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Baseline Survey Health and Nutrition

INTEGRATED FOOD SECURITY PROGRAMME
TRINCOMALEE

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LIST OF ABBREVIATIONS

ANC	Antenatal Care Clinic
ARI	Acute Respiratory Infections
BCG	Vaccine against tuberculosis
BMI	Body Mass Index
CHW	Community Health Worker (Health Volunteer)
DoH	Department of Health
DPT	Vaccine against diphtheria, whooping cough and tetanus
FAO	Food and Agriculture Organisation
IFSP	Integrated Food Security Programme
MOH	Medical Officer of Health
OPV	Vaccine against polio
PHI	Public Health Inspector
PHM	Public Health Midwife
PHFS	Public Health Field Assistant
PHNS	Public Health Nurse Sisters
SD	Standard deviation
SPHI	Supervision Public Health Inspector
SPHM	Supervision Public Health Midwife
UNICEF	United Nations Children's Fund
WHO	World Health Organisation

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1 Introduction

1.1 Objective of the Integrated Food Security Project and the Baseline Survey

In the Trincomalee District, an alarmingly high percentage of population is malnourished and impoverished. Due to the ongoing conflict that started over 15 years ago, houses, village infrastructure and production bases are destroyed. Particularly affected are households that depend on fishing, small-scale farming, daily labour, including in particular households run by single women, often widows as a consequence of the conflict. Many have recently returned from refugee camps to their home villages and are now without a means of livelihood.

Since August 1998 an **Integrated Food Security Program (IFSP)** is implemented in Trincomalee District under the Development Cooperation between Sri Lanka and Germany. The Ministry of Plan Implementation and Parliamentary Affairs through the District Planning Secretariat is implementing partner of the German Agency for Technical Cooperation (GTZ). The IFSP is planning and implementing its activities together with relevant government departments, Divisional Secretaries as well as local and international NGOs. The present phase is scheduled from August 1998 to March 2001.

IFSP intends to contribute to re-development and re-construction in the rural areas of Trincomalee district. The project purpose is, to enable poor groups in Trincomalee District, who are at risk of food insecurity and are affected by the conflict, to diversify and intensify their food and income sources and improve their diet and health care. This is intended by improving social and economic village infrastructure, health service, availability of additional employment opportunities and provision of financial services. An equitable treatment of the three ethnic groups will also help foster mutual understanding and channel common efforts towards development.

Trincomalee District is divided in 11 Divisions. In March 1999 a **nutrition baseline survey** was carried out in randomly selected villages, belonging to the five divisions in which the IFSP will initially focus the activities (Muthur, Eachchilampattai, Kuchchaveli, Gomarankadawela and Padivisipura).

The objectives of the survey are:

- to provide information on the magnitude, causes and effects of malnutrition in the project area
- to identify the most vulnerable groups in population for targeting of project activities and strategies
- to identify main health and nutrition problems for planning of project activities
- to assess the nutritional status of children under five years of age and their mothers
- to obtain Baseline Data for impact analysis of project activities in selected project villages of the IFSP Trincomalee (monitoring and evaluation)

The applied methodology as well as first results and conclusions of the survey are described in this report.

1.2 Background Information on Trincomalee

1.2.1 Geography

Trincomalee is a part of the Eastern Province of Sri Lanka. The district belongs to the dry zone and is divided into 11 divisions. From October to January the north east monsoon provides major rainfall. This season is agriculturally known as Maha season. The mean annual temperature is 27°C with a mean daily range of 6°C. The terrain is almost flat coastal region and has varied types of soil. The main types are reddish brown earth and alluvial soil, which are suitable for subsidiary food crops with irrigation in the dry season.

1.2.2 Population and Economy

In Trincomalee district there is an equal distribution between the three ethnic groups: 27.4% are Sinhalese, 35.4% are Tamil and 36.2% are Muslims. 42% of the population is younger than 15 years of age. The average family size is 4.5 and during 1981 - 1996 the annual population growth rate was 1.8%.

In 1987 more than 56,000 families have been displaced due to the conflict. More than 47,000 have been resettled in 1997 but still about 1,300 of displaced persons remain in camps.

Agriculture is the most important income source. Paddy cultivation depends on irrigation, but many of the major and minor irrigation systems have been destroyed or abandoned due to conflict only half of them are functioned by now.

1.2.3 Health and Nutrition

General public health indicators at the national level of Sri Lanka are relatively favourable.

The average life expectancy at birth was estimated at 72 years, infant mortality rate and under-five mortality rate were respectively 17 and 19 per 1000 live births in 1993. The adult illiteracy was estimated to be about 12% in 1990 [The World Bank. World Development Report 1995. Oxford University Press, New York, 1995].

Health care in Sri Lanka can be obtained free of charge. Deliveries should take place in hospitals and maternity homes. A vaccination service for children is provided, including BCG (against tuberculosis), DPT (diphtheria, whooping cough, tetanus), polio and measles. Public health activities are carried out by midwives who work in central dispensaries. Typical activities are immunisation of children, growth control of children and prenatal care as well as distribution of vitamin A capsules and deworming of school children.

Only a limited amount of reliable data on the health and nutrition situation in the North-Eastern Province of Sri Lanka is available. On the other hand the national data does not reflect the situation in the North-East, where the IFSP project area is situated. The North-Eastern Province is highly effected by the consequences of the ongoing war, such as internal displacement, destroyed social and economic infrastructure, lack of transport, food shortage, limited income sources, high number of widows and orphans, impairment of psycho-social development etc.

The health sector is highly affected. Health facilities are under-staffed and many positions are vacant. As a consequence, preventive and curative health services can not be provided in the quantity and quality required. This includes regular health services such as growth monitoring, vaccination and prenatal care. Due to government restrictions on the flow of goods into the "uncleared areas" (under LTTE control), which include construction material and medicine, the nutritional status and health situation in these areas is expected to be alarming.

2 Methodology

2.1 Survey Area, Time Schedule and Basic Principle

The survey was designed and carried out according to the guidelines described by Gross et al. (1997). The nutritional status of children under five years of age is considered as an indicator for the nutritional status of the whole population in the surveyed area. In addition, nutritional status is considered as poverty indicator.

The survey was designed to be carried out in all five divisions in which IFSP will concentrate the activities. An important criteria was the equally representation of the three ethnic groups (Tamil, Muslim, Sinhalese) in the survey sample.

The survey was carried out in two sequences. Due to logistical and administrative reasons the initial part of the baseline survey was carried out in the cleared areas only, thus Muthur, Kuchchaveli, Gomarankadawela and Padivisipura. Fifteen villages (5 Tamil, 5 Sinhales, 5 Muslim) were assessed between March 2-12, 1999. The assessment in the uncleared areas, belonging to Muthur and Eachchilampattai Divisions had to be postponed for logistical reasons and was conducted between July 12-16, 1999.

The enumerator training was held from February 15-19 and included a pre-test of the data collection methodology in the field.

Five villages have been randomly selected from each ethnic group (Tamil, Muslim, Sinhalese) in addition to another five villages from the Tamil population in the uncleared areas. 20 survey-villages were randomly selected. (Table 1).

Kuchchaveli	Gomarankadawela	Muthur (cleared)	Padivisipura	Muthur/ Eachchilampattai
Cassim Nagar (Muslim)	Kalyanapura (Sinhalese)	Mallikaitheevu (Tamil)	Srithissapura (Sinhalese)	Nalloor (Muthur, Tamil)
Pulmoddai I (Muslim)	Kandamalawe (Sinhalese)	Kiliveddy (Tamil)	Jeyanthiwewa (Sinhalese)	Kadakarai Chennai-S (Muthur, Tamil)
Pulmoddai G (Muslim)	Pampurukasewewa (Sinhalese)	Brarathipuram (Tamil)		Punnaiyadi (Eachch., Tamil)
Gopalapuram (Tamil)		Jinna Nagar (Muslim)		Valaithodam (Eachch., Tamil)
Kumpurupitty (Tamil)		Allai Nagar East (Muslim)		Illangaithurai (Eachch., Tamil)

Table 1. DS-Divisions, selected villages, and ethnic group

The survey data is not representative for the whole district of Trincomalee, but give baseline information that can be used for the planning and evaluation of project activities in the surveyed area.

2.2 Sample Size, Household Selection and Data Collection

The recommended sample size per cluster (village) of 25-30 was considered [Gross et al., 1997]. For the selection procedure of the households the Divisional Secretaries were asked to provide a complete list with the names of households having at least one child under-five. Based on this list, 25 households with children under five were randomly selected. The total sample size of 515 households, including 702 children, will allow an estimation of the true prevalence of stunting, wasting and underweight in the surveyed villages.

Five interdisciplinary enumerator teams collected the data. A supervisor with experience in data gathering with standardised questionnaires headed each team. All interviewers are working in Trincomalee district. They are very familiar with working with communities and had had a good knowledge of the village environment and living conditions. The IFSP Nutrition Expert Dr. Ines Reinhard and the nutrition-consultant Mrs. Daniela Kraemer supervised the survey teams.

Information was collected using a standardised questionnaire and anthropometric measurements of mothers and children under five years of age. Information was gathered on socio-economic aspects, health, hygiene, living conditions and food intake. Anthropometric data consisted of weight and length/height measurements of mothers and children. Weight was measured using solar digital weighing scales developed by SECA (Germany) with a precision of 0.1 kg. The subjects were asked to stand still at the centre of the platform, the feet were completely on the platform of the balance, barefoot and with minimum clothing. Height was measured using a „Microtoise“. The Microtoise was fixed to a vertical board and the reading was set to zero. Subject was measured barefoot in an upright position, the headpiece was gently lowered, crushing the hair and making contact with the top of the head. The height was recorded to the nearest 0.1 cm. Length of children younger than two years was measured with a length board in lying position.

2.3 Enumerator Selection and Training

Criteria for the enumerator selection were availability during training and data assessment, ability and motivation to do field work under difficult conditions and potential for further co-operation with IFSP. Enumerators and supervisors should be preferably female. The enumerators worked in interdisciplinary teams with members from the Health-, Education and Agriculture Department.

The enumerator training was carried out between February 15-19, 1999. The 5-day-training included a pre-test of the questionnaire in the field. The training objectives were:

- Introduction of IFSP and of the survey
- Training on methodology (questionnaires and measurement equipment)
- Integrated approach from different disciplines (Agriculture, Education, Health)
- Pre-testing the questionnaire
- Training on how to address the families
- Discussion on logistics and time-planning

Through practical training, role-playing and pre-test the enumerator got first experience in doing interviews. „What should be done - what should be avoided“-lists and „How to address the family“-handouts were prepared by the enumerators to facilitate their work in the field and to improve the quality of the data assessed.

2.4 Data Analysis

Data analysis was carried out with EPI-INFO and with SPSS for Windows (version 8.01). Z-scores of height-for-age, weight-for-height and weight-for-age were calculated with EPI-INFO using the National Centre for Health Statistics data from the United States (1985) as a reference.

3 Results

The current nutritional status of an individual is influenced by basic causes (e.g. political system or resources), underlying causes (food availability, care and environment) and direct causes (food intake and health status). Results are described and discussed along the UNICEF model on multiple causes of malnutrition (Figure 1). A comparison is made between the three ethnic groups, Tamil, Muslim and Sinhalese. Since the living conditions in the uncleared areas are considered to be different from the cleared areas (for various reasons), results for the Tamil population in the uncleared areas will be presented as a separate group ("Tamil-uncleared"). The units to which results will be referred to in this report is the individual (mother or child) as well as the household/family level. The terms household and family are used identically in this context, since one household is considered to consist out of one family unit.

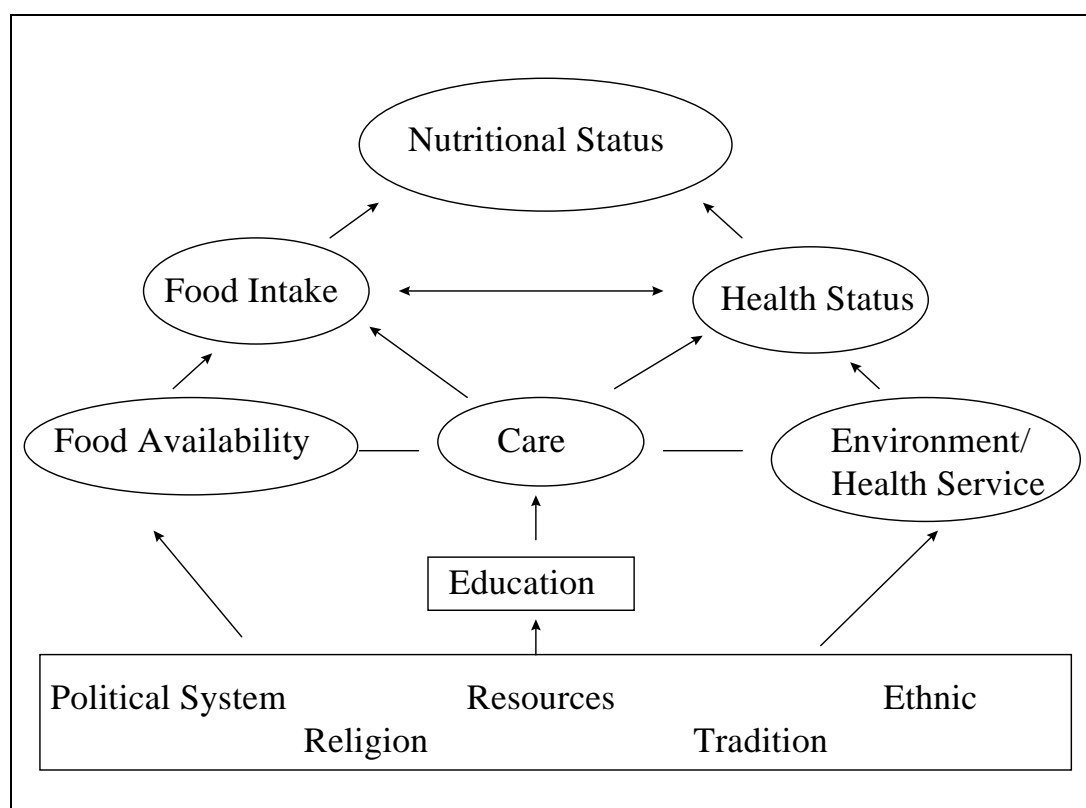


Figure 1. UNICEF: Strategy for improved nutrition of children and women in developing countries. New York, 1990, adapted by the authors.

3.1 General Living Conditions

3.1.1 Household characteristics

On average a household consists of five members, with little variation between the ethnic groups (Sinhalese: 4.4, Tamil-uncleared: 5.7). 5.4% of the households were female-headed households, predominantly amongst the Sinhalese population (9.3%). The mothers interviewed were on average 28 years old. The youngest was 16, the oldest 48.

All the families belonging to the survey sample had children under five. Amongst them the number of children under five years within one family (Table 2) indicates that birth spacing is weak amongst the Tamil and Muslim population. About 40% of the Tamil and Muslim families have two children under five and 5% of the Tamil families have three children under five.

Number of children under five	Tamil	Muslim	Sinhalese	Tamil (uncleared)	Total
1	56	62	82	47	62
2	39	37	17	48	35
3	5	1	1	5	3

Table 2. Number of children under five per family (in %)

10 % of the mothers had lost one child before it reached the age of five years 4% lost even two children and 1.5% more than two children under five. No significant differences were found between the ethnic groups. The reasons for the death of the children were not assessed

3.1.2 Displacement

Muslim and Tamil families are highly affected from displacements during war and civil unrest. The dimensions of displacement are shown in Table 3. Nearly 40% of the Muslim families have been displaced and resettled during the last 5 years, 26.4% of the Tamil population respectively. Besides, in all communities 2-7% of the families do not belong to the village and might therefore resettle to their original village as soon as security situation allows.

	Tamil	Muslim	Sinhalese	Tamil (uncleared)	Total
Families displaced to this village (not originally from this village)	7	4	4	2	4
Originally from this village, but displaces during the last 5 years	26	40	1	9	19

Table 3. Dimensions of displacement (in % of families)

3.1.3 Education of father and mother

The education level shows that the difference between men and women (father and mother) is not remarkable, whereas differences between the ethnic groups are significant. (Table 4, Figure 2, Figure 3).

In uncleared areas 61% of the fathers and 66% of the mothers were not able to read and write, compared to 13%/15% for all the other communities. Education level was best amongst the Sinhalese community, where 39%/31% had completed five years of schooling and even 48%/48% completed secondary school (fathers/mothers)

Schooling of father and mother	Father	Mother
Illiterate (unable to read and write)	24	28
Can read and write without completing grade five	14	17
Primary school completed (five years)	37	33
Secondary school completed (12 years)	25	22

Table 4. Schooling of father and mother (in %)

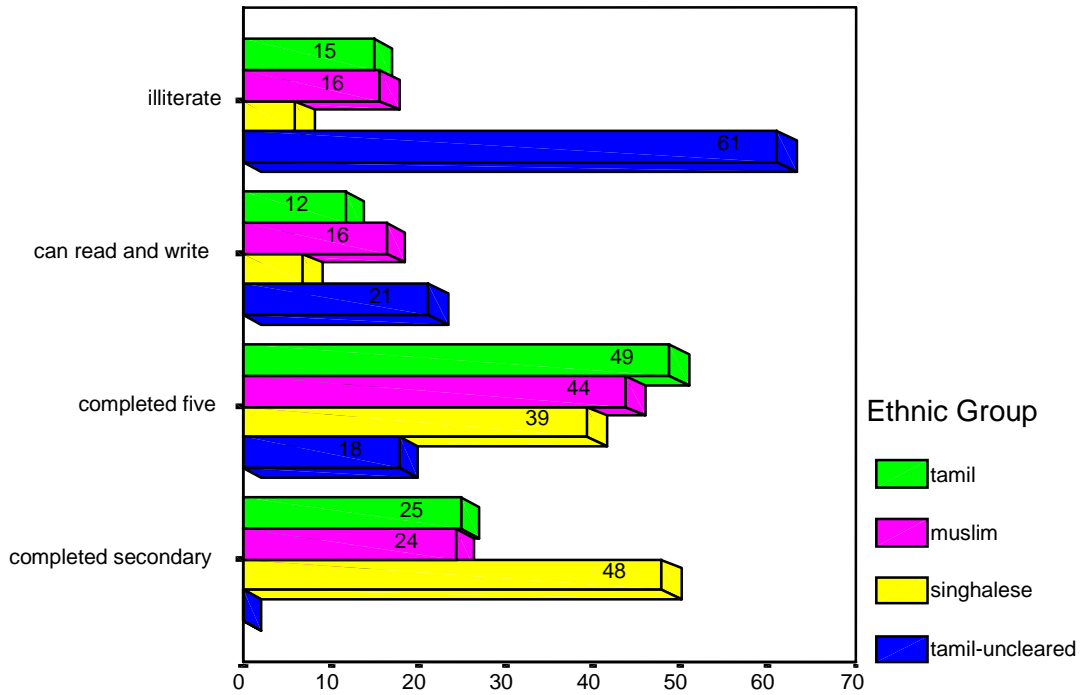


Figure 2. Formal schooling of father (in %)

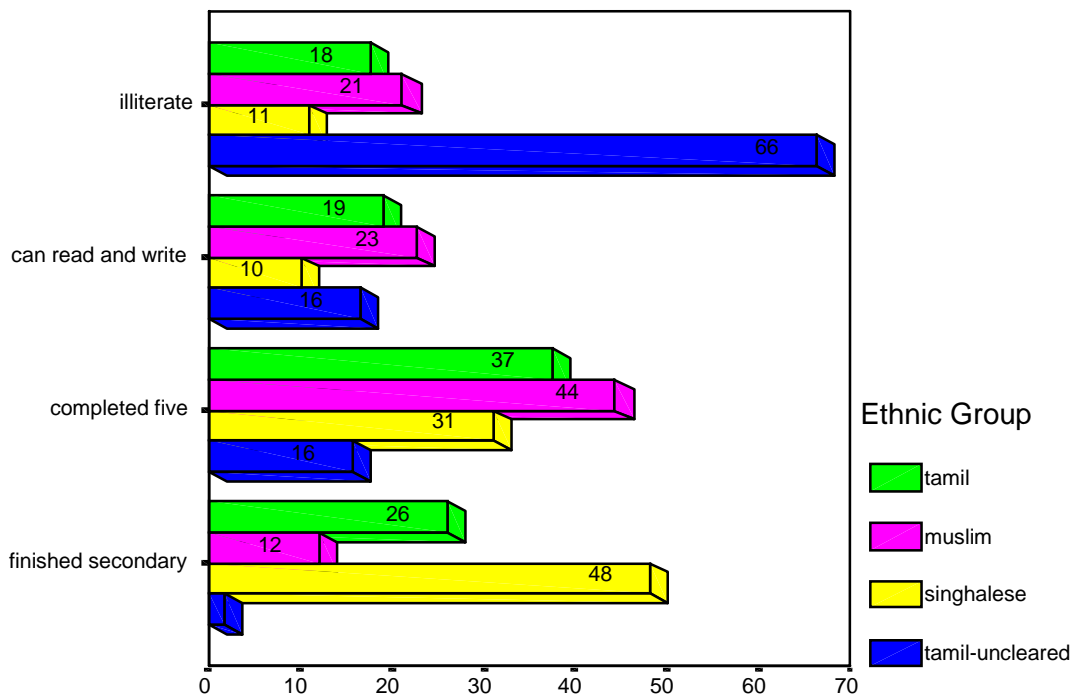


Figure 3. Formal schooling of mother (in %)

Illiterate = unable to read and write
 Can read and write = able to read and write without completing primary school (five years)
 Completed five = completed primary school (five years)
 Completed secondary = completed primary and secondary school (12 years)

3.1.4 Income sources

The main income sources of the survey population are farming (49%) and unskilled labour (44%) (Figure 4). Food aid plays an important role within the family income since 41% mentioned food aid as one of their main income sources. However, this indicates the high dependency from government aid. Other important income sources are fishing (19%) monthly salary from government or non-government employment (15%), skilled labour (11%) as well as small business (9%). Income from firewood, cattle/animals and animal products play only a minor role.

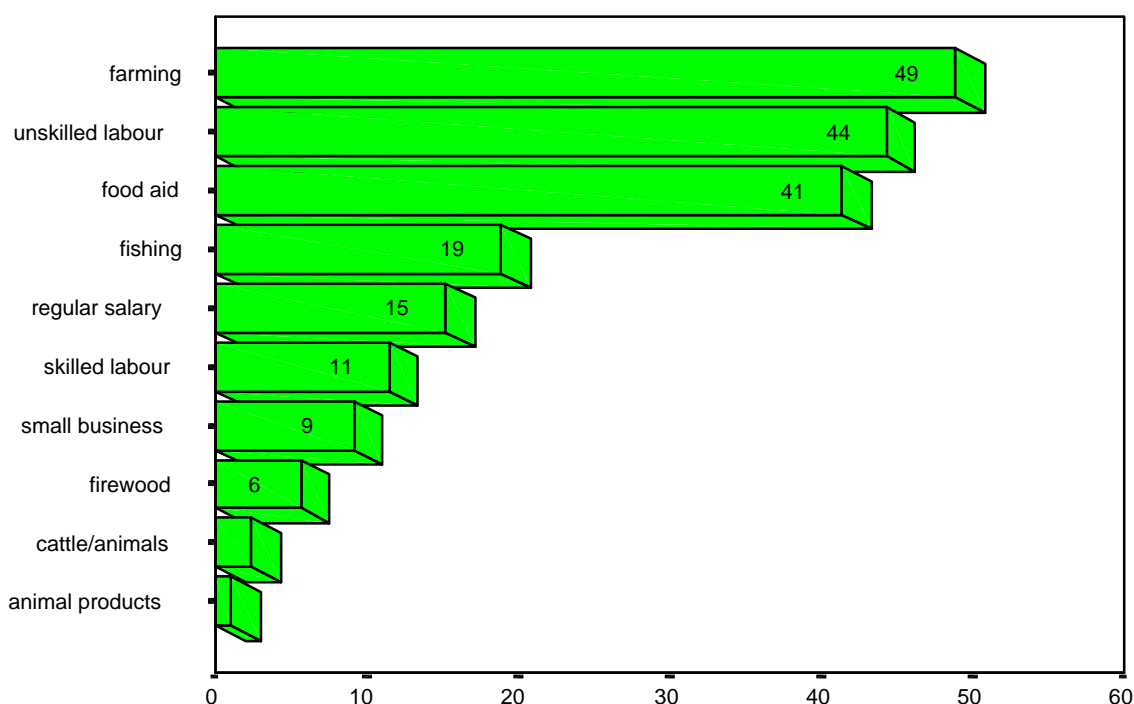


Figure 4. Main income sources of the total survey population (% of families)

Although there is little difference between the educational level of men and women (see 3.1.3), 89% of the women mentioned to be a housewife as their main occupation. Besides that, 10% of the Tamil women in the cleared areas are government employees and 6% are daily labourers, 9% in uncleared areas respectively. 15% of the Sinhalese women work as daily labourers and 4% in paid farming. 5% of the Muslim women are engaged in small business.

Main income sources for the Tamil population is farming (47%/56%), unskilled labour (54%/84%) and food aid (39%/61%), in cleared and uncleared areas respectively (Figure 5). 55% of the Tamil population in uncleared areas is depending on fishing, therefore they are highly affected by fishing restrictions due to security reasons.

Results show, that the Muslim community relies on a bigger variety of income sources, mainly food aid (51%) and unskilled labour (39%), but also fishing (22%), farming (21%) small business (18%) skilled labour (15%) and regular employment (11%) were mentioned.

Main income sources for the Sinhalese community is farming (73%) as well as regular salary (33%) although most of the salaries mentioned refers to homeguards, rather than other governmental or non-governmental employment. 19% mentioned skilled labour as one of their main income sources.

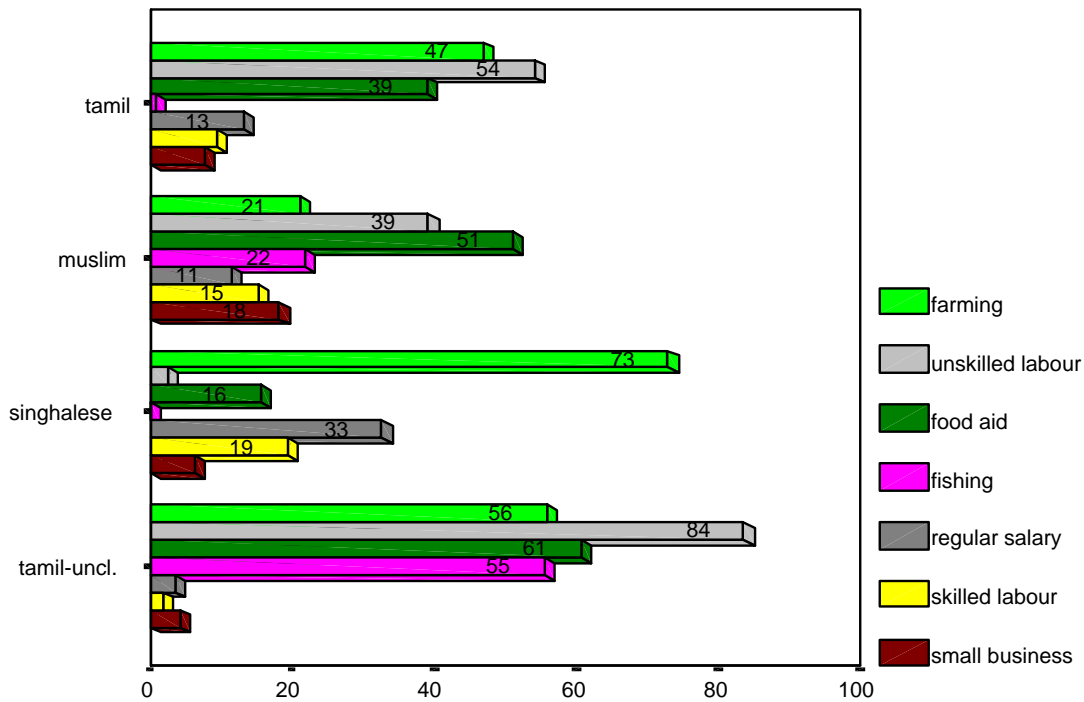


Figure 5. Main income sources of different ethnic groups (in % of families)

3.1.5 Main problems

Lack of income (71%) and food shortage (42%) was mentioned amongst most of the families in the survey area as their main problems (multiple answers were possible, Figure 6). About 25% of the households mentioned water supply, health services and transport as important problems.

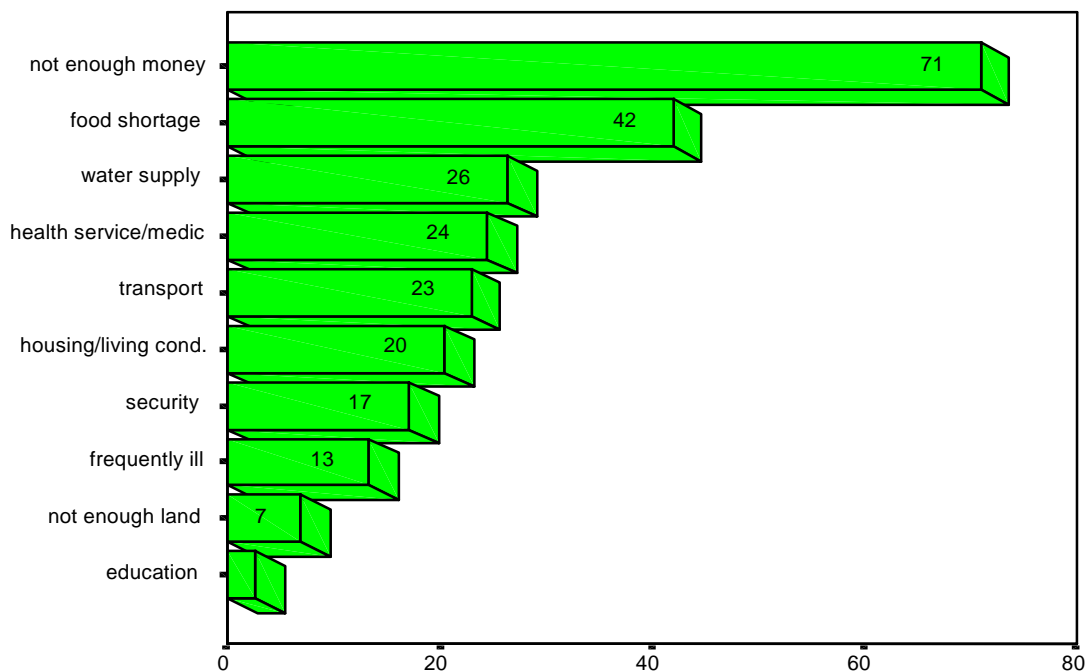


Figure 6. Main problems of the family (in % of households)

The degree to which the communities feel affected by the different problems was found to be very different. However, lack of money/income was mentioned most frequently by all communities (63-83%, Figure 7).

Tamil households in uncleared areas consider food shortage as their main problem (85%) and water supply (52%). Due to the precarious condition of the houses in uncleared areas (see 3.2.1) it is surprising, that only 8% of the households mentioned housing as their main problem. Food shortage is also an important issue for the Tamil (39%) and Muslim households (38%) in cleared areas.

37% of Tamil and 30% of Sinhalese households mentioned lack of health services. Relatively few households (14%) in uncleared areas mentioned that problem, which might be due to the good coverage of mobile health services provided by ICRC.

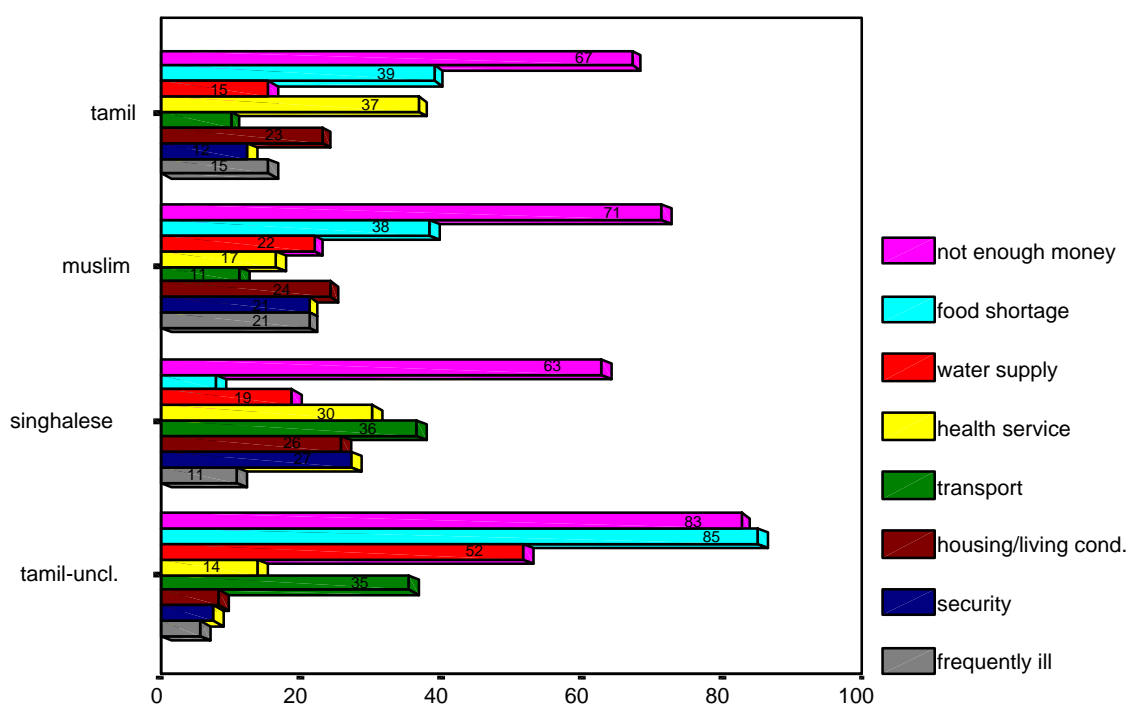


Figure 7. Main problems of the different ethnic groups (in % of households)

3.2 Environment

Underlying causes of malnutrition are unhealthy environment and insufficient health care.

Observations of the survey team reported generally a bad **personal and environmental hygiene** situation.

3.2.1 Housing facilities

The type of house and especially the type of roof are often used as an indicator for wealth or poverty of a household. Brick or cement blocks as wall material as well as asbestos/tiles as roof material can be considered as an indicator of relative wealth. Contrary to that, mud and cadjan walls as well as cadjan/palmyra/straw roofs can be considered as one indicator for poverty.

Survey findings concerning housing facilities show very different results amongst the different groups (Table 5).

The houses of the Muslim community are mainly out of a brick/cement wall (81%) and asbestos/tiles roof (71%). Walls of Sinhalese houses are made out of mud (50%) or brick (48%). 59% of the roofs had asbestos/tiles.

Housing of the Tamil population is poorer, especially in the uncleared areas, where 90% of the roofs are made out of cadjan/palmyra/straw and 94% of the walls either out of mud or cadjan. However, in the cleared areas still 42% of their roofs are asbestos/tiles and 54% of the walls from brick/cement.

Housing facilities	Tamil	Muslim	Sinhalese	Tamil (uncleared)	Total
Wall					
Mud	34	9	50	54	36
Red brick/cement block	54	81	48	6	48
Cadjan	11	9	1	40	15
Tinsheets	1	1	1	0	1
Roof					
Cadjan/palmyra/straw	47	24	27	90	46
Tin/aluminium	11	5	12	3	8
Asbestos/tiles	42	71	59	7	45
Plastic foil	0	0	2	0	1

Table 5. Wall and Roof material (in % of families)

Nearly 100% of the households in all communities used firewood for cooking. The use of kerosene, gas or electricity is an exception.

3.2.2 Water facilities and use

The availability of water usually has a high influence on personally hygiene. Nearly half of the households (48%) have not enough drinking water throughout the year. Most affected is the Tamil population in uncleared areas (73%), whereas the Tamil population in the cleared areas seems to be least affected (30%).

Water shortage mainly occur during the months of June to September (Figure 8)

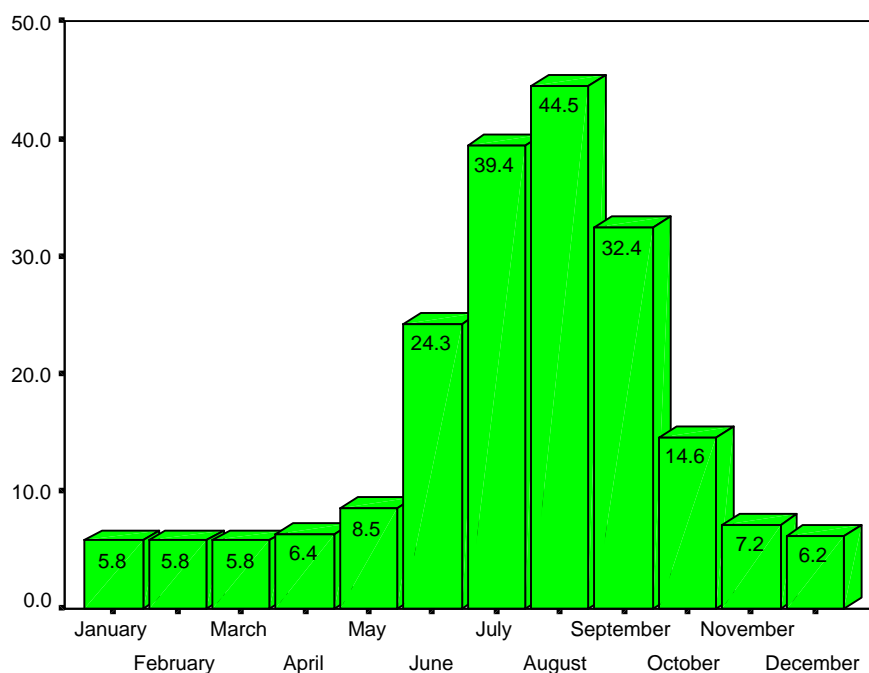


Figure 8. Water shortage of the survey population throughout the year (% of families)

Tamil and Muslim families are most effected (Figure 9). About 10% of the Tamil and Muslim families face water shortage throughout the year. In the uncleared areas 47-72% of the families suffer from water shortage during June to September.

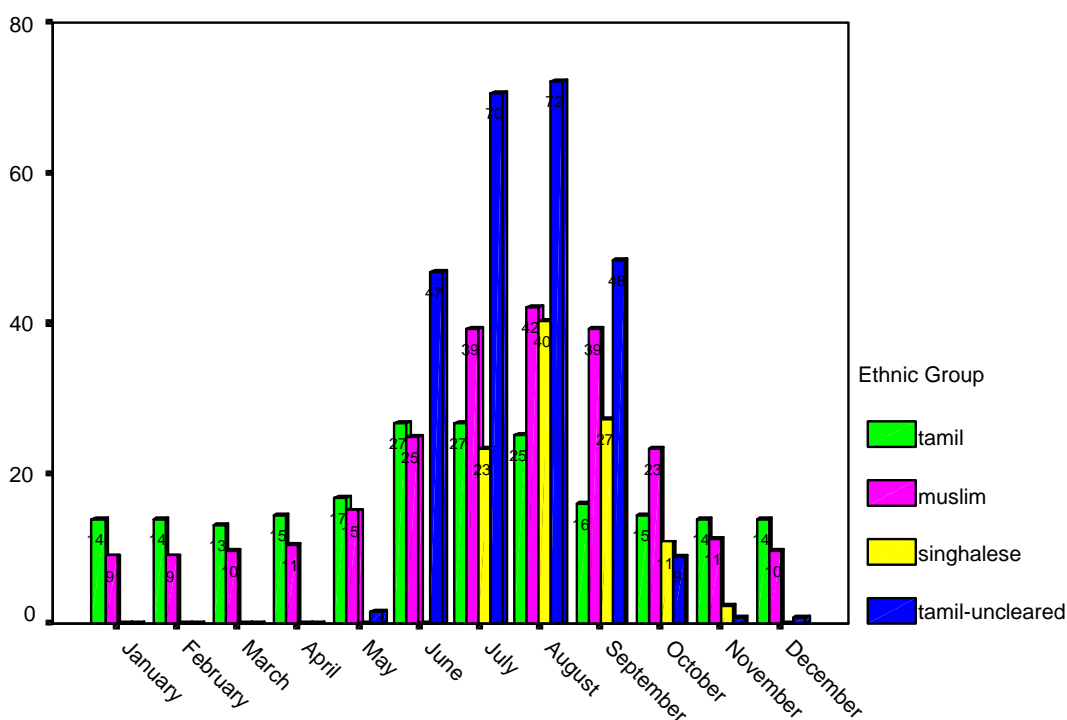


Figure 9. Months of water shortage by ethnic group.

Main source for drinking water are protected wells (88%) (Table 6). Very few people have access to tab water or tube wells. 9% of the families drink water from unprotected wells and 3% of the families in uncleared areas mentioned pond/tank as their drinking water source.

Drinking water source	Tamil	Muslim	Sinhalese	Tamil (uncleared)	Total
Tube well/tab	0	2	6	0	2
Protected well	98	92	78	85	88
Unprotected well	2	6	16	12	9
Pond/tank	0	0	0	3	1

Table 6. Source of drinking water (in % of families)

Boiling of drinking water is not yet a common practice in the survey area, although there is no problem with the availability of firewood. 19% of the families do never boil their drinking water (ACF 1997: 90%) and 60% only do it sometimes (Table 7). Most careful seems the Sinhalese community, where 37% always boil their drinking water.

Boiling of drinking water	Tamil	Muslim	Sinhalese	Tamil (uncleared)	Total	Families with unprotected wells
Always	25	14	37	6	21	33
Sometimes	58	63	48	74	60	60
Never	17	23	15	20	19	7

Table 7. Boiling of drinking water (in % of families)

Families who obtain their drinking water from unprotected wells seem a little more careful with boiling of drinking water. 33% do always, 60% sometimes and only 7% never boil drinking water, most of them amongst the Muslim community (13%).

Mothers were asked whether they wash their hands before eating and after the use of the toilets. 90% answered to wash hands before eating, thus it appears to be a common practice in all communities. About 33% of the mothers even wash their hands with soap, although only 4% in uncleared areas. High prices and restricted availability of soap could be a reason for that, but also lack of awareness and poor general hygiene due to a generally difficult access to clean water. 70% was their hand after using the toilet, but only 22% in uncleared areas which is likely to be related to the defecation place (see Table 8)

Washing hands	Tamil	Muslim	Sinhalese	Tamil (uncleared)	Total
Before eating					
Yes, with soap	45	42	40	4	33
Yes, without soap	49	51	45	88	58
sometimes	5	6	15	7	8
No	1	1	0	1	1
After using toilet					
Yes	93	90	72	22	70
Sometimes	3	5	14	30	17
No	3	5	14	48	13

Table 8. *Washing hands (in % of mothers)*

3.2.3 Defecation and garbage disposal

On average 40% of the surveyed families have access to latrines (ACF 1997: 38%), with 67% amongst the Sinhalese community (Table 9). In uncleared areas only 4% of the households have latrines, whereas 95% use any place in the open field for defecation. About 50% of the surveyed population defecates in the open field.

In addition, observations showed that hygiene and maintenance of the available latrines often remained poor and regular use of latrines needs to be questioned.

The risk of contamination of water and food through faeces is therefore very high. Awareness on risks of infection through faeces needs to be emphasised. Toilet facilities should be provided and their proper use promoted.

Garbage disposal is also a serious hygiene and environmental problem. 24% of the families leave their garbage openly in the street, garden or field.

Defecation and garbage disposal	Tamil	Muslim	Sinhalese	Tamil (uncleared)	Total
Defecation place					
Latrine	42	47	67	4	40
Open field	55	50	30	95	57
Others	3	3	3	1	3
Garbage disposal					
Openly in street/garden/field	15	14	27	40	24
Buried	28	14	34	8	21
Burned	57	72	39	52	55

Table 9. *Defecation place and garbage disposal (in % of families)*

3.3 Health Service/Facilities

The Department of Health Services (DoH) in Trincomalee is operating under difficult conditions. Besides lack of equipment, medical supplies and infrastructure facilities, major shortcomings are shortage of staff. Especially for skilled staff, such as doctors and supervising staff (Public Health Inspectors (PHIs) and midwives (PHM)), the situation is alarming (Table 10). Due to the prevailing conflict situation in the district, staff are not willing work in remote and higher risk areas, in particular skilled staff. Therefore one newly built hospital has been closed for two years since no doctor is willing to work there.

The national target is that one PHI should cover approx. 6.000 people and one midwife 3.000 people. But the actual staff situation in Trincomalee District allows only an average coverage of 13.000 people per PHI and 7.000 people per midwife. In the different areas the coverage varies a lot (e.g. Muthur: 3 PHIs for 55.000 people). All PHIs are male, all Midwives are female.

Designation	Existing staff	Target (necessary staff)
Medical Officer of Health (MOH)	3	11
Senior Public Health Instructor (SPHI)	0	11
Public Health Instructor (PHI)	26	48
Public Health Nurse (PHNS)	0	11
Supervision Public Health Midwife (SPHM)	0	11
Public Health Midwife (PHM)	50	115
Public Health Field Assistant (PHFA)	24	????

Table 10. Staff situation in MoH, Trincomalee District, Nov 1999

Health volunteers play an important role in Trincomalee District, since they fill at least some of the gaps caused by the shortage of qualified staff, especially in the remote areas and uncleared areas. They have been trained by various institutions (Family Health Bureau, EHED, ICRC, SLRC) and about 50 community health workers (CHW) are active.

In the presented survey, distribution of complementary food ("Triposha"), antenatal care (ANC), place of delivery, as well as the immunisation coverage were assessed to be used as indicators for the quality and accessibility of health services in the survey area.

3.3.1 Nutritional Program on additional food "Triposha"

There is a nutritional program in Sri Lanka to distribute complementary food ("Triposha") to pregnant and lactating women as well as to children under five when considered malnourished (according to centile classification on the growth card). "Triposha" is distributed during the antenatal clinics (ANC) and Well Baby Clinics (WBC)

Triposha is composed of a blend of corn, soya, non-fat dry milk, minerals and vitamins. One pack weighs 750g (100g = 356 kcal, 1500g = 5340 kcal). Target is to distribute two packs per women every months => 50g/day = 178 kcal/day

82% of the mothers received "Triposha" during their last pregnancy, but no information was gathered on the amount and frequency they have received it (Table 11).

3.3.2 Antenatal care (ANC)

Pregnant women should attend the antenatal care (ANC) once every month of pregnancy and weekly the month before delivery. The services that should be provided at ANC are weighing of the mother, provision of iron tablets in combination with Vitamin C and provision of two packets (1.5 kg) of Triposha (complementary food) every month.

According to the DoH, availability of Iron and Vitamin Tablets is not a problem in the survey area, whereas availability of Triposha is irregular and strongly depending on the provision from Colombo.

The coverage of was found to be good in the survey area. Only 3% never attended ANC during their last pregnancy, 11% attended only 1-3 times (Table 11). 25% of the women reached the target and 61% attended ANC at least 4-7 times during pregnancy. The coverage is best amongst the Sinhalese community.

Attending ANC during last pregnancy	Tamil	Muslim	Sinhalese	Tamil (uncleared)	Total
Never	4	3	1	5	3
1-3 times	7	9	5	22	11
4-7 times	77	78	20	71	61
8 times or more	12	10	74	2	25
Received "Triposha"	65	74	95	95	82

Table 11. Attendance of prenatal care during last pregnancy (% of mothers)

3.3.3 Place of Delivery

For the delivery of the last child very different results were found amongst the ethnic groups (Table 12). Whereas 90% of the Sinhalese mothers had delivered in the hospital, this was only the case for 17% of the mothers in uncleared areas, where 83% had delivered at home, without any trained assistance. Still 39% of the mothers in the survey area deliver at home without trained assistance, which is a good indicator for the difficult access to health facilities in the District.

Delivery of last child	Tamil	Muslim	Sinhalese	Tamil (uncleared)	Total
Hospital	62	65	90	17	59
Home delivery with trained assistance	5	4	0	0	2
Home delivery without trained assistance	33	31	10	83	39

Table 12. Place of delivery of last child (% of mothers)

3.3.4 Immunisation and Child Health Development Record (CHRD)

An immunisation program for children is part of the national health services. This includes BCG (against tuberculosis), DPT (diphtheria, whooping cough, tetanus), polio and measles. The coverage of the national vaccination program is fairly high. It is reported that 88% of children had received vaccination against measles, 89% against BCG, 91% have been fully immunised against DPT, 91% against Polio and 88% against measles [UNICEF, 1996].

As BCG is given to the child after birth, it is likely that the coverage is related to the place of delivery (at hospital child will receive BCG) and whether the immunisation has been successful or not (development of scar). Vaccination against diphtheria, whooping cough, tetanus (DPT), polio (OPV) and measles are given to the child during the first year of age. Therefore children older than 12 months should be fully immunised.

Immunisation coverage highly depends on the availability of health facilities and their usage by the mother.

All children under 5 years should possess a Child Health Development Record (CHDR), where immunisation, growth development as well as other preventive measures, such as deworming are noted. Table 13 shows, that 84% of the surveyed children had a CHDR and 4% had at least a vaccination sheet. Only 9% had neither of the two and 3% had lost their card (during displacement or other reasons). Best coverage is amongst the Sinhalese population, where 98% of the children had a CHDR.

Child Health Development Record (CHDR)	Tamil	Muslim	Sinhalese	Tamil (uncleared)	Total
CHDR available	81	75	98	85	84
Vaccination sheet, but no CHDR	4	6	0	4	4
CHDR not available or lost	7	4	1	2	3
Child has neither CHDR nor vaccination sheet	8	15	1	9	9

Table 13. Presence of Child Health Development Record (CHDR) (% children, n=701)

Children who did not have either CHDR or vaccination sheet were determined as 'non-immunised', since mother's information alone was not considered reliable.

In Table 14 the column "all" shows how many percent of children have received complete immunisation out of all children older than twelve months (with and without card or vaccination sheet (n=559)). The column "card" shows how many percent of children have received complete immunisation out of those children who were older than twelve months and had either CHDR or vaccination sheet (n= 482)

Some of the children without CHDR or vaccination sheet might nevertheless have completed the regular immunisation. Therefore the immunisation coverage presented under "all" might be too low. However, it gives the percentage of *all* children who *definitely* have received complete immunisation according to their age.

The results for the total of 559 children >12 months showed, that 80% to 88% have received complete immunisation against the respective diseases. From the 482 children >12 months and possessing either CHDR or vaccination sheet, 93 o 95% were completely vaccinated.

Immunisation coverage*	Tamil		Muslim		Sinhalese		Tamil (uncleared)		Total	
	all	card	all	card	all	card	all	card	all	card
DPT complete	77	93	69	85	98	100	80	93	80	93
OPV complete	76	92	69	86	98	100	79	93	80	93
Measles	79	96	75	93	96	98	80	94	82	95
BCG (scar developed)	90		84		83		91		88	

* = DPT, OPV, Measles: children > 12 months, BCG: all children

all = % of all children > 12 months (n=559)

card = % of children > 12 months who had a CHDR or vaccination sheet (n=482)

Table 14. Immunisation coverage by ethnic group (%)

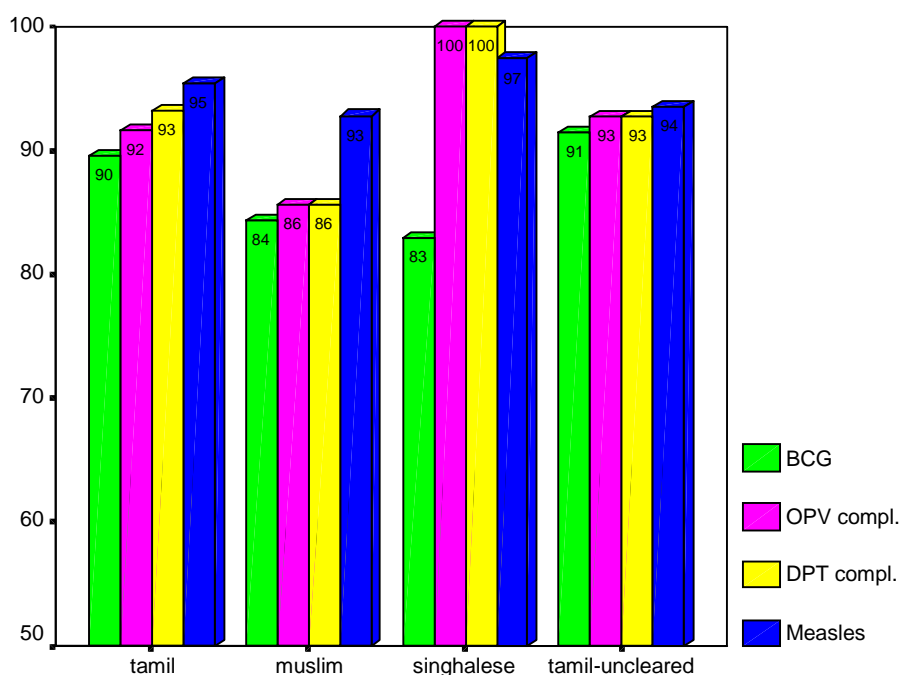


Figure 10. Immunisation status of children with CHDR by ethnic group (BCG: all children are included, OPV, DPT and measles: only children elder than 12 months are included (should be fully immunised)).

As shown in Table 13, Table 14 and Figure 10, Sinhalese children are well immunised. Nearly all children had CHRDR's and coverage for OPV, DPT and Measles is almost 100%. The findings on BCG scar development were surprising. Since BCG immunisation is provided after birth, one would expect to have a higher coverage amongst communities with a high rate of deliveries in the hospital. 90% of the Sinhalese mothers had delivered their last child in the hospital (Table 12), but nevertheless the BCG scar development was lowest amongst all communities (83%, Figure 10). Immunisation coverage is worst amongst the Muslim community. 15% of the Muslim had no CHRDR and amongst the children with CHRDR only 84-93% had complete immunisation according to their age. 8% of the Tamil children in cleared areas and 9% in uncleared areas did not possess a CHRDR. Immunisation coverage for the children with card was 90-95% against the respective diseases.

3.3.5 Deworming

39% of the children received deworming medicine during the last 6 months, most of them amongst the sinhalese community (63%) (Table 15). Due to the bad hygienic situation and the tradition of all three ethnic groups to eat with their hands, deworming campaigns in combination with awareness programmes are highly required.

Deworming (during last 6 months)	Tamil	Muslim	Sinhalese	Tamil (uncleared)	Total
Received deworming tablets	33	47	63	23	39

Table 15. Children who received deworming medicine during last 6 months) (% children, n=698)

3.4 Food Availability and Access

3.4.1 Food shortage

Insufficient food availability is one of the underlying causes of malnutrition. Figure 11 shows the months in which people suffer from food shortage. The Sinhalese population seems much less affected by seasonal food shortage than Tamils and Muslims. During the critical months (October to January, before harvest) up to 50% of the surveyed families mentioned food shortages. Subsistence farming versus cash-income needs to be related to the seasonal or unspecified food shortages throughout the year.

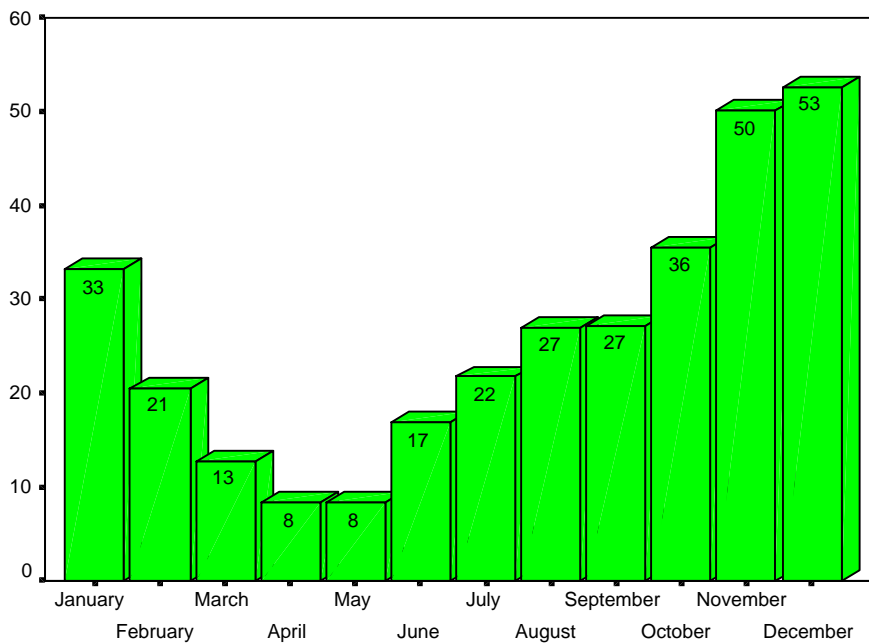


Figure 11. Food shortage throughout the year (%of families).

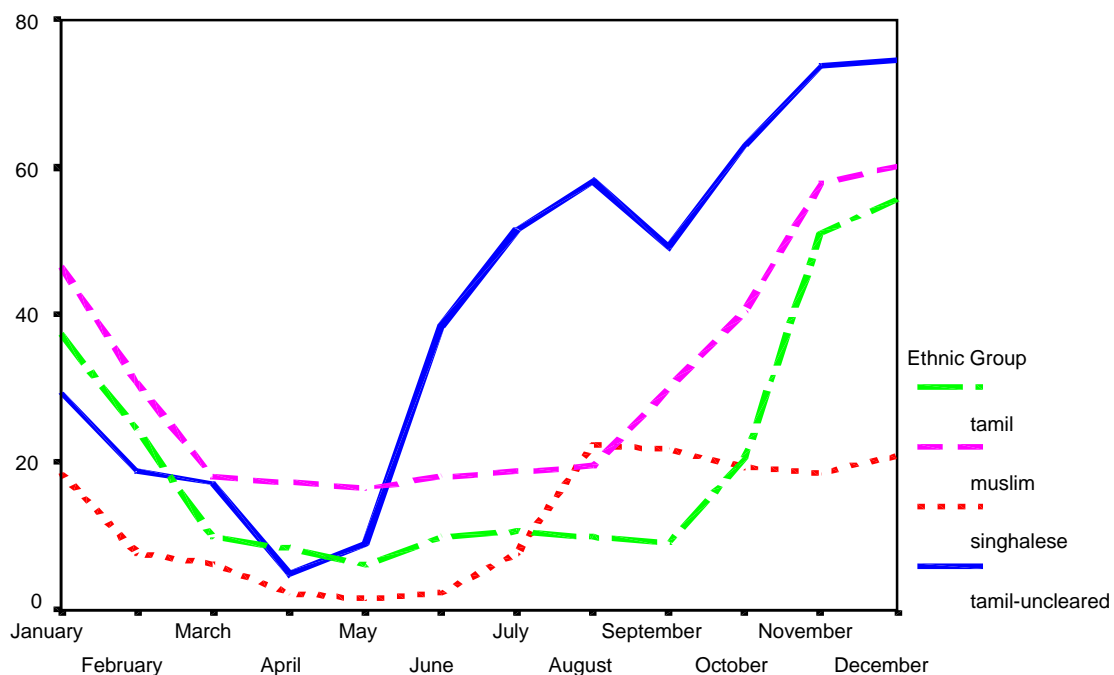


Figure 12. Food shortage throughout the year by ethnic group.

3.5 Care

Care is defined as the time, attention and help, spent by family or society to satisfy the physical, mental and social needs of its members, especially their children. This includes e.g. the breastfeeding and feeding practices for infants and children, hygiene, nutrition and health knowledge and disease treatment.

In the presented survey the knowledge of the mother on growth monitoring, use of iodized salt, diarrhoea treatment, breastfeeding as well as feeding practices were assessed as an indicator of care.

3.5.1 Mothers knowledge on growth monitoring

In 93% of the households at least one child had a health card (growth chart) and mothers were asked to interpret the meaning of the child's growth development. Only 33% of the mothers made a correct interpretation, 7% interpreted wrongly and 60 answered that they do not know how to interpret the chart (Table 16). In the Sinhalese community 60% of the mothers gave a correct interpretation compared to only 13% in uncleared areas.

Generally interest and awareness on the importance of growth monitoring of children are still low and need to be improved.

Interpretation of growth chart	Tamil	Muslim	Sinhalese	Tamil (uncleared)	Total
Correct	34	21	60	13	33
Wrong	7	5	8	10	7
Does not know how to interpret	59	75	32	78	60

Table 16. Interpretation of growth chart (in % of mothers)

3.5.2 Use of iodised salt

The use of iodised salt for cooking can be used as another indicator of nutrition knowledge and awareness. 42% of the women mentioned to use iodised salt, but none of the mothers in uncleared areas (Table 17). Testing the salt used by the mothers with the MBI-iodine-kit, showed, that 78% of them were correct and really used iodised salt. Tests in all households showed, that 53% used iodised salt, thus 11% more than those who mentioned to use iodised salt. However, some households use iodised salt without being aware to do so, others think they use it, but their salt does not contain iodine. Nevertheless, use of iodised salt could be further promoted in all areas and especially in uncleared areas availability has to be checked and awareness improved.

Use of iodized salt	Tamil	Muslim	Sinhalese	Tamil (uncleared)	Total
Don't know	22	9	18	68	29
No	31	34	18	32	29
Yes	47	57	46	0	42
Test positive (from answer "yes")	85	80	72	-	78
Test positive (total)	49	51	48	4	53

Table 17. Use of iodized salt (in % of mothers)

Main reason for not using iodized salt seems to be the lack of knowledge (71%) and lack of availability (21%) (Table 18) 5% think iodized salt is too expensive. Only few mothers have a critical attitude towards iodized salt, such as “not good for our body” (1%) or dirty appearance.

Reason for not using iodized salt	Tamil	Muslim	Sinhalese	Tamil (uncleared)	Total
Don't know	56	56	70	87	71
Not available	36	27	27	9	21
Too expensive	4	14	-	3	5
Not used to	3	-	-	-	1
Not good for our body	-	2	2	1	1
Others	1	1	1	-	1

Table 18. Reasons for not using iodised salt (in % of mothers who don't use it)

3.5.3 Diarrhoea treatment

For the analysis of diarrhoea treatment, mothers were asked what kind of fluids and foods they give when the child has diarrhoea (only the youngest child was considered, n=487) Results show, that mothers seem to be aware, that children need additional fluids. Only 6% of the mothers gave less or no fluids (Table 19).

Drinks given in case of diarrhoea	water	Coconut water	Jeewanee (oral rehydration solution)	Coffee	Less or nothing
	68	1	36	50	6

Table 19. Drinks given in case of diarrhoea (% of mothers youngest child, n=487, multiple answers possible).

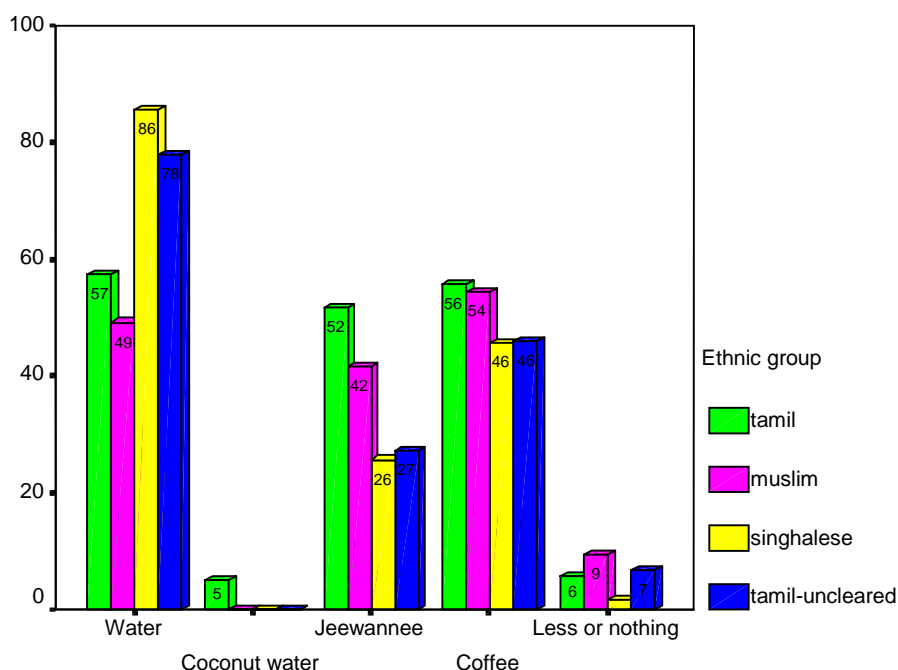


Figure 13. Drinks given during diarrhoea of child (% of mothers youngest child, n=487, multiple answers possible).

The fluids given were mainly water (68%) “Jeewanee” (oral rehydration solution, 36%) and Coffee (50%). Since coffee has a diuretic effect this is a dangerous practice during diarrhoea, which prevails within all three communities (Figure 13). Provision of “Jeewanee” should be encouraged, as well as coconut water, which was only given by 1% of the mothers (5% of the Tamil mothers, see Figure 13). Coconut water contains valuable minerals, which the child loses during diarrhoea, such as Potassium, and Magnesium.

Concerning foods given during diarrhoea the following results were found: 28% of the mothers feed the children as usual, 27% give only bread/biscuits or string hoppers, for 14% it is common practice to give honey and 12% give other foods (Table 20, Figure 14)

Foods given in case of diarrhoea	Feed as usual	Bread/biscuits /string hoppers	Honey	others	Give nothing
	29	38	13	1	19

Table 20. Foods given in case of diarrhoea child (% of mothers youngest child, only children >6 months, only one answer possible, n=441)

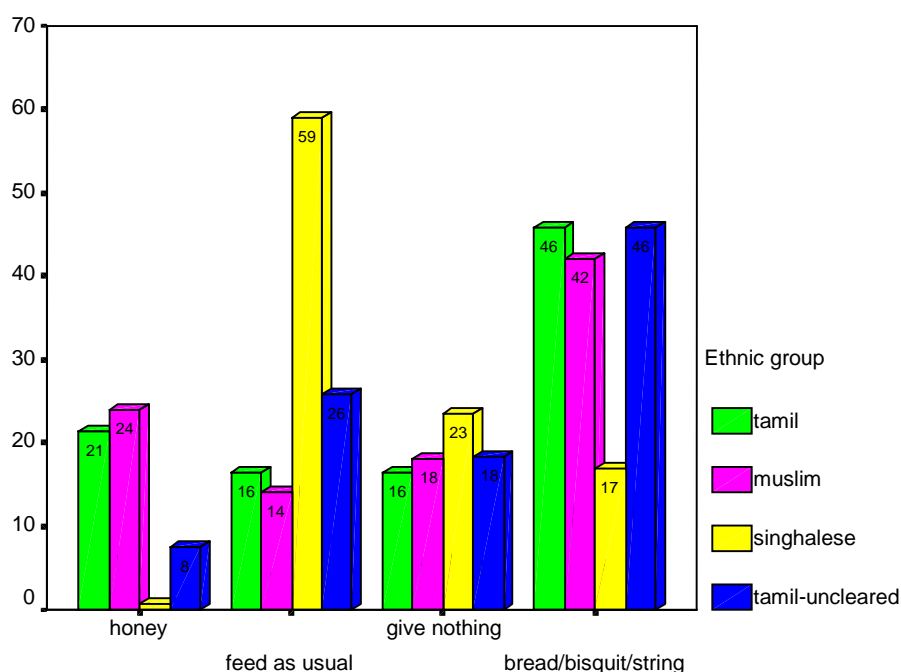


Figure 14. Foods given during diarrhoea of child (% of mothers youngest child, only children >6 months, n=441).

Most mothers go for medical treatment with their children when they suffer from diarrhoea. 79% mentioned to go always, 17% sometimes and only 1% never (Table 21).

Seeking for medical treatment in case of diarrhoea	Tamil	Muslim	Sinhalese	Tamil (uncleared)	Total
always	93	87	85	64	79
sometimes	6	12	14	35	17
never	1	1	1	1	1

Table 21. Going for medical treatment of diarrhoea

3.6 Food Intake

Micronutrient deficiencies, such as iron, Vitamin A and iodine deficiencies are likely to have a huge negative impact on human resources and national development. In 1996 UNICEF reported, that 0.6% of children suffered from clinical signs of Vitamin A deficiency and 0.7% suffered from nightblindness. Values above 1% are considered a serious public health problem. The Ministry of Health estimated that in 1992 about 65% of pregnant women suffer from iron deficiency anaemia. Iodine deficiency is highly prevalent in several areas, but mainly in the central and south-western part on Sri Lanka.

3.6.1 Breastfeeding

During the first few days after birth, the mother's breast produces a small amount of yellowish milk called colostrum. Colostrum is rich in antibodies, white cells and growth factor and therefore helps to strengthen the baby's immune system.

77% of the surveyed children had received colostrum after birth, 93% of Sinhalese but only 74% of Tamil mothers had given colostrum to their children and only 63% of the Tamil children in uncleared areas (Table 22).

Received colostrum after birth	Tamil	Muslim	Sinhalese	Tamil (uncleared)	Total
% of children (n=702)	74	83	93	63	77

Table 22. Children who received colostrum (% of children, n=702)

It was assessed which fluids were given to the children during their first 4 months of life. On average, 97% the children have received breastmilk, 20% of the children formula milk, 70% water and 3% other fluids (multiple answers possible)

Figure 15 shows which fluids were given to the children of the different ethnic groups. 40% of the Tamil children were given formula milk at least occasionally.

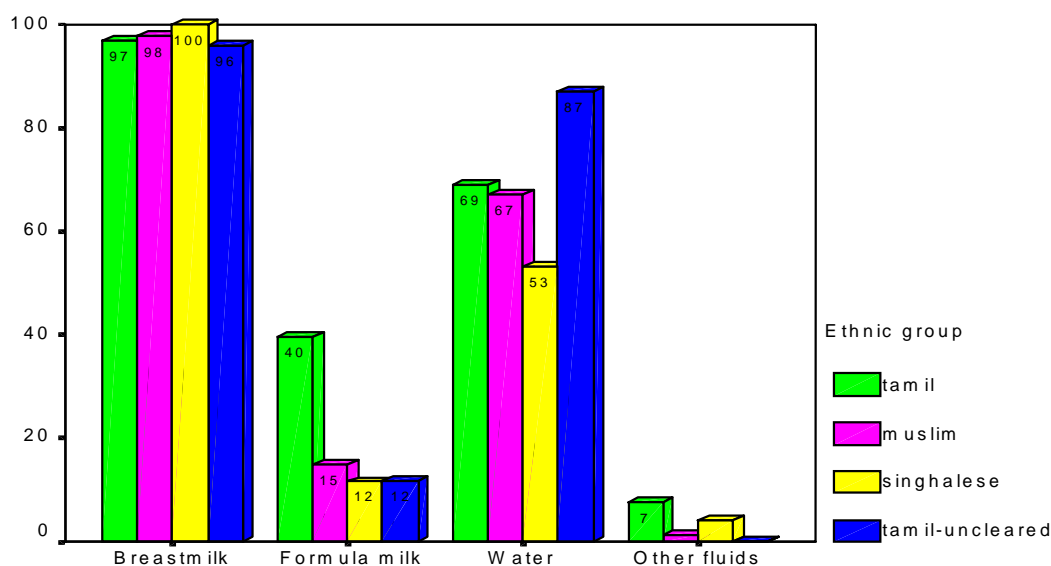


Figure 15. Fluids given to the children during their first four months of life (% of children n=702).

From all children in the survey sample (n=702) 5% (n=38) were four months old or younger, 8% (n=59) were six months and younger.

It is promoted to exclusively breastfeed children up to the age of 4-6 months (not to give any other fluids than breastmilk)

Up to 4 months 90% of the children were exclusively breastfed and 75% of the children up to 6 months.

Figure 16 shows, that most of the children are breastfed until the age of 18 months children

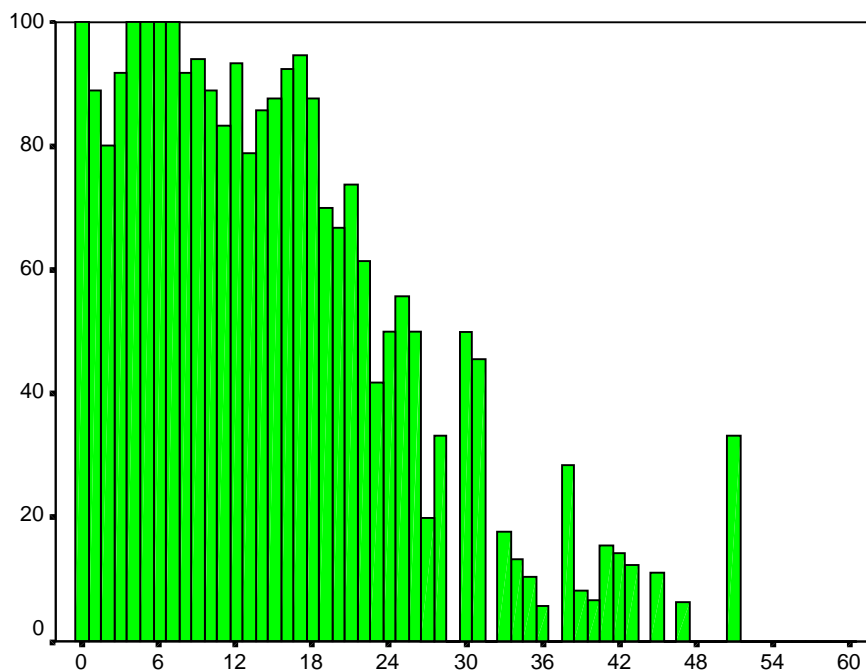


Figure 16. Breastfeeding of children (% of children, according to their age in months).

Children who are breastfed	< 6	>6-12	>12-24	>24-36	>36-48	> 48
% of children (age in months)	95	93	76	22	8	3

Table 23. Children who are breastfed per age group (% of children)

Most of the children were stopped to be given breastmilk because the mother wanted to stop breastfeeding (40%), 33% stopped because the mother was pregnant again, 17% because they had not enough milk and 8% because their mothers felt too weak.

3.6.2 Complementary food

The introduction of solid food (complementary food) is presented in Figure 17. By the age of 6 months about 80% of the child were fed with complementary food, but only 60% of the children within the Muslim community.

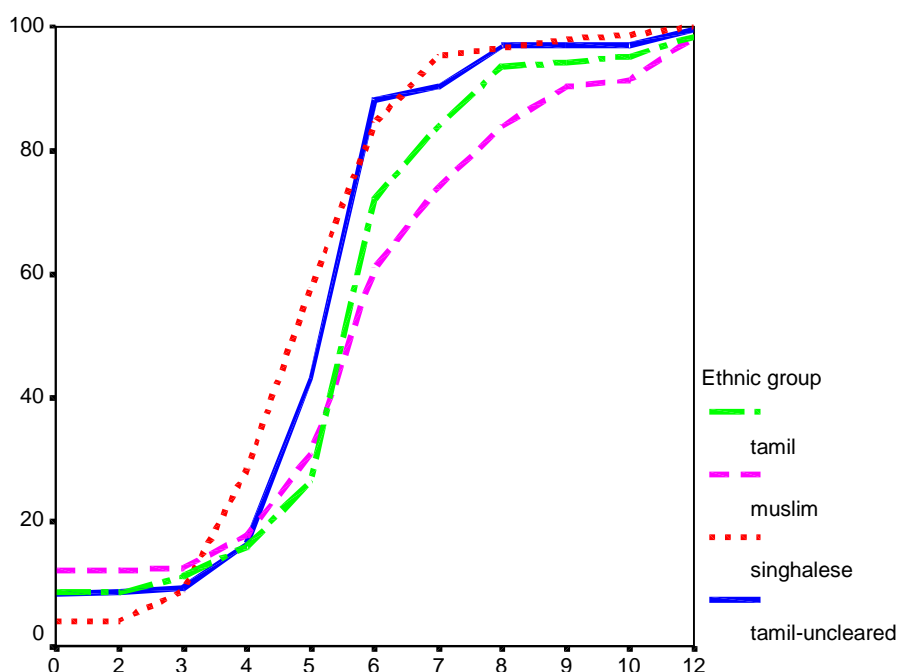


Figure 17. Introduction of complementary food (cumulative % of children, age in months)

3.6.3 Food Intake of children

It was assessed, how often the children receive foods such as starches (rice, maize, bread potatoes), pulses (dhal, mung beans, soya beans), meat/egg/fish, vegetables and fruits (Figure 18)

The mother's youngest child was considered, but only children from 6-60 months. Table 24 gives an overview of the child sample concerned.

Child sample for food frequency	Tamil	Muslim	Sinhalese	Tamil (uncleared)	Total
N=	122	124	124	121	491
Mean age (in months)	25	23	27	19	23
Standard deviation (SD)	□15	□15	□15	□13	□15

Table 24. Description of children concerned for food frequency study

Variety of the children's diet was best amongst the Sinhalese community. All food items are given to the children more often than amongst the other communities (Figure 18). The difference is remarkable for vegetables, which are consumed on average several times a month within the other communities, but several times a week within the Sinhalese community. Similar findings were made for fruits, which are consumed several times per month by Sinhalese children, but only on a monthly level within the other communities. However, children's diet seems poor in variety and the consumption of fruits and vegetables, as well as fish and pulses should be promoted.

The frequent consumption of biscuits amongst the Sinhalese children might be considered as an indicator of wealth.

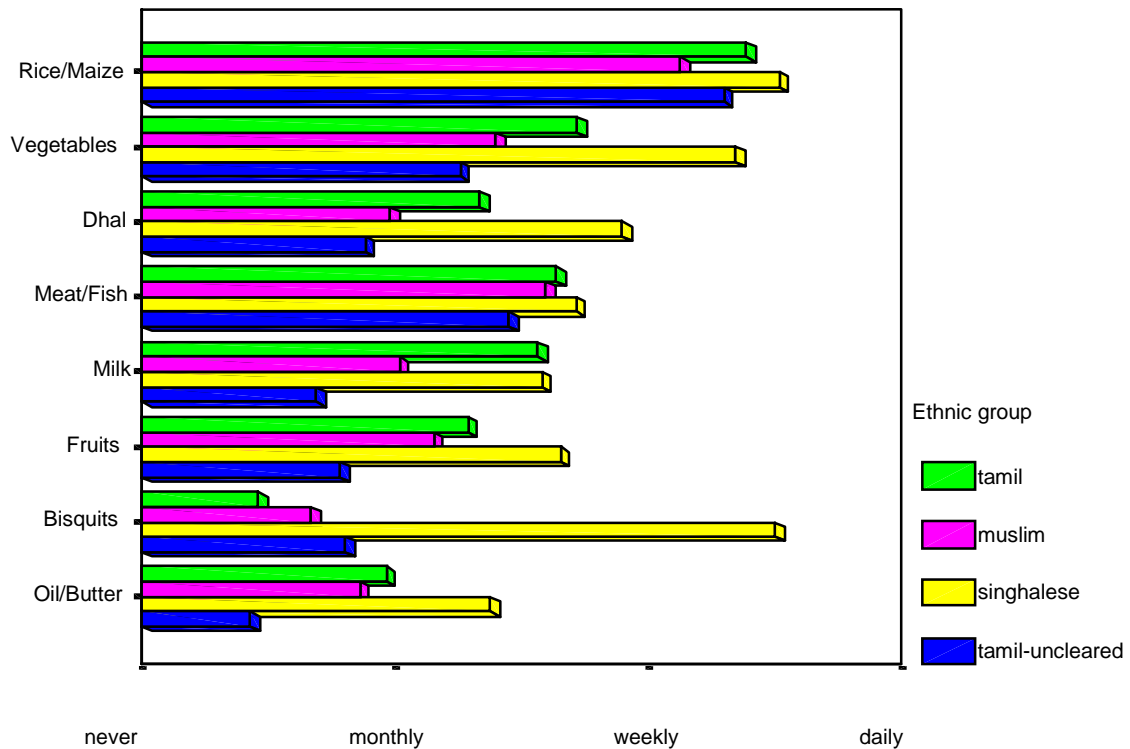


Figure 18. Consumption pattern of children > 6 months, (youngest child only , n=492)

3.6.4 Food intake of adults

The mean consumption pattern of main food items was investigated. Rice, as a staple food for all three ethnic groups is consumed daily (Figure 19, Figure 20). Consumption of *beans*, *green vegetables*, *other vegetables* as well as *oil and fat* is higher amongst the Sinhalese families. They consume the above mentioned food items several times a week, whereas consumption amongst Tamil and Muslim families is lower than on a weekly basis. Consumption of fruits as well as milk products was low amongst all three communities (monthly basis). Muslims and Tamils consume bread and fish more than once a week, consumption is lower amongst Sinhalese.

Diet in uncleared areas is very poor in variety, mainly consisting of rice, fish and vegetables. Frequency in consumption of oil, fruits as well as milk/milk products, eggs and meat is extremely low (monthly basis). The importance of fish in their diet indicates the vulnerability caused by fishing restrictions.

Awareness campaigns on healthy food (especially vegetables, fruits and fish, but also milk products (curd)) as well as improved availability on household level (e.g. through home gardening) are recommended activities, especially amongst the Tamil and Muslim population.

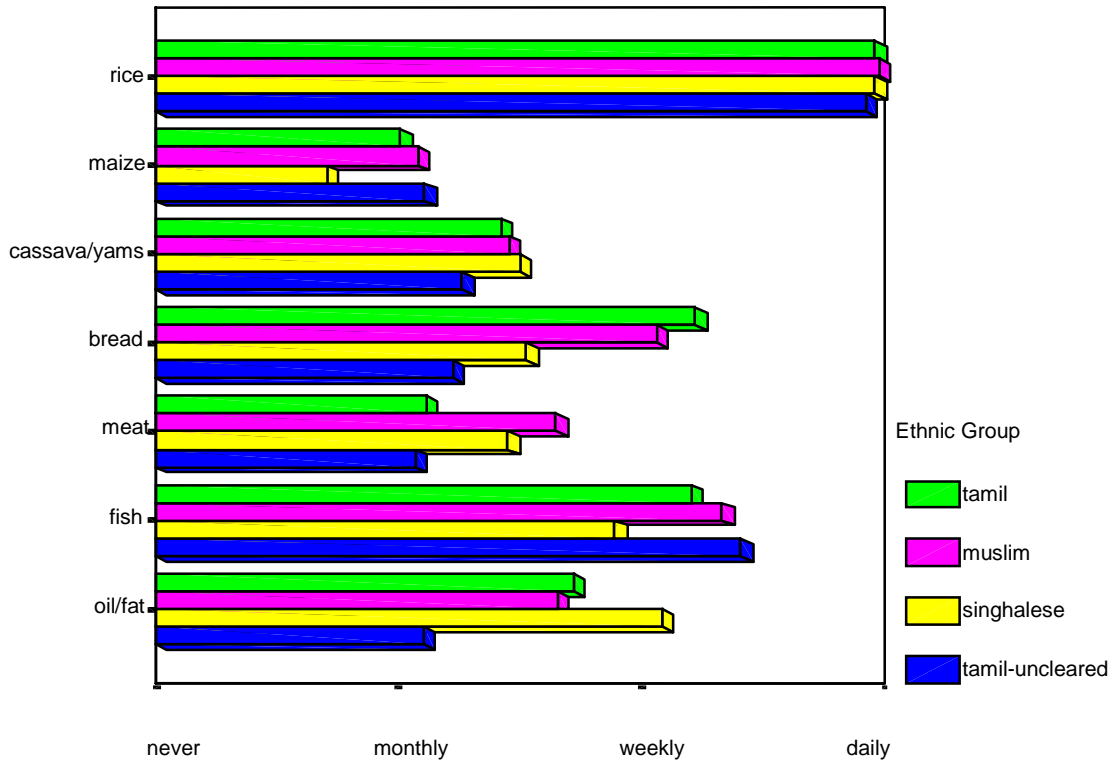


Figure 19. Mean consumption of food items by ethnic group (staples/meat/fat).

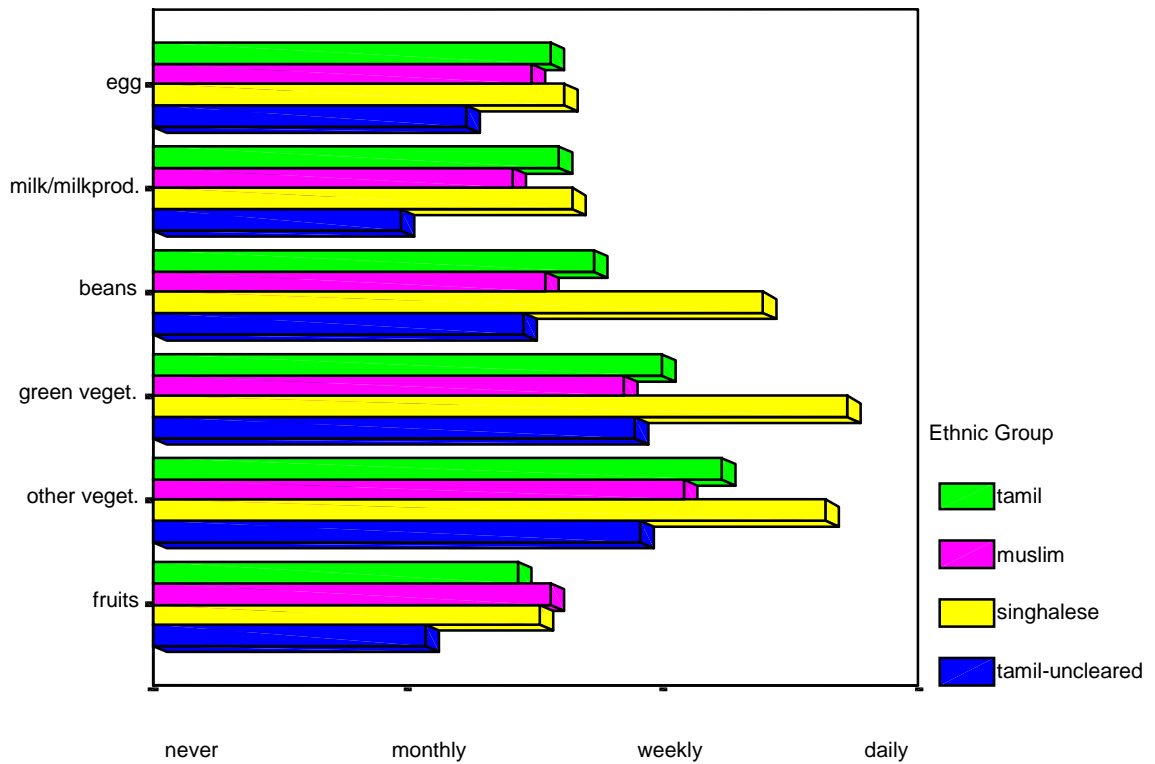


Figure 20. Mean consumption of food items by ethnic group (milk/egg/vegetables/fruits).

Fasting might have a negative impact on the nutritional status of women and children. As the Tamil and Muslim population is following strict fasting rules, it was intended to gather information on women's fasting habits, especially during pregnancy and lactation.

In comparison to the Tamil population, Muslims seem to be more strictly in following the fasting rules. During pregnancy 82% of the Muslim mothers follow the fasting rules and 78% during lactation (Table 25). Amongst the Tamil mothers values were 41% and 35 % respectively. Tamil women in uncleared areas seem to be less strict in following fasting rules, for unknown reasons. Type and extend of fasting needs to be further investigated towards its impact on food intake and care. During fasting periods Muslim women might still have a reasonable food intake in the evenings and early mornings. However, especially during breastfeeding it is of high importance that the mother gets enough fluids during the day to produce enough milk for the infant. Therefore strict fasting during breastfeeding is likely to have a negative impact on the breastfed child.

Following fasting rules	Tamil	Muslim	Sinhalese	Tamil (uncleared)
During pregnancy	41	82	0	15
During breastfeeding	35	78	0	20

Table 25. Following fasting rules during pregnancy and breastfeeding (in % of mothers)

Food restrictions during pregnancy and after delivery have also been investigated. 41% of the women have food restrictions during pregnancy and 59% after delivery (Table 26). The kind of restrictions has not been assessed during this survey, but further investigation is necessary to find out whether the restrictions concern foods that are rarely eaten anyway (such as monkeys) or whether restrictions have a serious impact on the daily diet.

Food restrictions	Tamil	Muslim	Sinhalese	Tamil (uncleared)	Total
During pregnancy	58	47	31	27	41
After delivery	42	48	62	55	59

Table 26. Food restrictions during pregnancy and breastfeeding (in % of mothers)

3.7 Health Status

Infectious diseases have a negative impact on the nutritional status, especially in children, because of reduced food intake (through less appetite or difficulties in eating) and an increased need for nutrients. As a consequence malnourished children are more likely to suffer from infections. Diseases develop more severely and children take longer to recover (vicious circle of malnutrition and infection).

Mothers were interviewed concerning the main health problems within their family as well as concerning the prevalence of diarrhoea, acute respiratory infections (ARI), fever and skin diseases amongst their children.

3.7.1 Main health problems

Fever is one of the main health problems for 85% of the surveyed mothers, and 6% mentioned malaria. Frequently mentioned were also ARI (Acute respiratory infections, 56%) and diarrhoea (17%). Figure 21 shows the main health problems within the different ethnic groups.

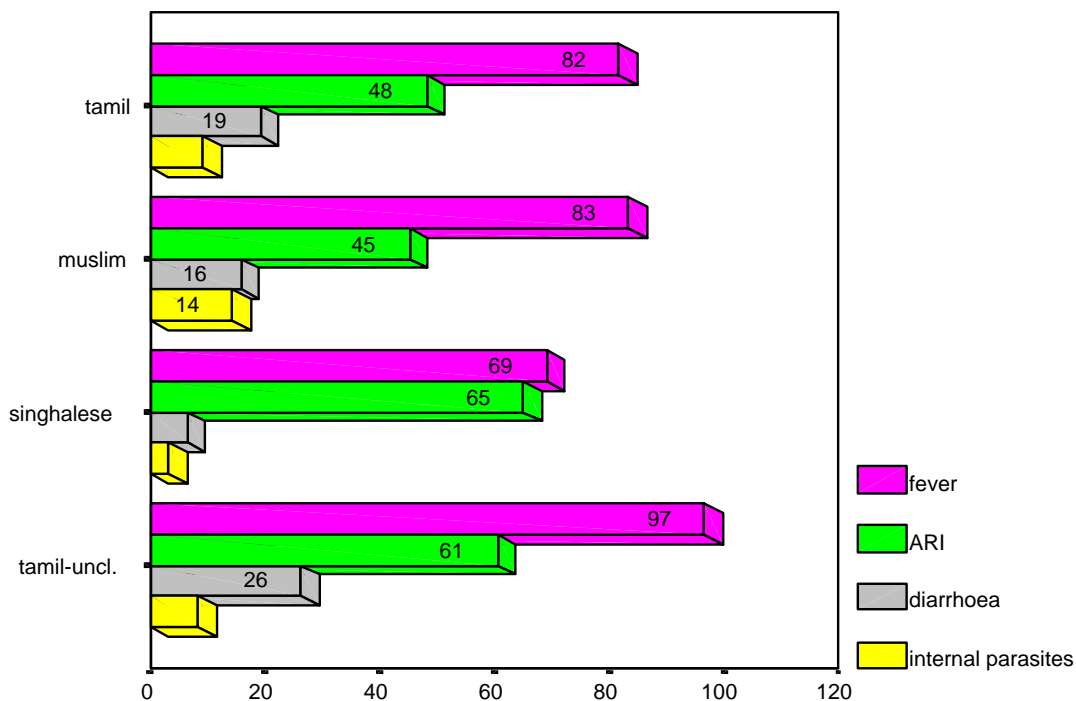


Figure 21. Main health problems in the family. (ARI = acute respiratory infections)

3.7.2 Prevalence of common diseases

According to their mothers 2.4% of the children had diarrhoea at the day of interview, 6.9% during the last seven days (Table 27). 47.7% of the children had any kind of acute respiratory infections (cough, cold, running nose) at the day of interview, 10.7 showed signs of skin disease and 13.8% were reported to have fever.

Disease prevalence	Diarrhoea		ARI	Skin disease	Fever
	now	-7	now	now	now
	2.4	6.9	47.7	10.7	13.8

“now” = at the day of interview

“-7 “ = during the last seven days

Table 27. Disease prevalence (% of children, n=702)

For the prevalence of diarrhoea and ARI no significant differences between the ethnic groups were found. Prevalence of skin disease was highest amongst the Tamil children in uncleared areas (18.6%) and lowest amongst the Sinhalese children (6.1%). Prevalence of fever was also comparatively low amongst the Sinhalese children (5.4%)

3.8 Nutritional Status

3.8.1 Nutritional Status of children under five

The birth weight of children was assessed. If mother's health and nutrition status is bad, their children tend to have a low birth weight. Birth weight under 2500g is considered to be too low. Children with low birth weight are likely to have a retarded mental and physical development. From the total survey sample the birth weight could only be obtained for 40% of the children (n=279), very few of them in uncleared areas (n=16). For all the other children the birth weight was not recorded.

Out of all children with available information on birth weight, 19% (n=29) had low birth weight (<2500g), which is higher than the findings of ACF, 1997 (16%). The highest prevalence of low birth weight was found amongst the Tamil children in uncleared areas (38%), whereas in the other communities 16-20% of the children weighed less than 2500g (Table 28)

The birth weight in the survey area was found to be generally low. The mean birth weight for the children with birth weight available was 2790g only (□490), which just above the cur-off point for low birth weight (2500g).

Low birth weight (<2500g)	Tamil n=96	Muslim n=45	Sinhalese n=122	Tamil (uncleared) n=16	Total n=279
% of children (with birth weight available)	16	16	20	38	19
Mean birth weight	2837 (□520)	2947 (□486)	2745 (□388)	2445 (□776)	2790 (□490)

Table 28. Low birth weight (% of children of which birth weight was recorded)

3.8.2 Nutritional status of children

To measure the nutritional status of children, the following indicators were applied:

- stunting = height-for-age Z-scores below -2 SD of reference population
Indicator for long-term nutritional deprivation.
- wasting = weight-for-height Z-scores below -2 SD of reference population
Indicator for acute malnutrition.
- underweight = weight-for-age Z-scores below -2 SD of reference population
Commonly used for national and regional statistics.

The weight and height measurements of the children were quoted in terms of Z-score, based on the standard deviations (SDs) above or below the median reference value for a person of a given age [FAO/WHO 1992]. Z-score using the US National Centre for Health Statistics (NCHS) norms [Hamill et al. 1979]. The level of median minus 2 SD is usually taken as the cut-off point or threshold, below which malnutrition exists [FAO/WHO 1992].

The findings of the survey shows, that 27% of the children are stunted (low height-for-age) and 50% underweighed (low weight-for-age), indicating a generally poor nutrition situation due to both, short-and long-term nutrition deprivation.

Prevalence of wasting (low weight-for-height) in the survey area is alarming (26%). Especially the Tamil and Sinhalese community is effected, but even the prevalence of 15% wasting within the Muslim community is high. Values above 10% are already considered a serious public health problem.

Immediate activities to reduce the prevalence of wasting are required. Permanent or recurrent phases of nutritional deprivation during early infancy are likely to have a huge negative impact on the physical and mental development of children.

8% of the children are both, stunted and wasted, most of them amongst the Tamil population in uncleared areas.

Overview on nutritional status	Tamil	Muslim	Sinhalese	Tamil (uncleared)	Total
N =	187	174	147	194	702
Age in months	30.6 (□16)	28.8(□16)	29.1(□16)	26.9(□16)	28.9(□16)
% stunting	34	16	15	42	27
% wasting	25	14	27	38	26
% underweight	54	33	41	69	50
% stunted and wasted	9	1	5	16	8
HAZ	-1.46 (□1.2)	-1.12 (□1.1)	-0.83 (□1.4)	-1.54 (□1.5)	-1.27 (□1.3)
WHZ	-1.35(□1.0)	-1.20 (□0.7)	-1.45 (□0.9)	-1.74 (□1.0)	-1.44 (□0.9)
WAZ	-1.95(□0.9)	-1.65 (□0.8)	-1.67 (□1.0)	-2.25 (□1.2)	-1.90 (□1.0)

Table 29. Overview on nutritional status of children (survey area)

Amongst the ethnic groups the nutritional status of Tamil children is worst, both in cleared and uncleared areas (Table 29, Figure 22). Both, long term and acute nutritional deprivation affect them, as stunting is an indicator for chronic inadequate food intake and wasting for acute malnutrition. Observations showed very poor hygiene conditions, both personal and environmental hygiene. Amongst seasonal food shortage and infectious diseases this is very likely to be the major reason for the high percentage of wasting. Many of the growth charts of the surveyed children showed a sudden fall in the growth line Mothers reported in many cases that these children lost weight because of an infectious disease. Still, further Data analysis has to be done to get details on reasons for the extremely high percentage of children suffering from wasting.

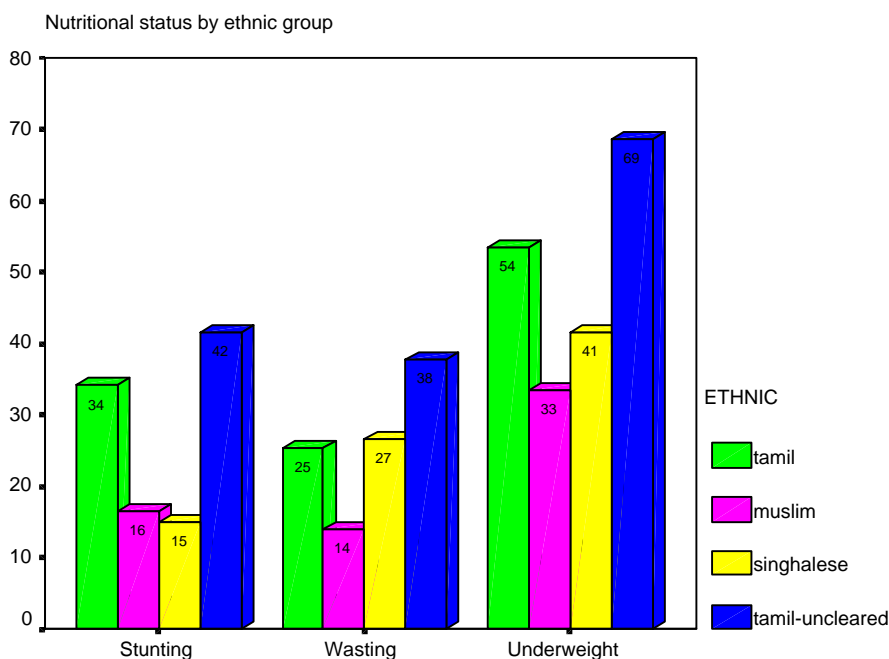


Figure 22. Nutritional status of children by ethnic group.

To compare the findings in the survey area with other surveys, results on the nutrition status of children 3-59 months are presented in Table 30.

The Survey conducted by Action Contre la Faim (ACF) included 900 children under five, selected from different GS-Divisions in Trincomalee District according to a cluster system. The survey area is comparable, although not identical, since ACF did consider two additional Divisions (Kinnyia, and Morawewa) and did not include Padivisipura. However, prevalence of malnutrition was found to be similar to the survey results in the survey presented in this report. Data on national level does not include the North Eastern Province, where no assessments of the nutritional status were made. For all three nutritional indicators (stunting, wasting and underweight) results of the survey area compare very unfavourable to the national level. Nutritional status of the Muslim children is comparable to national average, but prevalence of malnutrition amongst the tamil population, especially in the uncleared areas is much higher.

Ethnic group	% stunting	% wasting	% underweight	N=
Tamil	34	26	54	182
Muslim	17	15	34	169
Sinhalese	15	26	42	145
Tamil-uncleared	42	39	70	181
Total survey area	28	27	51	682
Total survey area (cleared)	25	25	47	570
ACF-Trincomalee 1997**	28	23	51	
National 1993 *	24	16	38	n.a.
National Data 95/96*	16	13	31	n.a.

* = the National Data does not include the North-Eastern Province: Source: Department of Census & Statistics; Demographic and Health Surveys 1993 and 1995/96

** = Action Contre la Faim (ACF) survey in 1997 included children 6-59 months

Table 30. Prevalence of malnutrition among children (3-59 months (cut-off point z-score<-2, survey results compared to ACF 1997 and national average 1993 and 1995/96)

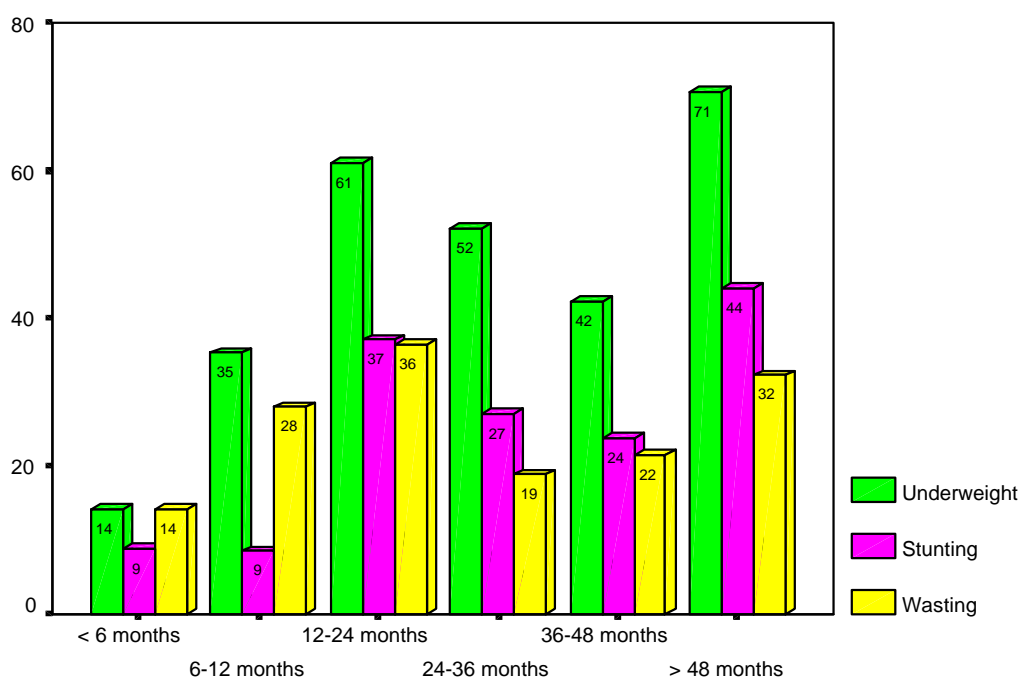


Figure 23. Nutritional status of children by age group (% of children, n=702).

Figure 23 shows the nutritional status per age group. Prevalence of wasting increases usually after the age of 6 months, when children are not anymore exclusively breastfed. Stunting is high in all age groups older than 12 months. Remarkable was the very high prevalence of stunting, wasting and underweight amongst the children older than four years. It needs to be questioned whether care for these children is neglected in favour of younger siblings.

Results on the nutritional status of children per Division are presented in Figure 24. However, interpretation of the results must be done with care. The survey sample was designed to compare the ethnic groups rather than the administrative divisions. Therefore the number of children within the ethnic groups are comparable (147-194, see Table 29), whereas the number of children in the samples of the respective Divisions varies a lot!

Only 59 children were measured and weighed in Padivisipura, compared to 256 children in Muthur. Nevertheless, Eachchilampattai and Muthur compare very unfavourable to the other divisions for all three nutritional status indicators. Wasting was very high in Padivisipura (36%, Sinhalese population), compared to 20% in Gomarankadawela (also Sinhalese population) the average of 27% amongst the total Sinhalese sample (see Table 29). Reasons for that are unknown and need to be further assessed.

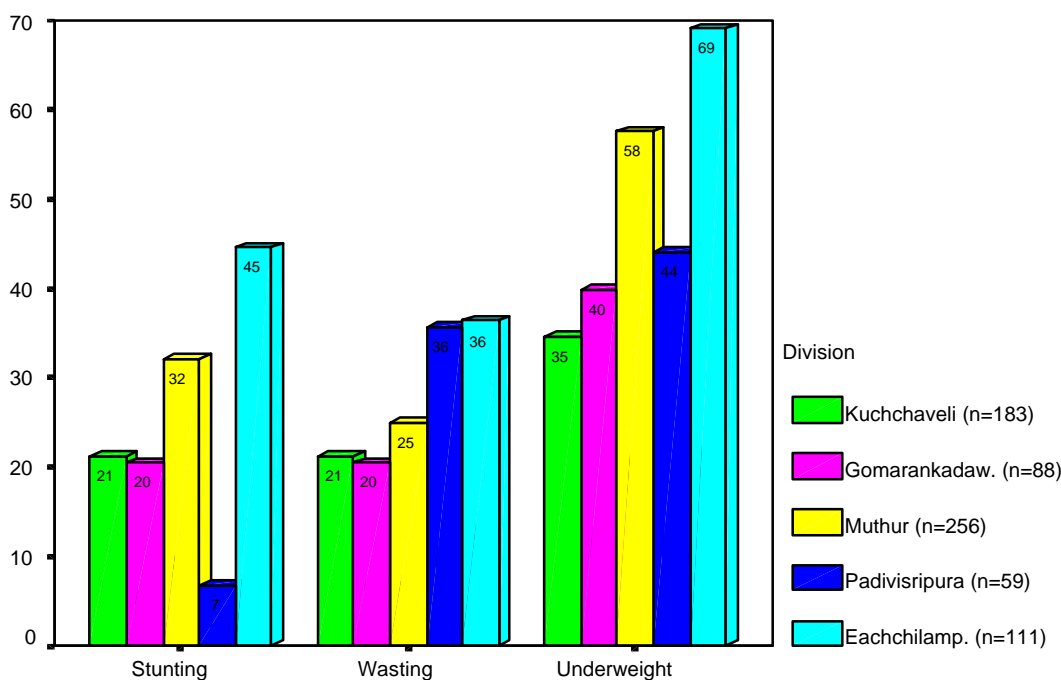


Figure 24. Nutritional status of children by Division (% of children, n=702).

3.8.3 Nutritional Status of non-pregnant mothers

The Body-Mass-Index (BMI) is a measure for fatness/thinness in adults. Normally body weight is proportional to body height and the BMI of well nourished adult ranges from 18.5 to 25. A BMI higher than 25 indicates obesity and a BMI lower than 18.5 is considered to be an indicator of energy deficiency. Women are considered severely malnourished if the BMI is lower than 17. To assess the nutritional status of mothers, their Body Mass Index (BMI) was calculated.

$$\text{BMI} = \frac{\text{Weight in kg}}{(\text{Height in metres})^2}$$

On average women weighed 44.5 kg and had a body height of 151 cm. 13% of the women were pregnant, 25% in uncleared areas. Average BMI in all three communities in cleared areas is >18.5, in uncleared areas the average BMI is 17.7, which indicates malnutrition (Table 31)

Ethnic group	N=	Weight of mother (kg)	Height of mother (cm)	Pregnant (in %)	BMI (non-pregnant)	N= (non-pregnant)
Tamil	124	44.5 (08)	151 (05)	9	19.5 (03)	113
Muslim	122	48.2 (09)	151 (05)	7	21.0 (03)	114
Sinhalese	125	44.9 (07)	151 (05)	10	19.5 (03)	112
tamil-uncleared	122	40.4 (06)	151 (06)	25	17.7 (03)	92
Total	493	44.5 (08)	151 (05)	13	19.4 (03)	431

Table 31. Basic information on the mothers in the survey sample

Nutritional status of women in the survey area is very serious. 48% of the women are malnourished (BMI <18.5), half of them severely malnourished (BMI <17) (Table 32)

BMI	Nutritional status	Tamil	Muslim	Sinhalese	Tamil (uncleared)	Total
< 17	Severely malnourished	22	12	18	48	24
17-18.4	Malnourished	28	17	23	29	24
18.5-25	Normal	45	58	54	23	46
> 25	Overweighed	5	13	5	0	6

Table 32. Prevalence of malnutrition among women (% of non-pregnant mothers)

Similar to the findings concerning children's nutritional status, malnutrition amongst Tamil mothers is worst (50%, in uncleared areas 77%). 48% of the women in uncleared areas are severely malnourished, which is an intolerable situation. Amongst the Muslim and Sinhalese communities malnutrition of women is lower, but still 29-40% are affected.

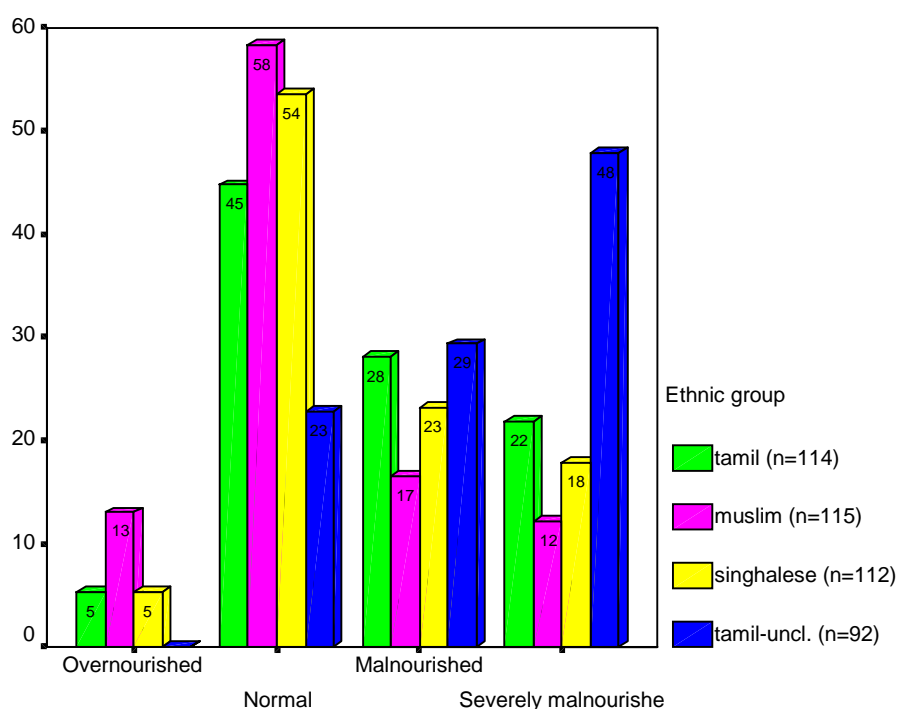


Figure 25. Nutritional status of non-pregnant mothers by ethnic group (in %, n=433)

However prevalence of malnutrition amongst mothers is alarming and the reasons for that are likely to be the same as for malnutrition amongst children (hygiene, seasonal food shortage, and disease) this needs to be further investigated. In addition to that, traditionally women do not eat with the other family members. They tend to eat last and leave bigger amounts and more nutritious food to their husband and children.

Results on the nutritional status of women per Division are presented in Figure 26. Similar to the nutritional status of children, interpretation of the results must be done with care. The survey sample was designed to compare the ethnic groups rather than the administrative divisions. Therefore the number of women within the ethnic groups are comparable whereas the number of women in the samples of the respective Divisions varies a lot!

Only 46 non-pregnant women were measured and weighed in Padivisipura, compared to 153 women in Muthur.

Similar to the findings for children, Eachchilampattai compares very unfavourable to the other divisions. 33% of the women are classified as moderately malnourished and 39% even as severely malnourished.

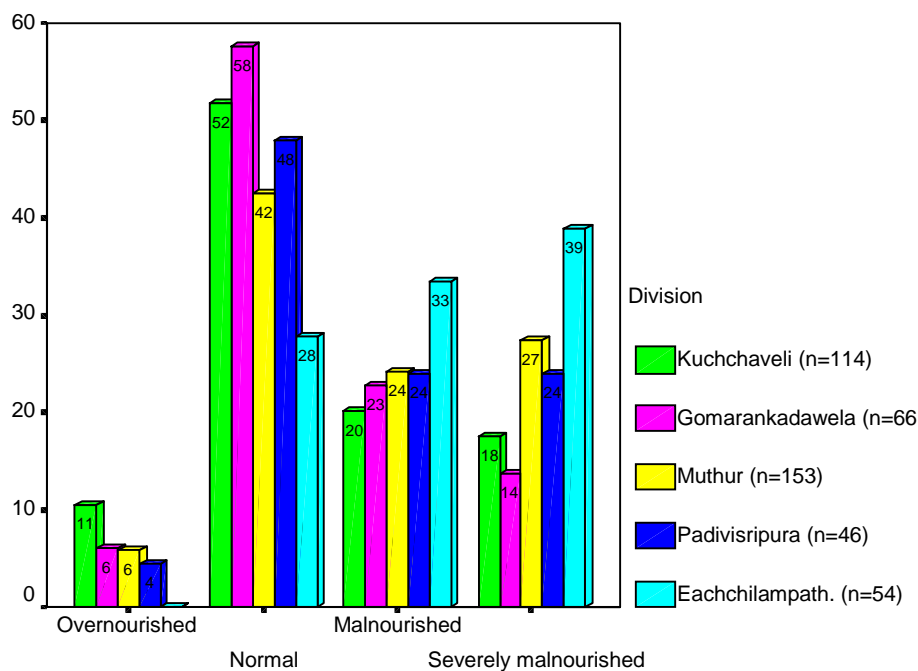


Figure 26. Nutritional status of non-pregnant mothers per division (in %, n=433)

4 Outlook

For most of the determinants of malnutrition that were assessed within this survey, the Tamil population (especially in uncleared areas) compared very unfavourable to the Sinhalese and Muslim population.

In uncleared areas infrastructure and transport is poor, the provision of government services is very limited, irrigation systems are lacking or not functioning etc. In addition to that, government restrictions on the flow of goods, (including construction material and medicine) pose an additional burden to the overall difficult situation.

To improve the situation as soon as possible the following **activities** are **suggested**:

- Community health worker (CHW) programme on village level for social mobilisation of the villagers to improve their awareness on health and nutritional constraints. In addition to that, the CHW could enable them to solve problems themselves by taking adequate action (community action plan).

Improved awareness on the following topics is highly necessary:

- personal and environmental hygiene
 - breastfeeding and complementary feeding practices
 - household food security (appropriate food, food sources, storage, processing, etc.)
 - ECCD (early childhood care and development)
 - national health services (immunisation programmes, delivery at health facilities)
- Deworming programme for children 1-10 years
 - improve food availability on household level, especially vegetables and fruits
 - home gardening
 - re-cultivation of abandoned farming land
 - school health and nutrition programme:
 - to spread health and nutrition messages through school children
 - improvements in living conditions
 - water-supply (tank and well rehabilitation)
 - hygiene and sanitation facilities
 - sewage and waste disposal

Presentation of these findings shows, that qualitative data assessments, e.g. focus-group discussions is necessary to:

- Specify reason for high prevalence of malnutrition amongst mothers and children (hygiene, seasonal food shortage, disease, education status, main income source etc.)
- Get details on reasons for the extremely high percentage of children suffering from wasting
- Further investigate the type and extend of fasting during pregnancy and lactation
- Assess the relation of subsistence farming versus cash-income to the seasonal or unspecified food shortages throughout the year.
- Get more information on hygiene, use and maintenance of available latrines

5 Summary and Conclusions

General Living conditions

On average a household consists of five members, with little variation between the ethnic groups. 5.4% of the households were female-headed households, predominantly amongst the Sinhalese population (9.3%). Muslim and Tamil families are highly affected from displacements during war and civil unrest. Nearly 40% of the Muslim families and 27% of the Tamil families in the survey sample have been displaced and resettled during the last 5 years. Besides, 4% of the total survey families do not belong to the village and might therefore resettle to their original village as soon as security situation allows.

The education level shows that the between men and women (father and mother) is not remarkable, whereas differences between the ethnic groups are significant. In uncleared areas 61% of the fathers and 66% of the mothers were not able to read and write, compared to 13%/15% for all the other communities. Education level was best amongst the Sinhalese community, where 39%/31% had completed five years of schooling and even 48%/48% completed secondary school (fathers/mothers)

Environment

The houses of the Muslim community are mainly out of a brick/cement wall (81%) and asbestos/tiles roof (71%). Walls of Sinhalese houses are made out of mud (50%) or brick (48%). 59% of the roofs had asbestos/tiles. Housing of the Tamil population is poorer, especially in the uncleared areas, where 90% of the roofs are made out of cadjan/palmyra/straw and 94% of the walls either out of mud or cadjan. However, in the cleared areas still 42% of their roofs are asbestos/tiles and 54% of the walls from brick/cement. Nearly 100% of the households in all communities used firewood for cooking. The use of kerosene, gas or electricity is an exception.

Nearly half of the households (48%) have not enough drinking water throughout the year. Most affected is the Tamil population in uncleared areas (73%), whereas the Tamil population in the cleared areas is least affected (30%). Water shortage mainly occurs during the months of June to September and about 10% of the Tamil and Muslim families face water shortage throughout the year.

Main sources for drinking water are protected wells (88%). Very few people have access to tab water or tube wells. 9% of the families drink water from unprotected wells and 3% of the families in uncleared areas mentioned pond/tank as their drinking water source.

Boiling of drinking water is not yet a common practice in the survey area. 19% of the families do never boil their drinking water and 60% only do it sometimes.

On average 40% of the surveyed families have access to latrines, with 67% amongst the Sinhalese community. In uncleared areas only 4% of the households have latrines.

Health Services and Facilities

The coverage of antenatal care (ANC) was found to be good in the survey area. Only 3% never attended ANC during their last pregnancy, 11% attended only 1-3 times, 61% attended ANC at least 4-7 times during pregnancy and 25% of the women reached the target (>7 times) The coverage is best amongst the Sinhalese community.

Whereas 90% of the Sinhalese mothers had delivered their last child in the hospital, this was only the case for 17% of the mothers in uncleared areas, where 83% had delivered at home, without any trained assistance. Still 39% of the mothers in the survey area deliver at home without trained assistance, which is a good indicator for the difficult access to health facilities in the District.

84% of the surveyed children under five had a CHRDR (Child Health Development Record) and 4% had a vaccination sheet. Only 9% had neither of the two and 3% had lost their card (during displacement or other reasons). 98% of the Sinhalese children had a CHRDR, whereas 15% of the Muslim children had neither CHRDR nor vaccination sheet.

For results on immunisation coverage children who did not have either CHRDR or vaccination sheet were determined as 'non-immunised', since mother's information alone was not considered reliable.

Out of the total number of 559 children >12 months 80% to 88% have received complete immunisation against the respective diseases. From the 482 children >12 months and possessing either CHRDR or vaccination sheet, 93 to 95% were completely vaccinated.

Immunisation coverage (% of all children > 12 months) for OPV, DPT and Measles was almost 100% amongst the Sinhalese children. 15% of the Muslim had neither CHRDR nor vaccination sheet and amongst those children with CHRDR or vaccination sheet only 84-93% had complete immunisation according to their age.

39% of the children received deworming medicine during the last 6 months, most of them amongst the Sinhalese community (63%).

Food availability and Access

During the critical months (October to January, before harvest) up to 50% of the surveyed families mentioned food shortages. The Sinhalese population seems much less affected by seasonal food shortage than Tamils and Muslims.

Food availability in terms of quantity and quality on household level is still a crucial factor. During the critical months (October to January, before harvest) up to 50% of the surveyed families mentioned food shortages. A large amount of agriculture land is abandoned due to security problems, e.g. abandoned irrigation systems etc. Land cultivation is practised close to the village only. Only few families have home gardens. Possibilities new cultivation and re-cultivation should be assessed and supported, such as repair of minor irrigation systems.

Travelling through the survey area showed that in the Divisional Centres food and consuming goods are available in remarkable variety. However, distances to the villages are often very far and transport facilities poor. If accessibility in terms of transport and money can be assured, these goods seem to be easily available. Therefore additional employment opportunities are likely to have a positive impact on food availability, thus possibly also on the nutritional status.

Care

In 93% of the households at least one child had a health card (growth chart, CHDR). Only 33% of the mothers made a correct interpretation. In the Sinhalese community 60% of the mothers gave a correct interpretation compared to only 13% in uncleared areas.

42% of the women mentioned to use iodised salt, but none of the mothers in uncleared areas. Testing the salt used by the mothers with the MBI-iodine-kit, showed, that 78% of them were

correct and really used iodised salt. Tests in all households showed, that 53% used iodised salt, thus 11% more than those who mentioned to do so. Main reason for not using iodized salt seems to be the lack of knowledge (71%) and lack of availability (21%).

Analysis of diarrhoea treatment showed, that mothers seem to be aware, that children need additional fluids. The fluids given were mainly water (68%) “Jeewanee” (oral rehydration solution, 36%) and Coffee (50%). 28% of the mothers feed the children as usual, 27% give only bread/biscuits or string hoppers, for 14% it is common practice to give honey.

Most mothers go for medical treatment with their children when they suffer from diarrhoea. 79% mentioned to go always, 17% sometimes and only 1% never.

Food Intake

77% of the surveyed children had received colostrum after birth, 93% of Sinhalese but only 74% of Tamil mothers had given colostrum to their children and only 63% of the Tamil children in uncleared areas. 90% of the children up to four months were exclusively breastfed and 75% of the children up to 6 months. Most of the children are breastfed until the age of 18 months children

By the age of 6 months about 80% of the child were fed with solid food (complementary food), but only 60% of the children within the Muslim community.

Variety of the children's diet (children > 6 months) was best amongst the Sinhalese community. All food items are given to the children more often than amongst the other communities. Vegetables are given several times per week on average but only several times a month within the other communities. Fruits are given several times per month to Sinhalese children, but only on a monthly level within the other communities. However, children's diet seems poor in variety and the consumption of fruits and vegetables, as well as fish and pulses should be promoted.

The mean consumption pattern of main food items was investigated. Rice, as a staple food for all three ethnic groups is consumed daily. Consumption of *beans, green vegetables, other vegetables* as well as *oil and fat* is higher amongst the Sinhalese families (several times per week), whereas consumption amongst Tamil and Muslim families is lower than on a weekly basis. Consumption of fruits as well as milk products was low amongst all three communities (monthly basis).

Diet in uncleared areas is very poor in variety, mainly consisting of rice, fish and vegetables. Frequency in consumption of oil, fruits as well as milk/milkproducts, eggs and meat is extremely low (monthly basis). The importance of fish in their diet indicates the vulnerability caused by fishing restrictions.

In comparison to the Tamil population, Muslims seem to be more strictly in following the fasting rules. During pregnancy 82% of the Muslim mothers follow the fasting rules and 78% during lactation. Amongst the Tamil mothers values were 41% and 35 % respectively. Tamil women in uncleared areas seem to be less strict in following fasting rules, for unknown reasons. 41% of the women have food restrictions during pregnancy and 59% after delivery. The kind of restrictions has not been assessed.

Health Status

Fever is one of the main health problems for 85% of the surveyed mothers, 56% mentioned acute respiratory infections (ARI), 17% diarrhoea and 6% Malaria.

According to their mothers, 2.4% of the children had diarrhoea at the day of interview and 6.9% during the last seven days. 47.7% of the children had any kind of acute respiratory infections (cough, cold, running nose) at the day of interview, 10.7 showed signs of skin disease and 13.8% were reported to have fever. For the prevalence of diarrhoea and ARI no significant differences between the ethnic groups were found. Prevalence of skin disease was highest amongst the Tamil children in uncleared areas (18.6%).

Nutritional status

Birth weight could only be obtained for 40% of the children, very few of them in uncleared areas. Out of all children with available information on birth weight, 19% had low birth weight (<2500g). The highest prevalence of low birth weight was found amongst the Tamil children in uncleared areas (38%), whereas in the other communities 16-20% of the children weighed less than 2500g

Prevalence of wasting (low weight-for-height, indicator for acute malnutrition is extremely high amongst all three ethnic groups. (26%, children 0-59 months). This compares very unfavourable to national data from 1995/96 (13% wasting) which is excluding the North-Eastern Province. Observations showed very poor living conditions, both personal and environmental hygiene. Amongst seasonal food shortage and infectious diseases these are very likely to be the major reason for the high percentage of wasting.

Stunting (height-for-age) is applied as an overall indicator of the long-term health and nutrition situation of a population. 27% of the children under five were stunted, in uncleared areas 42% and amongst the Tamil children in cleared areas 34%.

8% of the children were *stunted and wasted*, in uncleared areas even 16%.

The comparison of *findings in the survey area with national prevalence of malnutrition* (children 3-59 months), show very unfavourable results for all three nutritional indicators. Prevalence of stunting is 28% compared to 16%, prevalence of wasting 27% compared to 13%, prevalence of underweight is 51% compared to 31%. Data on national level (Demographic Health Survey 95/96) did not include the North Eastern Province.

Nutritional status of women in the survey area is very serious. 48% of the women are malnourished (BMI <18.5), half of them severely malnourished (BMI <17).

Similar to the findings concerning children's nutritional status, malnutrition amongst Tamil mothers is worst (50%, in uncleared areas 77%). 48% of the women in uncleared areas are even severely malnourished, which is an intolerable situation. Amongst the Muslim and Sinhalese communities malnutrition of women is lower, but still 29-40% are affected. The reasons for that are likely to be the same as for malnutrition amongst children (hygiene, seasonal food shortage, and disease) but this needs to be further investigated.

REFERENCES

Bau, A.-M.

Nutrition Baseline Survey, East Sumba, Indonesia, 1998

Department of Census and Statistics

Women and Men in Sri Lanka, Ministry of Finance, Planning, Ethnic Affairs and National Integration, Colombo, 1995

Dr. T. Krimmel, K. Schiffer

Projektvorbereitungsbericht, MIK and GTZ, Eschborn, Germany, 1997

F.S. King, A. Burgess

Nutrition for Developing Countries, Oxford University Press, New York, 1996

de Koning, F.

Nutrition Baseline Survey of the IFSP-GTZ South Gondar, Ethiopia, 1997

Gross, R. et al.

Guidelines for Nutrition Baseline Surveys in Communities, TROPMED and GTZ, Bangkok, Thailand, 1997

Levie, J.

Nutrition, Health and Water-Sanitation Survey, ACF, Trincomalee District, Sri Lanka, 1997

Schultink, W.

Report of a Nutritional Baseline Survey in IFSP-GTZ, Mulanje District, Malawai, 1996

UNICEF

Strategy for improved nutrition of children and women in developing countries, New York, 1990

UNICEF

The state of the world's children 1998, Oxford University Press, New York, 1998

World Bank

World Development Report 1995. Oxford University Press, New York, 1995

ANNEX 1: Participants of the Survey**MUTHUR**

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<i>NAME</i>	<i>DESIGNATION</i>	<i>FUNKTION</i>
Mr.Sadasivam Sinnathamby	ADE	supervisor
Dr. S.Abraham	MOH	supervisor
Mrs.Kalirajah Malinidevi	midwife	enumerator
Miss.Selvanayagam Kanthimathi	midwife	enumerator
Mrs.Maheswary Tharmasegaram	AI	enumerator
Dr.Jayalojana Sundaralingam	health	enumerator
Mrs. Santhidevy Pavalakanthan	DDE	enumerator
Mrs. Pakiyavathy Muthulingam	ADE	enumerator

PADAVISIRIPURA

<i>NAME</i>	<i>DESIGNATION</i>	<i>FUNKTION</i>
Mr.H.M.Wimalasiri	MOH	supervisor
Mrs.Parameswari Paramakuru	AI	enumerator
Ms.W.A.Palika Piriadarshini Weerakoon	midwife	enumerator
Ms.Manel Chandrakanthi	midwife	enumerator
Ms.H.L.Chandani Hiniduma Liyanage	midwife	enumerator
Ms.S.Chandra Navarathne	midwife	enumerator

GOMARANKADAWELA

<i>NAME</i>	<i>DESIGNATION</i>	<i>FUNKTION</i>
Dr. (Mrs.) H.A.C.S.Manchanayake	Dr. Med	supervisor
Ms.Rwthigha Maachelamane	AI	enumerator
Ms.W.A.Palika Piriadarshini Weerakoon	midwife	enumerator
Ms.Manel Chandrakanthi	midwife	enumerator
Ms.H.L.Chandani Hiniduma Liyanage	midwife	enumerator
Ms.S.Chandra Navarathne	midwife	enumerator

JOINING THE DIFFERENT TEAMS ACCORDING TO NEEDS

<i>NAME</i>	<i>DESIGNATION</i>	<i>FUNKTION</i>
Dr. (Mrs.) Ines Reinhard	Dr. oec. troph.	supervisor
Mrs. Daniela Kraemer	Dipl. oec. troph	supervisor

ANNEX 2: Guidelines and Equipment for Interviews

Introduction of the Enumerator to the Mother/Family

Greeting	addressing the family politely
Introduction of myself	who I am, my name, from where, which organisation
Explanation of survey	assessment of Nutrition and Health situation in this area Interview and measurements duration about ½ to one hour
Confidentiality	explain that no names are noted and no information is used by government!!
ask politely for cooperation	
Benefits	no immediate aid possibly future village development activities
Clarification	check time availability of mother for interview check whether this family has children under 5 check availability of her children under 5

How to end the interview/measurements

- Say thank you
- If the family has questions or problems, take time to advice them as good as you can!!

Enumerator equipment:

- Scale
- Measuring board for child
- Measuring board for adults/older children
- Nail
- Iodine kits
- Example health card to show mother
- Questionnaires
- Pens
- File
- ID-Card
- Permission letters for check points (enumerators and equipment)
- Flag for car/van
- First aid box
- Cap/hat
- Appropriate shoes
- Water
- Lunch parcel

What should be done - What should be avoided?

Enter Date, Interview No., Codes etc. carefully

At beginning of the interview:

Introduce yourself, give the survey objectives, duration of interview, explain about confidentiality

Sit comfortably for the interview

Ask slowly and clear

Don't read the answers, listen carefully to the answers of the mother

Don't influence the answers

Don't use English words in the questions

Don't be impatient, don't get angry

Write clearly and not too small, don't use pencils

If you made a mistake, correct it clearly

Ask and enter the birth date of the child very carefully. It is of high importance !

Do the weight and height measurements carefully

Don't leave any boxes blank

Codes: 77 = don't know
 88 = others
 99 = no answer

If 88 = others, you must specify

Say thank you at the end of the interview