

**BOSSASO IDP NUTRITION SURVEY  
REPORT  
BOSSASO DISTRICT  
BARI REGION  
SOMALIA**

August 2003



## **Acknowledgment**

UNICEF wishes to thank the: Ministry of Social Affairs (MOSA) and the Bossaso Mayor for facilitating the fieldwork in the Bossaso Internally Displaced Person (IDP) camps amidst security threats and for participating in discussions of the preliminary survey results in Bossaso town.

UNICEF is grateful to all enumerators and supervisors who provided invaluable inputs and participated in the survey and FSAU for providing contextual information relating to food security, participation in training field staff and supervising data collection.

The data could not have been obtained without the cooperation and support of the communities surveyed especially the mothers and caregivers that took time off their busy schedules to respond to the interviewers.

Bossaso, 28 August 2003

## Executive summary

UNICEF, in collaboration with MOSA, conducted a nutrition survey in the Bossaso IDP camps on 2-11 July 2003. Beside the main objective of assessing the nutrition status of the under five children using weight for height measurements, the survey also sought to determine potential risk factors associated with malnutrition, household characteristics and measles, National Immunisation Days (NIDs) and vitamin A supplementation coverage. The main findings were as follows:

### Household and general population characteristics

Of the 1,585 households interviewed, 40% are female-headed; the median household size is 4 persons. About 44% of those interviewed claim to be refugees from Ethiopia. About 70% study population arrived before 2000 with majority coming from the Central and South zones of Somalia. The reasons for movement are stated as being insecurity (50%), lack of jobs (30%) and lack of food (14%).

It appears that the population relies almost entirely on purchases (99%) for their food source. Income is mainly derived from casual work (90%). Coping mechanisms revolve around borrowing (86.5%) and begging (11%).

### Water and environmental sanitation

For drinking water, the population relies mainly on tanker/truck vendors (45%), protected wells (26%) and berkads (21%). Three quarter of the population relieve themselves in the bush/open ground whilst about a quarter of the population use pit latrines that are observed to be used and dirty (43%).

### Nutrition status, feeding practice and risk factors analysis

Nutrition status analysis, using EpiInfo software, of the eligible 1,077 children, 65-110 cm, suggests severe and global acute malnutrition rates of 3.2% and 16.2% weight-for-height (W/H) Z-Scores respectively.

About 46% of the 6-23 months old children are not breastfed. Over 70% of same children stopped breastfeeding after 6 months of age whilst 71% had complementary feeds introduced during the first 6 months period recommended for exclusive breastfeeding. About half of these children are fed 4 or more times in a day. However, the quality and quantity of food given especially among the poor IDPs is limiting. A concurrent food security assessment with the nutrition survey revealed that protein and vitamins rich foods (cowpeas, powdered milk, meat and vegetables) formed a relatively low proportion of the food sources for poor households.

Analysis of potential risk factors indicates existence of significant statistical association with malnutrition for sanitary facility, child sex, age group, diarrhoea, and Acute Respiratory Illness (ARI). Children whose families utilise pit latrines were at an increased risk (RR 1.39) of being malnourished, possibly due to the dirty state of many latrines (43%). Young children, the 6-23 month age group, were much more likely (RR 1.66) to be malnourished whilst male children were at an increased risk (RR 1.39) of being malnourished compared to their female counterparts (an odd phenomenon that will require further investigation). Children with history of diarrhoea were one and half times more likely to be malnourished whilst those with history of ARI were at a nearly two-fold increased risk of being malnourished

### Health seeking behaviour, morbidity and immunisation

Families seek medical assistance at private clinic/pharmacy (54%) and public health facilities (35%) when their child(ren) fall sick. ARI (24%) and diarrhoea (22%) are significant causes of morbidity.

Among the 12-23 months old children, 28.5% had received measles immunisation based on card verification only and 64% by card or history anytime before the survey. Of the infants eligible for measles immunisation, only about 40% [editor – check with 68% cited on page 12 as corrected by FSAU] had received their jabs as at the time of the survey

During the spring polio NIDs second round conducted on 23-25 March, 88% of the 6-59 months children population received the polio dose (the preliminary second round polio NIDs results gives a 88% coverage for Bossaso district). Of those who missed out during the March second round Spring 2003 NIDs, 44% reported that the polio team did not visit, 36% said that the child was not at home whilst 12% thought the vaccine was unsafe/unimportant.

Survey results suggest 92.5% vitamin A supplementation coverage during the preceding 6 months to the survey.

### Conclusions and Recommendations

Modeling of a Community based nutrition activity, in collaboration with A70 [editor – what is this?], initially at the Askar IDP camp to be implemented in September. Intervention strategies are to target mothers, fathers and other caregivers at household level to address care concerns especially for the young children (6-23 months old). The main areas of focus should include promotion of exclusive breastfeeding, appropriate young child feeding, diet diversification, and improvement in household hygiene and health care practices. Other objectives will be improvement of micronutrient coverage and other health facility based services.

Continuation of current EPI activities to ensure that all eligible children are full immunised to take care of vaccine preventable diseases.

The challenge to consolidate joint interventions by agencies and local authorities to address sanitation concerns that is significantly association with malnutrition still stands.

Table 1: Summary statistics

	<i>n</i>	<i>(%)</i>
Global acute malnutrition (n=1,077)	174	(16.2)
Severe acute malnutrition	34	(3.2)
Diarrhoea past 2 weeks	239	(22.2)
ARI past 2 weeks	258	(24)
Malaria past 2 weeks	139	(12.9)
Measles past 1 month	37	(3.4)
Measles immunisation – card and/or history:		
9-11 months (n=72)	28	(38.9)
12-23 months (n=270)	98	(63.7)
9-59 months (n=1,014)	376	(68)
OPV:		
Last round (2 <sup>nd</sup> round, March 2003)	942	(87.5)
4 doses previous year (2002)	314	(29.2)
Vitamin A supplementation (past 6 months)	996	(92.5)
<i>Are you breastfeeding child (n=404):</i>		
Yes	217	(53.7)
No	185	(45.8)
Never	2	(0.5)
<i>Age when child stopped breastfeeding (n=185):</i>		
0-6 months	54	(29.2)
7-11 months	81	(43.8)
12 months or more	50	(27)
<i>Weaning age (n=402):</i>		
0-6 months	284	(70.6)
7 months or more	118	(29.4)
<i>Feeding frequency (n=404):</i>		
Once	1	(0.2)
2 times	24	(5.9)
3 times	168	(41.6)
4 or more times	211	(52.2)

## TABLE OF CONTENTS

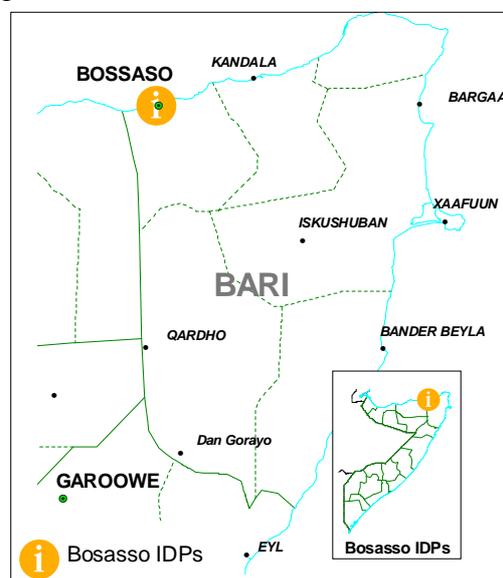
<b>ACKNOWLEDGMENT</b> .....	<b>I</b>
<b>EXECUTIVE SUMMARY</b> .....	<b>II</b>
<b>1. BACKGROUND</b> .....	<b>1</b>
1.1 FOOD SECURITY CONTEXT .....	1
1.2 HEALTH CONTEXT .....	3
1.3 WATER AND SANITATION CONTEXT .....	3
<b>2. SURVEY OBJECTIVES</b> .....	<b>4</b>
<b>3. SURVEY METHODOLOGY</b> .....	<b>4</b>
3.1 STUDY POPULATION, SURVEY DESIGN AND METHODS .....	4
3.2 MEASURING TECHNIQUE AND RECORDING .....	4
3.3 TRAINING AND SUPERVISION .....	5
<b>4. DATA PROCESSING AND ANALYSIS</b> .....	<b>5</b>
<b>5. FINDINGS AND INTERPRETATION OF RESULTS</b> .....	<b>7</b>
5.1 DESCRIPTION OF THE STUDY POPULATION .....	7
5.2 FOOD, INCOME SOURCES AND COPING STRATEGIES .....	8
5.3 WATER AND ENVIRONMENTAL SANITATION .....	9
5.4 ANALYSIS OF NUTRITION DATA .....	10
5.5 HEALTH AND MORBIDITY .....	12
5.6 MEASLES IMMUNISATION AND VITAMIN A SUPPLEMENTATION .....	12
5.7 FEEDING PRACTICES .....	14
5.8 ANALYSIS OF POTENTIAL RISK FACTORS .....	14
<b>6. DISCUSSION AND FINDINGS</b> .....	<b>16</b>
<b>7. CONCLUSION AND RECOMMENDATIONS</b> .....	<b>18</b>
<b>ANNEXES</b> .....	<b>19</b>
ANNEX 1: PUNTLAND TRADITIONAL CALENDAR .....	19
ANNEX 2: BOSSASO IDP SURVEY QUESTIONNAIRE .....	20

### *Table of tables*

<i>Table 1: Summary statistics</i> .....	<i>iv</i>
<i>Table 2: Nutrition status indicators and cut off points</i> .....	<i>5</i>
<i>Table 3: Household characteristics</i> .....	<i>7</i>
<i>Table 4: Food, income and coping strategy</i> .....	<i>8</i>
<i>Table 5: Water and sanitation</i> .....	<i>9</i>
<i>Table 6: Distribution according to age and sex</i> .....	<i>10</i>
<i>Table 7: Distribution according to sex and nutritional status (weight/height index in Z score or oedema)</i> .....	<i>10</i>
<i>Table 8: Distribution according to age and nutritional status (weight/height index in Z score or oedema)</i> .....	<i>10</i>
<i>Table 9: Indicators – proportions and confidence interval</i> .....	<i>11</i>
<i>Table 10: Distribution according to age and nutritional status – proportions and confidence interval</i> .....	<i>11</i>
<i>Table 11: Health seeking behaviour</i> .....	<i>12</i>
<i>Table 12: Morbidity history (n=1,077)</i> .....	<i>12</i>
<i>Table 13: Measles coverage and vitamin A supplementation</i> .....	<i>12</i>
<i>Table 14: OPV and vitamin A supplementation coverage</i> .....	<i>13</i>
<i>Table 15: Feeding practice</i> .....	<i>14</i>
<i>Table 16: Description of risk factors and results of bivariate analysis with respect to prevalence of global acute malnutrition</i> .....	<i>15</i>

## 1. Background

Bossaso town is located in Bossaso District in Bari Region, Puntland. The town serves as the main seaport that facilitates trade between parts of Somalia including Ethiopia and the Gulf States. Because of relative peace and job opportunities, this coastal town continues to play host to internally displaced persons fleeing from the central and southern parts of Somalia and Ethiopia because of insecurity and famine. While the majority of the migrants have settled in town, several small groups continue to live in the outskirts of town in privately owned land in shelter-like structures made of such materials as wood, plastic sheets and cement bags. Fire outbreak is a common hazard; in July, two consecutive fires razed Bulla Eelay camp – one of the largest of such camps in Bossaso town. Poor sanitation and limited access to other basic services also contribute to the vulnerability of the population.



### 1.1 Food security context

From findings of a food security assessment done concurrently with the nutrition survey, casual employment remains the main source of livelihood among these populations. The activities undertaken by men include market services as porters, loading and unloading of items at the seaport/wholesale shops of different items, market vending, as well as providing unskilled or semiskilled labour at construction sites. A significant number of women engage in garbage collection, petty trading, sorting/grading of frankincense or are employed as house helps. These activities are irregular and seasonal, mainly available in cooler months (between November and April).

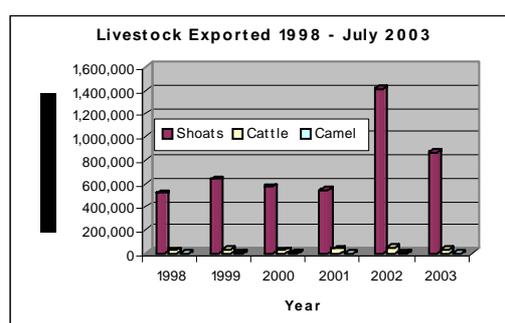
Since late 1999, a number of factors have negatively influenced the food security situation amongst the population in Puntland with quite some adverse effects on the livelihood of the IDPs:

- The livestock ban imposed by the Gulf States in September 2000 had devastating effects on livestock trade in Somalia especially in the North East zone. The port activity in Bossaso that normally employs a substantial number of the IDPs relies a lot on livestock activities and was therefore affected.
- The injection of substantial amount of bank notes in the economy in 2002 resulted to inflationary tendencies that reduced the purchasing power of the poor IDPs.
- The political instability Puntland Region has undergone since 2001 affected livelihood activities in the region
- Increased rural urban migration occasioned by drought situation experienced in some parts of Somalia like Sool plateau led to influx of people into Bossaso. This has also been coupled with influx of immigrant labourers from different parts of the region.

- The closure of the Bossaso seaport in July 2003 due to the seasonal tides contributed to a reduction in job opportunities, consequently reducing the income available to these populations.

Majority of the IDP population live under makeshift shelters predisposing them to respiratory infections among other diseases. In July 2003, 2 consecutive fire outbreaks with Bulla Eelay camps rendered at least 300 households homeless. This is an economic burden to the poor IDP households and they lost nearly all the household assets. However, UNCEF and WFP provided emergency shelter materials and food rations.

In 2003, the food security situation of the majority of Bossaso IDP population improved especially for those engaged in market services and construction sector due to a gradual boost of import and export (see graph for export of animals in 2002) related activities and booming construction sector. The volume of import and export cargo has been growing since 2002 while demand of construction labour has remarkably improved. Consequently daily unskilled wage rate, which began to rise late year 2002, has remained favourable and stable. Unskilled construction workers earn SoSh 40,000 per day. Those providing market services as porters could earn 20,000-40,000 per day but the frequency of work and earnings is irregular for construction work depending on e.g. seasonality of market and trade activities and movements of economic migrants.



However, despite the general improvement in income opportunities, poor wealth groups within the IDP population, comprising about two third of the total IDPs, are experiencing a period of food insecurity since June 2003. This is mainly attributed to the effects of seasonal hot weather period that normally lowers port activities and thereby income opportunities.

The IDP households currently have meagre income sources mainly from their coping activities. These include a **reduction of spending on non-essentials** in order to increase staple food purchases from available income though the poorest section of the community, about 20-25% of the total IDP households, do not have such 'expenditure diversion' avenues as their expense on non-essentials is normally insignificant. Subsequently, they are hard hit and mainly rely on other coping strategies like:

- **Borrowing food** from food vendors or kiosks within the camp.
- Beg for support from neighbouring families in the town, thereby receiving **gifts** in the form of either food or cash to purchase food.
- **Migration of 1-2 household members** at stress period to cooler towns of Puntland or Somaliland, in search of work.
- **Changing of consumption pattern** is the common distress strategy as revealed by key informants during the assessment. Reducing the quantity of food is the common possibility as seasonal effects limit further options to increase access to food and income of households. They eat two meals everyday instead of the usual three. It is reported that nutrient intake has subsequently reduced as the two meals are not adequate in both quality and quantity.

### **1.2 Health context**

There is one MCH center, one public hospital and several private clinics and pharmacies in the town. UNICEF supports the MCH center with essential drugs and EPI supplies. The MCH center serves the town population, including the IDPs with essential health services and EPI. Previously, utilization of Bossaso MCH was relatively low but this has been boosted by introduction of Clean delivery kits (CDKs) and Insecticide treated mosquito nets (ITNs) that are sold at a subsidised fee to expectant mothers and caretakers of under five children in case of ITNs.

Health staff from the MCH center provide three rounds per year of EPI outreach services to the IDPs since 2001 and this complements the routine services. Results of first round Bossaso EPI acceleration conducted in May/June indicate that one third of the beneficiaries were from the IDP camps. The prevalence of diarrhoea and other communicable diseases are known to be high and cholera cases are usually first reported from the IDP camps. This year's Bossaso cholera outbreak in June was rapidly contained with an overall case fatality of 2.5% (compared to the 6.2% of April – June 2002 cholera outbreak).

### **1.3 Water and Sanitation context**

Within Bossaso town, there are about 17 shallow wells with hand pumps supported by UNICEF. Water from these shallow wells is obtained free of charge. However, with the introduction of "Bossaso Water Project" (i.e. distribution of deep-well water through city water-pipe network) by UNICEF in 2000, most of the IDP camps now have access to piped water outlets (i.e. water kiosks: 5 are in place, 3 are under construction and 3 are in plan). The shallow well hand-pump water is currently being used only for domestic (i.e. non-drinking) purposes.

The sanitation status in the IDP camps has been poor due to continuous dumping of solid wastes and human excreta in the open grounds. No land is available for garbage dumping in the city and IDPs usually dump the garbage in the camps. UNICEF has been actively involved in this sector by supporting construction of toilets, mobilising IDP communities in the promotion of hygiene practices, provision of sanitation tools and in social mobilisation activities for cholera prevention and response to epidemics/outbreak.

Some of the sanitation facilities (i.e. toilets) supported by UNICEF have been taken over by the private landowners and run for income raising purposes. However, many of them are not properly maintained. Some other private latrines do exist within the camps and these, too, charge a fee for maintenance. Generally, many IDPs continue to relieve themselves in open ground/bush.

To address the problem of garbage dumping, in 2001 before the political conflict, with collective initiatives of Bossaso Municipalities and Bossaso communities, mass-scale garbage collection was initiated with encouraging results. However, a lasting solutions for the garbage dumping sites and town planning to provide access roads is yet to be found.

## **2. Survey objectives**

- To assess the nutrition status of the Bossaso IDP under five children population using weight for height measurements
- To determine potential risk factors associated with malnutrition
- To determine household characteristics of study population
- To determine immunisation – measles and NIDs – and vitamin A supplementation coverage of study population

## **3. Survey methodology**

### **3.1 Study population, survey design and methods**

Because of conflicting statistics as well as seasonal variations/movements, the survey was designed to screen all households and eligible children in each identified household/family grouping in the 11 IDP settlements/sub-settlements in Bossaso. Subsequently, questionnaires (see annex 2) were administered to all the 1,585 household heads and nutrition status systematically assessed for 1,077 eligible 6-59 months old children in these households/family groupings.

Mothers and caretakers were interviewed as to whether their eligible children had: suffered from diarrhoea, ARI and malaria in the 2 weeks prior to the survey; contracted measles in past one month; received vitamin A supplementation in past 6 months; and measles and polio immunisation status. Those with children less than 23 months were interviewed on their feeding practices. Where the caretaker or child was absent, an appointment was made for a later visit by the team.

The assessment of nutritional status was based on simple anthropometric data and limited only to eligible children. Weight-for-height was the indicator of choice. Diarrhoea was defined as watery stool passed at least three times a day; ARI defined as a child having fever and cough; whilst measles defined as a child with fever and rash and cough, running nose or red eyes.

### **3.2 Measuring technique and recording**

#### Weight

For weighting purposes, 25-kg salter scales were used. The scale was adjusted to zero with the weighing pants attached to the hook, child freed of heavy clothing, the weighing pants put on and child suspended from the weighing scales by the handles of the pants. Weight was read to the nearest 0.1 kg with scale at eye level.

#### Height

Children up to 2 years (23 months or 85 cm) of age were measured on a horizontal measuring board and the length read to the nearest 0.1 cm. Those over 2 years of age (or over 85 cm)

were measured standing on a horizontal surface against a vertical measuring device and height read to the nearest 0.1 cm.

### Age

An attempt at determination of age was based on recall using a local calendar of events (see annex 2) and estimates recorded in months. However, with the choice of nutrition indicator being weight-for-height, approximate age was useful in cross tabulation analysis.

### Oedema

Oedema was diagnosed by moderate thumb pressure applied to the back of both feet or ankles for about 3 seconds. This was recorded only for children who had such thumb impression signs remaining for some time on both feet.

## **3.3 Training and supervision**

A 3-day training session for seven teams – each composed of 2 enumerators and 1 team leader – was conducted prior to the actual survey on 2-4 July 2003. Plenary session included defining the role and tasks of each member of a survey team, selection of the first and subsequent households in pre-identified clusters as in the sampling frame, interviewing techniques, completion and coding of the survey form, and carrying out anthropometric measurements.

Demonstration of and practice in using questionnaires and measuring heights and weights of children was done followed by a field practical session (in one section of the IDP camp). Here, team members organised survey activities, carried out survey procedures and field-tested the questionnaires. The teams later reconvened, after fieldwork, for feedback and standardisation of procedures.

## **4. Data processing and analysis**

EpiInfo 6 software was used for data processing and analysis. Data for household and child(ren) were entered in two separate files with household numbers as the unique identifier. A questionnaire (.qes) file, with dummy variables, was first created followed by data file (created out of the .qes file) and a CHECK file for interactive checking. The CHECKs set up included must-enter, legal values, range, conditional jumps and programme check.

Depending on the length of the digits anticipated, missing variable, where applicable, were coded as 9/99/999 and excluded (recode 9/99/999=.) during analysis. With a clean data set, the EPINUT programme was used to determine the W/H Z-scores. For ease of data analysis, an analysis programme (.pgm) was written that RELATED household and child files to produce relevant tabulations and associations with nutrition indicators and cut off points as in the table below.

Table 2: Nutrition status indicators and cut off points

Nutritional status	W/H Z-Score	W/H % of MEDIAN
Severe acute malnutrition	< -3 or oedema	< 70% or oedema

*Bossaso IDP nutrition survey, August 2003*

Moderate acute malnutrition	Between -3 and < -2	Between 70% and < 80%
Global acute malnutrition	< -2 or oedema	< 80% or oedema

---

## 5. Findings and interpretation of results

### 5.1 Description of the study population

Of the 1,585 households interviewed, 40% were female-headed with the median household size being 4 (interquartile range 3-5). About 44% of those interviewed claim to be refugees from Ethiopia. About 70% study population arrived before 2000 with majority coming from the Central and South zones of Somalia. The reasons for movement are stated as being insecurity (50%), lack of jobs (30%) and lack of food (14%). Table 3 gives details of the household characteristics.

Table 3: Household characteristics

	<i>n</i>	<i>(%)</i>
<i>Sex – Household head (n=1,585):</i>		
Male	946	(59.7)
Female	639	(40.3)
<i>Household size:</i>	4 (3-5)	
<i>Household residence status:</i>		
Resident	9	(0.6)
Resident returnee	10	(0.6)
Internally displaced	866	(54.6)
Refugee	700	(44.2)
<i>Place of origin (n=1576):</i>		
Ethiopia	711	(45.1)
Kenya	7	(0.4)
SCZ	815	(51.7)
Mudug	5	(0.3)
Nugal	4	(0.3)
Bari	3	(0.2)
NWZ	29	(1.8)
Yemen	2	(0.1)
<i>Date of arrival (n=1576):</i>		
2002	128	(8.1)
2001	217	(13.8)
2000	132	(8.4)
1999	182	(11.5)
1998	188	(11.9)
Before 1998	729	(46.3)
<i>Reason for movement (n=1576):</i>		
Insecurity	724	(45.9)
Lack of jobs	620	(39.3)
Food shortage	217	(13.8)
Water shortage	15	(1)

## 5.2 Food, income sources and coping strategies

Data suggests that the population rely almost entirely on purchases (99%) for their food source. Income is mainly derived from casual work (90%). Coping mechanisms revolve around borrowing (86.5%) and begging (11%).

Table 4: Food, income and coping strategy

	<i>n</i>	<i>(%)</i>
<i>Main food source (n=1585):</i>		
Own animal products	1	(0.1)
Household crop production	7	(0.4)
Wild food collection	8	(0.5)
Purchases	1,569	(99)
<i>Main source of income (n=981):</i>		
Business	72	(4.6)
Causal work	1,427	(90.4)
Salaried employment	14	(0.9)
Begging	59	(3.7)
Remittances/gifts	5	(0.3)
Others – fishing	2	(0.1)
<i>Coping strategy (n=1585):</i>		
Remittances/gifts	13	(0.8)
Livestock sale	3	(0.2)
Splitting the family	21	(1.3)
Begging	169	(10.7)
Borrowing	1371	(86.5)
Food aid	9	(9)
Wild food collection	2	(0.1)

### 5.3 Water and Environmental sanitation

For drinking water, the population relies mainly on tanker/truck vendors (45%), protected wells (26%) and berkads (21%). Three quarter of the population relieve themselves in the bush/open ground whilst about a quarter of the population use pit latrines, of which 43% were observed to be used and dirty, compared to 54% that were used and clean.

Table 5: Water and sanitation

	<i>n</i>	<i>(%)</i>
<i>Main source of drinking water (n=1,585):</i>		
Borehole	8	(0.5)
Open wells	19	(1.2)
Protected wells	414	(26.1)
Berkads	333	(21)
Muscid	1	(0.1)
Tap/piped water	84	(5.3)
Tanker/truck vendor	726	(45.8)
<i>Sanitation facility (n=1579):</i>		
Pit latrine	387	(24.5)
Flush toilets	2	(0.1)
Bush/open grounds	1,190	(75.4)
<i>Observe (n=389):</i>		
Used and clean	209	(53.7)
Unused	12	(3.1)
Used and dirty	168	(43.2)

## 5.4 Analysis of nutrition data

### 5.4.1 Distribution

Table 6: Distribution according to age and sex

	Boys		Girls		Total	
	n	(%)	n	(%)	n	(%)
6-11 months	76	(56.3)	59	(43.7)	135	(12.5)
12-23 months	136	(50.4)	134	(49.6)	270	(25.1)
24-35 months	124	(49.8)	125	(50.2)	249	(23.1)
36-47 months	86	(46)	101	(54)	187	(17.4)
48-59 months	108	(45.8)	128	(54.2)	236	(21.9)
Total	530	(49.2)	547	(50.8)	1077	(100)

	Boys		Girls		Total	
	n	(%)	n	(%)	n	(%)
6-23 months	212	(52.3)	193	(47.7)	405	(37.6)
24-59 months	318	(47.3)	354	(52.7)	672	(62.4)
Total	530	(49.2)	547	(50.8)	1077	(100)

Table 7: Distribution according to sex and nutritional status (weight/height index in Z score or oedema)

	Severe < -3 + oedema		Moderate -3 ≤ z < -2		Normal ≥ -2		Oedema n (%)
	n	(%)	n	(%)	n	(%)	
Male	18	(3.4)	82	(15.5)	430	(81.1)	2 (0.4)
Female	16	(2.9)	58	(10.6)	473	(86.5)	1 (0.2)
Total	34	(3.2)	140	(13)	903	(83.8)	3 (0.3)

	GaM < -2 + oedema		Normal ≥ -2		Total	
	n	(%)	n	(%)	n	(%)
Male	100	(18.9)	430	(81.1)	530	(49.2)
Female	74	(13.5)	473	(86.5)	547	(50.8)
Total	174	(16.2)	903	(83.8)	1077	(100)

There exists an association between sex and global acute malnutrition: boys are 1.4 times more likely than girls to be malnourished (p=0.022)

Table 8: Distribution according to age and nutritional status (weight/height index in Z score or oedema)

	Severe < -3 + oedema		Moderate -3 ≤ z < -2		Normal ≥ -2		Oedema n (%)
	n	(%)	n	(%)	n	(%)	
6-11 months	5	(3.7)	16	(11.9)	114	(84.4)	0 0
12-23 months	20	(7.4)	46	(17)	204	(75.6)	2 (0.7)
24-35 months	7	(2.8)	40	(16.1)	202	(81.1)	1 (0.4)
36-47 months	1	(0.5)	9	(4.8)	177	(94.7)	0 0
48-59 months	1	(0.4)	29	(12.3)	206	(87.3)	0 0
Total	34	(3.2)	140	(13)	906	(83.8)	3 (0.3)

	Severe < -3 + oedema		Moderate -3 ≤ z < -2		Normal ≥ -2		Oedema n (%)
	n	(%)	n	(%)	n	(%)	
6-23 months	25	(6.2)	62	(15.3)	318	(78.5)	2 (0.5)
24-59 months	9	(1.3)	78	(11.6)	585	(87.1)	1 (0.1)
Total	34	(3.2)	140	(13)	903	(83.8)	3 (0.3)

	GaM < -2 + oedema		Normal ≥ -2		Total	
	n	(%)	n	(%)	n	(%)
6-11 months	21	(15.6)	114	(84.4)	135	(12.5)
12-23 months	66	(24.4)	204	(75.6)	270	(25.1)
24-35 months	47	(18.9)	202	(81.1)	249	(23.1)
36-47 months	10	(5.3)	177	(94.7)	187	(17.4)
48-59 months	30	(12.7)	206	(87.3)	236	(21.9)
Total	174	(16.2)	903	(83.8)	1077	(100)

	GaM < -2 + oedema		Normal ≥ -2		Total	
	n	(%)	n	(%)	n	(%)
6-23 months	87	(21.5)	318	(78.5)	405	(37.6)
24-59 months	87	(12.9)	585	(87.1)	672	(62.4)
Total	174	(16.2)	903	(83.8)	1077	(100)

There exists an association between age group and global acute malnutrition; the 6-23 age group are 1.7 times more likely to be malnourished (p=0.000)

## 5.4.2 Indicators

Table 9: Indicators – proportions and confidence interval

	Proportion (%)	95% Confidence Interval (%)
Oedema	3 (0.3)	
Global acute malnutrition	174 (16.2)	(14 – 18.5%)
Severe acute malnutrition	34 (3.2)	(2.2 – 4.4%)

## 5.4.3 Interpretive analysis

Table 10: Distribution according to age and nutritional status – proportions and confidence interval

	Global acute malnutrition	
	Proportion (%)	95% Confidence Interval (%)
6-23 months	87 (21.5)	(17.6 – 25.9%)
24-59 months	87 (12.9)	(10.5 – 15.8%)

	Severe acute malnutrition	
	Proportion (%)	95% Confidence Interval (%)
6-23 months	25 (6.2)	(4.1 – 9.1%)
24-59 months	9 (1.3)	(0.7 – 2.6%)

### 5.5 Health and morbidity

Families seek medical assistance at private clinic/pharmacy (54%) and public health facilities (35%) when their child(ren) fall sick. ARI (24%) and diarrhoea (22%) are significant causes of morbidity.

Table 11: Health seeking behaviour

	<i>n</i>	(%)
<i>Seek assistance when child sick (n=820):</i>		
Yes	767	(93.5)
No – lack of money	53	(6.5)
<i>Where (n=767):</i>		
Traditional healer	30	(3.9)
Religious – <i>Qoran</i> recitation	55	(7.2)
Private clinic/pharmacy	411	(53.6)
Public health facility	271	(35.3)

Table 12: Morbidity history (n=1,077)

	<i>n</i>	(%)
Diarrhoea (past 2 weeks)	239	(22.2)
ARI (past 2 weeks)	258	(24)
Malaria (past 2 weeks)	139	(12.9)
Measles (in last one month)	37	(3.4)

### 5.6 Measles immunisation, Polio immunization and vitamin A supplementation

Among the 12-23 months old children, 28.5% had received measles immunisation based on card verification only and 64% by card or history anytime before the survey. Of the infants eligible for measles immunisation, only about 68% had received their jabs as at the time of the survey

Table 13: Measles coverage

	<i>No (%) received immunisation</i>	<i>No (%) received immunisation</i>	<i>No (%) received immunisation</i>
	<i>9- 11 months (n=72)</i>	<i>12-23 months (n=270)</i>	<i>9-59 months (n=1,014)</i>
Yes – with card	13 (20.8)	77 (28.5)	222 (21.9)
Yes – with history/without card	15 (18.1)	95 (35.2)	467 (46.1)
No	44 (61.1)	98 (36.3)	325 (32.1)

Table 14: OPV and vitamin A supplementation coverage

	<i>n</i>	<i>(%)</i>
<i>No of times OPV received in 2002 (n=1,077):</i>		
Once	69	(6.4)
2 times	225	(20.9)
3 times	421	(39.1)
4 times	314	(29.2)
None	48	(4.5)
<i>OPV received in NIDs round 2 March 2003 (n=1,077):</i>	942	(87.5)
<i>Reason for missing OPV (n=135):</i>		
Team did not come	60	(44.4)
Child not at home	49	(36.3)
Child sleeping	2	(1.5)
Child sick	3	(2.2)
Vaccine unsafe	5	(3.7)
OPV unimportant	16	(11.9)
<i>Vitamin A supplementation coverage (n=1,077):</i>	996	(92.5)

During the spring polio NIDs second round conducted on 23-25 March:

- 88% of the 6-59 months children population received the polio dose (the preliminary second round polio NIDs results gives a 88% coverage for Bossaso district)
- No association exist between sex and polio administration ( $p=0.589$ ); both boys and girls had equal opportunity of being immunised against polio
- Of those who missed out during the March second round Spring 2003 NIDs, 44% reported that the polio team did not visit, 36% said that the child was not at home whilst 12% thought the vaccine was unsafe/unimportant.

Survey results suggest 92.5% vitamin A supplementation coverage during the preceding 6 months to the survey.

### 5.7 Feeding practices

About 46% of the 6-23 months old children had stopped breastfeeding as at the time of the survey. Over 70% of same children stopped breastfeeding after 6 months of age whilst 71% had complementary feeds introduced during the first 6 months period recommended for exclusive breastfeeding. About half of these children are fed 4 or more times in a day.

Table 15: Feeding practice

	<i>n</i>	<i>(%)</i>
<i>Are you breastfeeding child (n=404):</i>		
Yes	217	(53.7)
No	185	(45.8)
Never	2	(0.5)
<i>Age when child stopped breastfeeding (n=185):</i>		
0-6 months	54	(29.2)
7-11 months	81	(43.8)
12 months or more	50	(27)
<i>Weaning age (n=402):</i>		
0-6 months	284	(70.6)
7 months or more	118	(29.4)
<i>Feeding frequency (n=404):</i>		
Once	1	(0.2)
2 times	24	(5.9)
3 times	168	(41.6)
4 or more times	211	(52.2)

### 5.8 Analysis of potential risk factors

Analysis of potential risk factors (see Table 16) indicates existence of significant statistical association with malnutrition for sanitary facility, child sex, age group, diarrhoea, and ARI:

- Children whose families utilise pit latrines were at an increased risk (RR 1.39) of being malnourished
- Male children were at an increased risk (RR 1.39) of being malnourished compared to their female counterparts
- Young children, the 6-23 month age group, were much more likely (RR 1.66) to be malnourished
- Children with history of diarrhoea were one and half times more likely to be malnourished
- Children with history of ARI were at a nearly two-fold increased risk of being malnourished

Table 16: Description of risk factors and results of bivariate analysis with respect to prevalence of global acute malnutrition

Exposure variable	n	(%)	Crude RR	95% CI	p-value
<i>Household head sex:</i>					
Male	110	(16.1)	1	0.75-1.32	0.957
Female	64	(16.2)			
<i>Sanitary facility:</i>					
Pit latrine/flush toilet	63	(20.3)	1.39	1.05-1.84	0.027
Bush/open ground	111	(14.5)			
<i>Child sex:</i>					
Male	100	(18.9)	1.39	1.06-1.84	0.0216
Female	74	(13.5)			
<i>Age group:</i>					
6-23	87	(21.5)	1.66	1.27-2.17	0.000
24-59	87	(12.9)			
<i>Diarrhoea:</i>					
Yes	53	(22.2)	1.54	1.15-2.05	0.006
No	121	(14.4)			
<i>ARI:</i>					
Yes	62	(24)	1.76	1.33-2.32	0.000
No	112	(13.7)			
<i>Malaria:</i>					
Yes	30	(21.6)	1.41	0.99-2	0.082
No	144	(15.4)			
<i>Measles:</i>					
Yes	6	(16.2)	1	0.48-2.12	0.828
No	168	(16.2)			
<i>Vitamin A:</i>					
Yes	160	(16.1)	0.93	0.57-1.53	0.897
No	14	(17.3)			
<i>Weaning age:</i>					
0-6 months	55	(19.4)	0.74	0.5-1.08	0.160
Over 6 months	31	(26.3)			

## **6. Discussion and Findings**

The global acute malnutrition for Bossaso has been found to be 16.2% (CI: 14-18.5%) and the severe acute malnutrition at 3.2% (CI: 2.2-4.4%). According to WHO classification (1995), this prevalence depicts a poor nutrition situation. This may be attributed to the following factors:

**Sanitary facility:** Ironically, children whose families utilise pit latrines were at an increased risk of being malnourished. However, survey findings indicate that 43% of pit latrine utilised were observed to be used and dirty – a significant indication that public latrines if not properly used and cleaned can be a source of diseases such as diarrhoea that ultimately leads to malnutrition.

**Diarrhoea:** Children with history of diarrhoea, 2 weeks before the survey, were one and half times more likely to be malnourished. Diarrhoeal disease is closely linked to sanitary a facility that is also association with malnutrition in this study. Similarly, it is worth noting that Bossaso town experienced a cholera outbreak with its origin from the IDP camps.

**Acute Respiratory Infection (ARI):** Children with history of ARI, 2 weeks before the survey, were at a nearly two-fold increased risk of being malnourished. Majority of IDP population lives under makeshift shelter predisposing them to respiratory diseases. The hot, windy and dusty conditions do not help either.

**Young children:** the 6-23 month age group was more likely to be malnourished. This can be explained on early cessation of breastfeeding (46%) in this age group, early introduction of complementary foods (71% of children weaned before 6 months), feeding frequency (only about half are fed 4 or more times) and inadequate weaning foods both in quality and quantity. A rather odd phenomenon is seen where male children are at an increased risk of being malnourished compared to their female counterparts. This however requires more investigation before a solid conclusion can be made.

Combination of factors that negatively influenced the food security situation and reduced the income and purchasing powers of IDPs that include:

- The livestock ban imposed by the Gulf States in September 2000 had devastating effects on livestock trade in Somalia especially in the North East zone. The port activity in Bossaso that normally employs a substantial number of the IDPs relies a lot on livestock activities and was therefore affected
- The injection of substantial amount of bank notes in the economy in 2002 resulted to inflationary tendencies that reduced the purchasing power of the poor IDPs
- The political instability Puntland Region has undergone since 2001 affected livelihood activities in the region
- Increased rural urban migration occasioned by drought situation experienced in some parts of Somalia like Sool plateau led to influx of people into Bossaso. This has also been coupled with influx of immigrant labourers from different parts of the region.
- The 15 May – 15 September off peak season of the Bossaso seaport with closure in July 2003 due to the seasonal tides contributed to a reduction in job opportunities, consequently reducing the income available to these populations.

As the IDPs depend entirely on purchases for food source and on borrowing/begging (97%) as a coping mechanism, above factors impacted negatively on household income with limited resources for food and little or no amount for private clinic/pharmacy prescription.

The factors mentioned below may well have controlled further deterioration of the nutrition status:

With an MCH offering a full range of services, a referral hospital and several private clinics and pharmacies in town, there is significant access to health services for the Bossaso residents. Over 80% of IDP families interviewed sought medical assistance either from public health facilities or private clinic/pharmacy. However, survey did not determine details of how prompt the services were sought or whether prescribed prescription was acquired in full and used as recommended.

Increased access to EPI services: Results of first round Bossaso EPI acceleration conducted in May/June indicate that one third of the beneficiaries were from the IDP camps.

Well coordinated cholera outbreak prevention and control activities: the June 2003 Bossaso cholera outbreak was rapidly contained with an overall case fatality of 2.5% (compared to the 6.2% of April – June 2002 cholera outbreak).

Relative improvement of Bossaso IDP population food security situation: In 2003, the food security situation of the majority of Bossaso IDP population improved especially for those engaged in market services and construction sector due to a gradual boost of import and export related activities and booming construction sector. The volume of import and export cargo has been growing since 2002 while demand of construction labour has remarkably improved. Consequently daily unskilled wage rate, which began to rise late year 2002, has remained favourable and stable. Unskilled construction workers earn SoSh 40,000 per day. Those providing market services as porters could earn 20,000-40,000 per day but the frequency of work and earnings is irregular for construction work depending on e.g. seasonality of market and trade activities and movements of economic migrants.

## 7. Conclusion and Recommendations

Levels of malnutrition remain persistently high as illustrated in the table below, which shows results from previous surveys in Bossasso.

<i>Nutrition status (w/h z-score)</i>	<i>May 2000 (n=535)</i>	<i>May 2001 (n=568)</i>	<i>July 2002 (n=598)</i>	<i>July 2003 (n=1,077)</i>
Global acute malnutrition	63 (11.7%)	89 (15.7%)	112 (18.7%)	174 (16.2%)
Severe acute malnutrition	12 (2.2%)	23 (4%)	45 (7.5%)	34 (3.2%)
Oedema	0	8 (1.4%)	11 (1.8%)	3 (0.3%)

Proposed interventions include:

Modeling of a Community based nutrition activity, in collaboration with A70, initially at the Askar IDP camp to be implemented in September. Intervention strategies are to target mothers, fathers and other caregivers at household level to address care concerns especially for the young children (6-23 months old). The main areas of focus should include promotion of exclusive breastfeeding, appropriate young child feeding, diet diversification, and improvement in household hygiene and health care practices. Other objectives will be improvement of micronutrient coverage and other health facility based services.

Continuation of current EPI activities to ensure that all eligible children are full immunised to take care of vaccine preventable diseases.

The challenge to consolidate joint interventions by agencies and local authorities to address sanitation concerns that is significantly association with malnutrition still stands.

## Annexes

### Annex 1: Puntland traditional calendar

Months	Annual Events	1998	1999	2000	2001	2002	2003
JAN	Mid of Jiilaal		55	43	Soon 31	Soon fur 19	Sidatal 7
FEB	End of Jiilaal		54	42	Soon fur 30	Sidatal 18	Arafo lid Al-Ad Haa 6
MAR	Start of Gu Season		53	41	Sidataal 29	Arafo lid Al-Ad Haa 17	Sako 5
APR	Middle Gu Season		52	40	Arafo lid Al-Ad-haa 28	Sako 16	Safar 4
MAY	End of Gu Season		51	Meeting in Arte Shirka Carta 39	Safar 27	Safar 15	Mowliid 3
JUNE	Start of Haga Season		50	38	End of Formal Administration in Puntland Mowliid 26	Mowliid 14	Malmadoone Bilo-Samo I 2
JULY	Middle of Haga Season		49	37	Siyaaro 25	Siyaaro 13	Bilo-Samo II 1
AUG	End of Haga Season	Establishment of Puntland State	48	36	Fighting in Bossaso Jamaadul Awal 24	Jamaadul Awal 12	
SEPT	Start of Deyr Season	59	47	35	Jamaadul Akhir 23	Jamaadul Akhir 11	
OCT	Middle of Deyr Season	58	46	34	Sabuux (Rajab) 22	Sabuux (Rajab)/ Shacbaan 10	
NOV	End of Deyr	57	45	33	Fighting in Garowe Soon Dheere (Shacbaan) 21	Shacbaan/ Ramadan 9	
DEC	Start of Jiilaal	56	44	32	Soon (Ramadan) 20	Soon (Ramadan) 8	

**Annex 2: Bossaso IDP survey questionnaire**

Household No.	Date	Team Number	Cluster Number	Name of supervisor	Section	Subsection

Name of household head	Q1 Sex 1= M 2 = F	Q2 Household size	Q3 No. of u5s

Q4 Household residence status	Q5 Place of origin (Country/region)	Q6 Date of arrival (year)	Q7 Reason for movement
1 = Resident: Go to No. 8 2 = Resident returnee 3 = Internally displaced 4 = Refugee 5 = Other – specify	1: Ethiopia 2: Kenya 3: South and Central zone 4: Mudug 5: Nugal 6: Bari 7: Somaliland 8: Other	1: 2002 2: 2001 3: 2000 4: 1999 5: 1998 6: Before 1998	1 = Insecurity 2 = Lack of jobs 3 = Food shortage 4 = Water shortage 5 = Other – specify

Q8 Household's main food source?	Q9 Household's main income source	Q10 How does this household survive during food shortages (coping strategies)?	Q11 Main source of drinking water	Q12 Sanitation Facility	Q13 When your child is sick, do you seek assistance?
1 = Animal products from own production 2 = Household crop production 3 = Purchases 4 = Remittances/Gifts 5 = Begging 6 = Wild foods collection 7 = Others – specify	1 = Small business 2 = Casual work 3 = Salaried employment 4 = Sale of crops 5 = Sales of animals and animal products 6 = Remittances/Gifts 7 = Others – specify	1= Remittances/Gifts 2= Sale of more livestock 3= Splitting of the family 4= Begging 5= Borrowing 6= Food aid 7= Purchases 8= Wild food collection 9= Others – specify	1 = Borehole 2 = Open wells 3 = Protected wells 4 = Berkads 5 = Catchments/pond 6 = Stream/river 7 = Muscid 8 = Tap/piped water 9 = Tanker/truck vendor 10 = Others – specify	1 = Pit latrines: Go to Q12b 2 = Flash toilets 3 = Bush/Open ground  Q12b Condition of the facility (Observe) 1 = Used and clean 2 = Unused 3 = Used and dirty 4 = Others – specify	1 = Yes: Go to Q13b 2 = No: Go to Q13c  Q13b Where? 1 = Traditional healer 2 = Private clinic/pharmacy 3 = Public health facility 4 = Others – specify  Q13c Why? – specify

Serial No	Name	Q14 Sex  1 = M 2 = F	Q15 Age (Months)	Q16 Oedema  1 = Yes 2 = No	Q17 Height (Cm)	Q18 Weight (Kg)

For Q28-31, ask mothers with child(ren) 6-23 months old

Serial No.	Q19 Diarrhoea in last 2 weeks?	Q20 ARI in last 2 weeks?	Q21 Malaria in last 2 weeks?	Q22 Measles in last 1 month?	Q23 Vaccinated against measles?	Q24 Vitamin A provided in the last 6 months?	Q25 Number of times OPV received during 2001 NIDs?	Q26 OPV received in last NIDs round?	Q27 Reason for missing OPV dose(s)?	Q28 Are you B/F child?	Q29 If no, how old was child when you stopped B/F?	Q30 At what age was child given foods other than breast milk?	Q31 How many times in a day do you feed child?
	1 = Yes 2 = No	1 = Yes 2 = No	1 = Yes 2 = No	1 = Yes 2 = No	1 = past 6m (card) 2 = past 6m (recall) 3 = before 6m (card) 4 = before 6m (recall) 5 = None	1 = Yes 2 = No	1 = Once 2 = 2 times 3 = 3 times 4 = None	1 = Yes: Go to Q28 2 = No	1 = team didn't come 2 = child not at home Care taker refused because: 3 = child sleeping 4 = child sick 5 = vaccine unsafe 6 = OPV not important 7 = Other -specify	1 = Yes 2 = No 3 = Never: Go to Q31	1 = 0-6m 2 = 7-11m 3 = 12m or more	1 = 0-6m 2 = 7m or more	1 = Once 2 = 2 times 3 = 3 times 4 = 4 or more