

# **Emergency nutrition measures with internally displaced children under five years in district of Trincomalle, Sri Lanka**

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## ABSTRACT

**Background:** After a short period of peace, hostilities between the Government of Sri Lanka and the Liberation of Tamil Tigers Eelam (LTTE) was raged on again thus many persons were left homeless and displaced in the Northern and Eastern region of the country. The displaced persons moving into camps, which was established in schools, churches, temples etc..

**Objectives:** To collect baseline nutrition information among children 6 – 59 months in internally displaced population (IDP) living in camps in Trincomalle district.

**Methods:** This was a cross sectional study. Clusters were identified as IDP camps. All the children under five years in IDP camps in Trincomalle district were studied. Data was collected by interviewing the mother or main caretaker of the child. Weight and height of children and mothers were measured.

**Results:** A total of 710 children less than five years old in IDP camps in Trincomalle were studied. Results showed that 25.7%, 17.4% and 39.2% were wasted, stunted and underweight respectively. Wasting was higher than district data of 2003. The coverage for Vitamin A megadose supplementation was high as 77%. The prevalence of respiratory infection was 43.3% and diarrhoea was 26.6% during the last two weeks. Early introduction of other food was found to a problem with 16.5% practicing what is recommended by MOH starting other foods at 5-6 months. Frequency of feeding was good with 92.8% feeding children 6-59 months children 3 or more than 3 times per day. Children's diet was diverse but with high use of sugar and low consumption of fruits and vegetables. Very low percentage of children had received supplementary food like Triposha and CSB.

**Conclusion and Recommendations:** The high prevalence of wasting with low degree of stunting was observed. It is important to establish supplementary feeding programme among children and follow up of severely wasted children very closely with strengthening of Vitamin A megadose supplementation to combat high rate of respiratory tract infections. Educational programmes should be established to control diarrhoeal diseases.

## INTRODUCTION

With the hostilities which raged on between the Government of Sri Lanka and the Liberation of Tamil Tigers Eelam (LTTE) many persons were left homeless and displaced in the Northern and Eastern region of the country. But after the implementation of the peace treaty in the year 2001 many of the displaced persons returned to their homeland. Ironically, just as a smoke of the war is beginning to settle uncertain times began yet again, after a short period of “so called peace”. Thus the displacement of persons reoccurred leading to the displaced persons moving into camps, which was established in schools, churches, temples etc..

The district of Trincomale in the Eastern Province of Sri Lanka, is home to the Koddigar bay, a natural harbour, which provided most of the 526,414 population in the district with jobs related to fishing and cultivation of prawn farms. The others who were not in the fishing industry involved in agricultural activities and rest migrated to the city to find work to feed their families. The district comprised of multi ethnic society including Sinhalese, Muslims and Sri Lankan Tamils.

Crude birth rate, crude death rate and total fertility rate in the Trincomale district is 24.7, 4.7 and 2.6 per 1000 population respectively. Around 74.1% of the households have access to safe drinking water and only mere 25.6% of households have sanitary latrine. About 45% of the children under five years were under weight (below the -2SD of weight for age) and 30.5% of babies were born with low birth weight (< 2500g of birth weight)<sup>1</sup>.

A demographic and health (DHS) survey in 2000 indicated 14%, 13.5% and 29.4% of children under five years in Sri Lanka were wasted, stunted and underweight respectively<sup>2</sup>. The prevalence of anaemia among preschoolers was 30% and 33.3% of preschoolers had biochemical deficiency of Vitamin A<sup>3,4</sup>.

It is a point to keep in mind that population of Sri Lanka has been suffering from under nutrition, affecting particularly infants, children of young age groups and pregnant women. Hence the nutritional status of the displaced persons will hit rock bottom even from the now low level that they are in. So the necessity of a survey under emergency situation to assess the nutritional status among children under five years has arisen.

## **OBJECTIVES**

- To determine the current levels of under nutrition among children under five years in internally displaced population (IDP) living in camps of Trincomalle district,
- To determine the factors related to under nutrition among them,
- To establish the baseline information needed for Ministry of Health and other relevant organizations to target and monitor nutrition interventions under emergency situation.

## METHODS

A cross sectional rapid assessment survey was carried out in all the IDP camps in the district of Trincomalle. The study population was identified as children less than 5 years. All the IDP camps were included in the survey and all children under five years present in IDP camps were included in the assessment of nutritional status.

**Data collection:** Field investigators were trained one week prior to the data collection by the Medical Specialists in the Medical Research Institute. The survey team consisted of field health staff from Trincomale district. Data collection was supervised by Deputy Provincial Director of Health Services, Trincomale and the project officer, UNICEF sub office in the district. Data collection period was 21<sup>st</sup> – 26<sup>st</sup> June 2006. All the MOHs were informed about the study and permission was obtained from the relevant health authorities. Verbal consent was taken from the parent or guardian of children prior to the study, after explaining the purpose and the study methods to them.

Data collection was carried out by using the following techniques:

**Interviewer administered questionnaire:** An interviewer-administered questionnaire was used to collect information from the mother of the child or from a responsible caregiver. The following information was gathered: basic information (date of birth if not age, sex); morbidity and feeding data; access to water and sanitation; dietary diversity data etc.

**Anthropometric measurements:** Weight, height/length of children and mid upper arm circumference was measured using standard techniques described by the World Health Organisation (WHO)<sup>5</sup>. Measurements were taken by the trained Public Health Inspectors (PHI) from the Trincomale district. Weight was measured with minimal clothing and without shoes to the nearest 100 g with Seca weighing scale (no corrections have been made

for the weight of the clothing). Length was measured for children under 2 years of age and height was measured for children over 2 years to the nearest 0.1 cm with a measuring board.

### **Data analysis**

Data was entered in Epi6 software package and the analysis was carried out by the Department of Nutrition, MRI. Age was calculated in months from the child's birthday. Weight-for-age, weight-for-height and height-for-age were calculated for children by using EPINUT software. The NCHS reference data was used and the Z score below -2SD was taken as cut off values to estimate prevalence of stunting, wasting and underweight according to the recommendations made by the World Health Organisation (WHO)<sup>6</sup>. Chi square test was applied and the level of significance was taken when the P value  $\leq 0.05$ .

## RESULTS

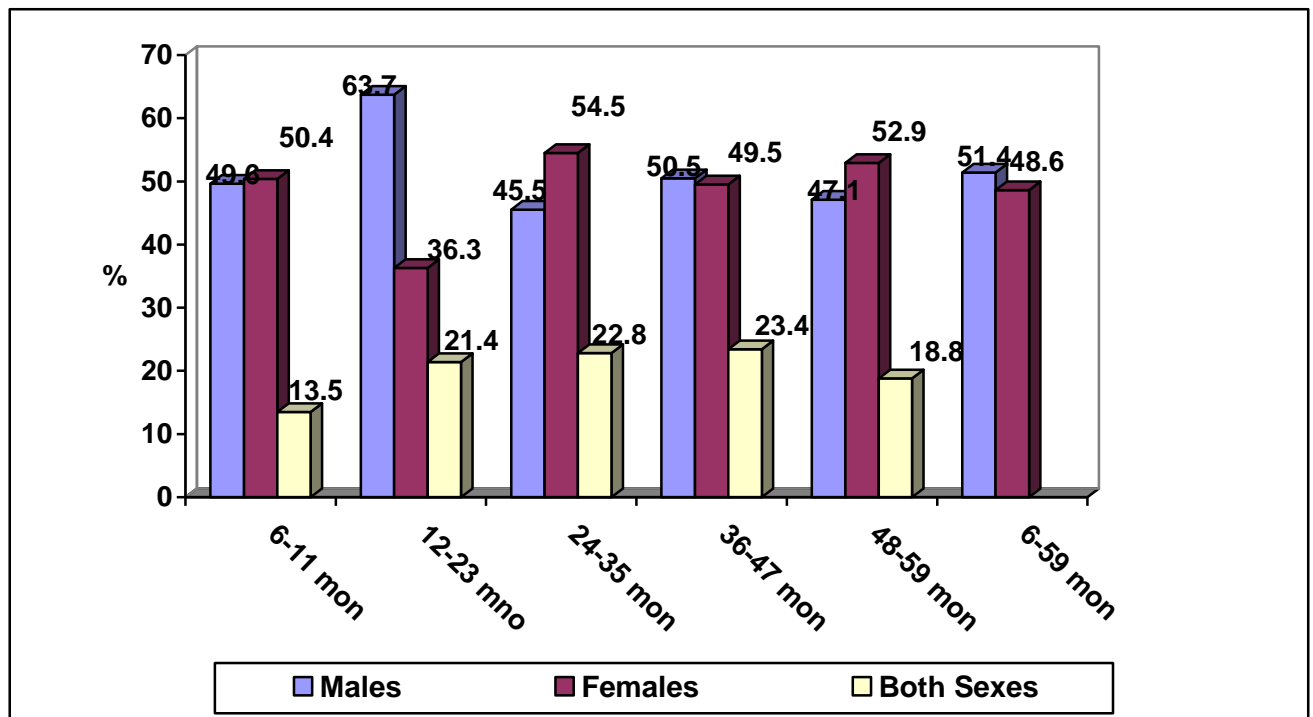
### 3.1. Basic information

A total of 755 children less than 5 years of aged living in eight IDP camps in Trincomale District were covered by the study. Majority (89.5%) of respondents were mothers of the child, (4.5%) were father and (5.9%) were caregivers as shown in Table 1. Majority (77.8%) of the respondents were between 15-34 years of age and 18.8% were between 35-49 years.

**Table 1: The relationship of the main caregiver to the index child. n=836**

Care giver	'n	%
Mother	748	89.5
<b>Father</b>	<b>39</b>	<b>4.7</b>
Care giver	49	5.9
Total	836	100

**Figure 1: The age distribution of children studied by sex.(n=874)**



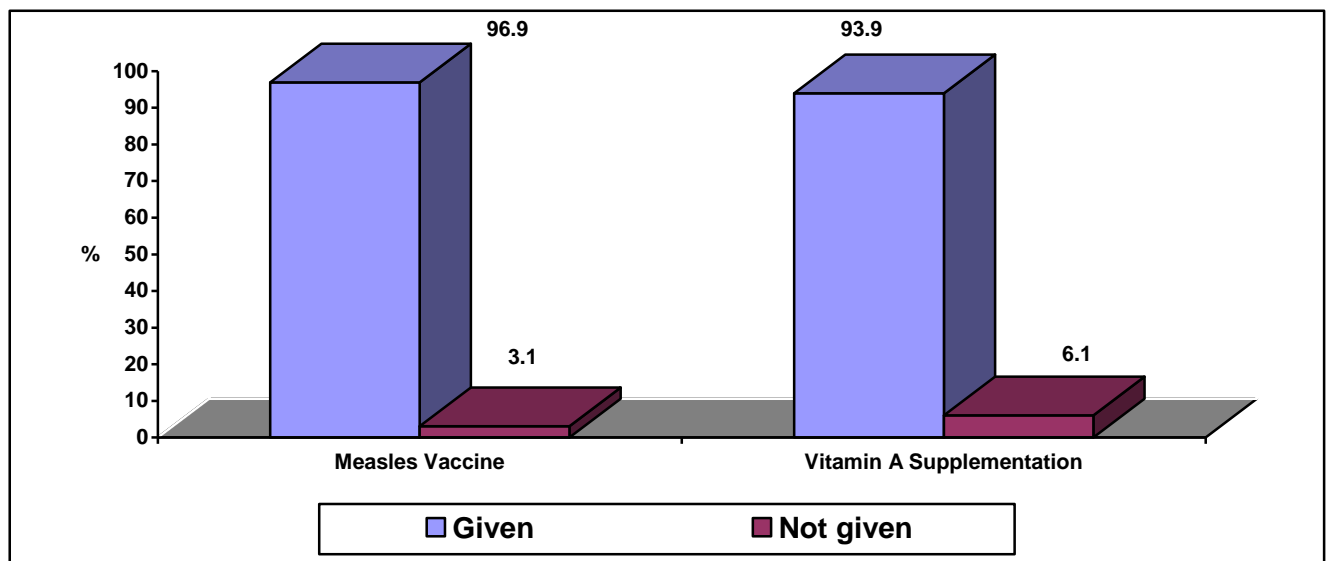


As shown in Figure 1, 13.5% of the children studied were within 6-11 months age group and 18.8% were between 48-59 months. The highest (23.4%) number of children was in the age group of 36-47months. There were 51.4% boys and 48.6% girls. Both the small (<4 household members) and normal (5 - 7 household members) households had the same percentage at 45.8% and big (7 –10 household members) households were 7.8%. Most (96.3%) of the households visited had 2 or less children under five years. Majority of children were living with their mothers.

### 3.2 Health Characteristics

In Sri Lanka measles vaccine together with vitamin A mega dose supplementation is given routinely to children at the age of 9 months, Vitamin A is repeated at 18 months. Children receive 100,000 IU at 9 and 18 months. As shown in Figure 2, 96.9% of the children over 9 months were given measles vaccine, 93.9% of the targeted age groups had received Vitamin A dose . This information was obtained from the CHDR.

**Figure 2: Proportion of children who received measles vaccine and Vitamin A Supplementation n=875.**



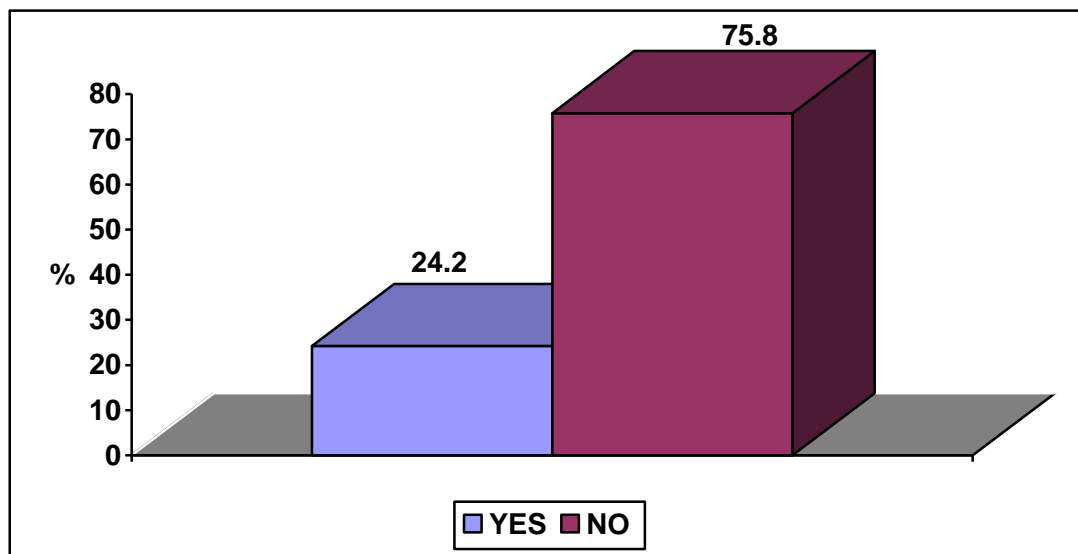
Measles coverage has increased when compared with 81.2% recorded in DHS results of 2000. Considering that a child can have the measles vaccine

and Vitamin A supplementation on the same day, there was a small difference observed.

### 3.3. Morbidity

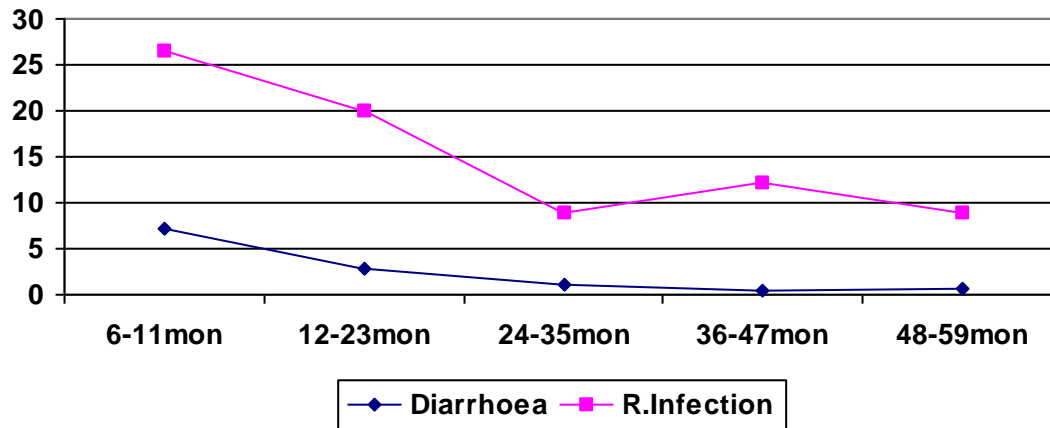
The prevalence of important childhood diseases was determined. The study showed in according Figure 3 that 24.2% of the children had had some illness during two weeks prior to study.

**Figure 3 Morbidity during 2 weeks prior to study**



Disease is an underlying cause of malnutrition. Sick children are difficult to feed yet their nutrient requirement increases due to infection. Mothers do not appreciate the importance of feeding a sick child more frequently. It is important for health workers to support mothers in this area so that they can increase food intake for the child during illness.

**Figure 4 Prevalence of diseases by age group**



The important illness was RI defined as cough and cold with or without fever, had a high prevalence of 12.4% among the children studied. According to figure 4, RI was the top cause of morbidity in all ages. Diarrhoea, defined as 3 watery stools per day had a prevalence of 2.0 %. The other conditions such as malaria, measles and dengue fever were insignificant two weeks before study.

Figure 4 also revealed that diarrhoea and respiratory infections were high in the 6-11 month followed by the 12-23 months.

Over a third (32.4%) of the children were currently breast-feeding Table 10. A majority (93.3%) of the 6-11 months children were breast feeding, 65.4% in the age group 12-23 were still breast feeding and 8.8% in the over 24 months age group were also breast feeding.

### 3.4. Child feeding Practices

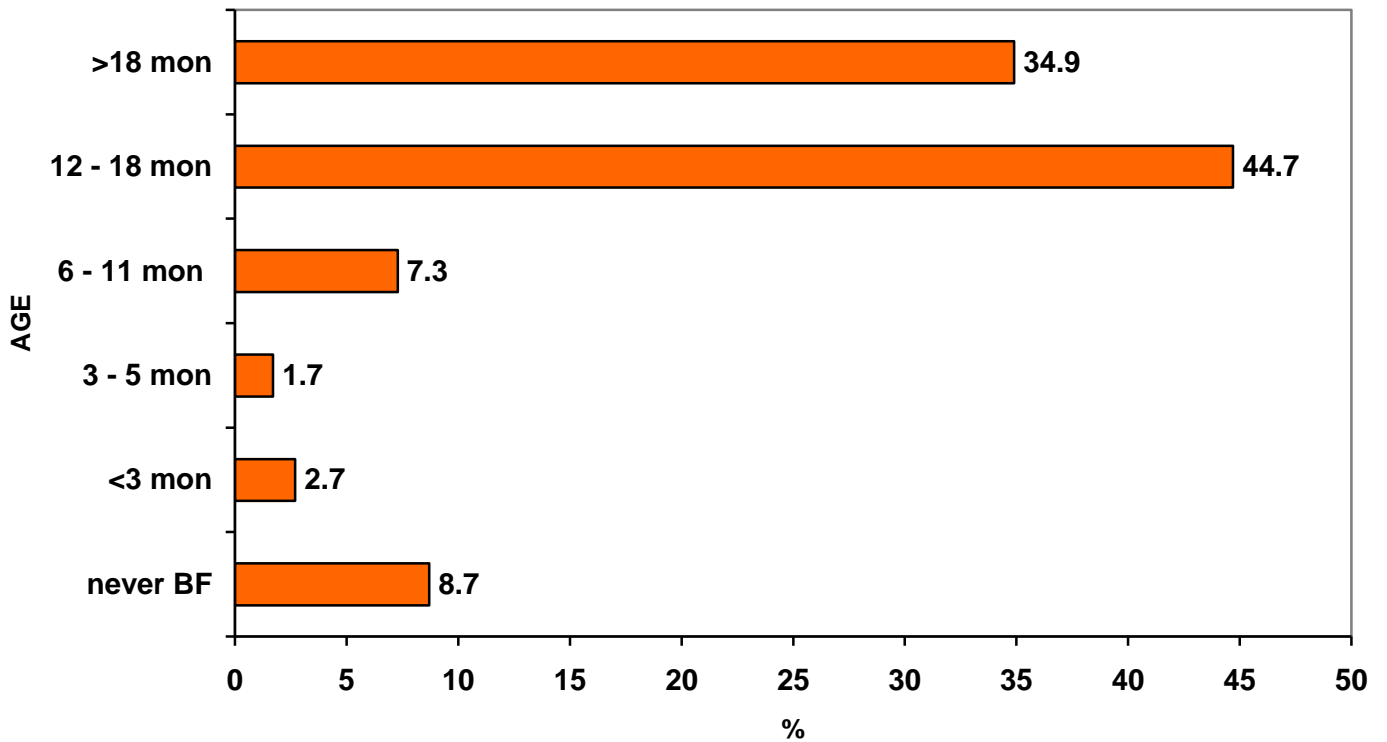
Table 2: Current breast feeding pattern by age group

Age (months)	Breastfeeding				Total	
	Yes		No		n	%
	n	%	n	%		
6 – 11	106	93.8	7	6.2	113	13.5
12-23	117	65.4	62	34.6	179	21.4

24 – 59	48	8.8	496	91.2	544	65.1
<b>Total</b>	<b>271</b>	<b>32.4</b>	<b>565</b>	<b>67.6</b>	<b>836</b>	<b>100</b>

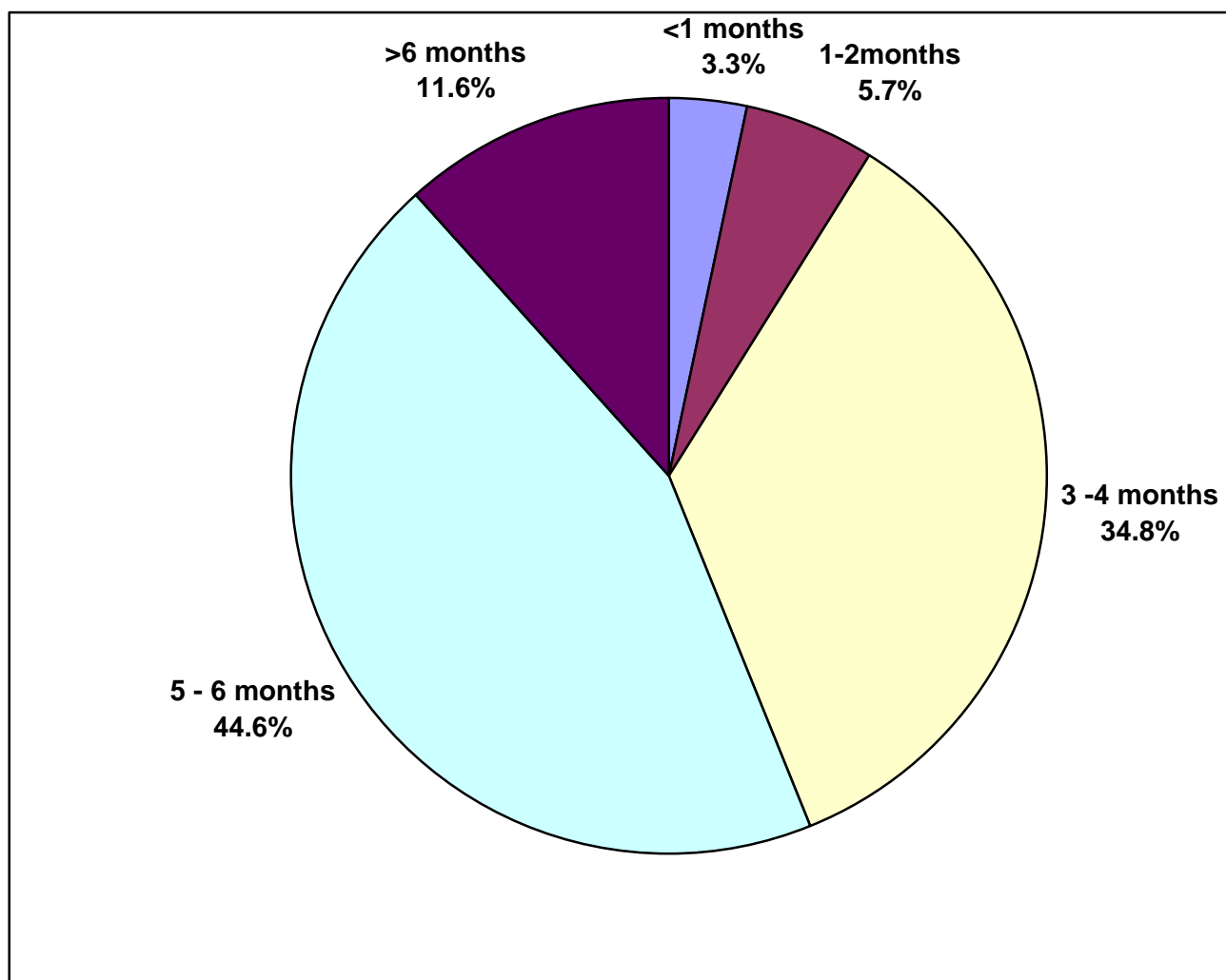
Table 2 shows that a majority (65.1%) of children stopped breast-feeding before 24 months. Children who were never breast-fed were (8.7%) in Trincomale District.

**Figure 5: Age at which breast-feeding was stopped**



An investigation of the age at which other foods and fluids (including water) were introduced was done and results show that 44.6% follow the Ministry of Health recommendation to introduce other foods between 5-6 months (Figure 5). However, 43.8% children were given other foods before recommended time below 4 months and 11.6% introduced other foods late.

**Figure 6: Age at which other foods and fluids (including water) were introduced**



**Table 3: Number of feeds by age group (n=836).**

Age (months)	Number of meals eaten				Total	
	<=2		>=3		n	%
	n	%	n	%		
6 – 23	64	21.9	228	78.1	292	34.9
24 – 59	21	3.9	523	96.1	544	65.1
<b>Total</b>	<b>85</b>	<b>10.2</b>	<b>751</b>	<b>89.8</b>	<b>836</b>	<b>100</b>

The study revealed (Table 3) that 89.9% of the children were fed more than three times a day. Sanitation need to be improved, This shows a majority of caregivers abide by the recommended practice.

Investigation on general food restriction showed (Table 4) only 4.2% do not give children under five certain foods. Some of the foods restricted included fruits and vegetables and grains

**Table 4: General food restrictions to children**

<b>Child restricted to eat some foods</b>	<b>'n</b>	<b>%</b>
<b>Yes</b>	<b>35</b>	<b>4.2</b>
<b>No</b>	<b>801</b>	<b>95.8</b>
<b>Total</b>	<b>836</b>	<b>100</b>

In Trincomale district almost half (47.9%) the respondents change feeding patterns during illness (Table 5), the changes cover the following patterns: reducing amount of food (25.3%), only fluids given (22.1%) and increasing food (0.5%). Increasing food intake during illness had the least respondents and yet it is the desirable practice.

**Table 5: Changes in feeding patterns for children during illness**

<b>Food types</b>	<b>'n</b>	<b>%</b>
<b>Amount of food reduced</b>	<b>184</b>	<b>25.3</b>
<b>Only fluids are given</b>	<b>161</b>	<b>22.1</b>
<b>Amount of food increased</b>	<b>4</b>	<b>0.5</b>
<b>No change</b>	<b>379</b>	<b>52.1</b>
<b>Total</b>	<b>728</b>	<b>100</b>

Table 6 shows the food consumption of children during the past 24 hours prior to the interview day. In this population 91.6% of the children ate Rice/ rice flour, bread/wheat preparations and maize. Fruit and vegetables consumption was very low although much better when compared Ampara and Hambantota districts. As in all the other districts studied, the practice of the use of sugar in tea and biscuits was outstanding recording 67.9%. Low usage of Triposha and Samaphosha fortified cereals was also noticeable. While the Vitamin A supplementation programme had high coverage it is a short-term programme. Long-term measures for micronutrient malnutrition

control of fortification and dietary diversification should be promoted in this district.

**Table 6: Proportion of children and food consumption as per 24-hour recall.**

	<b>'n</b>	<b>%</b>
<b>Rice/rice flour preparations, bread/wheat flour preparations, maize</b>	<b>766</b>	<b>91.6</b>
<b>Pulses/Soya</b>	<b>105</b>	<b>12.6</b>
<b>Milk and milk products</b>	<b>486</b>	<b>58.1</b>
<b>Fish/dry fish, egg, meat</b>	<b>684</b>	<b>81.8</b>
<b>Sugar in tea &amp; biscuits</b>	<b>568</b>	<b>67.9</b>
<b>Manioc, sweet potatoes, yam, potatoes</b>	<b>207</b>	<b>24.8</b>
<b>Yellow to orange fruits and vegetables</b>	<b>216</b>	<b>25.8</b>
<b>Green leafy vegetables</b>	<b>169</b>	<b>20.2</b>
<b>Other Fruits</b>	<b>352</b>	<b>42.1</b>
<b>Other Vegetables</b>	<b>253</b>	<b>30.3</b>
<b>Thriposha, Samaphosha</b>	<b>88</b>	<b>10.5</b>
<b>CSB, other cereals</b>	<b>75</b>	<b>9.0</b>
<b>Infant formula</b>	<b>50</b>	<b>6.0</b>

### **3.5. Food security**

**Table 7: Major source of total household food basket (n=832).**

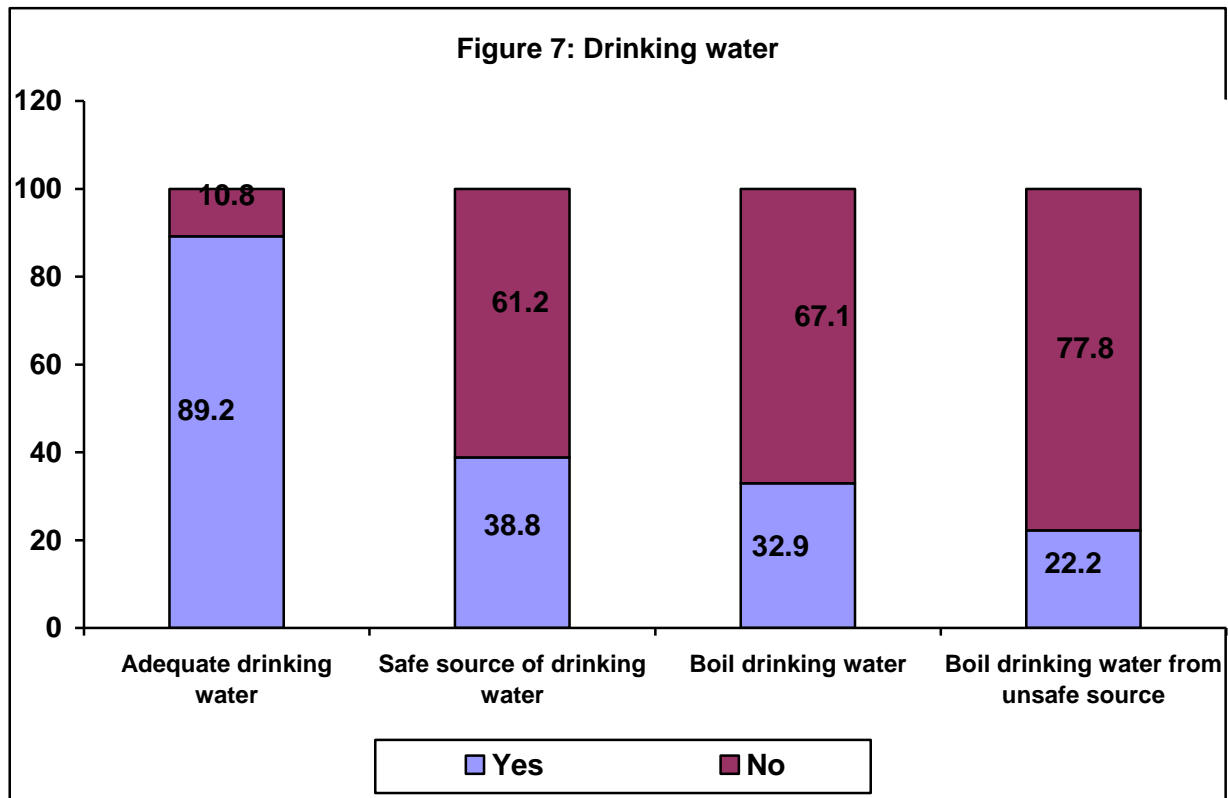
<b>Main source of Household total food basket</b>	<b>'n</b>	<b>%</b>
<b>Own production</b>	<b>182</b>	<b>21.9</b>
<b>Purchases</b>	<b>649</b>	<b>78.0</b>
<b>Food Aid from Government</b>	<b>1</b>	<b>0.1</b>
<b>Total</b>	<b>832</b>	<b>100</b>

The major source of total household food basket is purchases, (Table 7) shows that 78.0% get food from the market, 29.1% produce their own food and only 0.1% received food aid from government. Few (8.7%) household had a garden and used the produce 1-3 days a week. The fact that only a few households have garden explains the low usage of fruits and vegetables in



children’s diet. FAO publication “Home garden for improving nutrition in Asia” promotes home garden as a source of income, fuel, food and herbs. The publication is a good resource material for garden promotion.

### 3.6. Water and sanitation



Adequacy of drinking water in Trincomale district was confirmed by 89.2% Figure 7. However when the quality of water was assessed, 61.2% of the respondents stated that their sources of drinking water were unsafe Figure 7. An assessment of the practice of boiling water revealed that only 32.9% boiled their water for drinking. The practice of boiling water was further explored among those who had unsafe water showed that only 29.7% indicated that they boil their water, Figure 7

**Table 8: Status of sanitary facilities n=832**

Assessment of sanitary facilities n=836		
Own toilet	n	%

<b>Yes</b>	<b>500</b>	<b>59.8</b>
<b>No</b>	<b>336</b>	<b>40.2</b>
Type of toilet n=500	n	%
<b>Water sealed</b>	<b>462</b>	<b>92.4</b>
<b>Pit latrine</b>	<b>22</b>	<b>4.4</b>
<b>Other</b>	<b>16</b>	<b>3.2</b>

Table 8 shows availability of own toilet, more (59.8) than half the population studied owned toilets. Three types of toilets were own by households, 92.4% used water sealed 4.4% used pit latrines and 3.2 used other types of toilets. Those who had no toilets of their own used communal sealed toilets (42.3%), bush (25.6%) and communal pit (16.6%), neighbours toilets (10.7%) and 5.4% used the ocean.

### 3.7. Nutrition situation

#### 3.7.1. Low birth weight

Table 9 shows that children born with weight less than 2500 grams were 13.1 percent, this is lower than the national average (16.7%) reported in DHS 2000.

**Table 9: Proportion of children with a birth weight < 2500g.**

<b>Birth Weight</b>	<b>n</b>	<b>%</b>
≥ 2500g	612	86.9
< 2500g	92	13.1
<b>Total</b>	<b>704</b>	<b>100</b>

#### 3.7.2. Prevalence of Wasting, Stunting and Underweight in children

According to Figure 8 the prevalence of wasting was 20.1%, stunting was 22.1% and underweight was 33.4%. The majority of the wasted, stunted and underweight were in the moderate category. The Trincomale District Global acute malnutrition rates were higher than the 2000 DHS and but lower than the district results (23.0%) obtained in the 2005 assessments as shown in

Figure 8. All three indicators show some improvement from last year results. The situation has return to the level of 2000. The programmes in place are still required to prevent deterioration of the nutritional status.

Figure 8 Prevalence of Wasting, Stunting and Underweight n=875

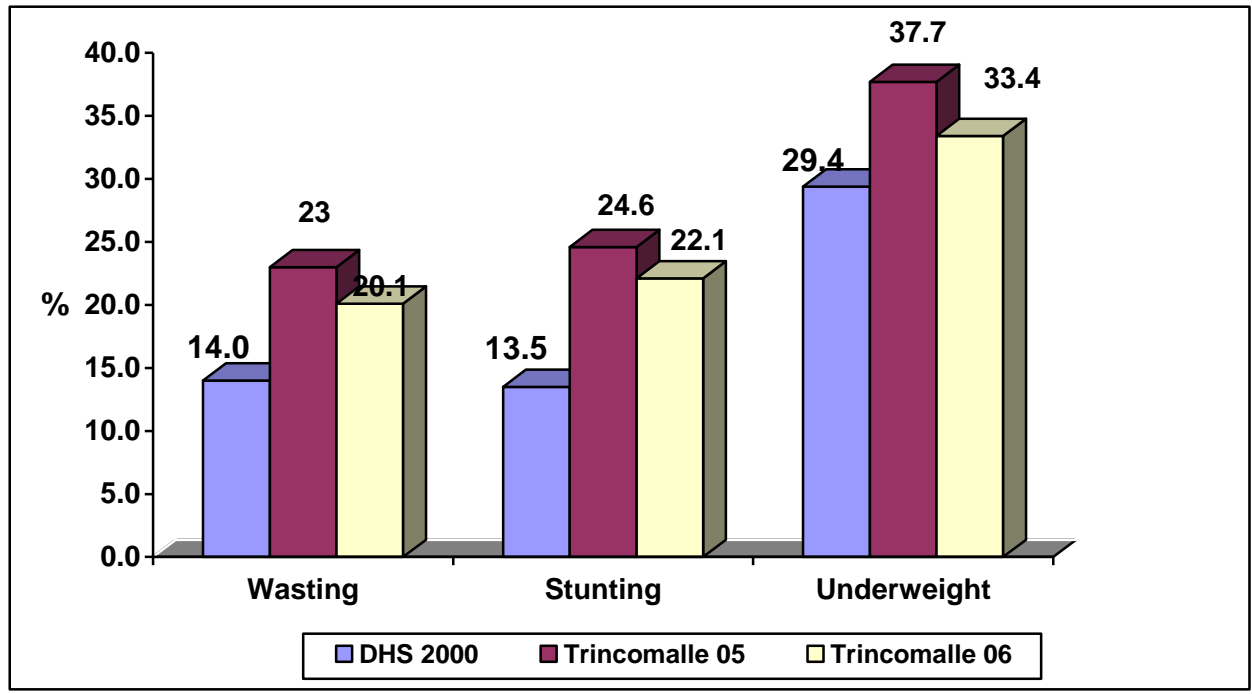


Figure 9: Under five Nutritional status by age group

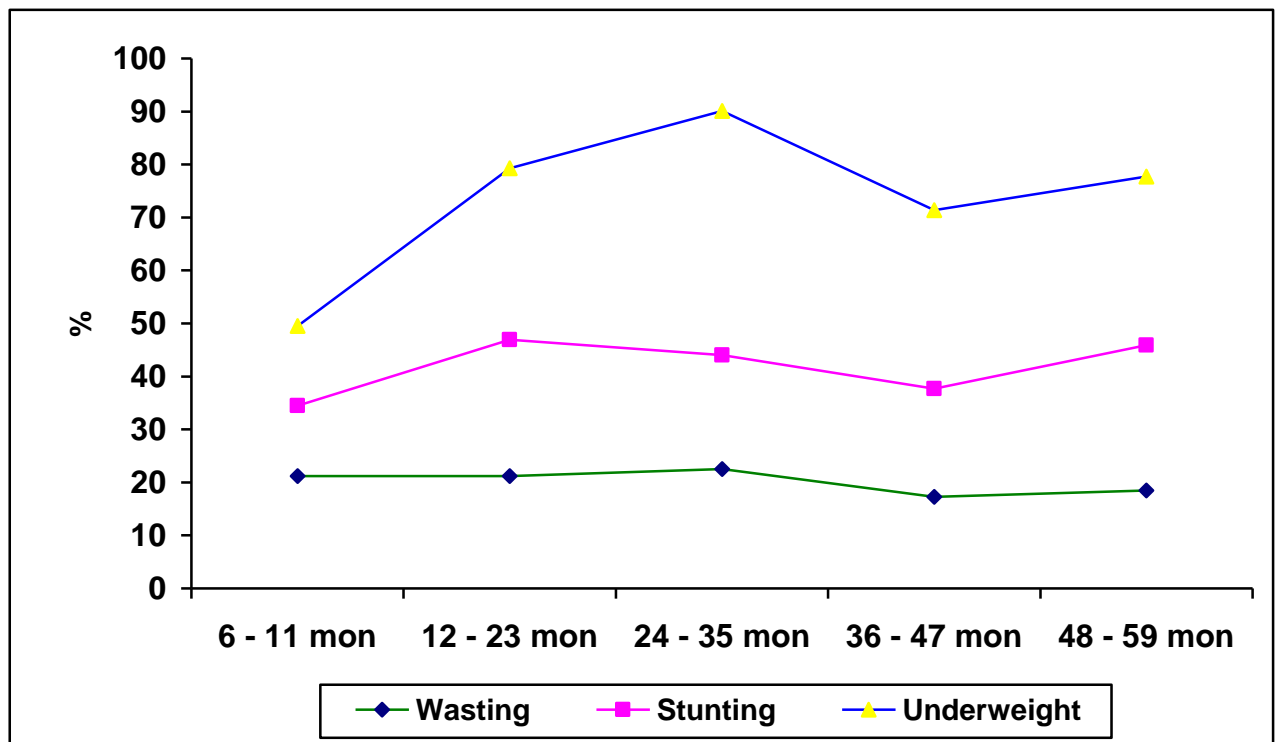


Figure 9 shows all nutrition indicators started off at very high rates compared to most districts studied by during these assessments. Wasting and stunting increased with age until ages 36-47 were it dropped and started rising again. The lowest underweight rate of 15.0% was recorded among the 6-11 months age group while the highest of 46.1% was among the 24 – 35 months age group. The same pattern was observed with stunting rates. These results reflect problems during the period when breast milk is replaced by complementary feeds. Early introduction was done by 43.8% and late introduction was practiced by 11.6% that was the highest in all the 6 districts studied. Frequency of feeding was good among children over 24 months old. Among those who were wasted feeding frequency had an association with wasting which was statistically significant.

Morbidity in this district was 24.2% and food restriction was practiced by 25.3% who reduced food given to babies during illness. Reduction of food during illness had significant association with RI. Those children who had been given less food during illness were prone to RI, Table 10.

**Table 10: Weight for height score and risk factors**

Risk factor	Wasting				Total	Test Statistics
	Yes		No			
Frequency of feeding						
<=2	25	29.4	60	70.6	85	Chi 4.49
>=3	143	19.0	608	81.0	751	p-value 0.034
Respiratory infection	Reduce amount of Food					
	Yes		No			
	'n	%	'n	%		
Yes	33	31.7	71	68.3	104	Chi 5.91
No	151	20.6	581	79.4	732	p-value 0.015

## DISCUSSION

Those displaced virtually lost their livelihood, natural sources of food and their long-established coping mechanisms – all of which could negative influence the nutritional status of the population in particular the most vulnerable groups like children.

When the study findings were compared with the National data<sup>2</sup> the prevalence of wasting, stunting, and underweight among children in IDP camps is higher than national and district prevalence. The low prevalence of stunting in this population is a prominent feature. Because stunting is a cumulative process, the percentage of stunted children increases with age. The highest prevalence was found to be at around the age of 36 - 47.9 months. This observation indicates the nutritional status in this population is not a long-standing problem.

Based on the proposed epidemiological criteria for assessing severity of under nutrition in population by the WHO, when the percentage of underweight is  $\geq 30$  and the percentage of wasting is  $\geq 15$  it indicates a very high prevalence. When the percentage of stunting is  $< 20$  it indicated of low prevalence. According to that this population indicates very high prevalence of underweight and wasting and a low prevalence of stunting.

Vitamin A mega dose supplementation is usually undertaken as a routine programme in Sri Lanka. All the children at the age of 9 months and 18 months are supposed to be given 100,000 IU single dose of Vitamin A. This study revealed that only 32.9% children of the targeted age groups had received Vitamin A mega dose during the last 6 months. This observation alerts the situation with the high incidence of respiratory tract infections as Vitamin A has a positive contribution to the overall wellbeing of an individual especially in relation to the infections.

It is recommended to give more than four feeds per day for children to meet the nutrient requirement because of the small feeds that they take<sup>7</sup>. This study revealed that the highest prevalence of wasting was observed between the 1 – 2 years of age and only 38.1% of children of that age were fed 3 times per day. This observation is very important with the high prevalence of wasting in this population.

Eating a variety of diet is very important to fulfil the daily nutrients requirement for children especially calories, proteins, vitamins and minerals. But the food consumption pattern of children revealed that the children aged 6 – 23 months were mainly fed with rice, milk and sugar and about three fourths had not received any supplementary foods.

Added sugar in the tea or beverages was one of the main sources of energy in all the age groups. Though Sri Lanka has adopted a policy not to add sugar and salt for the children less than one year, in this population 26.4% of infants (6-12 months) were given added sugar in tea and beverages. It is important to note that it could not be prevented under the disaster circumstances.

It is well shown that even before the tsunami disaster, under nutrition was the single developmental challenge for Sri Lankan children. It was expected that this situation would increase the risk of under nutrition among the vulnerable groups, in particular children and women.

## **CONCLUSION AND RECOMMENDATIONS**

Malnutrition in Trincomale was still very high but compared to previous year results there is marked decrease using all three indicators. Wasting was associated with frequency of feeding a practice which can be addressed by communication messages. Early introduction to solids is still a major problem and late introduction also needs to be addressed. Promotion of exclusive

breast-feeding needs to be strengthened by having breast-feeding campaigns. Food given to children was not diversified and fruits and vegetables consumption was particularly low. There was excessive use of sugar and biscuits.

RI and food restriction during illness were found to be significant, when the child was ill it was likely to be restricted from eating certain foods This study showed restriction was more on protective foods required for immunity. Most households did not have their own gardens. Water and sanitation was poor with more households using unsafe water and few households boiling water.

## **4.2. Recommendations**

It is therefore recommended that:-

- Programmes of supplementing feeding for children below 6-59 months old be initiated in Trincomale District.
- Vitamin A supplementation be supported until dietary diversification is fully appreciated.
- Support setting up of gardens in order to improve dietary diversification
- Launch the exclusive breast feeding campaigns
- Develop nutrition IEC materials on feeding a sick child and preparing calorie and nutrient dense complementary foods
- Set up sentinel surveillance to cover food, health and nutrition issues.

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## ANNEXURES

**Annex 1: Means Z-score by age group and sex**

Age (months)	Mean Z-scores								
	Wasting			Underweight			Stunting		
	Male	Female	Both	Male	Female	Both	Male	Female	Both
6 – 11	-0.699	-0.586	-0.642	-0.708	-0.912	-0.811	-0.187	-0.394	-0.291
12 – 23	-1.241	-1.006	-1.156	-1.722	-1.405	-1.607	-0.334	-0.018	-0.219
24 – 35	-1.233	-1.268	-1.252	-1.826	-1.897	-1.865	-0.271	-0.270	-0.270
36 – 47	-1.192	-1.028	-1.111	-1.650	-1.657	-1.654	-0.265	-0.269	-0.267
48 – 59	-1.119	-1.180	-1.151	-1.672	-1.708	-1.691	-1.444	-0.293	-0.364
6 – 59	-1.136	-1.055	-1.097	-1.586	-1.584	-1.585	-1.175	-1.111	-1.144



## **Annex 2**

### **Rapid Nutrition Assessment questionnaire**

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