: |___|____|____| |____|____||____|
Camp Cluster Household Woman

Child 1 Id: |___|____|____| |____|____||____||____|
Camp Cluster Household Woman Child

Child 2 Id: |___|____|____| |____|____||____||____|
Camp Cluster Household Woman Child

Camp code
1 =Aiun **2** =Auserd **3** = Smara and 27th **4**=Dakla

Section 7
How many days in the last week did you and child (ren) eat the following:? **Write the number of times, no more than seven per food group.**
Did you and your child(ren) eat any of the following during the last 24 hours? **Mark with an X (Y= yes, N=No and DK= Don't know)**
* means that the food can have been eaten as part of a stew, salad or on it's own.
From where did you get the food groups? **Use the following code. (1= food distribution, 2= purchase, 3=own production, 4=gift, 5= borrow, 6= other, 7= Don't know**

		Woman				Sources	Child 1				Child 2			
		Yesterday (24 hours)			7 days		Yesterday (24 hours)			7 days	Yesterday (24 hours)			7 Days
	Food groups	Y	N	DK			Y	N	DK		Y	N	DK	
7.1.1	Do you drink milk? **Yes |__| No |__|**														
7.1.1.1	Camel milk (with water)													
7.1.1.2	Goat milk (with water)													
7.1.1.3	Other milk like Candia, powder milk													
7.1.1.4	Milk with cocoa, juice, like Candia, Rubi													
7.1.1.5	Gruel with milk, trigo soup													
7.1.2	Yoghurt (with water)													
7.1.3	Tea or Coffee													
7.1.4	Juice													
7.1.5	Soft drinks (Coke, Fanta, Chinchin, Gazuz)													
7.1.6	Infant formula													

		Women				Source	Child 1				Child 2			
		Yesterday (24 hours) Y	N	DK	7 days		Yesterday (24 hours) Y	N	DK	7 days	Yesterday (24 hours) Y	N	DK	7 days
7.1.7	Fortified Blended Foods (WSB)													
7.1.8	Biscuits given at school													
7.1.9	Gruel;trigo, gofio, barley, other													
7.1.10	Rice, s													
7.1.11	Spagethi,													
7.1.12	Cous cou													
7.1.13	Bread													
7.1.14	Biscuits													
7.1.15	Lentils*, Beans/peas*													
7.1.16	Potatoes*, turnip													
7.1.17	Carrots*, pumpkin													
7.1.18	Spinach													
7.1.19	Tomato*, peppers													
7.1.20	Zucchini, (courgette), aubergine													
7.1.21	Onion*													
7.1.22	Eggs*													
7.1.23	Meat: Goat camel, chicken*													
7.1.24	Liver*,													
7.1.25	Stomach*, kidney, heart, intestine													
7.1.26	Tuna*, sardines, dry fish													
7.1.27	Cheese													
7.1.28	Oil, animal fat, Any foods made with fat (e.g. fried potatoes)*													
7.1.29	Margarine*,													
7.1.30	Orange/Clementine/lemon													
7.1.31	Apple/Pear/Banana													
7.1.32	Dates													
7.1.33	Jam													
7.1.34	Chocolate/Sweets/ Caramelos													
7.1.35	Cakes/muffins													
7.1.36	Nuts, peanuts													
7.1.37	Other foods **(escribir)**													

7.2 How many main meals did you eat yesterday? |_____|

7.3 How many times did you eat between meals yesterday? |_____|

7.4 How many main meals did your child eat yesterday? |_____|Child 1 |_____|Child 2

7.5 How many times the child eat between meals yesterday? |_____|Child 1 |_____|Child 2